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

August 28, 2019

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

RE: **Notice of Exempt Modification for T-Mobile:**
876391 - T-Mobile Site ID: CT11503A
14 Thompson Hill Road, Columbia, CT 06237
Latitude: 41° 43′ 3.44″ / Longitude: -72° 17′ 59.09″

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 161-foot mount on the existing 180-foot Monopole Tower, located at 14 Thompson Hill Road, Columbia, CT. The tower is owned by Crown Castle and the property is owned by Joshua and Eileen Lanati. T-Mobile now intends to replace three (3) existing antennas with six (6) new 600/700 MHz antennas. The new antennas will be installed at the 161-ft level of the tower. T-Mobile is also proposing tower mount modifications. As shown on the enclosed mount analysis.

Planned Modifications:
Tower:

Remove:
(6) 1 5/8" Coax

Remove and Replace:
(3) LNX 6515DS-A1M Antenna **(REMOVE)** - (3) RFS-APXVAARR24_43-U-NA20 Antenna 600/700 MHz **(REPLACE) &** (3) AIR32_B66A_B2A Antenna 1900/2100 MHz **(REPLACE)**

(3) RRUS11 B12 **(REMOVE) –** (3) Radio 4449 B71/B12 **(REPLACE)**

Install New:
(3) 1 5/8" Hybrid Fiber Line

Existing to Remain:
(3) TMA
(6) 1 5/8" Coax
(1) Fiber line
(3) AIR21 KRC118023-1_B2A_B4P Antenna 1900/2100 MHz

Ground:
Upgrade to existing ground cabinet. (Internally)

Upgrade existing breakers.
Remove existing cabinet and replace with new RBS 6102 MU AC cabinet.

The facility was approved by the Town of Columbia Planning and Zoning Commission on November 16, 1999. This approval was given with conditions that were met.

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.C.S.A. § 16-50j-73, a copy of this letter is being sent to Steven M. Everett, First Selectman for the Town of Columbia, Paula Stahl, Town Planner, Crown Castle as the tower owner, and Joshua Lanati, the property 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.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

Anne Marie Zsamba
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(201) 236-9224
AnneMarie.Zsamba@crowncastle.com

Attachments

cc:

Steven M. Everett, First Selectman
323 Route 87
Columbia, CT 06237

Paula Stahl, Town Planner
323 Route 87
Columbia, CT 06237

Joshua and Eileen Lanati
14 Thompson Hill Road
Columbia, CT 06237

Crown Castle, Tower Owner

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Exhibit A

Original Facility Approval

WN OF COLUMBIA
Planning & Zoning Commission
P.O. Box 165
Columbia, Connecticut 06237

Telephone: (860) 228-0440
Fax: (860) 228-1952

CERTIFIED #:
November 30, 1999

Sprint Spectrum L.P.
9 Barnes Industrial Road
Wallingford, CT 06492

Dear Sirs,

At a meeting held on November 16, 1999, the Columbia Planning and Zoning Commission took the following action:

approved the application of Sprint Spectrum for a telecommunications facility at 14 Thompson Hill Road, property of Thomas R. Deojay, RA2 zone, based on the submitted application, including plans entitled: "Sprint PCS, Columbia, 14 Thompson Hill Road, Columbia, Connecticut CT33XC571" prepared by Goodkind & O'Dea, Inc., 59 Elm Street, Suite 101, New Haven, Connecticut 06510, consisting of 10 sheets labeled T1, S1, and Z1-Z8, with all sheets revised to 9/14/99 except sheet S1 revised 11/8/99, with the following conditions:

1. The tower shall be structurally capable of supporting six users.
2. Prior to filing the final plan in the Land Records, a bond shall be posted to assure removal of the facility according to Section 52.7.15.5. The bond amount shall be proposed by the applicant and approved by the Town Engineer. Bond form shall be cash or letter of credit.
3. The Town Planner shall be contacted one week prior to the start of any work associated with this approval, including site development and tree removal. At the Planner's request, a preconstruction meeting with the Planner, developer and subcontractors shall be held prior to the start of work.
4. Any additional use of the site, including and not limited to additional antennas, cabinets, or other structures, and site work, requires additional permitting by the Commission.
5. The location of the tower and associated compound and the proposed driveway shall be staked out by a licensed surveyor prior to excavation or construction. The tower and compound fence shall be shown on an as-built survey at the A2 level of accuracy prior to commencement of use.
6. Clearcutting of timber shall be prohibited in a 100-foot ring around the lease area.
7. The text of this approval shall be placed on the final plan.

Technical Items
1. A signature block shall be placed on each sheet.
2. Plan sheets shall be numbered or otherwise indexed in the lower right corner.
3. Add to the sedimentation and erosion control notes on Z6:
    1. The Planner and Wetlands Agent may modify the erosion control requirements based on field conditions so as to minimize erosion and siltation on the site.
    2. Erosion controls shall be installed and inspected by the Planner prior to stump removal, grubbing, or other construction. The driveway shall be built per plan prior to development of the tower site.
    3. Prior to any work including tree removal, the Planner shall be provided with the name and phone number of a contact responsible for site work and erosion control who is on call 24 hours/day.

IN ORDER FOR THE APPROVAL TO BECOME FINAL, THE ABOVE CONDITIONS MUST BE FULFILLED.

Note that this action may be appealed for a fifteen day period following publication of notice of action in the Willimantic Chronicle. (Notice was published on or about November 22, 1999.) Do not hesitate to contact me at 228-0440 if you have any questions.

Sincerely,

Martha Fraenkel
Land Use Planner/Zoning Official

MF/ds

cc: Tom Regan

encl: procedures

CERTIFIED MAIL # Z 039 122 992

"SUMMARY RULING"
(APPROVAL WITH CONDITIONS)

As provided for in Connecticut General Statutes Section 22a-36 through 22a-45, as amended, and in Sections 5,6.6b, 9.1 through 9.10 of the Inland Wetlands.and Watercourse Regulations of the Town of Columbia, I move that the application No. AP9899-20 and described below be approved and a permit be granted with the conditions listed below in that the proposed activity does not have a significant impact on the wetlands or watercourses as defined in Section 2.20 in the Inland Wetlands Commission Regulations.

Applicant: Sprint PCS

Address: 9 Barnes Industrial Rd. Wallingford, CT 06492

Address of Activity: 14 Thompson Hill Rd

Property owned by: Thomas R. & Willie Jo Deojay

Maps Dated: 5/28/99

Application received on: 6/1/99

For the proposed activity: Upgrade existing gravel access drive by placing fill & 18" RCP - area of fill & disturbance in wetlands approximately 230 sq. ft.

Conditions:

1. The Inland Wetland Commission Agent is to be notified 48 hours before the commencement of any part of the activity approved above.

2. The granting of this permit does not relieve the applicant from obtaining additional permits and/or approvals required by other agencies, federal, state and local.

3. If an approval or permit is granted by another agency and contains conditions affecting the wetlands and/or watercourses and the area 75 feet from their flagged boundaries not addressed by this permit, the applicant must resubmit the application for further consideration by the Inland Wetlands Commission for a decision before work on the activity is to take place.

4. The duration of this permit is for five (5) years unless extended; by this Agency, and shall expire upon the completion of the activity approved herein or within one year of the start of the activity; whichever is sooner.

5. The applicant shall not assign or transfer this permit, or any part thereof, without the written permission of the Agency.

6. All activities for the prevention of soil erosion, such as silt fences and hay bales shall be under the direct supervision of the Inland Wetland Agent and if he deems it necessary, a certified engineer, who shall employ the best management practices, consistent with the terms and conditions of this permit, to control storm water discharges and to prevent erosion and sedimentation, to otherwise prevent pollution of wetlands or watercourses.

7. A copy of this motion and conditions listed, when approved by a majority vote of the IWC members present, shall constitute a permit for the activity described in the application and accompanying data when signed and dated by the Agent.

8. Diversion plan in place if work undertaken during streamflow. Plan to be approved by agent.

9. See additional conditions dated 7/6/99 attached.

Motion by: C. Robinson
Seconded by: C. Sanborn
Commission Action: Approved
Date: 7/6/99

John Valente, Agent

July 6, 1999
Additional conditions for Sprint PCS

Driveway Crossing
1. Engineer to meet with agent and contractor.
2. Engineer to flag crossing and set elevations.
3. All silt fence to be in place prior to any work within 100' of wetlands.
4. Engineer to be present during initial stage of culvert installation and provide as-built certifying correct implementation of plan.

Driveway Design Outside of the Upland Review Area
1. Design of driveway is to prevent concentrated flows.
2. Any flow pattern greater than 200' to be broken up by acceptable erosion and soil measures, leak offs, grade changes or culverting.
3. All disturbed areas to be mulched and seeded.
4. All excess fill material to be deposited greater than 100' from wetlands - graded, seeded and mulched.

Mitigation
1. Mitigation to be done under the direction of the soil scientist.
2. Soil scientist to provide report to Commission on implementation of plan.
3. Soil scientist to verify success of planting at the beginning and end of the following growing season and provide report to Commission.

CERTIFIED MAIL # Z 039 122 992

"SUMMARY RULING"
(APPROVAL WITH CONDITIONS)

As provided for in Connecticut General Statutes Section 22a-36 through 22a-45, as amended, and in Sections 5,6.6b, 9.1 through 9.10 of the Inland Wetlands.and Watercourse Regulations of the Town of Columbia, I move that the application No. AP9899-20 and described below be approved and a permit be granted with the conditions listed below in that the proposed activity does not have a significant impact on the wetlands or watercourses as defined in Section 2.20 in the Inland Wetlands Commission Regulations.

Applicant: Sprint PCS

Address: 9 Barnes Industrial Rd. Wallingford, CT 06492

Address of Activity: 14 Thompson Hill Rd

Property owned by: Thomas R. & Willie Jo Deojay

Maps Dated: 5/28/99

Application received on: 6/1/99

For the proposed activity: Upgrade existing gravel access drive by placing fill & 18" RCP - area of fill & disturbance in wetlands approximately 230 sq. ft.

Conditions:

1. The Inland Wetland Commission Agent is to be notified 48 hours before the commencement of any part of the activity approved above.

2. The granting of this permit does not relieve the applicant from obtaining additional permits and/or approvals required by other agencies, federal, state and local.

3. If an approval or permit is granted by another agency and contains conditions affecting the wetlands and/or watercourses and the area 75 feet from their flagged boundaries not addressed by this permit, the applicant must resubmit the application for further consideration by the Inland Wetlands Commission for a decision before work on the activity is to take place.

4. The duration of this permit is for five (5) years unless extended; by this Agency, and shall expire upon the completion of the activity approved herein or within one year of the start of the activity; whichever is sooner.

5. The applicant shall not assign or transfer this permit, or any part thereof, without the written permission of the Agency.

6. All activities for the prevention of soil erosion, such as silt fences and hay bales shall be under the direct supervision of the Inland Wetland Agent and if he deems it necessary, a certified engineer, who shall employ the best management practices, consistent with the terms and conditions of this permit, to control storm water discharges and to prevent erosion and sedimentation, to otherwise prevent pollution of wetlands or watercourses.

7. A copy of this motion and conditions listed, when approved by a majority vote of the IWC members present, shall constitute a permit for the activity described in the application and accompanying data when signed and dated by the Agent.

8. Diversion plan in place if work undertaken during streamflow. Plan to be approved by agent.

9. See additional conditions dated 7/6/99 attached.

Motion by: C. Robinson
Seconded by: C. Sanborn
Commission Action: Approved
Date: 7/6/99

John Valente, Agent

July 6, 1999
Additional conditions for Sprint PCS

Driveway Crossing
1. Engineer to meet with agent and contractor.
2. Engineer to flag crossing and set elevations.
3. All silt fence to be in place prior to any work within 100' of wetlands.
4. Engineer to be present during initial stage of culvert installation and provide as-built certifying correct implementation of plan.

Driveway Design Outside of the Upland Review Area
1. Design of driveway is to prevent concentrated flows.
2. Any flow pattern greater than 200' to be broken up by acceptable erosion and soil measures, leak offs, grade changes or culverting.
3. All disturbed areas to be mulched and seeded.
4. All excess fill material to be deposited greater than 100' from wetlands - graded, seeded and mulched.

Mitigation
1. Mitigation to be done under the direction of the soil scientist.
2. Soil scientist to provide report to Commission on implementation of plan.
3. Soil scientist to verify success of planting at the beginning and end of the following growing season and provide report to Commission.

Exhibit B

Property card

14 THOMPSON HILL RD

Location	14 THOMPSON HILL RD	**Mblu**	011/ / 069/ /
Acct#	00054300	**Owner**	LANATI JOSHUA & EILEEN
Assessment	$250,400	**Appraisal**	$502,300
PID	543	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$127,400	$374,900	$502,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$89,200	$161,200	$250,400

Owner of Record

Owner	LANATI JOSHUA & EILEEN	**Sale Price**	$155,000
Co-Owner		**Certificate**	
Address	14 THOMPSON HILL RD COLUMBIA, CT 06237	**Book & Page**	0197/0163
		Sale Date	04/14/2011
		Instrument	28

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
LANATI JOSHUA & EILEEN	$155,000		0197/0163	28	04/14/2011
DEOJAY THOMAS R ESTATE OF	$0		0122/0722	25	09/23/2010
DEOJAY THOMAS R	$0		0122/0722		10/25/1999
DEOJAY THOMAS R & WILLIE JO	$0		0059/0018		05/18/1982

Building Information

Building 1 : Section 1

Year Built:	1955
Living Area:	1,677
Replacement Cost:	$190,432
Building Percent Good:	66
Replacement Cost Less Depreciation:	$125,700

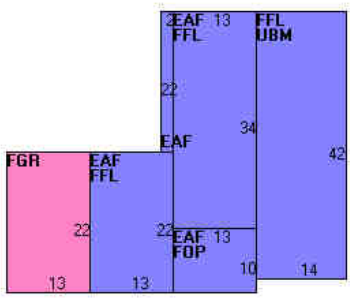
Building Attributes

Building Photo

Field	Description
Style	Conventional
Model	Residential
Grade:	Average +20
Stories:	1 1/2 Stories
Occupancy	1
Exterior Wall 1	Stucco/Masonry
Exterior Wall 2	Wood Shingle
Roof Structure:	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Pine/Soft Wood
Interior Flr 2	
Heat Fuel	Electric
Heat Type:	Electr Basebrd
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	8 Rooms
Bath Style:	Average
Kitchen Style:	Average
Whirlpool	
Fireplace(s)	1
Fndtn. Level	

(http://images.vgsi.com/photos2/ColumbiaCTPhotos//\00\00\75/76.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
FFL	First Floor Living	1,316	1,316
EAF	Attic, Expansion, Finished	902	361
FGR	Garage, Framed	286	0
FOP	Porch, Open, Finished	130	0
UBM	Basement, Unfinished	588	0
		3,222	1,677

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	1010
Description	Single Fam
Zone	RA
Neighborhood	12

Land Line Valuation

Size (Acres)	29.4
Frontage	0
Depth	0
Assessed Value	$161,200

Alt Land Appr Category No

Appraised Value $374,900

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
BRN3	Barn 1 St. w Loft			540 S.F.	$1,300	1
SHD1	Shed Frame			64 S.F.	$400	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$127,400	$374,900	$502,300
2016	$127,400	$374,900	$502,300
2015	$123,000	$374,900	$497,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$89,200	$161,200	$250,400
2016	$89,200	$161,200	$250,400
2015	$86,100	$160,330	$246,430


14 THOMPSON HILL RD COLUME
14 Thompson Hill Rd
Columbia, CT 06237
14 Thompson Hill Rd
Columbia, CT 06237
Energy Systems of Conn
Willimantic Rd
Baptist Fellowship
Roses Bridge Rd
Edgarton Rd
Dunkin' Donu
Calypso Blue Pool & Spa
Hunters Ridge
Thompson Hill Rd
14 Thompson Hill Road
Clarks Brook
Macht Rd
Satellite
Google

Exhibit C

Construction Drawings

SCOPE OF WORK

ITEMS TO BE INSTALLED ON & REMOVED FROM EXISTING TOWER:

- REMOVE EXISTING ANTENNA MOUNTS, REMOVE (4) EXISTING ANTENNAS, AND REMOVE (2) EXISTING TMAS

- INSTALL T-MOBILE ANTENNA MOUNT (VFA12-HD) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE ANTENNA (APXVAARR24_43-U-NA20) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE RADIO (4449 B71+B12) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE RADIO (4415 B25) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE RADIO (4415 B66A) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE ANTENNA (APX16DWV-16DWV-S-E-A20)TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL T-MOBILE COAX JUMPER CABLES (TYP. OF 12 PER SECTOR, TOTAL OF 36).
- INSTALL T-MOBILE 6x12 HCS HYBRID CABLE (TOTAL OF 3).

ITEMS TO BE INSTALLED ON EXISTING EQUIPMENT PAD:

- REMOVE (1) RBS 6201 ODE
- REMOVE (1) DUS 41
- REMOVE (2) RUS01 B2
- REMOVE (4) RUS01 B12
- REMOVE (8) COAX CABLES
- INSTALL (2) ERICSSON BASEBAND 6630 UNITS
- INSTALL (1) RBS 6102 MU AC EQUIPMENT CABINET

ITEMS TO REMAIN:

- (1) DUG20

SITE ADDRESS:	33 JANOWSKI ROAD ASHFORD, CT 06278
LATITUDE (NAD 83):	N 41° 57' 7.70"
LONGITUDE (NAD 83):	W 72° 11' 43.90"
COUNTY:	WINDHAM
JURISDICTION:	-
LANDLORD:	CROWN CASTLE INTERNATIONAL 500 W. CUMMINGS PARK, STE 3600 WOBURN, MA 01801
STRUCTURE TYPE:	SELF-SUPPORT
STRUCTURE HEIGHT:	192'
RAD CENTER:	158'
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	SITE PLAN
S-1	PROPOSED TOWER ELEVATION & ANTENNA LAYOUT PLAN
S-2	EQUIPMENT DETAILS
S-3	MOUNT DETAIL
RF-1	ANTENNA INFORMATION CHART
RF-2	RF EQUIPMENT SCHEMATIC
E-1	ONE LINE DIAGRAM
G-1	GROUNDING RISER DIAGRAM

CROWN CASTLE SITE ID #: 876345
CROWN CASTLE SITE NAME: SKY HILL

ENGINEERING

2018 CONNECTICUT STATE BUILDING CODE
2018 AMENDMENT WITH 2015 INTERNATIONAL BUILDING CODE
2009 ICC/ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2017 NATIONAL ELECTRICAL CODE (NFPA 70 2017)
ANSI/TIA-222-G

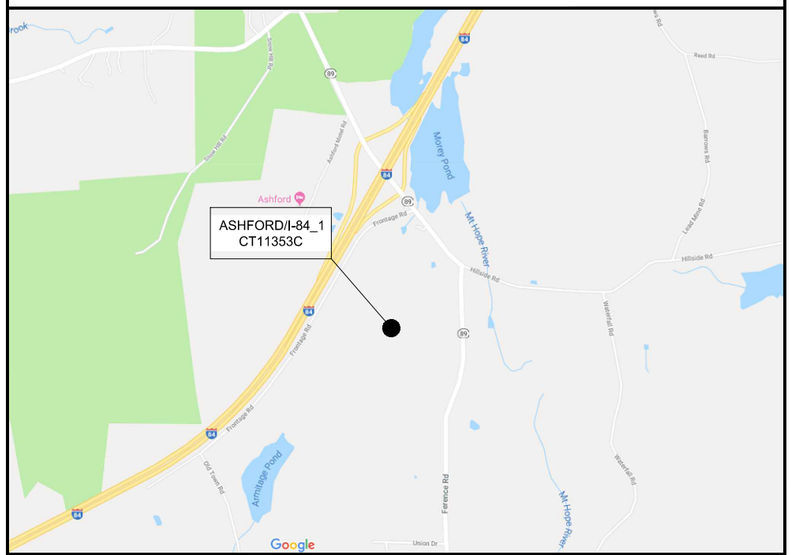
NOTE:

ALL CONSTRUCTION ACTIVITIES ARE TO BE COMPLETED DIRECTLY THROUGH CROWN. CONTRACTOR MUST HAVE CONSTRUCTION PO AND NTP FROM CROWN DIRECT IN ORDER TO BEGIN. PRE-APPROVAL TO ENTER THE PROPERTY MUST BE OBTAINED. FOR ACCESS AUTHORIZATION, PLEASE CONTACT CROWN.

L600 PROJECT
SITE NUMBER: CT11353C

SITE NAME: ASHFORD/I-84_1
CROWN SITE NAME: SKY HILL
BU#: 876345
T-MOBILE RAN TEMPLATE: 67D93D4 OUTDOOR

VICINITY MAP



84 EAST - EXIT 72, TURN RIGHT OFF RAMP, TURN RIGHT ON FRONTAGE ROAD. TURN LEFT ON JANOSKI. SELF SUPPORT TOWER IN BACK ABOUT 1/4 MILE. ACCESS RD: 41.57'19.9800", 072.11'44.9160"

GENERAL NOTES

1. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
3. HANDICAP REQUIREMENTS ARE NOT REQUIRED.
4. THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
5. ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RADIOS AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
6. NO COMMERCIAL SIGNAGE IS PROPOSED.

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

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
31055
LICENSED PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004
DRAWN BY: JT
CHECKED BY: DC

SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

TITLE SHEET

T-1

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" - CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
   THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. 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/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED-STD-10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE" AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. 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 CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR 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 E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. 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, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. 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 CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR 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.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. 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.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
   CARRIER: T-MOBILE
   TOWER OWNER: CROWN CASTLE USA INC.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CROWN CASTLE.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 20,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) 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 FLUSH TO FINISH GRADE 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.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW " CT11353C".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG (-)	BLACK**

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34055
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	JT
CHECKED BY:	DC

SUBMITTALS

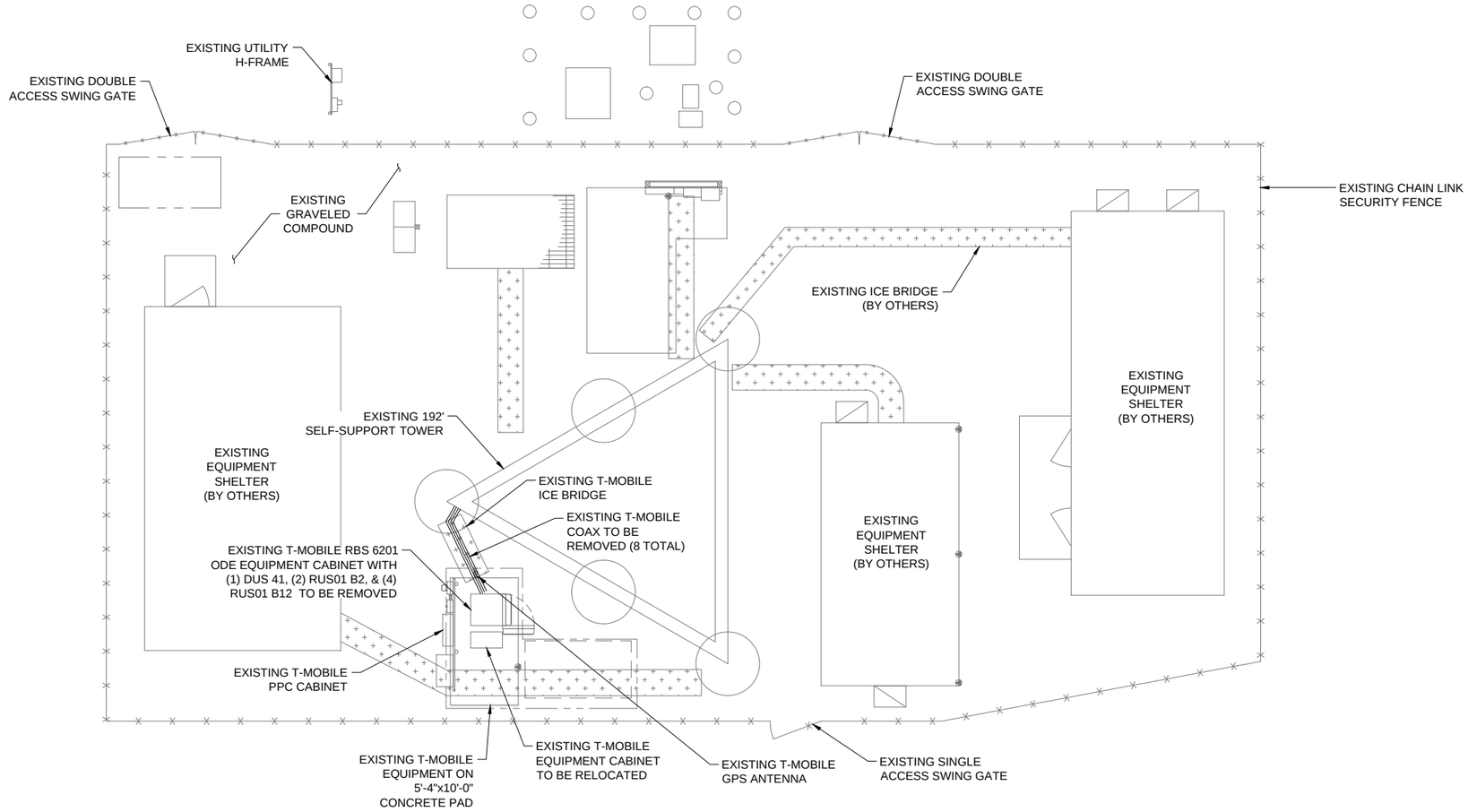
1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

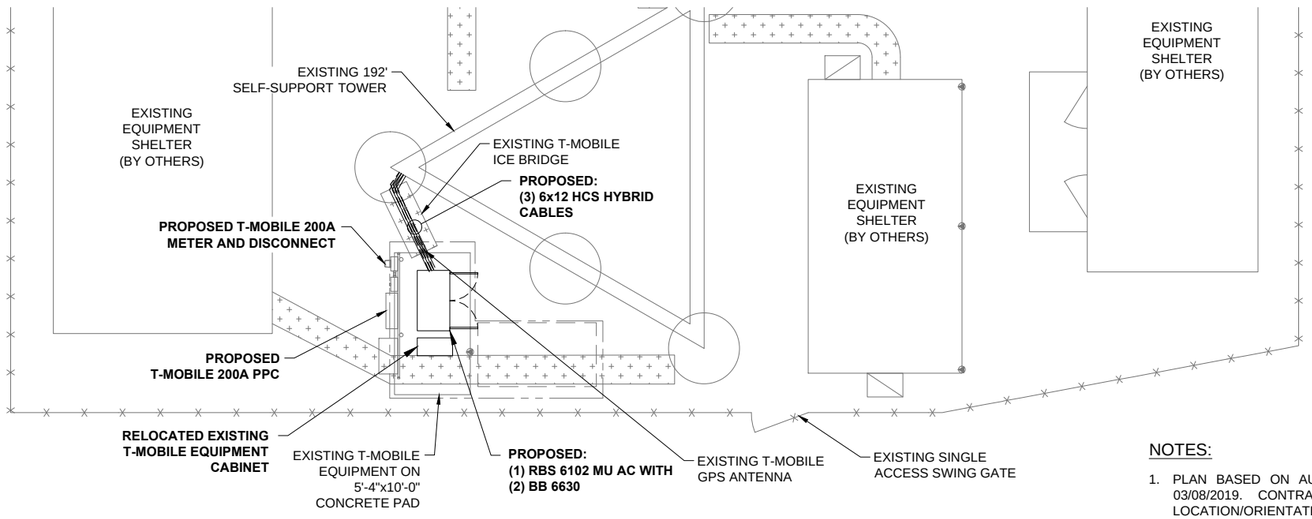
GENERAL NOTES

GN-1

TRUE NORTH



EXISTING SITE PLAN



PROPOSED SITE PLAN

NOTES:

1. PLAN BASED ON AUTOCAD DRAWINGS ISSUED BY CROWN CASTLE ON 03/08/2019. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

1 SITE PLAN

SCALE: 3/16" = 1'-0"

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34055
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004

DRAWN BY: JT

CHECKED BY: DC

SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

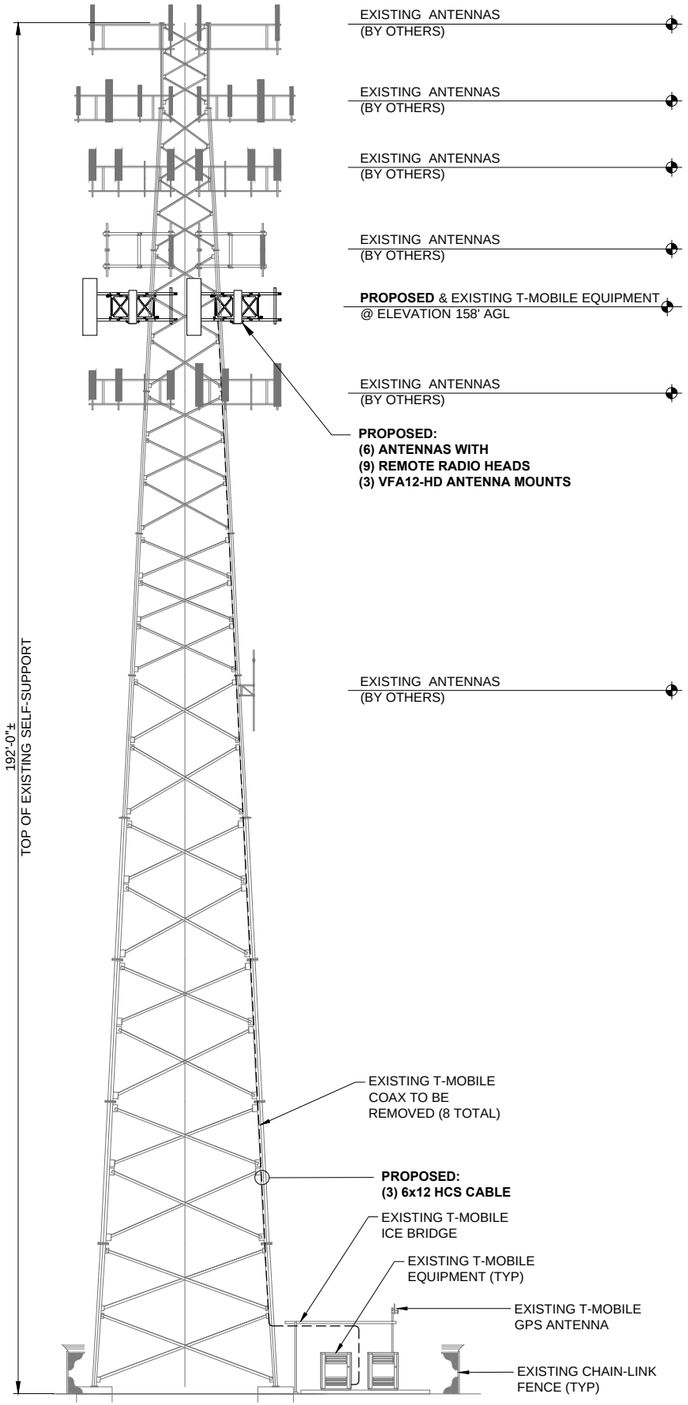
ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

SITE PLAN

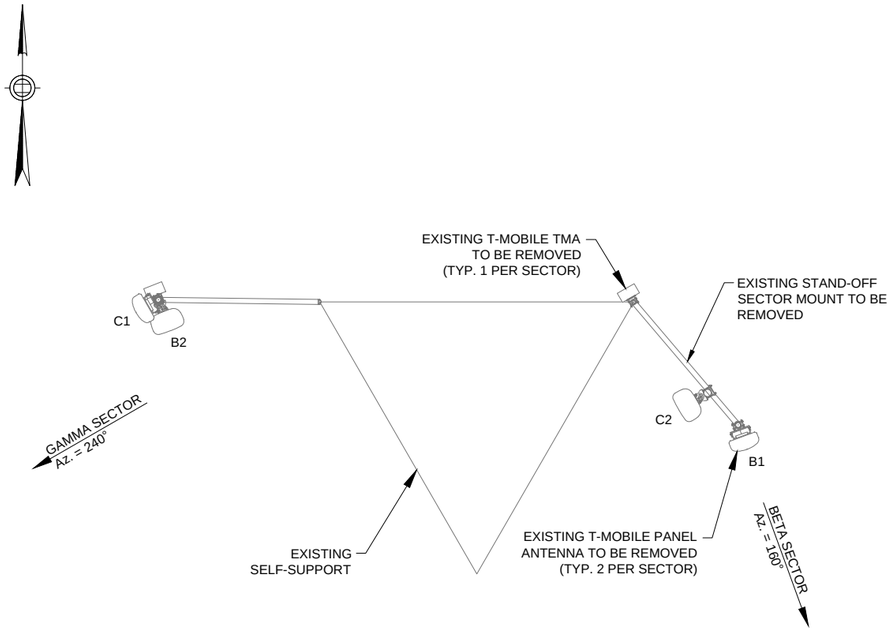
C-1

NOTES:

1. CONTRACTOR SHALL REFER TO THE STRUCTURAL ANALYSIS REPORT; SITE NUMBER: CT11353C; SITE NAME: ASHFORD/I-84_1; CROWN BU NUMBER: 876345; CROWN SITE NAME: SKY HILL; CROWN ORDER NUMBER: 495679; ISSUED BY B+T GROUP. DATED ON 06/19/19. PER THIS ANALYSIS NO MODIFICATIONS ARE REQUIRED. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE INSTALLED PROPERLY AS DESCRIBED IN THIS REPORT.

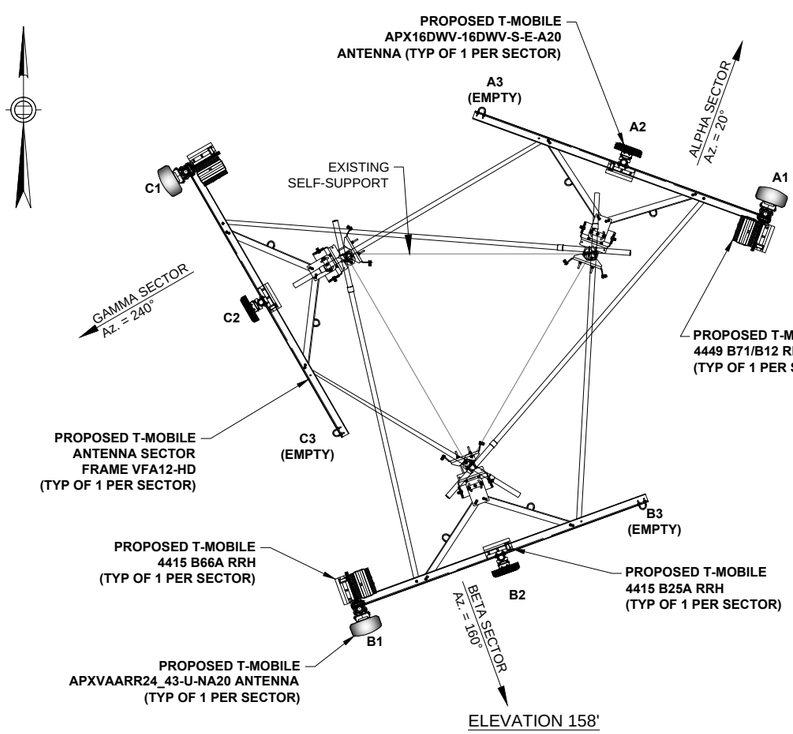


1 TOWER ELEVATION — SCALE: 3/32" = 1'-0"



ELEVATION 158'

2 EXISTING ANTENNA LAYOUT — SCALE: N.T.S.



ELEVATION 158'

3 PROPOSED ANTENNA LAYOUT — SCALE: N.T.S.

NOTES:

1. CONTRACTOR SHALL REFER TO THE MOUNT ANALYSIS REPORT; SITE NUMBER: CT11353C; SITE NAME: ASHFORD/I-84_1; CROWN BU NUMBER: 876345; CROWN SITE NAME: SKY HILL; CROWN ORDER NUMBER: 495679; ISSUED BY MASTEC NETWORK SOLUTIONS, DATED ON 06/13/2019. PER THIS ANALYSIS NO MODIFICATIONS ARE REQUIRED FOR THE PROPOSED EQUIPMENT. CONTRACTOR SHALL CONFIRM ALL T-MOBILE EXISTING AND PROPOSED EQUIPMENT ARE INSTALLED IN ACCORDANCE WITH THIS REPORT.
2. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
3. CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34005
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	JT
CHECKED BY:	DC

SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

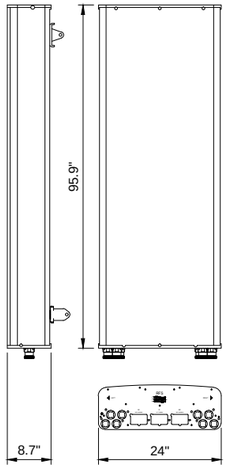
ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

PROPOSED TOWER ELEVATION & ANTENNA LAYOUT PLAN

S-1

MANUFACTURER: RFS
MODEL NO.: APXVAARR24_43-U-NA20

COLOR: LIGHT GRAY
DIMENSIONS (LxWxD): 95.9" x 24" x 8.7"
2436mm x 609mm x 222mm
WEIGHT (lbs): 58
CONNECTOR: 8 x 4.3-10 FEMALE AT BOTTOM +
6 AISG CONNECTORS (3 MALE/3 FEMALE)
SURVIVAL/RATED WIND VELOCITY (KM/H): 241 (150)

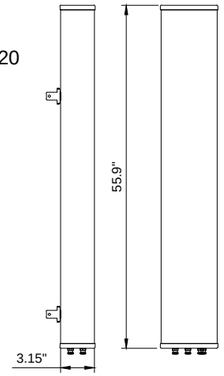


1 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

MANUFACTURER: RFS
MODEL NO.: APX16DWV-16DWV-S-E-A20

COLOR: LIGHT GRAY
DIMENSIONS (LxWxD): 55.9" x 13" x 3.15"
WEIGHT (lbs): 40.7
CONNECTOR: (4) 7-16 Long Neck FEMALE/ BOTTOM
SURVIVAL/RATED WIND LOAD @ FRONT: 200km/h (125mph)
WIND LOAD @ FRONT: 756 N (170lbf)
WIND LOAD @ MAX: 756 N (170lbf)
WIND LOAD @ SIDE: 231 N (52lbf)
WIND LOAD @ REAR: 408 n (92lbf)

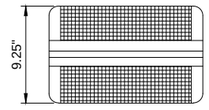


2 ANTENNA SPECIFICATIONS

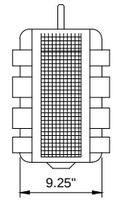
SCALE: N.T.S.

MANUFACTURER: ERICSSON
MODEL NO.: 4449 B71+B12

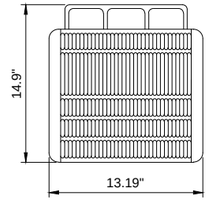
COLOR: LIGHT GRAY
DIMENSIONS (LxWxD): 14.9" x 13.19" x 9.25"
378mm x 335mm x 235mm
WEIGHT (lbs): 74



PLAN



SIDE



FRONT

3 RRUS SPECIFICATIONS

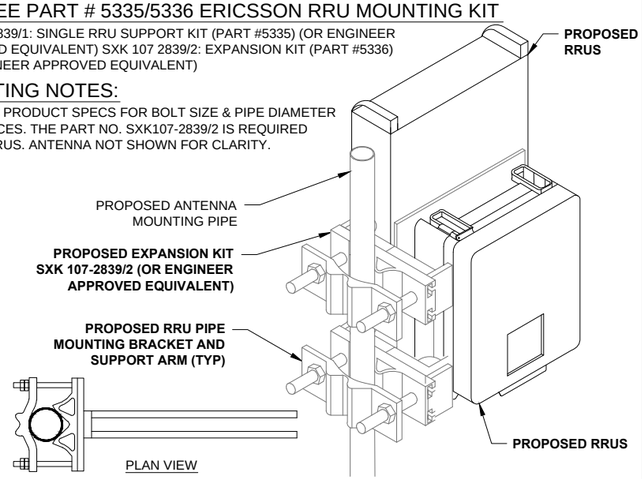
SCALE: N.T.S.

CUE DEE PART # 5335/5336 ERICSSON RRU MOUNTING KIT

SXK 107 2839/1: SINGLE RRU SUPPORT KIT (PART #5335) (OR ENGINEER APPROVED EQUIVALENT) SXK 107 2839/2: EXPANSION KIT (PART #5336) (OR ENGINEER APPROVED EQUIVALENT)

MOUNTING NOTES:

REFER TO PRODUCT SPECS FOR BOLT SIZE & PIPE DIAMETER TOLERANCES. THE PART NO. SXK107-2839/2 IS REQUIRED FOR (2) RRUS. ANTENNA NOT SHOWN FOR CLARITY.



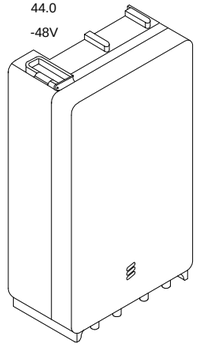
PLAN VIEW

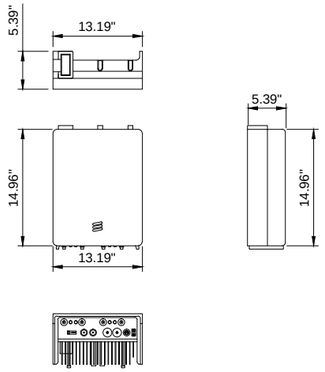
4 RRU MOUNTING DETAIL

SCALE: N.T.S.

MANUFACTURER: ERICSSON
MODEL NO.: RRUS-4415 B25
TECHNOLOGY: LTE 1900
DIMENSIONS (HxWxD): 14.96" x 13.19" x 5.39"
WEIGHT (lbs): 44.0
POWER SUPPLY: -48V

NOTE:
PENDING FINAL PRODUCT SPECIFICATION



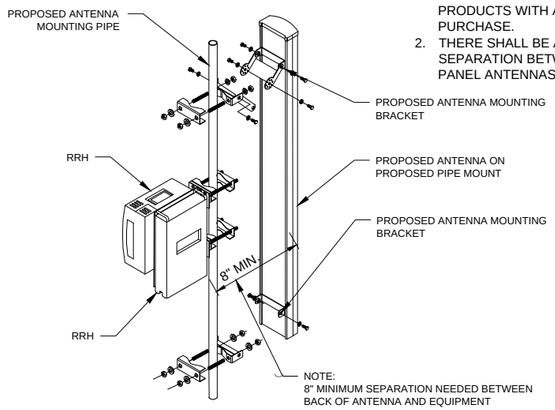


5 RRUS SPECIFICATIONS

SCALE: N.T.S.

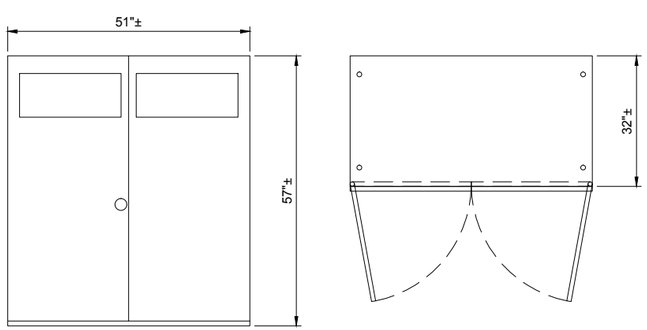
NOTES:

1. MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE.
2. THERE SHALL BE A MINIMUM 3'-0" SEPARATION BETWEEN ALL LTE PANEL ANTENNAS.



6 ANTENNA MOUNTING DETAIL

SCALE: N.T.S.



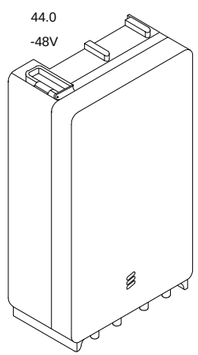
NOTES:
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- FOR COMPLETE SPECIFICATIONS REFER TO ERICSSON'S WEB SITE.

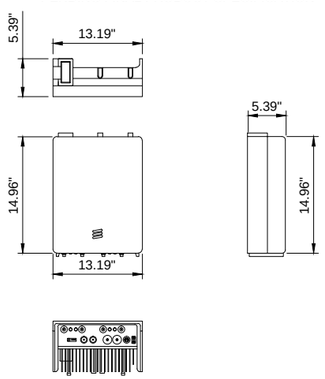
7 ERICSSON BBS 6102 CABINET

SCALE: N.T.S.

MANUFACTURER: ERICSSON
MODEL NO.: RRUS-4415 B66
TECHNOLOGY: LTE 1900
DIMENSIONS (HxWxD): 14.96" x 13.19" x 5.39"
WEIGHT (lbs): 44.0
POWER SUPPLY: -48V

NOTE:
PENDING FINAL PRODUCT SPECIFICATION





8 RRUS SPECIFICATIONS

SCALE: N.T.S.

9 DETAIL NOT USED

SCALE: N.T.S.

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34055
LICENSED PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004
DRAWN BY: JT
CHECKED BY: DC

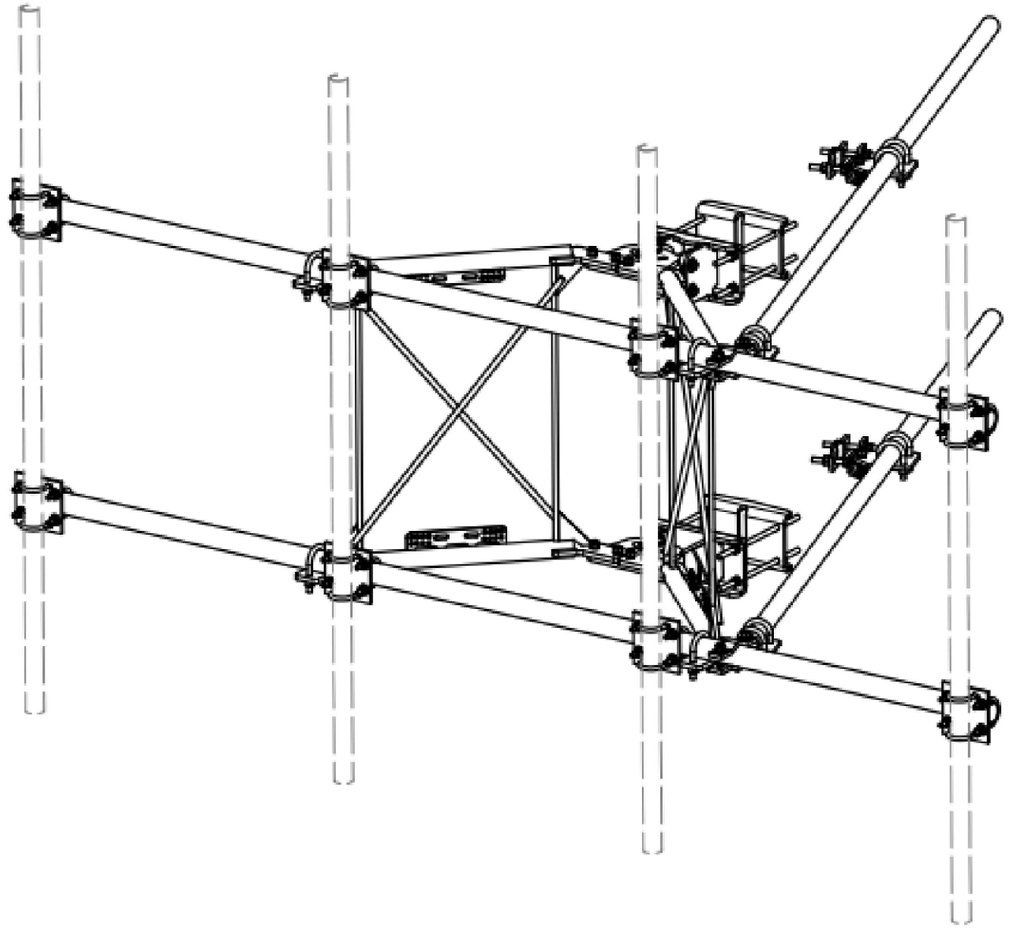
SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

EQUIPMENT DETAILS

S-2



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-VFAW	SUPPORT ARM		71.41	142.81
2	1	X-HDCAMTBW	CLAMP WELDMENT FOR BCAM-HD		33.86	33.86
3	1	X-MHTPHD	MULTI-HOLE TAPER PLATE WELDMENT		36.24	36.24
4	2	X-VFAPL4	VFA-HD PIVOT PLATE	12 in	15.88	31.77
5	2	X-LCBP4	BENT BACKING PLATE	13 in	19.00	38.01
6	1	X-HDCAMSS	ANGLE ADJUSTMENT WELDMENT FOR BCAM-HD		16.39	16.39
7	4	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	23.49
8	1	X-HDCAMSP	POSITIONING PLATE WELDMENT FOR BCAM-HD		2.58	2.58
9	4	X-TBCA	TIE BACK CLIP ANGLE		2.01	8.02
10	8	SCX2	CROSSOVER PLATE	7 in	4.80	38.37
11	4	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	14.37
12	8	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.36	18.90
13	2	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
14	2	P30150	2-7/8" X 150" (2-1/2" SCH. 40) GALVANIZED PIPE	150 in	76.94	153.87
15	4	A34212	3/4" x 2-1/2" UNC HEX BOLT (A325)	2 1/2 in	0.48	1.92
16	4	G34FW	3/4" HDG USS FLATWASHER		0.06	0.24
17	4	G34LW	3/4" HDG LOCKWASHER		0.04	0.17
18	4	G34NUT	3/4" HDG HEAVY 2H HEX NUT		0.21	0.85
19	8	G58R-18	5/8" x 18" THREADED ROD (HDG.)	18 in	0.40	3.19
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
22	4	X-UB5300	5/8" X 3" X 5-1/4" X 2-1/2" U-BOLT (HDG.)		1.15	4.60
23	8	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	8.00
24	2	G5807	5/8" x 7" HDG HEX BOLT GR5 FULL THREAD	7 in	0.70	1.41
25	1	G5806	5/8" x 6" HDG HEX BOLT GR5 FULL THREAD	6 in	0.62	0.62
26	8	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	3.55
27	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
28	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
29	25	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.76
30	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
31	71	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.22
32	32	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	23.64
33	16	X-UB1212	1/2" X 2" X 3" X 1-1/4" U-BOLT (HDG.)		0.60	9.56
34	64	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.18
35	64	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.89
36	64	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.58
					TOTAL WT. #	738.06

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
	REVISION HISTORY			
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION TO B-CAM CONNECTION		CEK	12/7/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

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 ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION:
12' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

SITE PRO 1 — A valmont company
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 1/25/2017		VFA12-HD	1 OF 5
CLASS / SUB	DRAWING USAGE	CHECKED BY	DWG. NO.	
81 / 02	CUSTOMER	BMC 12/13/2017	VFA12-HD	

1 VFA12-HD MOUNT DETAIL — SCALE: N.T.S.

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34055
LICENSED PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004
DRAWN BY: JT
CHECKED BY: DC

SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

MOUNT DETAIL

S-3

67D93D4 OUTDOOR - TOWER TOP EQUIPMENT SCHEDULE (RE: CT11353C_L600_3.1_DRAFT_2019-05-09)													
ANTENNA NUMBER (FROM L TO R)	ANTENNA MODEL	ANTENNA AZIMUTH	MECH. TILT	ELEC. TILT	ANTENNA CENTERLINE FROM GROUND	TMA/RRUS MODEL	TMA/RRUS QUANTITY	COAX/HYBRID CABLE			JUMPERS		
								SIZE/TYPE	QUANTITY	LENGTH	TYPE	QTY	LENGTH
A1	**APX16DWV-16DWV-S-E-A20**	**20°**	**0°**	**2°**	**158'**	**RADIO 4415 B25**	**1**	**6x12 HCS**	**1**	**203'**	**COAX**	**4**	**10'**
A2	**APXVAARR24_43-U-NA20**	**20°**	**0°**	**2°**	**158'**	**RADIO 4449 B71+B12** **RADIO 4415 B66A**	**1** **1**	-	-	-	**COAX** **COAX**	**4** **4**	**10'** **10'**
B1	**APX16DWV-16DWV-S-E-A20**	**160°**	**0°**	**2°**	**158'**	**RADIO 4415 B25**	**1**	**6x12 HCS**	**1**	**203'**	**COAX**	**4**	**10'**
B2	**APXVAARR24_43-U-NA20**	**160°**	**0°**	**2°**	**158'**	**RADIO 4449 B71+B12** **RADIO 4415 B66A**	 **1**	-	-	-	**COAX** **COAX**	**4** **4**	**10'** **10'**
C1	**APX16DWV-16DWV-S-E-A20**	**240°**	**0°**	**2°**	**158'**	**RADIO 4415 B25**	**1**	**6x12 HCS**	**1**	**203'**	**COAX**	**4**	**10'**
C2	**APXVAARR24_43-U-NA20**	**240°**	**0°**	**2°**	**158'**	**RADIO 4449 B71+B12** **RADIO 4415 B66A**	 **1**	-	-	-	**COAX** **COAX**	**4** **4**	**10'** **10'**

NOTES:

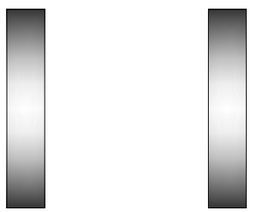
1. EQUIPMENT LISTED IN **BOLD**, DELINEATES THAT THE EQUIPMENT IS PROPOSED

1 EQUIPMENT INFORMATION CHART

SCALE: NONE

KEY
EXISTING
PROPOSED

KEY
ANTENNA POSITION AS VIEW FROM BEHIND



EQUIPMENT NOTES:

1. THE HYBRID CABLE LENGTH SHOW IS ONLY AN ESTIMATE AND SHOULD NOT BE USED FOR ORDERING MATERIALS. CONFIRM THE REQUIRED HYBRID CABLE LENGTH WITH T-MOBILE PRIOR TO ORDERING OR INSTALLATION.
2. THE CONTRACTOR SHALL TEST THE OPTICAL FIBER AFTER INSTALLATION IN ACCORDANCE WITH T-MOBILE STANDARDS AND SUPPLY THE RESULTS TO T-MOBILE.
3. THE CONTRACTOR SHALL CONFIRM THE TOWER TOP EQUIPMENT LIST ABOVE WITH THE FINAL T-MOBILE RFDS PRIOR TO INSTALLATION.
4. ALL EXISTING AND PROPOSED ANTENNA CABLES SHALL BE COLOR CODED PER T-MOBILE STANDARDS.
5. REFER TO EQUIPMENT INSTALLATION STANDARDS FOR ADDITIONAL INFORMATION.
6. REFER TO EQUIPMENT MANUFACTURER'S SPECIFICATION SHEETS FOR ADDITIONAL INFORMATION NOT LISTED ABOVE.

2 ANTENNA KEY

SCALE: NONE

67D93D4 OUTDOOR - TOWER LOADING SUMMARY				
EQUIPMENT TYPE	EXISTING QUANTITY	QUANTITY REMOVED	QUANTITY ADDED	TOTAL QUANTITY
PANEL ANTENNA	4	4	6	6
COAX CABLE	8	8	0	0
HYBRID CABLE	0	0	3	3
FIBER JUMPER	0	0	0	0
COAX JUMPER	0	0	36	36
TMA	2	2	0	0
RADIO	0	0	9	9

3 ANTENNA & CABLE SCHEDULE

SCALE: NONE

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
31055
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004

DRAWN BY: JT

CHECKED BY: DC

SUBMITTALS

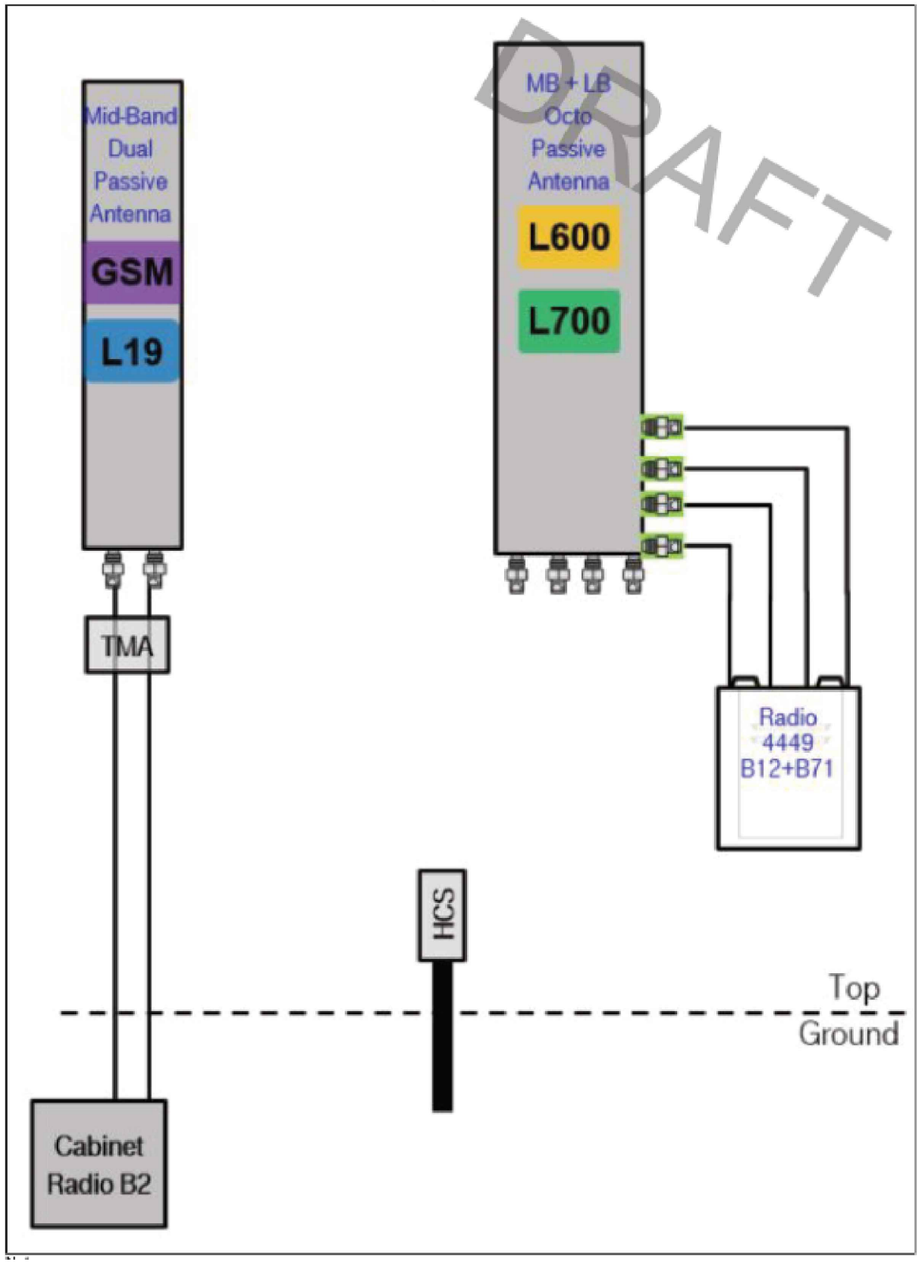
1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

ANTENNA
INFORMATION CHART

RF-1

SITE CONFIGURATION: 67D93D4 OUTDOOR



1 RF EQUIPMENT SCHEMATIC

SCALE: NONE

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34055
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004

DRAWN BY: JT

CHECKED BY: DC

SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

RF EQUIPMENT SCHEMATIC

RF-2

ONE LINE DIAGRAM NOTES:

1. ELECTRICAL SERVICE SHALL BE 200A, 240/120V, 1Ø, 3W

2. FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT, REFER TO VENDOR PRINTS PROVIDED BY EQUIPMENT MANUFACTURER.

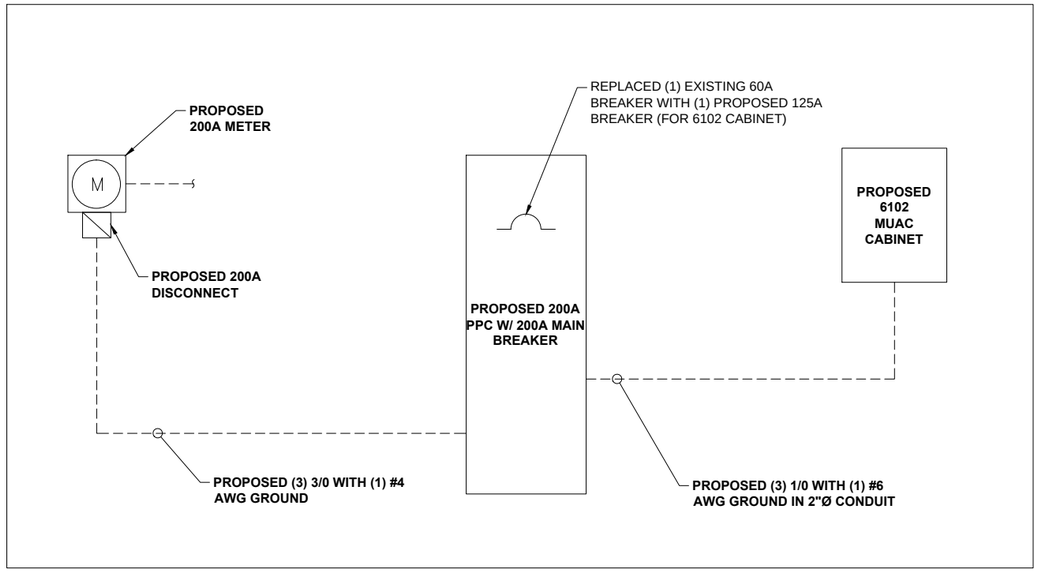
NOTES:

1. CONTRACTOR SHALL VERIFY AVAILABLE FAULT CURRENT WITH POWER COMPANY AND ENSURE ALL ELECTRICAL EQUIPMENT IS SUITABLE FOR AVAILABLE FAULT CURRENT.

2. CONTRACTOR SHALL COORDINATE UTILITY SERVICES WITH LOCAL UTILITY COMPANIES. VERIFY ALL REQUIREMENTS WITH UTILITY COMPANY STANDARDS.

3. ONE-LINE DIAGRAM IS SCHEMATIC ONLY AND NOT INDICATIVE OF ACTUAL EQUIPMENT LAYOUT.

4. CONTRACTOR SHALL LABEL METER SOCKET WITH SERVICE OWNER NAMEPLATE W/ 1/2" MINIMUM LETTERS.



1 ONE LINE DIAGRAM

SCALE: NONE

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34055
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: ERCC0004

DRAWN BY: JT

CHECKED BY: DC

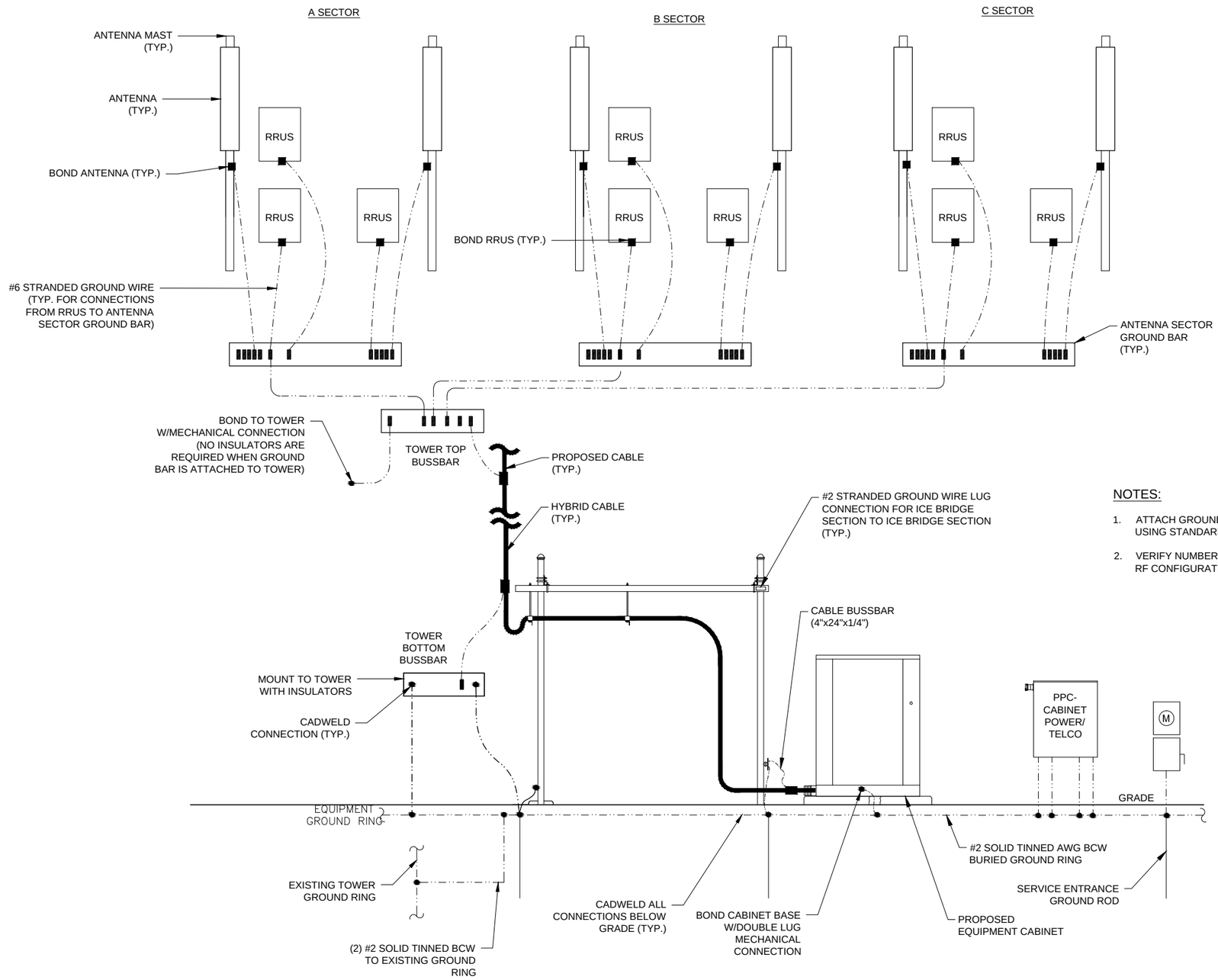
SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

ONE LINE
DIAGRAM

E-1



NOTES:

1. ATTACH GROUND BAR DIRECTLY TO THE TOWER USING STANDARD ADAPTER.
2. VERIFY NUMBER OF CABLES/TMAS PER T-MOBILE RF CONFIGURATION.

GROUNDING NOTES:

1. BELOW GROUND ALL GROUNDING CONDUCTORS TO BE #2 AWG SOLID TINNED BARE COPPER WIRE (BCW) U.O.N.
2. ABOVE GROUND ALL GROUNDING CONDUCTORS TO BE #2 AWG STRANDED INSULATED COPPER WIRE U.O.N.
3. PROVIDE BONDING AND GROUNDING CONDUCTORS WITH GREEN TYPE THWN INSULATION, U.O.N.
4. LEAVE 4' EXCESS GROUND WIRE COILED UP ABOVE GRADE. SEAL/WEATHERPROOF CONDUIT.

1 GROUNDING RISER DIAGRAM

SCALE: N.T.S.

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

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

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
DANIEL J. CORNING
34055
LICENSED PROFESSIONAL ENGINEER

PROJECT NO:	ERCC0004
DRAWN BY:	JT
CHECKED BY:	DC

SUBMITTALS

1	08/21/19	ISSUED FOR CONSTRUCTION
0	07/18/19	ISSUED FOR PERMITTING

ASHFORD/I-84_1
CT11353C
SKY HILL
876345
33 JANOWSKI ROAD
ASHFORD, CT 06278

GROUNDING RISER DIAGRAM

G-1

Exhibit D

Structural Analysis Report

Date: **June 26, 2019**

Heather Simeone
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

AW Solutions
300 Crown Oak Centre Drive
Longwood, FL 32750
(407) 260-0231

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11503A
	Carrier Site Name:	Sprint Columbia Rt 6
Crown Castle Designation:	**Crown Castle BU Number:**	876391
	Crown Castle Site Name:	COLUMBIA / DEOJAY
	Crown Castle JDE Job Number:	559338
	Crown Castle Work Order Number:	1728254
	Crown Castle Order Number:	479837 Rev. 1
Engineering Firm Designation:	**AW Solutions Project Number:**	876391
Site Data:	**14 Thompson Hill Rd, COLUMBIA, Tolland County, CT** **Latitude *41° 43' 3.44"*, Longitude *-72° 17' 59.09"*** **180 Foot - Monopole Tower**	

Ms. Simeone,

AW Solutions is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

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: Proposed Equipment Configuration **Sufficient Capacity - 96.7%**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut State Building Code (2015 IBC). Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Charles Springer, E.I. / AL

Respectfully submitted by:

06/27/19

Alan Lockrem, P.E.
Director of Engineering

tnxTower Report - version 8.0.5.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
161.0	161.0	3	ericsson	AIR 32 B2A B66AA w/ Mount Pipe	10	1-5/8
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe		
		3	ericsson	KRY 112 144/2		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 305-1]		
		1	Site Pro1	Site Pro1 PRK-SFS-L Reinforcement Kit		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
180.0	181.0	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		
		3	rfs celwave	APXVTM14-ALU-I20		
	180.0	1	tower mounts	Platform Mount [LP 301-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
147.0	150.0	3	alcatel lucent	RRH2X60-AWS	1 14	1/2 1-5/8
		3	alcatel lucent	RRH2X60-PCS		
		6	andrew	HBXX-6517DS-A2M w/ Mount Pipe		
		6	andrew	LNX-6514DS-A1M w/ Mount Pipe		
		1	lucent	KS24019-L112A		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		6	rfs celwave	FD9R6004/1C-3L		
	147.0	1	tower mounts	Platform Mount [LP 712-1]		
141.0	141.0	3	ericsson	RRUS 11	-	-
		1	tower mounts	Pipe Mount [PM 601-3]		
140.0	140.0	3	cci antennas	HPA-65R-BUU-H6	2 4 12 1	3/8 7/16 1-5/8 2
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B2		
		3	ericsson	RRUS 4478 B14		
		3	kmw communications	EPBQ-654L8H6-L2		
		3	powerwave technologies	1001983		
		12	powerwave technologies	7020.00		
		6	powerwave technologies	7770.00		
		6	powerwave technologies	LGP 17201		
		6	powerwave technologies	LGP21901		
		2	raycap	DC6-48-60-18-8F		
		1	tower mounts	Platform Mount [LP 1301-1]		
83.0	84.0	2	kathrein	OG-860/1920/GPS-A	2 2	1/2 1-1/4
	83.0	2	tower mounts	Side Arm Mount [SO 701-1]		
78.0	79.0	1	kathrein	OG-860/1920/GPS-A	1	1/2
	78.0	1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Goodkind & O'Dea, Inc	1613526	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI	1613632	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI	1614546	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.5.0), 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 and maintained in accordance with the manufacturer's specifications.
2) 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. AW Solutions should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary) (Monopole Tower)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 131.75	Pole	TP31.39x21x0.25	1	-15.96	1470.56	56.6	Pass
L2	131.75 - 86.71	Pole	TP40.46x29.921x0.375	2	-26.61	2843.87	74.7	Pass
L3	86.71 - 43.16	Pole	TP48.96x38.5229x0.4375	3	-41.54	4017.93	79.2	Pass
L4	43.16 - 0	Pole	TP57.25x46.668x0.5	4	-64.11	5532.07	77.0	Pass
							Summary	
						Pole (L3)	79.2	Pass
						Rating =	79.2	Pass

Table 5 - Tower Component Stresses vs. Capacity (Monopole Tower) - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	85.4	Pass
1	Base Plate	0	89.2	Pass
1	Base Foundation Structural	0	92.8	Pass
1	Base Foundation Soil Interaction	0	96.7	Pass

Structure Rating (max from all components) =	96.7%

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

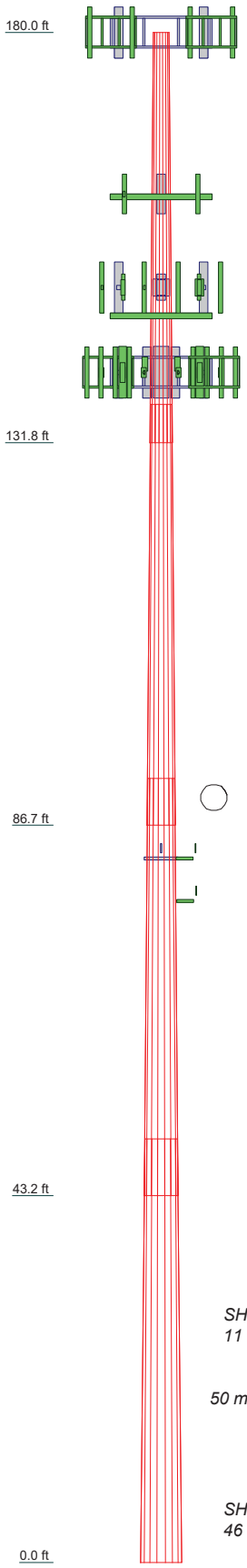
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	48.2500	18	0.2500	4.5000	21.0000	31.3900	A572-65	3.4
2	49.5400	18	0.3750	5.5800	29.9210	40.4600		7.0
3	49.1300	18	0.4375	6.6700	38.5229	48.9600		10.1
4	49.8300	18	0.5000		46.6680	57.2500		13.8
								34.3



ALL REACTIONS ARE FACTORED

AXIAL 102 K

SHEAR 11 K

MOMENT 1443 kip-ft

TORQUE 0 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 64 K

SHEAR 46 K

MOMENT 5918 kip-ft

TORQUE 1 kip-ft
REACTIONS - 130 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 79.2%

AW Solutions
300 Crown Oak Centre Drive
Longwood, FL 32750
Phone: (407) 260-0231
FAX:

Job: **BU876391**			
Project: **WO1728254**			
Client: Crown Castle	Drawn by: Charles.Springer		App'd:
Code: TIA-222-H	Date: 06/26/19		Scale: NTS
Path: R:\Central_Data\CROWN CASTLE\CRC - STRUCTURAL\BU876391 - WO1728254\ENGINEERING\BU876391 - WO1728254.eri			Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

1) Tower is located in Tolland County, Connecticut.
2) Tower base elevation above sea level: 561.0000 ft.
3) Basic wind speed of 130 mph.
4) Risk Category II.
5) Exposure Category C.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height: 0.0000 ft.
9) Nominal ice thickness of 1.5000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56.00 pcf.
12) A wind speed of 50 mph is used in combination with ice.
13) Temperature drop of 50 °F.
14) Deflections calculated using a wind speed of 60 mph.
15) A non-linear (P-delta) analysis was used.
16) Pressures are calculated at each section.
17) Stress ratio used in pole design is 1.05.
18) Tower analysis based on target reliabilities in accordance with Annex S.
19) Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
20) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules	
Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces	
Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA	
Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression	
Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable	
Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation	
Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque	
Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check	
Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption	
Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption	
Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles	
Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction	
Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow	
SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets	
SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments	
				Pole With Shroud Or No Appurtenances	
				Outside and Inside Corner Radii Are Known	

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	180.0000-131.7500	48.2500	4.50	18	21.0000	31.3900	0.2500	1.0000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	131.7500-86.7100	49.5400	5.58	18	29.9210	40.4600	0.3750	1.5000	A572-65 (65 ksi)
L3	86.7100-43.1600	49.1300	6.67	18	38.5229	48.9600	0.4375	1.7500	A572-65 (65 ksi)
L4	43.1600-0.0000	49.8300		18	46.6680	57.2500	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	21.2854	16.4651	895.6507	7.3663	10.6680	83.9568	1792.4800	8.2341	3.2560	13.024
	31.8357	24.7096	3027.1937	11.0547	15.9461	189.8389	6058.3706	12.3571	5.0846	20.339
L2	31.2968	35.1671	3878.5647	10.4888	15.1999	255.1711	7762.2328	17.5869	4.6061	12.283
	41.0263	47.7112	9685.4835	14.2302	20.5537	471.2287	19383.7113	23.8601	6.4610	17.229
L3	40.2534	52.8864	9691.6750	13.5203	19.5696	495.2402	19396.1025	26.4482	6.0100	13.737
	49.6478	67.3796	20042.5020	17.2255	24.8717	805.8363	40111.3765	33.6962	7.8470	17.936
L4	48.7491	73.2687	19730.5260	16.3897	23.7074	832.2531	39487.0139	36.6413	7.3336	14.667
	58.0560	90.0622	36644.7678	20.1462	29.0830	1260.0065	73337.7538	45.0397	9.1960	18.392

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.0000-131.7500				1	1	1			
L2 131.7500-86.7100				1	1	1			
L3 86.7100-43.1600				1	1	1			
L4 43.1600-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LCF158-50J(1-5/8)	B	No	Surface Ar (CaAa)	161.0000 - 0.0000	9	9	-0.250 0.000	2.0100		0.92
HB158-1-08U8-S8J18(1-5/8) ***83***	A	No	Surface Ar (CaAa)	147.0000 - 0.0000	2	2	0.000 0.100	1.9800		1.30
LDF4-50A(1/2)	C	No	Surface Ar (CaAa)	83.0000 - 0.0000	2	2	-0.500 -0.480	0.6250		0.15
LDF6-50A(1-1/4) ***78***	C	No	Surface Ar (CaAa)	83.0000 - 0.0000	2	2	-0.480 -0.450	1.5500		0.60
LDF4-50A(1/2)	B	No	Surface Ar (CaAa)	78.0000 - 0.0000	1	1	-0.480 -0.480	0.6250		0.15

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
180									
HB114-1-0813U4-M5J(1-1/4)	A	No	No	Inside Pole	180.0000 - 0.0000	4	No Ice	0.0000	1.20
							1/2" Ice	0.0000	1.20
							1" Ice	0.0000	1.20
							2" Ice	0.0000	1.20
161									
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	B	No	No	Inside Pole	161.0000 - 0.0000	1	No Ice	0.0000	1.07
							1/2" Ice	0.0000	1.07
							1" Ice	0.0000	1.07
							2" Ice	0.0000	1.07
147									
LDF4-50A(1/2)	A	No	No	Inside Pole	147.0000 - 0.0000	1	No Ice	0.0000	0.15
							1/2" Ice	0.0000	0.15
							1" Ice	0.0000	0.15
							2" Ice	0.0000	0.15
LDF7-50A(1-5/8)	A	No	No	Inside Pole	147.0000 - 0.0000	12	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
							2" Ice	0.0000	0.82
140									
2" Rigid Conduit	C	No	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	2.80
							1/2" Ice	0.0000	2.80
							1" Ice	0.0000	2.80
							2" Ice	0.0000	2.80
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	0.06
							1/2" Ice	0.0000	0.06
							1" Ice	0.0000	0.06
							2" Ice	0.0000	0.06
WR-VG122ST-BRDA(7/16)	C	No	No	Inside Pole	140.0000 - 0.0000	2	No Ice	0.0000	0.14
							1/2" Ice	0.0000	0.14
							1" Ice	0.0000	0.14
							2" Ice	0.0000	0.14
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	0.06
							1/2" Ice	0.0000	0.06
							1" Ice	0.0000	0.06
							2" Ice	0.0000	0.06
WR-VG122ST-BRDA(7/16)	C	No	No	Inside Pole	140.0000 - 0.0000	2	No Ice	0.0000	0.14
							1/2" Ice	0.0000	0.14
							1" Ice	0.0000	0.14
							2" Ice	0.0000	0.14
LDF7-50A(1-5/8)	C	No	No	Inside Pole	140.0000 - 0.0000	12	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
							2" Ice	0.0000	0.82
ICE 200(2)	C	No	No	Inside Pole	140.0000 - 0.0000	1	No Ice	0.0000	0.23
							1/2" Ice	0.0000	0.23
							1" Ice	0.0000	0.23
							2" Ice	0.0000	0.23

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.0000-131.7500	A	0.000	0.000	6.039	0.000	0.42
		B	0.000	0.000	52.913	0.000	0.27
		C	0.000	0.000	0.000	0.000	0.11
L2	131.7500-86.7100	A	0.000	0.000	17.836	0.000	0.78
		B	0.000	0.000	81.477	0.000	0.42

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.61
L3	86.7100-43.1600	A	0.000	0.000	17.246	0.000	0.76
		B	0.000	0.000	80.959	0.000	0.41
		C	0.000	0.000	17.330	0.000	0.65
L4	43.1600-0.0000	A	0.000	0.000	17.091	0.000	0.75
		B	0.000	0.000	80.774	0.000	0.41
		C	0.000	0.000	18.775	0.000	0.65

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	180.0000-131.7500	A	1.488	0.000	0.000	13.221	0.000	0.56
		B		0.000	0.000	77.021	0.000	1.08
		C		0.000	0.000	0.000	0.000	0.11
L2	131.7500-86.7100	A	1.436	0.000	0.000	39.047	0.000	1.19
		B		0.000	0.000	118.599	0.000	1.67
		C		0.000	0.000	0.000	0.000	0.61
L3	86.7100-43.1600	A	1.364	0.000	0.000	37.193	0.000	1.13
		B		0.000	0.000	126.297	0.000	1.70
		C		0.000	0.000	50.270	0.000	1.11
L4	43.1600-0.0000	A	1.223	0.000	0.000	36.076	0.000	1.10
		B		0.000	0.000	126.775	0.000	1.65
		C		0.000	0.000	52.893	0.000	1.11

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	180.0000-131.7500	3.5673	-4.5447	2.5115	-3.6365
L2	131.7500-86.7100	4.1018	-6.4657	2.5270	-5.1604
L3	86.7100-43.1600	5.5528	-5.7811	4.1831	-3.9407
L4	43.1600-0.0000	6.0637	-6.1409	4.6965	-4.2909

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	6	LCF158-50J(1-5/8)	131.75 - 161.00	1.0000	1.0000
L1	11	HB158-1-08U8-S8J18(1-5/8)	131.75 - 147.00	1.0000	1.0000
L2	6	LCF158-50J(1-5/8)	86.71 - 131.75	1.0000	1.0000
L2	11	HB158-1-08U8-S8J18(1-5/8)	86.71 - 131.75	1.0000	1.0000
L2	21	LDF4-50A(1/2)	86.71 - 83.00	1.0000	1.0000
L2	22	LDF6-50A(1-1/4)	86.71 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L2	24	LDF4-50A(1/2)	83.00 86.71 - 78.00	1.0000	1.0000
L3	6	LCF158-50J(1-5/8)	43.16 - 86.71	1.0000	1.0000
L3	11	HB158-1-08U8-S8J18(1-5/8)	43.16 - 86.71	1.0000	1.0000
L3	21	LDF4-50A(1/2)	43.16 - 83.00	1.0000	1.0000
L3	22	LDF6-50A(1-1/4)	43.16 - 83.00	1.0000	1.0000
L3	24	LDF4-50A(1/2)	43.16 - 78.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
180									
APXVTM14-ALU-I20	A	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.1200 4.5200 4.9300 5.8000	2.0600 2.4200 2.8000 3.6000	0.06 0.10 0.14 0.25
APXVTM14-ALU-I20	B	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.1200 4.5200 4.9300 5.8000	2.0600 2.4200 2.8000 3.6000	0.06 0.10 0.14 0.25
APXVTM14-ALU-I20	C	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.1200 4.5200 4.9300 5.8000	2.0600 2.4200 2.8000 3.6000	0.06 0.10 0.14 0.25
NNVV-65B-R4	A	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	12.2711 12.7660 13.2679 14.2927	5.7500 6.2069 6.6713 7.6222	0.08 0.15 0.23 0.41
NNVV-65B-R4	B	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	12.2711 12.7660 13.2679 14.2927	5.7500 6.2069 6.6713 7.6222	0.08 0.15 0.23 0.41
NNVV-65B-R4	C	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	12.2711 12.7660 13.2679 14.2927	5.7500 6.2069 6.6713 7.6222	0.08 0.15 0.23 0.41
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice	2.3218 2.5266 2.7388	2.2381 2.4407 2.6507	0.06 0.08 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice 2" Ice	3.1855	3.0929	0.17
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
(2) RRH2X50-800	A	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.7008 1.8640 2.0345 2.3979	1.2822 1.4275 1.5803 1.9081	0.05 0.07 0.09 0.14
(2) RRH2X50-800	B	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.7008 1.8640 2.0345 2.3979	1.2822 1.4275 1.5803 1.9081	0.05 0.07 0.09 0.14
(2) RRH2X50-800	C	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.7008 1.8640 2.0345 2.3979	1.2822 1.4275 1.5803 1.9081	0.05 0.07 0.09 0.14
TD-RRH8X20-25	A	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
TD-RRH8X20-25	B	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
TD-RRH8X20-25	C	From Leg	4.0000 0.00 1.00	0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
Platform Mount [LP 301-1]	C	None		0.00	180.0000	No Ice 1/2" Ice 1" Ice 2" Ice	30.1000 40.8000 51.5000 72.9000	30.1000 40.8000 51.5000 72.9000	1.59 2.03 2.47 3.35
161									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.3292 6.7751 7.2137 8.1168	5.6424 6.4259 7.1313 8.5907	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.3292 6.7751 7.2137 8.1168	5.6424 6.4259 7.1313 8.5907	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.3292 6.7751 7.2137 8.1168	5.6424 6.4259 7.1313 8.5907	0.11 0.17 0.23 0.38
KRY 112 144/2	A	From Leg	4.0000 0.00 0.00	0.00	161.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.4794 0.5681 0.6642 0.8786	0.2317 0.2994 0.3763 0.5523	0.01 0.01 0.02 0.04
KRY 112 144/2	B	From Leg	4.0000 0.00	0.00	161.0000	No Ice 1/2"	0.4794 0.5681	0.2317 0.2994	0.01 0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	0.6642	0.3763	0.02
						1" Ice	0.8786	0.5523	0.04
						2" Ice			
KRY 112 144/2	C	From Leg	4.0000	0.00	161.0000	No Ice	0.4794	0.2317	0.01
			0.00			1/2"	0.5681	0.2994	0.01
			0.00			Ice	0.6642	0.3763	0.02
						1" Ice	0.8786	0.5523	0.04
						2" Ice			
Platform Mount [LP 305-1]	C	None		0.00	161.0000	No Ice	18.0100	18.0100	1.12
						1/2"	23.3300	23.3300	1.35
						Ice	28.6500	28.6500	1.58
						1" Ice	39.2900	39.2900	2.05
						2" Ice			
Site Pro1 PRK-SFS-L Reinforcement Kit	C	None		0.00	161.0000	No Ice	4.0250	1.6334	0.64
						1/2"	4.9668	2.0438	0.83
						Ice	5.9086	2.4542	1.03
						1" Ice	7.7922	3.2750	1.41
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.0000	0.00	161.0000	No Ice	14.6900	6.8700	0.19
			0.00			1/2"	15.4600	7.5500	0.31
			0.00			Ice	16.2300	8.2500	0.46
						1" Ice	17.8200	9.6700	0.79
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.0000	0.00	161.0000	No Ice	14.6900	6.8700	0.19
			0.00			1/2"	15.4600	7.5500	0.31
			0.00			Ice	16.2300	8.2500	0.46
						1" Ice	17.8200	9.6700	0.79
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.0000	0.00	161.0000	No Ice	14.6900	6.8700	0.19
			0.00			1/2"	15.4600	7.5500	0.31
			0.00			Ice	16.2300	8.2500	0.46
						1" Ice	17.8200	9.6700	0.79
						2" Ice			
AIR 32 B2A B66AA w/ Mount Pipe	A	From Leg	4.0000	0.00	161.0000	No Ice	7.0872	6.3736	0.16
			0.00			1/2"	7.5606	7.2305	0.23
			0.00			Ice	8.0206	7.9731	0.30
						1" Ice	8.9662	9.5071	0.46
						2" Ice			
AIR 32 B2A B66AA w/ Mount Pipe	B	From Leg	4.0000	0.00	161.0000	No Ice	7.0872	6.3736	0.16
			0.00			1/2"	7.5606	7.2305	0.23
			0.00			Ice	8.0206	7.9731	0.30
						1" Ice	8.9662	9.5071	0.46
						2" Ice			
AIR 32 B2A B66AA w/ Mount Pipe	C	From Leg	4.0000	0.00	161.0000	No Ice	7.0872	6.3736	0.16
			0.00			1/2"	7.5606	7.2305	0.23
			0.00			Ice	8.0206	7.9731	0.30
						1" Ice	8.9662	9.5071	0.46
						2" Ice			
RADIO 4449 B12/B71	A	From Leg	4.0000	0.00	161.0000	No Ice	1.6500	1.3000	0.08
			0.00			1/2"	1.8104	1.4448	0.09
			0.00			Ice	1.9781	1.5970	0.11
						1" Ice	2.3359	1.9237	0.16
						2" Ice			
RADIO 4449 B12/B71	B	From Leg	4.0000	0.00	161.0000	No Ice	1.6500	1.3000	0.08
			0.00			1/2"	1.8104	1.4448	0.09
			0.00			Ice	1.9781	1.5970	0.11
						1" Ice	2.3359	1.9237	0.16
						2" Ice			
RADIO 4449 B12/B71	C	From Leg	4.0000	0.00	161.0000	No Ice	1.6500	1.3000	0.08
			0.00			1/2"	1.8104	1.4448	0.09
			0.00			Ice	1.9781	1.5970	0.11
						1" Ice	2.3359	1.9237	0.16
						2" Ice			
147									
(2) LNX-6514DS-A1M w/	A	From Leg	4.0000	0.00	147.0000	No Ice	8.4106	7.0817	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.00 3.00			1/2" Ice 1" Ice 2" Ice	8.9745 9.5048 10.5853	8.2729 9.1847 11.0232	0.13 0.21 0.39
(2) LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	8.4106 8.9745 9.5048 10.5853	7.0817 8.2729 9.1847 11.0232	0.06 0.13 0.21 0.39
(2) LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	8.4106 8.9745 9.5048 10.5853	7.0817 8.2729 9.1847 11.0232	0.06 0.13 0.21 0.39
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.9700 8.7300 9.5100 11.1100	5.9900 6.7200 7.4700 9.0200	0.08 0.14 0.21 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.9700 8.7300 9.5100 11.1100	5.9900 6.7200 7.4700 9.0200	0.08 0.14 0.21 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	7.9700 8.7300 9.5100 11.1100	5.9900 6.7200 7.4700 9.0200	0.08 0.14 0.21 0.40
KS24019-L112A	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1407 0.1979 0.2621 0.4148	0.1407 0.1979 0.2621 0.4148	0.01 0.01 0.01 0.02
(2) FD9R6004/1C-3L	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
(2) FD9R6004/1C-3L	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
(2) FD9R6004/1C-3L	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3142 0.3862 0.4656 0.6468	0.0762 0.1189 0.1685 0.2940	0.00 0.01 0.01 0.02
RRH2X60-AWS	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.5002 3.7609 4.0285 4.5849	1.8157 2.0519 2.2894 2.7852	0.06 0.08 0.11 0.17
RRH2X60-AWS	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.5002 3.7609 4.0285 4.5849	1.8157 2.0519 2.2894 2.7852	0.06 0.08 0.11 0.17
RRH2X60-AWS	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	3.5002 3.7609 4.0285 4.5849	1.8157 2.0519 2.2894 2.7852	0.06 0.08 0.11 0.17
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000	0.00	147.0000	No Ice	4.8000	2.0000	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 3.00			1/2" Ice 1" Ice 2" Ice	5.0704 5.3481 5.9259	2.1926 2.3926 2.8148	0.08 0.12 0.21
DB-T1-6Z-8AB-0Z	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.8000 5.0704 5.3481 5.9259	2.0000 2.1926 2.3926 2.8148	0.04 0.08 0.12 0.21
RRH2X60-PCS	A	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.2000 2.3926 2.5926 3.0148	1.7233 1.9015 2.0870 2.4804	0.06 0.08 0.10 0.16
RRH2X60-PCS	B	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.2000 2.3926 2.5926 3.0148	1.7233 1.9015 2.0870 2.4804	0.06 0.08 0.10 0.16
RRH2X60-PCS	C	From Leg	4.0000 0.00 3.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.2000 2.3926 2.5926 3.0148	1.7233 1.9015 2.0870 2.4804	0.06 0.08 0.10 0.16
Platform Mount [LP 712-1]	C	None		0.00	147.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	24.5300 29.9400 35.3500 46.1700	24.5300 29.9400 35.3500 46.1700	1.34 1.65 1.96 2.58
141									
Pipe Mount [PM 601-3]	C	None		0.00	141.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.3900 5.4800 6.5700 8.7500	4.3900 5.4800 6.5700 8.7500	0.20 0.24 0.28 0.36
RRUS 11	A	From Leg	1.0000 0.00 0.00	0.00	141.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.7845 2.9919 3.2066 3.6584	1.1872 1.3342 1.4897 1.8326	0.05 0.07 0.10 0.15
RRUS 11	B	From Leg	1.0000 0.00 0.00	0.00	141.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.7845 2.9919 3.2066 3.6584	1.1872 1.3342 1.4897 1.8326	0.05 0.07 0.10 0.15
RRUS 11	C	From Leg	1.0000 0.00 0.00	0.00	141.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	2.7845 2.9919 3.2066 3.6584	1.1872 1.3342 1.4897 1.8326	0.05 0.07 0.10 0.15
140									
(2) 7770.00	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	5.5085 5.8673 6.2332 6.9859	2.9282 3.2730 3.6252 4.3517	0.04 0.07 0.11 0.20
(2) 7770.00	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	5.5085 5.8673 6.2332 6.9859	2.9282 3.2730 3.6252 4.3517	0.04 0.07 0.11 0.20
(2) 7770.00	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice Ice 1" Ice	5.5085 5.8673 6.2332 6.9859	2.9282 3.2730 3.6252 4.3517	0.04 0.07 0.11 0.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
HPA-65R-BUU-H6	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.2200 10.0000 10.7900 12.4300	4.6500 5.3600 6.0900 7.6000	0.05 0.11 0.17 0.32
HPA-65R-BUU-H6	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.2200 10.0000 10.7900 12.4300	4.6500 5.3600 6.0900 7.6000	0.05 0.11 0.17 0.32
HPA-65R-BUU-H6	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	9.2200 10.0000 10.7900 12.4300	4.6500 5.3600 6.0900 7.6000	0.05 0.11 0.17 0.32
(2) LGP 17201	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.6680 1.8289 1.9973 2.3561	0.4669 0.5676 0.6752 0.9115	0.03 0.04 0.06 0.09
(2) LGP 17201	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.6680 1.8289 1.9973 2.3561	0.4669 0.5676 0.6752 0.9115	0.03 0.04 0.06 0.09
(2) LGP 17201	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.6680 1.8289 1.9973 2.3561	0.4669 0.5676 0.6752 0.9115	0.03 0.04 0.06 0.09
RRUS 32 B2	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7313 2.9531 3.1823 3.6628	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16
RRUS 32 B2	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7313 2.9531 3.1823 3.6628	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16
1001983	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.0524 0.0861 0.1272 0.2317	0.1757 0.2317 0.2950 0.4439	0.00 0.01 0.01 0.02
1001983	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.0524 0.0861 0.1272 0.2317	0.1757 0.2317 0.2950 0.4439	0.00 0.01 0.01 0.02
1001983	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.0524 0.0861 0.1272 0.2317	0.1757 0.2317 0.2950 0.4439	0.00 0.01 0.01 0.02
(2) LGP21901	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.2310 0.2941 0.3647 0.5280	0.1575 0.2129 0.2756 0.4234	0.01 0.01 0.01 0.02
(2) LGP21901	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice	0.2310 0.2941 0.3647 0.5280	0.1575 0.2129 0.2756 0.4234	0.01 0.01 0.01 0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
(2) LGP21901	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.2310 0.2941 0.3647 0.5280	0.1575 0.2129 0.2756 0.4234	0.01 0.01 0.01 0.02
EPBQ-654L8H6-L2	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	13.2369 13.7443 14.2587 15.3085	4.9596 5.4142 5.8761 6.8223	0.08 0.16 0.23 0.41
EPBQ-654L8H6-L2	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	13.2369 13.7443 14.2587 15.3085	4.9596 5.4142 5.8761 6.8223	0.08 0.16 0.23 0.41
EPBQ-654L8H6-L2	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	13.2369 13.7443 14.2587 15.3085	4.9596 5.4142 5.8761 6.8223	0.08 0.16 0.23 0.41
(4) 7020.00	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1021 0.1469 0.1991 0.3258	0.1750 0.2393 0.3109 0.4765	0.00 0.01 0.01 0.02
(4) 7020.00	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1021 0.1469 0.1991 0.3258	0.1750 0.2393 0.3109 0.4765	0.00 0.01 0.01 0.02
(4) 7020.00	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1021 0.1469 0.1991 0.3258	0.1750 0.2393 0.3109 0.4765	0.00 0.01 0.01 0.02
RRUS 4478 B14	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	1.0588 1.1969 1.3425 1.6558	0.06 0.08 0.09 0.14
RRUS 4478 B14	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	1.0588 1.1969 1.3425 1.6558	0.06 0.08 0.09 0.14
RRUS 4478 B14	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	1.0588 1.1969 1.3425 1.6558	0.06 0.08 0.09 0.14
RRUS 32	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.8571 3.0830 3.3163 3.8052	1.7766 1.9677 2.1658 2.5829	0.06 0.08 0.10 0.16
RRUS 32	B	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.8571 3.0830 3.3163 3.8052	1.7766 1.9677 2.1658 2.5829	0.06 0.08 0.10 0.16
RRUS 32	C	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice	2.8571 3.0830 3.3163 3.8052	1.7766 1.9677 2.1658 2.5829	0.06 0.08 0.10 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
RRUS 32 B2	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.7313 2.9531 3.1823 3.6628	1.6681 1.8552 2.0493 2.4585	0.05 0.07 0.10 0.16
(2) DC6-48-60-18-8F	A	From Leg	4.0000 0.00 0.00	0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.7915 1.2743 1.4503 1.8314	0.7915 1.2743 1.4503 1.8314	0.02 0.04 0.05 0.10
Platform Mount [LP 1301-1]	C	None		0.00	140.0000	No Ice 1/2" Ice 1" Ice 2" Ice	51.7000 62.7000 73.7000 95.7000	51.7000 62.7000 73.7000 95.7000	2.26 2.94 3.61 4.95
83									
OG-860/1920/GPS-A	A	From Leg	3.0000 0.00 1.00	0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3077 0.3952 0.4897 0.6997	0.3667 0.4572 0.5548 0.7708	0.00 0.01 0.01 0.03
OG-860/1920/GPS-A	B	From Leg	3.0000 0.00 1.00	0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3077 0.3952 0.4897 0.6997	0.3667 0.4572 0.5548 0.7708	0.00 0.01 0.01 0.03
Side Arm Mount [SO 701-1]	A	From Leg	1.5000 0.00 0.00	0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8500 1.1400 1.4300 2.0100	1.6700 2.3400 3.0100 4.3500	0.07 0.08 0.09 0.12
Side Arm Mount [SO 701-1]	B	From Leg	1.5000 0.00 0.00	0.00	83.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8500 1.1400 1.4300 2.0100	1.6700 2.3400 3.0100 4.3500	0.07 0.08 0.09 0.12
78									
OG-860/1920/GPS-A	B	From Leg	3.0000 0.00 1.00	0.00	78.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.3077 0.3952 0.4897 0.6997	0.3667 0.4572 0.5548 0.7708	0.00 0.01 0.01 0.03
Side Arm Mount [SO 701-1]	B	From Leg	1.5000 0.00 0.00	0.00	78.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.8500 1.1400 1.4300 2.0100	1.6700 2.3400 3.0100 4.3500	0.07 0.08 0.09 0.12

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 131.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.23	-1.96	2.16
			Max. Mx	8	-15.98	-594.50	-0.31
			Max. My	2	-15.96	0.36	595.54
			Max. Vy	8	30.93	-594.50	-0.31
			Max. Vx	2	-31.00	0.36	595.54
			Max. Torque	11			0.73
L2	131.75 - 86.71	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.64	-3.83	4.14
			Max. Mx	8	-26.62	-2069.04	-2.43
			Max. My	2	-26.61	2.49	2073.12
			Max. Vy	8	36.12	-2069.04	-2.43
			Max. Vx	2	-36.19	2.49	2073.12
			Max. Torque	11			0.73
L3	86.71 - 43.16	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-74.12	-6.81	5.53
			Max. Mx	8	-41.54	-3720.76	-3.28
			Max. My	2	-41.54	2.84	3727.08
			Max. Vy	8	41.35	-3720.76	-3.28
			Max. Vx	2	-41.42	2.84	3727.08
			Max. Torque	13			1.20
L4	43.16 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-101.99	-9.47	6.94
			Max. Mx	8	-64.11	-5908.16	-3.65
			Max. My	2	-64.11	3.07	5917.66
			Max. Vy	8	46.01	-5908.16	-3.65
			Max. Vx	2	-46.07	3.07	5917.66
			Max. Torque	13			1.20

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	101.99	-10.83	0.00
	Max. H_x	21	48.11	45.95	0.02
	Max. H_z	3	48.11	0.02	46.01
	Max. M_x	2	5917.66	0.02	46.01
	Max. M_z	8	5908.16	-45.95	-0.02
	Max. Torsion	13	1.19	-22.99	-39.86
	Min. Vert	23	48.11	39.80	23.02
	Min. H_x	9	48.11	-45.95	-0.02
	Min. H_z	15	48.11	-0.02	-46.01
	Min. M_x	14	-5913.59	-0.02	-46.01
	Min. M_z	20	-5902.92	45.95	0.02
	Min. Torsion	25	-1.19	22.99	39.86

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	53.46	0.00	0.00	-1.61	-2.07	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	64.15	-0.02	-46.01	-5917.66	3.07	1.05
0.9 Dead+1.0 Wind 0 deg - No Ice	48.11	-0.02	-46.01	-5834.99	3.65	1.05
1.2 Dead+1.0 Wind 30 deg - No Ice	64.15	22.96	-39.84	-5122.32	-2950.46	0.62
0.9 Dead+1.0 Wind 30 deg - No Ice	48.11	22.96	-39.84	-5050.72	-2908.88	0.62
1.2 Dead+1.0 Wind 60 deg - No Ice	64.15	39.78	-22.99	-2954.97	-5114.15	0.03
0.9 Dead+1.0 Wind 60 deg - No Ice	48.11	39.78	-22.99	-2913.46	-5042.52	0.02
1.2 Dead+1.0 Wind 90 deg - No Ice	64.15	45.95	0.02	3.65	-5908.16	-0.58
0.9 Dead+1.0 Wind 90 deg - No Ice	48.11	45.95	0.02	4.08	-5825.48	-0.58
1.2 Dead+1.0 Wind 120 deg - No Ice	64.15	39.80	23.02	2960.71	-5119.77	-1.02
0.9 Dead+1.0 Wind 120 deg - No Ice	48.11	39.80	23.02	2920.09	-5048.04	-1.03
1.2 Dead+1.0 Wind 150 deg - No Ice	64.15	22.99	39.86	5123.87	-2960.28	-1.19
0.9 Dead+1.0 Wind 150 deg	48.11	22.99	39.86	5053.23	-2918.52	-1.19

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
- No Ice 1.2 Dead+1.0 Wind 180 deg	64.15	0.02	46.01	5913.59	-8.32	-1.03
- No Ice 0.9 Dead+1.0 Wind 180 deg	48.11	0.02	46.01	5831.99	-7.53	-1.04
- No Ice 1.2 Dead+1.0 Wind 210 deg	64.15	-22.96	39.84	5118.25	2945.22	-0.61
- No Ice 0.9 Dead+1.0 Wind 210 deg	48.11	-22.96	39.84	5047.72	2905.01	-0.61
- No Ice 1.2 Dead+1.0 Wind 240 deg	64.15	-39.78	22.99	2950.89	5108.91	-0.02
- No Ice 0.9 Dead+1.0 Wind 240 deg	48.11	-39.78	22.99	2910.45	5038.65	-0.02
- No Ice 1.2 Dead+1.0 Wind 270 deg	64.15	-45.95	-0.02	-7.73	5902.92	0.57
- No Ice 0.9 Dead+1.0 Wind 270 deg	48.11	-45.95	-0.02	-7.09	5821.61	0.57
- No Ice 1.2 Dead+1.0 Wind 300 deg	64.15	-39.80	-23.02	-2964.79	5114.52	1.01
- No Ice 0.9 Dead+1.0 Wind 300 deg	48.11	-39.80	-23.02	-2923.10	5044.17	1.01
- No Ice 1.2 Dead+1.0 Wind 330 deg	64.15	-22.99	-39.86	-5127.94	2955.03	1.19
- No Ice 0.9 Dead+1.0 Wind 330 deg	48.11	-22.99	-39.86	-5056.24	2914.64	1.19
- No Ice 1.2 Dead+1.0 Ice+1.0 Temp	101.99	0.00	-0.00	-6.94	-9.47	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101.99	0.00	-10.84	-1439.72	-9.23	0.27
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	101.99	5.42	-9.39	-1247.61	-724.78	0.16
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	101.99	9.38	-5.42	-723.05	-1248.72	0.01
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101.99	10.83	-0.00	-6.66	-1440.61	-0.14
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	101.99	9.38	5.42	709.63	-1249.14	-0.26
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	101.99	5.41	9.38	1233.87	-725.52	-0.30
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101.99	-0.00	10.84	1425.56	-10.08	-0.27
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	101.99	-5.42	9.39	1233.45	705.47	-0.16
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	101.99	-9.38	5.42	708.89	1229.40	-0.01
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	101.99	-10.83	0.00	-7.51	1421.29	0.14
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	101.99	-9.38	-5.42	-723.79	1229.83	0.26
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	101.99	-5.41	-9.38	-1248.03	706.20	0.30
Dead+Wind 0 deg - Service	53.46	-0.00	-9.23	-1180.90	-1.05	0.21
Dead+Wind 30 deg - Service	53.46	4.61	-7.99	-1022.35	-589.79	0.13
Dead+Wind 60 deg - Service	53.46	7.98	-4.61	-590.32	-1021.09	0.00
Dead+Wind 90 deg - Service	53.46	9.22	0.00	-0.56	-1179.36	-0.12
Dead+Wind 120 deg - Service	53.46	7.99	4.62	588.89	-1022.22	-0.21
Dead+Wind 150 deg - Service	53.46	4.61	8.00	1020.09	-591.76	-0.24
Dead+Wind 180 deg - Service	53.46	0.00	9.23	1177.51	-3.32	-0.21
Dead+Wind 210 deg - Service	53.46	-4.61	7.99	1018.96	585.43	-0.12
Dead+Wind 240 deg - Service	53.46	-7.98	4.61	586.92	1016.72	-0.00
Dead+Wind 270 deg - Service	53.46	-9.22	-0.00	-2.83	1175.00	0.12
Dead+Wind 300 deg - Service	53.46	-7.99	-4.62	-592.28	1017.85	0.21
Dead+Wind 330 deg -	53.46	-4.61	-8.00	-1023.48	587.39	0.24

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-53.46	0.00	0.00	53.46	0.00	0.000%
2	-0.02	-64.15	-46.01	0.02	64.15	46.01	0.000%
3	-0.02	-48.11	-46.01	0.02	48.11	46.01	0.000%
4	22.96	-64.15	-39.84	-22.96	64.15	39.84	0.000%
5	22.96	-48.11	-39.84	-22.96	48.11	39.84	0.000%
6	39.78	-64.15	-22.99	-39.78	64.15	22.99	0.000%
7	39.78	-48.11	-22.99	-39.78	48.11	22.99	0.000%
8	45.95	-64.15	0.02	-45.95	64.15	-0.02	0.000%
9	45.95	-48.11	0.02	-45.95	48.11	-0.02	0.000%
10	39.80	-64.15	23.02	-39.80	64.15	-23.02	0.000%
11	39.80	-48.11	23.02	-39.80	48.11	-23.02	0.000%
12	22.99	-64.15	39.86	-22.99	64.15	-39.86	0.000%
13	22.99	-48.11	39.86	-22.99	48.11	-39.86	0.000%
14	0.02	-64.15	46.01	-0.02	64.15	-46.01	0.000%
15	0.02	-48.11	46.01	-0.02	48.11	-46.01	0.000%
16	-22.96	-64.15	39.84	22.96	64.15	-39.84	0.000%
17	-22.96	-48.11	39.84	22.96	48.11	-39.84	0.000%
18	-39.78	-64.15	22.99	39.78	64.15	-22.99	0.000%
19	-39.78	-48.11	22.99	39.78	48.11	-22.99	0.000%
20	-45.95	-64.15	-0.02	45.95	64.15	0.02	0.000%
21	-45.95	-48.11	-0.02	45.95	48.11	0.02	0.000%
22	-39.80	-64.15	-23.02	39.80	64.15	23.02	0.000%
23	-39.80	-48.11	-23.02	39.80	48.11	23.02	0.000%
24	-22.99	-64.15	-39.86	22.99	64.15	39.86	0.000%
25	-22.99	-48.11	-39.86	22.99	48.11	39.86	0.000%
26	0.00	-101.99	0.00	-0.00	101.99	0.00	0.000%
27	0.00	-101.99	-10.84	-0.00	101.99	10.84	0.000%
28	5.42	-101.99	-9.39	-5.42	101.99	9.39	0.000%
29	9.38	-101.99	-5.42	-9.38	101.99	5.42	0.000%
30	10.83	-101.99	-0.00	-10.83	101.99	0.00	0.000%
31	9.38	-101.99	5.42	-9.38	101.99	-5.42	0.000%
32	5.41	-101.99	9.38	-5.41	101.99	-9.38	0.000%
33	-0.00	-101.99	10.84	0.00	101.99	-10.84	0.000%
34	-5.42	-101.99	9.39	5.42	101.99	-9.39	0.000%
35	-9.38	-101.99	5.42	9.38	101.99	-5.42	0.000%
36	-10.83	-101.99	0.00	10.83	101.99	-0.00	0.000%
37	-9.38	-101.99	-5.42	9.38	101.99	5.42	0.000%
38	-5.41	-101.99	-9.38	5.41	101.99	9.38	0.000%
39	-0.00	-53.46	-9.23	0.00	53.46	9.23	0.000%
40	4.61	-53.46	-7.99	-4.61	53.46	7.99	0.000%
41	7.98	-53.46	-4.61	-7.98	53.46	4.61	0.000%
42	9.22	-53.46	0.00	-9.22	53.46	-0.00	0.000%
43	7.99	-53.46	4.62	-7.99	53.46	-4.62	0.000%
44	4.61	-53.46	8.00	-4.61	53.46	-8.00	0.000%
45	0.00	-53.46	9.23	-0.00	53.46	-9.23	0.000%
46	-4.61	-53.46	7.99	4.61	53.46	-7.99	0.000%
47	-7.98	-53.46	4.61	7.98	53.46	-4.61	0.000%
48	-9.22	-53.46	-0.00	9.22	53.46	0.00	0.000%
49	-7.99	-53.46	-4.62	7.99	53.46	4.62	0.000%
50	-4.61	-53.46	-8.00	4.61	53.46	8.00	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance

1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00003608
3	Yes	4	0.00000001	0.00054007
4	Yes	6	0.00000001	0.00022795
5	Yes	6	0.00000001	0.00006481
6	Yes	6	0.00000001	0.00022745
7	Yes	6	0.00000001	0.00006465
8	Yes	5	0.00000001	0.00002827
9	Yes	4	0.00000001	0.00049208
10	Yes	6	0.00000001	0.00022613
11	Yes	6	0.00000001	0.00006407
12	Yes	6	0.00000001	0.00022959
13	Yes	6	0.00000001	0.00006526
14	Yes	5	0.00000001	0.00005796
15	Yes	4	0.00000001	0.00069883
16	Yes	6	0.00000001	0.00022615
17	Yes	6	0.00000001	0.00006428
18	Yes	6	0.00000001	0.00022655
19	Yes	6	0.00000001	0.00006443
20	Yes	5	0.00000001	0.00004910
21	Yes	4	0.00000001	0.00062956
22	Yes	6	0.00000001	0.00022936
23	Yes	6	0.00000001	0.00006520
24	Yes	6	0.00000001	0.00022599
25	Yes	6	0.00000001	0.00006402
26	Yes	4	0.00000001	0.00005760
27	Yes	5	0.00000001	0.00073544
28	Yes	6	0.00000001	0.00014839
29	Yes	6	0.00000001	0.00014818
30	Yes	5	0.00000001	0.00073506
31	Yes	6	0.00000001	0.00014533
32	Yes	6	0.00000001	0.00014673
33	Yes	5	0.00000001	0.00072554
34	Yes	6	0.00000001	0.00014267
35	Yes	6	0.00000001	0.00014275
36	Yes	5	0.00000001	0.00072386
37	Yes	6	0.00000001	0.00014631
38	Yes	6	0.00000001	0.00014502
39	Yes	4	0.00000001	0.00010186
40	Yes	4	0.00000001	0.00082322
41	Yes	4	0.00000001	0.00081768
42	Yes	4	0.00000001	0.00009921
43	Yes	4	0.00000001	0.00079752
44	Yes	4	0.00000001	0.00083570
45	Yes	4	0.00000001	0.00010282
46	Yes	4	0.00000001	0.00079463
47	Yes	4	0.00000001	0.00079862
48	Yes	4	0.00000001	0.00009981
49	Yes	4	0.00000001	0.00083258
50	Yes	4	0.00000001	0.00079595

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
L1	180 - 131.75 (1)	TP31.39x21x0.25	48.2500	0.0000	0.0	23.9407	-15.96	1400.53	0.011
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	49.5400	0.0000	0.0	46.2983	-26.61	2708.45	0.010
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	49.1300	0.0000	0.0	65.4119	-41.54	3826.60	0.011
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	49.830	0.0000	0.0	90.062	-64.11	5268.64	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
			0			2			

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	595.68	1032.18	0.577	0.00	1032.18	0.000
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	2074.48	2686.80	0.772	0.00	2686.80	0.000
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	3728.32	4552.13	0.819	0.00	4552.13	0.000
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	5918.45	7440.33	0.795	0.00	7440.33	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 131.75 (1)	TP31.39x21x0.25	31.03	420.16	0.074	0.66	1110.15	0.001
L2	131.75 - 86.71 (2)	TP40.46x29.921x0.375	36.22	812.53	0.045	0.66	2767.88	0.000
L3	86.71 - 43.16 (3)	TP48.96x38.5229x0.4375	41.42	1147.98	0.036	1.19	4735.72	0.000
L4	43.16 - 0 (4)	TP57.25x46.668x0.5	46.07	1580.59	0.029	1.19	7855.36	0.000

Pole Interaction Design Data

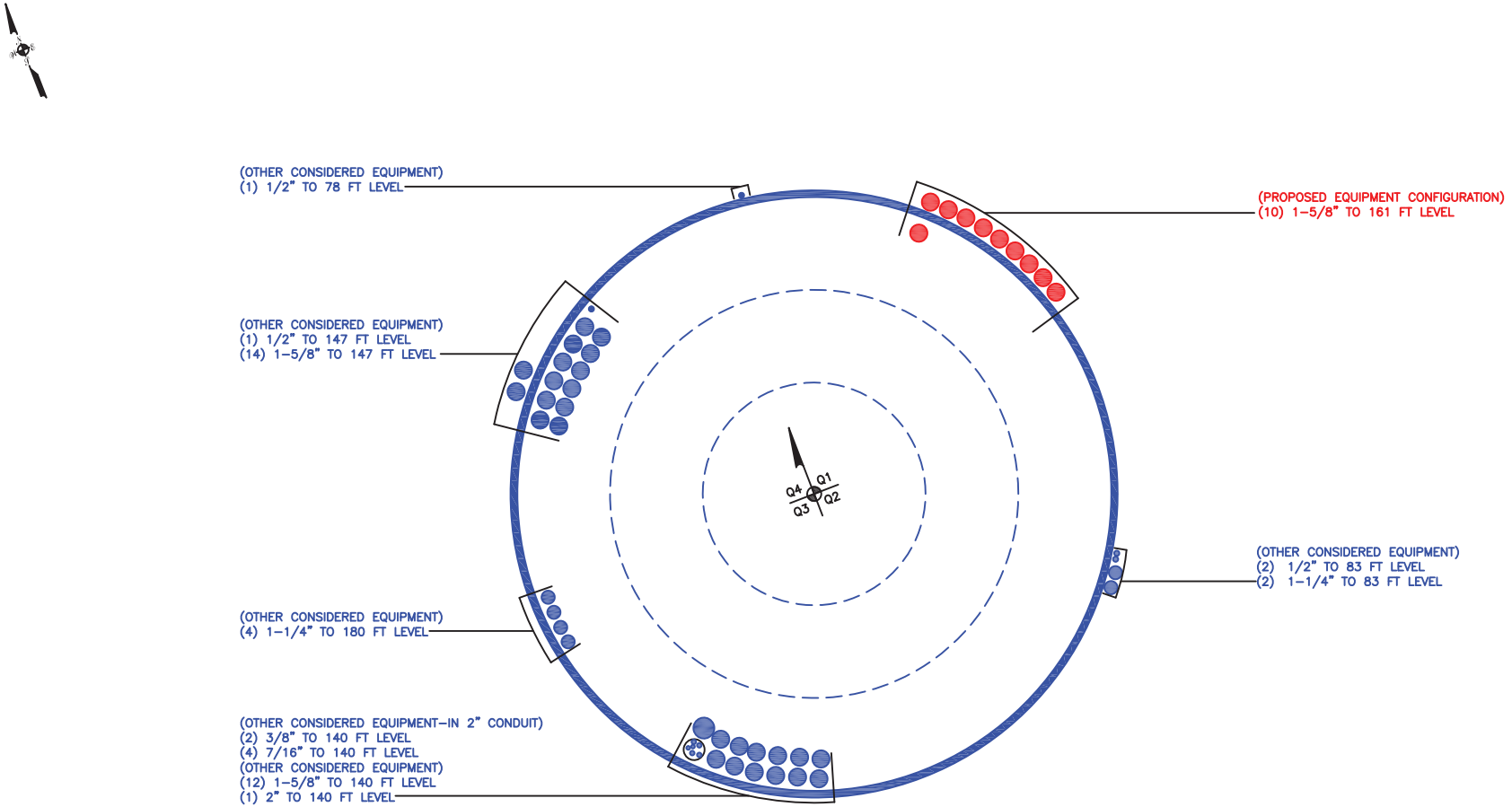
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 131.75 (1)	0.011	0.577	0.000	0.074	0.001	0.594	1.050	4.8.2
L2	131.75 - 86.71 (2)	0.010	0.772	0.000	0.045	0.000	0.784	1.050	4.8.2
L3	86.71 - 43.16 (3)	0.011	0.819	0.000	0.036	0.000	0.831	1.050	4.8.2
L4	43.16 - 0 (4)	0.012	0.795	0.000	0.029	0.000	0.808	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	180 - 131.75	Pole	TP31.39x21x0.25	1	-15.96	1470.56	56.6	Pass
L2	131.75 - 86.71	Pole	TP40.46x29.921x0.375	2	-26.61	2843.87	74.7	Pass
L3	86.71 - 43.16	Pole	TP48.96x38.5229x0.4375	3	-41.54	4017.93	79.2	Pass
L4	43.16 - 0	Pole	TP57.25x46.668x0.5	4	-64.11	5532.07	77.0	Pass
							Summary	
						Pole (L3)	79.2	Pass
						RATING =	**79.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876391 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

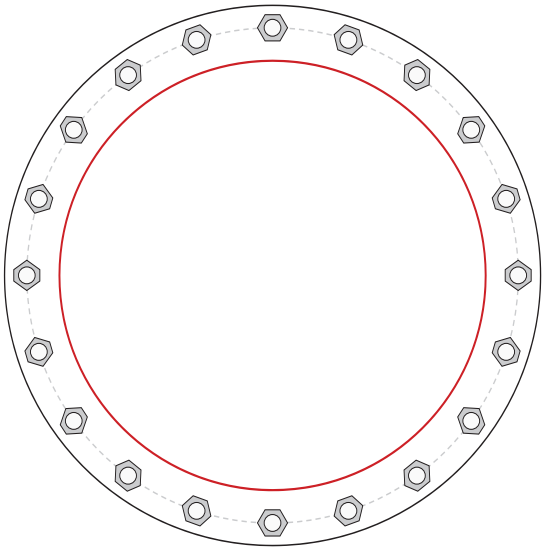
Monopole Base Plate Connection

Site Info	
BU #	876391
Site Name	COLUMBIA / DEOJAY
Order #	479837 R1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0.5

Applied Loads	
Moment (kip-ft)	5918.45
Axial Force (kips)	64.11
Shear Force (kips)	46.07

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 66" BC

Base Plate Data

72" OD x 2.25" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

57.25" x 0.5" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 218.32	ϕPn_c = 243.75	**Stress Rating**
Vu = 2.3	ϕVn = 73.13	**85.4%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	50.58	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**89.2%**	**Pass**

Pier and Pad Foundation

BU # :	876391
Site Name:	COLUMBIA / DEO
App. Number:	479837 R1

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	64	kips
Base Shear, Vu_comp:	46	kips
Moment, M_u:	5918	ft-kips
Tower Height, **H**:	180	ft
BP Dist. Above Fdn, bp_{dist}:	2.75	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	7	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	9	
Pier Rebar Quantity, **mc**:	39	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	6	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	7	ft
Pad Width, **W**:	26	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom), **Sp**:	9	
Pad Rebar Quantity (Bottom), **mp**:	35	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	100	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:	20	
Base Friction, μ:		
Neglected Depth, **N**:	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	5	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	229.93	46.00	**19.1%**	**Pass**
Bearing Pressure (ksf)	9.00	6.61	**73.5%**	**Pass**
*Overturning (kip*ft)*	6514.10	6296.54	**96.7%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	6306.92	6148.00	**92.8%**	**Pass**
Pier Compression (kip)	31187.52	108.10	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	4775.11	3764.52	**75.1%**	**Pass**
Pad Shear - 1-way (kips)	926.68	425.16	**43.7%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	5843.75	3688.80	**60.1%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**96.7%**
Structural Rating*:	**92.8%**

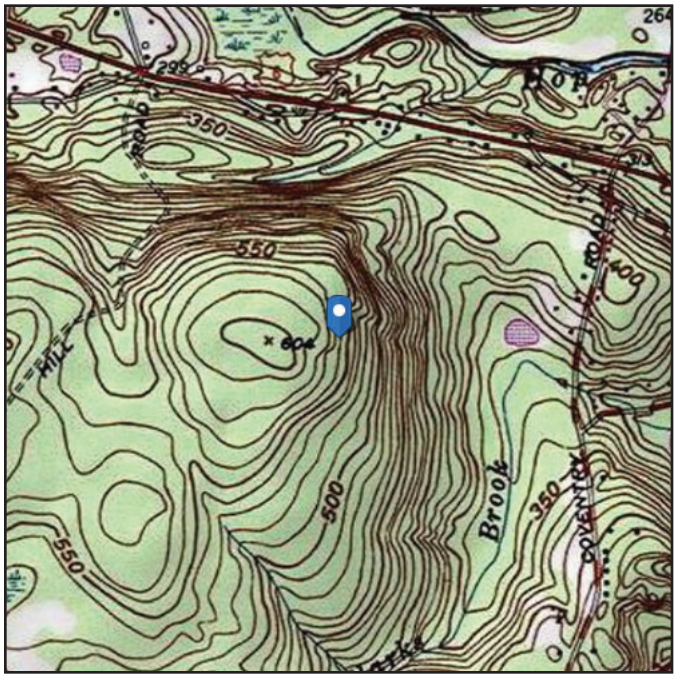
Version 3.2.0

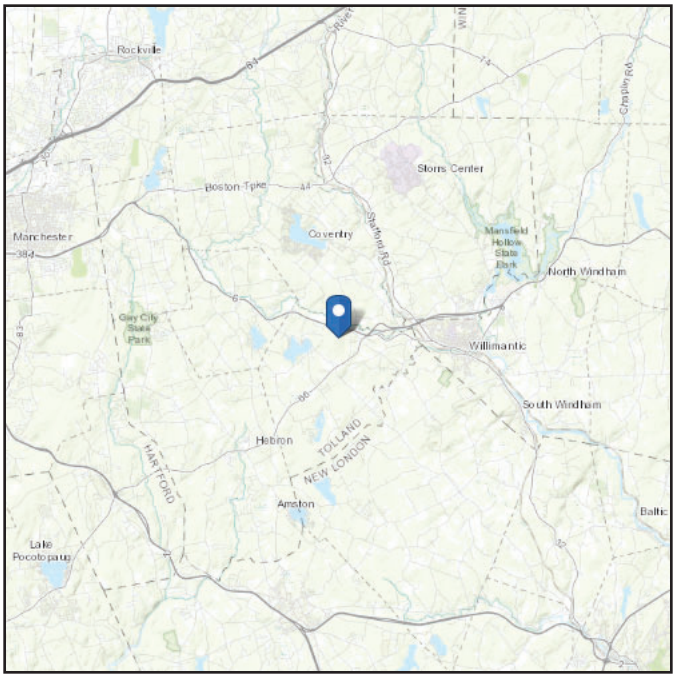
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 560.51 ft (NAVD 88)
Latitude: 41.717622
Longitude: -72.299747





Wind

Results:

Wind Speed:	127 Vmph 130 mph per City of Columbia requirements
10-year MRI	78 Vmph
25-year MRI	88 Vmph
50-year MRI	95 Vmph
100-year MRI	104 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Jun 24 2019

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

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

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

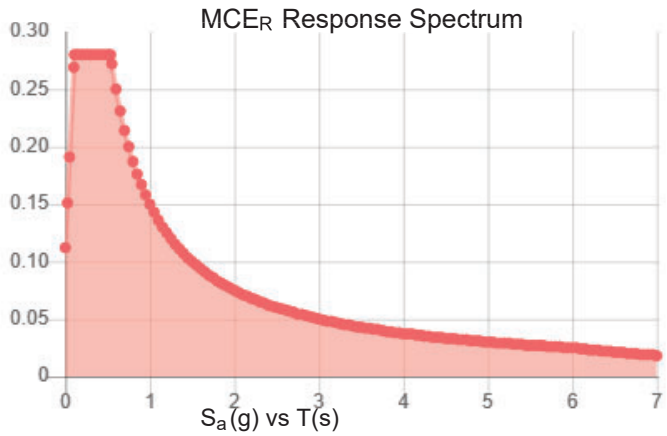
Seismic

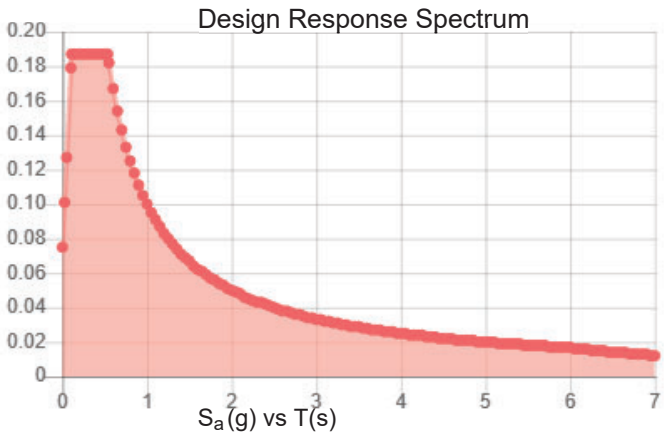
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.175	S_{DS} :	0.187
S_1 :	0.062	S_{D1} :	0.1
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.088
S_{MS} :	0.28	PGA_M :	0.14
S_{M1} :	0.15	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Jun 24 2019

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Jun 24 2019

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

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

Exhibit E

Mount Analysis

PAUL J. FORD & COMPANY

Date: June 19, 2019

Kevin Morrow
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679

Subject:	**Mount Modification Report**	
Carrier Designation:	***T-Mobile* Equipment Change-out**	
	Carrier Site Number:	CT11503A
	Carrier Site Name:	Sprint Columbia Rt 6
Crown Castle Designation:	**Crown Castle BU Number:**	876391
	Crown Castle Site Name:	Columbia / Deojay
	Crown Castle JDE Job Number:	559338
	Crown Castle Purchase Order Number:	1395161
	Crown Castle Order Number:	479837 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	A37519-1593.003.7191
Site Data:	**14 Thompson Hill Rd, Columbia, Tolland County, CT** **Latitude 41.717622°, Longitude -72.299747°**	
Structure Information:	**Tower Height & Type:**	**180 Foot Monopole**
	Mount Elevation:	**161 Foot**
	Mount Type:	**(1) 12.5 Foot Platform**

Dear Kevin Morrow,

Paul J Ford and Company is pleased to submit this "Mount Modification Report" to determine the structural integrity of the T-Mobile 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 is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

12.5' Platform	**54.9%**	**SUFFICIENT***

***The mount has sufficient capacity once the modifications, as described in Section 4.1 Recommendations of this report, are completed.**

This analysis utilizes an ultimate 3-second gust wind speed of 130 mph as required by the 2018 Connecticut State Building Code and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount Modifcation prepared by: Sean Connaughton

Respectfully submitted by:

Steven Pozz, E.I.
Structural Designer
spozz@pauljford.com

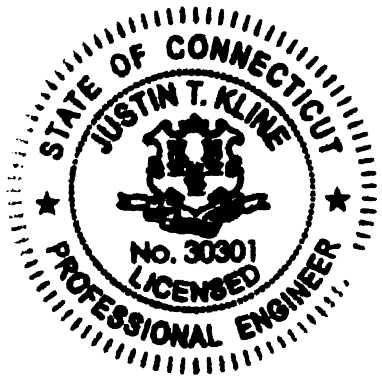


TABLE OF CONTENTS

1) INTRODUCTION

The existing mount under consideration is (1) 12.5' Platform mount mapped by RKS on 04/01/2019.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	C
Topographic Factor at Base:	1.000
Topographic Factor at Mount:	1.000
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
161	162	3	Ericsson	KRY 112 144/2	(1) 12.5' Platform
	161	3	Ericsson	AIR 32 B2A B66AA	
		3	Ericsson	ERICSSON AIR 21 B2A B4P	
		3	RFS/Celwave	APXVAARR24_43-U-NA20	
		3	Ericsson	RADIO 4449 B12/B71	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Mount Mapping	876391 Dated: 04/22/2019	8352757	CCISites
Order	ID: 479837 Rev. 1 Dated: 04/15/2019	-	CCISites

3.1) Analysis Method

RISA-3D (version 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision C).

3.2) Assumptions

1) *The analysis of the existing tower or the effect of the mount attachment to the tower is not within the current scope of work.*
2) *The antenna mounting system was properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications and all bolts are tightened as specified by the manufacturer and AISC requirements.*
3) *The configuration of antennas, mounts, and other appurtenances are as specified in Table 1.*
4) *All member connections have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report. All U-Bolt connections have been properly tightened. This analysis will be required to be revised if the existing conditions in the field differ from those shown in the above referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.*
5) *Steel grades are as follows, unless noted otherwise:*
   - *a) Channel, Solid Round, Angle, Plate, Unistrut* — *ASTM A36 (GR 36)*
   - *b) Pipe* — *ASTM A53 (GR 35)*
   - *c) HSS (Rectangular)* — *ASTM 500 (GR B-46)*
   - *d) HSS (Round)* — *ASTM 500 (GR B-42)*
   - *e) Threaded Rods* — *ASTM F1554 (GR 36)*
   - *f) Connection Bolts* — *ASTM A325*
   - *g) U-Bolts* — *SAE J429 (GR 2)*
6) *Proposed equipment is to be installed in the locations specified in Appendix A. Any changes to the proposed equipment locations will render this report invalid.*
7) *Existing mount pipes will be replaced with 8-ft tall x P2.5 STD (2.88" O.D. x 0.189") pipes to accommodate the proposed antennas where required*

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the mount.

4) ANALYSIS RESULTS

Table 3- Mount Component Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Face Horizontals	161	29.3	Pass
1	Bracing Members		31.1	Pass
1	Grating Support Members		26.0	Pass
1	Standoff Members		18.9	Pass
1	Ring Plate		Sufficient	
1	Corner Plates		46.0	Pass
1	Mount Pipes		54.9	Pass
1	Mount to Tower Connection		21.7	Pass

Mount Rating (max from all components) =	**54.9%**

Notes:
1) See additional documentation in "Appendix C – Software Analysis Output" for calculations supporting the % capacity consumed.

4.1) Recommendations

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the structural modifications listed below must be completed.

- Install SitePro1 PRK-SFS-L Platform Reinforcement Kit or EOR approved equivalent as indicated in "Appendix D – Supplemental Modification Information" and in conformance with the attached manufacturer drawings.
- Install RFS/Celwave APXVAARR24_43-U-NA20 antennas on 8-ft long, P2.5 STD (2.88" O.D. x 0.189) mount pipes. See Appendix D details.

Connection from the mount to the tower and local stresses on the tower are sufficient.

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING MOUNTS BY PAUL J. FORD AND COMPANY

1) It is the responsibility of the client to ensure that the information provided to Paul J. Ford and Company is accurate and complete. Paul J. Ford and Company will rely on the accuracy and completeness of such information in performing or furnishing services under this project.

2) If the existing conditions are not as represented on the referenced drawings and/or documents, Paul J. Ford and Company should be contacted immediately to evaluate the significance of the deviation.

3) The mount has been analyzed according to the minimum design loads recommended by the Reference Standard. If additional design loads are required, Paul J. Ford and Company should be made aware of this prior to the start of the project.

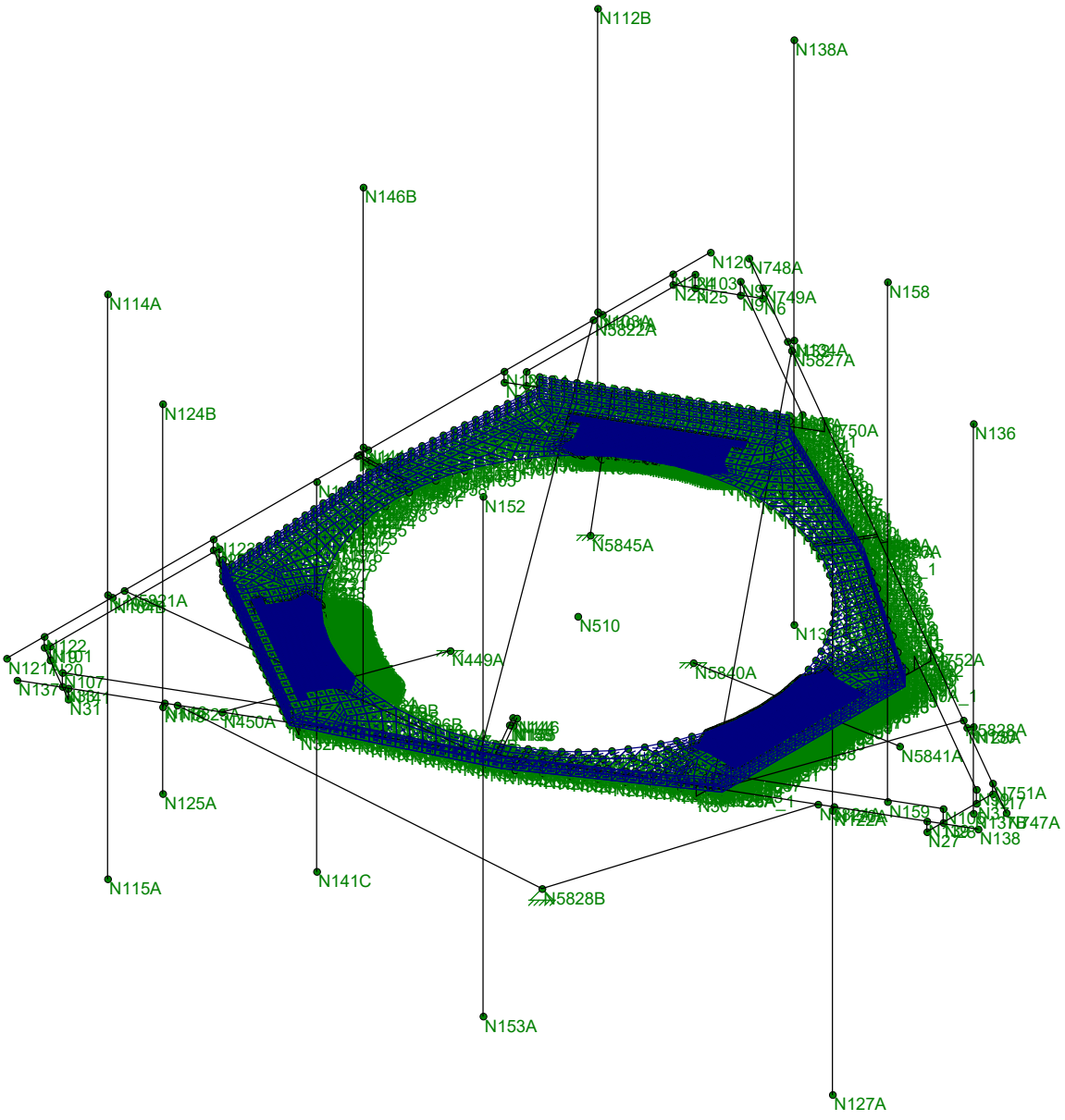
4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.

5) All Services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Paul J. Ford and Company is not responsible for the conclusions, opinions and/or recommendations made by others based on the information supplied herein.

****

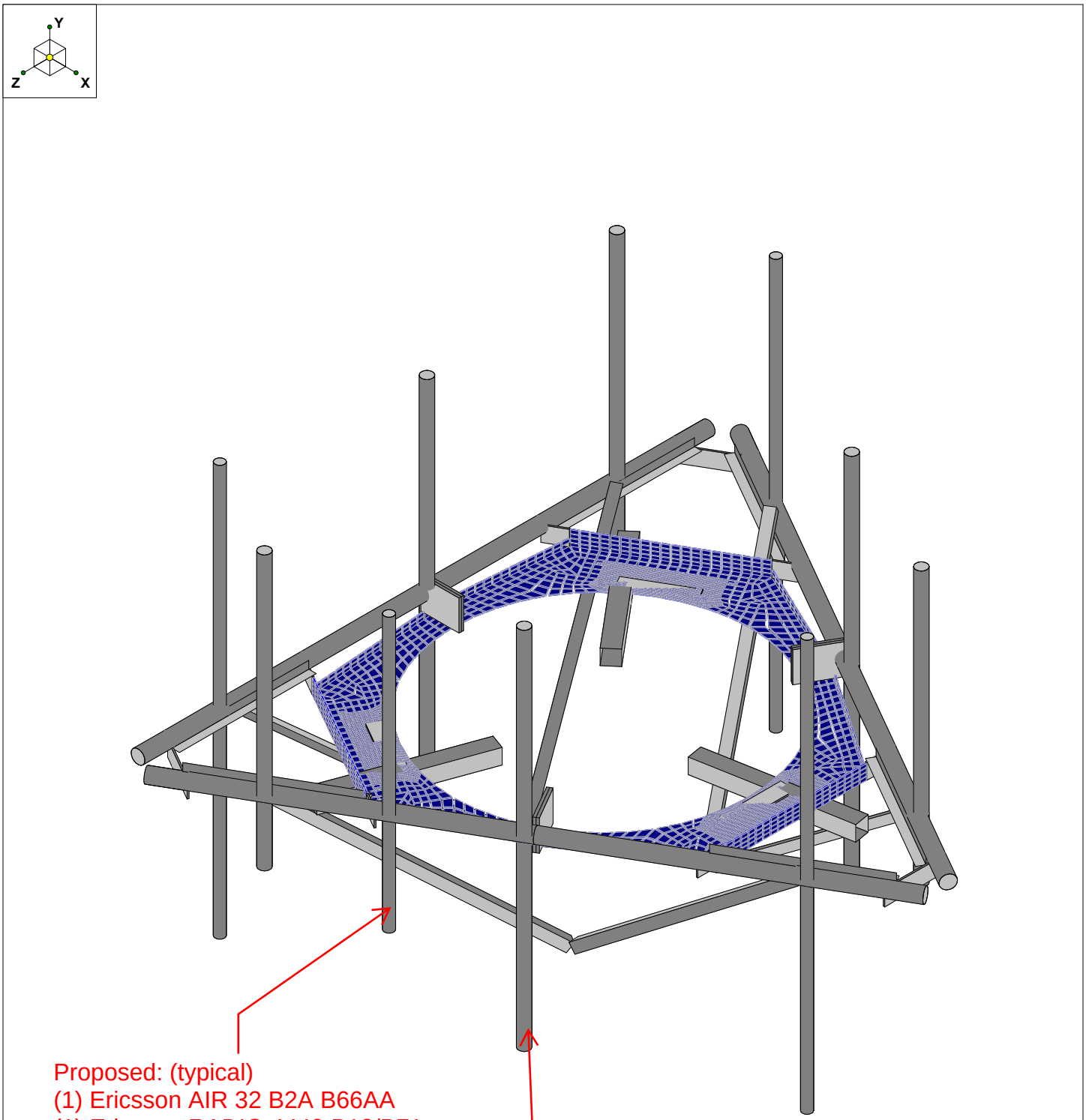
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 1
SPC		June 18, 2019 at 10:55 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...



Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 2
SPC		June 18, 2019 at 11:10 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...

APPENDIX B

SOFTWARE INPUT CALCULATION

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Project # 37519-1593.003.7191
By SPC

Date: 06/18/19

Analysis 30 degrees

v1.2, Effective 4/18/19

Mount Loading per TIA-222-H

Structure Information

Mount Type =	3 Sectors	
Mount Elev, z =	161	ft
Ground Elev, z_s =	560.51	ft
Wind Speed =	130	mph
Ice Wind Speed =	50	mph
Ice Thickness =	1.5	in
Exposure Cat =	C	
Structure Class =	II	
Topographic Cat =	1	
Crest Height =	0	ft

Velocity Pressure Coefficients

z_g =	900	ft	
a =	9.50		
K_{zmin} =	0.85		
K_z =	1.40		Calculated Value
Ke =	0.98		Ground Elevation Factor
K_z =	1.40		Velocity Press Coef (Section 2.6.5.2)
K_{zt} =	1.00		Topographic Factor (Section 2.6.6.4)
Gh =	1.00		Gust Effect Factor (Section 2.6.7)
K_d =	0.95		Wind Dir Probability Factor (Table 2-2)
K_a =	0.90		Shielding factor (Section 16.6)
q_z=	50.71	psf	Velocity Pressure (Section 2.6.9.6)

Ice Loading

Ii =	1.00		Ice Importance Factor (Table 2-3)
Iwi =	1.00		Wind Ice Importance Factor (Table 2-3)
q_z=	8.51	psf	Ice Velocity Pressure (Section 2.6.9.6)
K_{iz} =	1.17		Ice Escalation Factor (Section 2.6.8)
T_{iz} =	1.76	in	Factored Ice Thickness (Section 2.6.8)
h =	1.00	in	Bar Grating Height
W_i =	12.87	psf	Grating Ice Weight

Wind Pressures

Pressure =	50.714	psf
Ice Pressure =	8.506	psf

Antenna Attachment Labels & Elevations (inches with Respect to Bottom of Member)

Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)
A	A1	75.0	30	108.0	B	B1	75.0	30	108.0	C	C1	75.0	30	108.0	D			
A	A2	90.0	6	96.0	B	B2	90.0	6	96.0	C	C2	90.0	6	96.0	D			
A	A3	54.0	6	72.0	B	B3	54.0	6	72.0	C	C3	54.0	6	72.0	D			
A (2)	A1	74.0	74	108.0	B (2)	B1	74.0	74	108.0	C (2)	C1	74.0	74	108.0	D			
A (2)	A3	36	36	72.0	B (2)	B3	36	36	72.0	C (2)	C3	36	36	72.0	D			
A					B					C					D			
A					B					C					D			
A					B					C					D			
A					B					C					D			
A					B					C					D			

Antennas

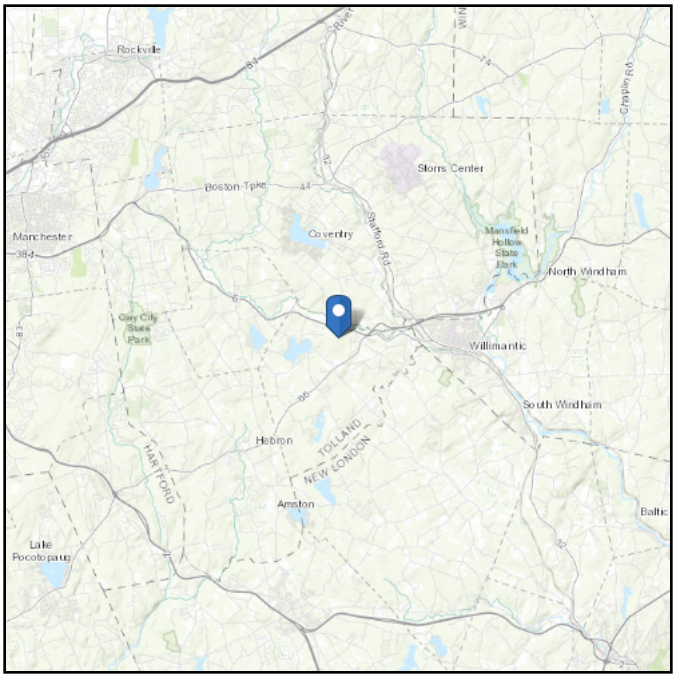
Item	Manufacturer	Antenna	Height (in)	Width (in)	Depth (in)	Flat or Round	Weight (lbs)	Antenna Attachment Locations					
								Label	Label	Label	Label	Label	Label
1	ERICSSON	AIR 32 B2A B66AA	59.25	12.87	8.66	Flat	143	A3	B3	C3			
2	ERICSSON	ERICSSON AIR 21 B2A B4P	56	12.1	7.87	Flat	91.5	A1	B1	C1			
3	RFS CELWAVE	APXVAARR24_43-U-NA20	95.9	24	8.7	Flat	128	A2	B2	C2			
4	ERICSSON	KRY 112 144/2	8.65	6.65	3.19	Flat	9.7	A1(2)	B1(2)	C1(2)			
5	ERICSSON	RADIO 4449 B12/B71	15	13.2	9.3	Flat	74	A3(2)	B3(2)	C3(2)			
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 560.51 ft (NAVD 88)
Latitude: 41.717622
Longitude: -72.299747



Wind

Results:

Wind Speed:	127 Vmph
10-year MRI	78 Vmph
25-year MRI	88 Vmph
50-year MRI	95 Vmph
100-year MRI	104 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Tue Apr 30 2019

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

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

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

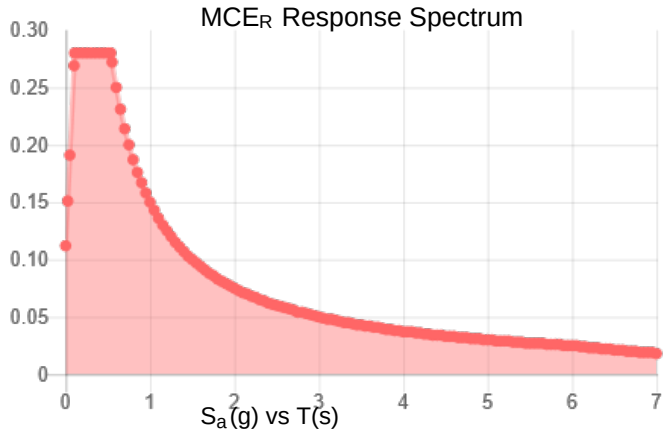
Seismic

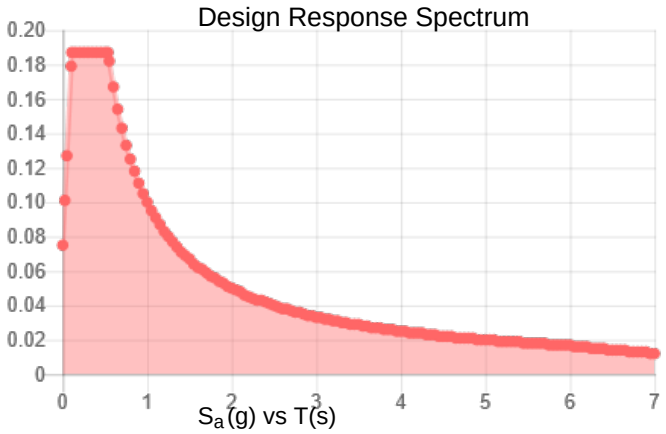
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.175	S_{DS} :	0.187
S_1 :	0.062	S_{D1} :	0.1
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.088
S_{MS} :	0.28	PGA_M :	0.14
S_{M1} :	0.15	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Apr 30 2019

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

Ice

Results:

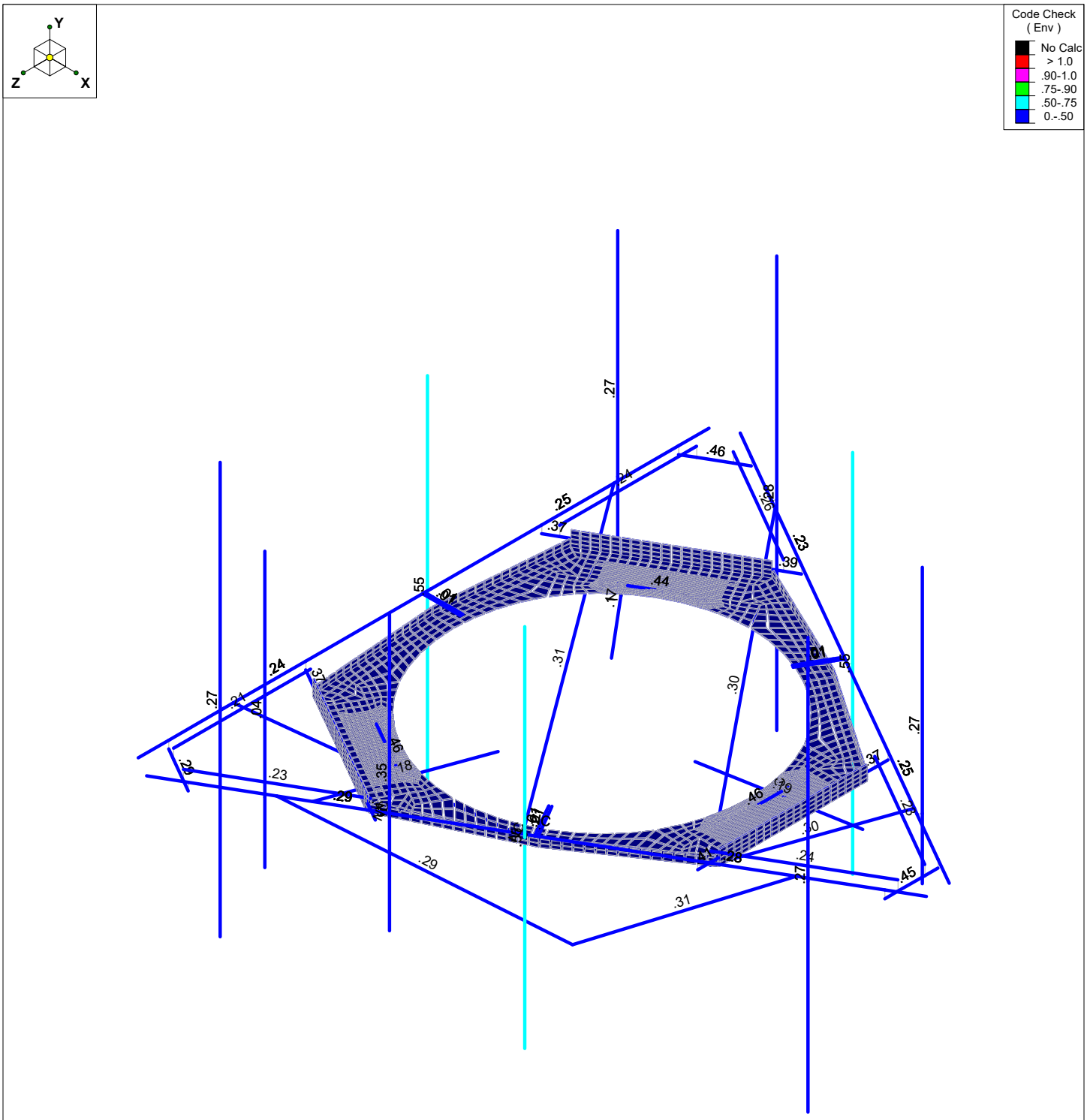
Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Apr 30 2019

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

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

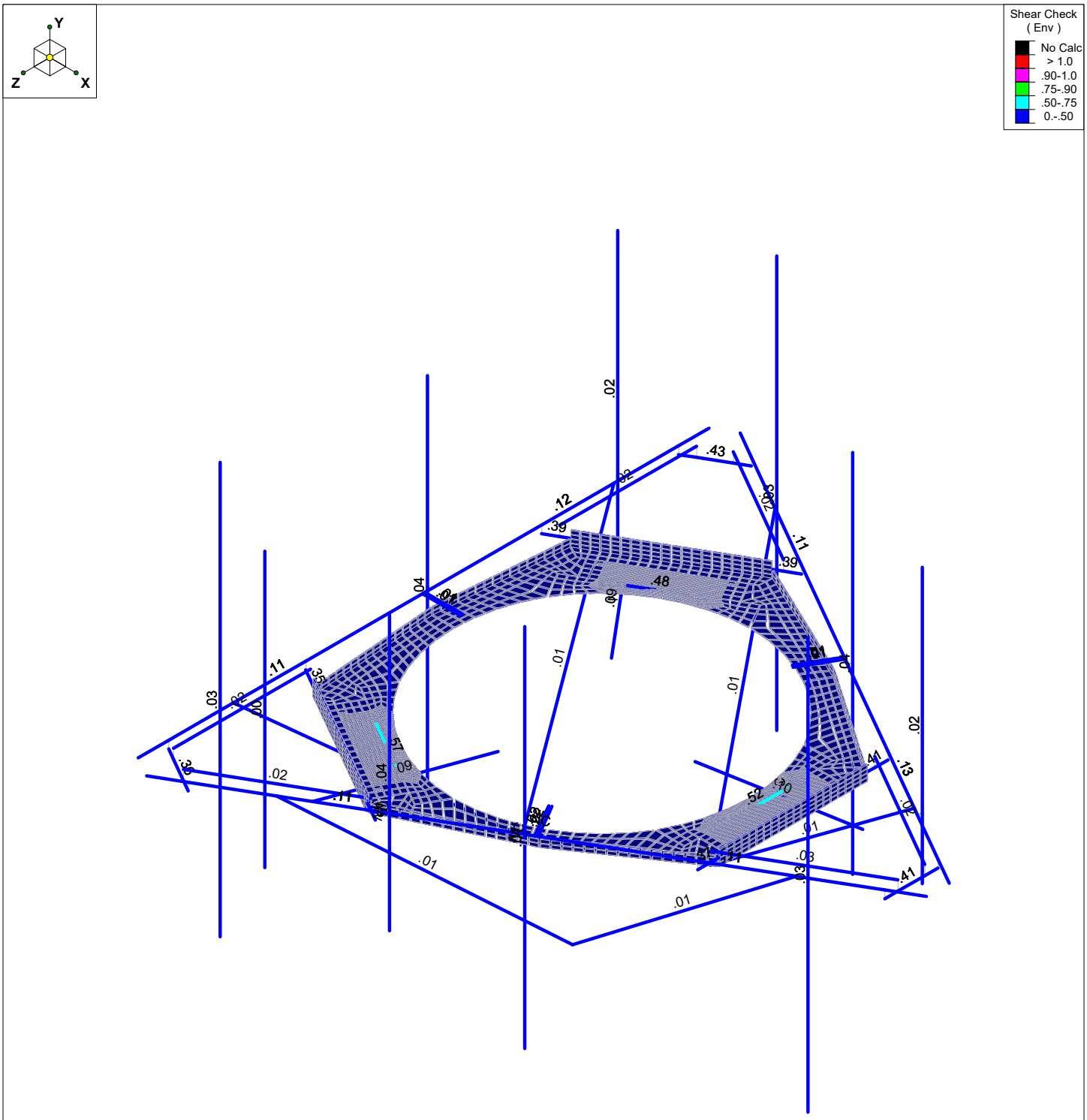
APPENDIX C

SOFTWARE ANALYSIS OUTPUT



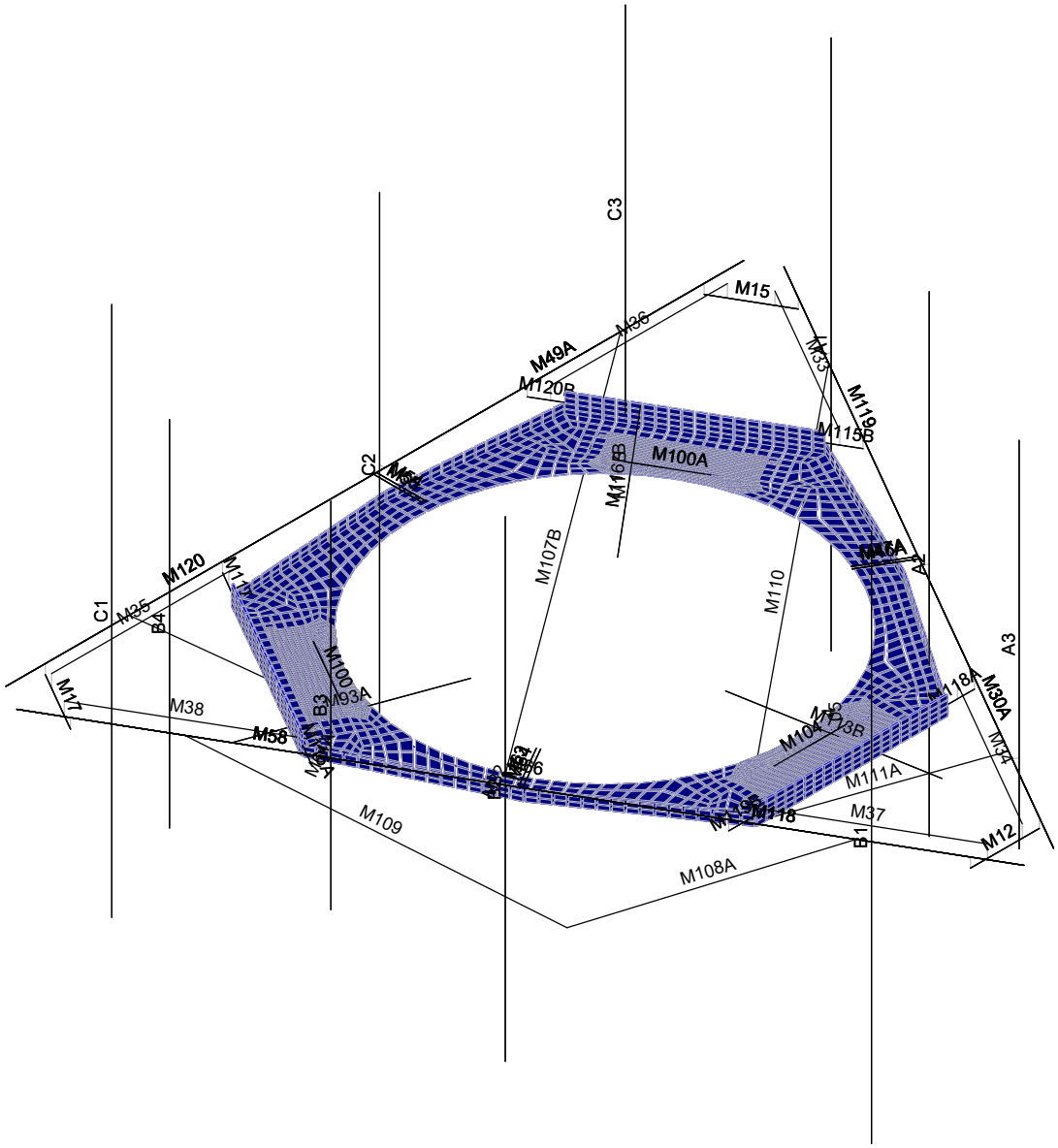
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 3
SPC		June 18, 2019 at 11:18 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...



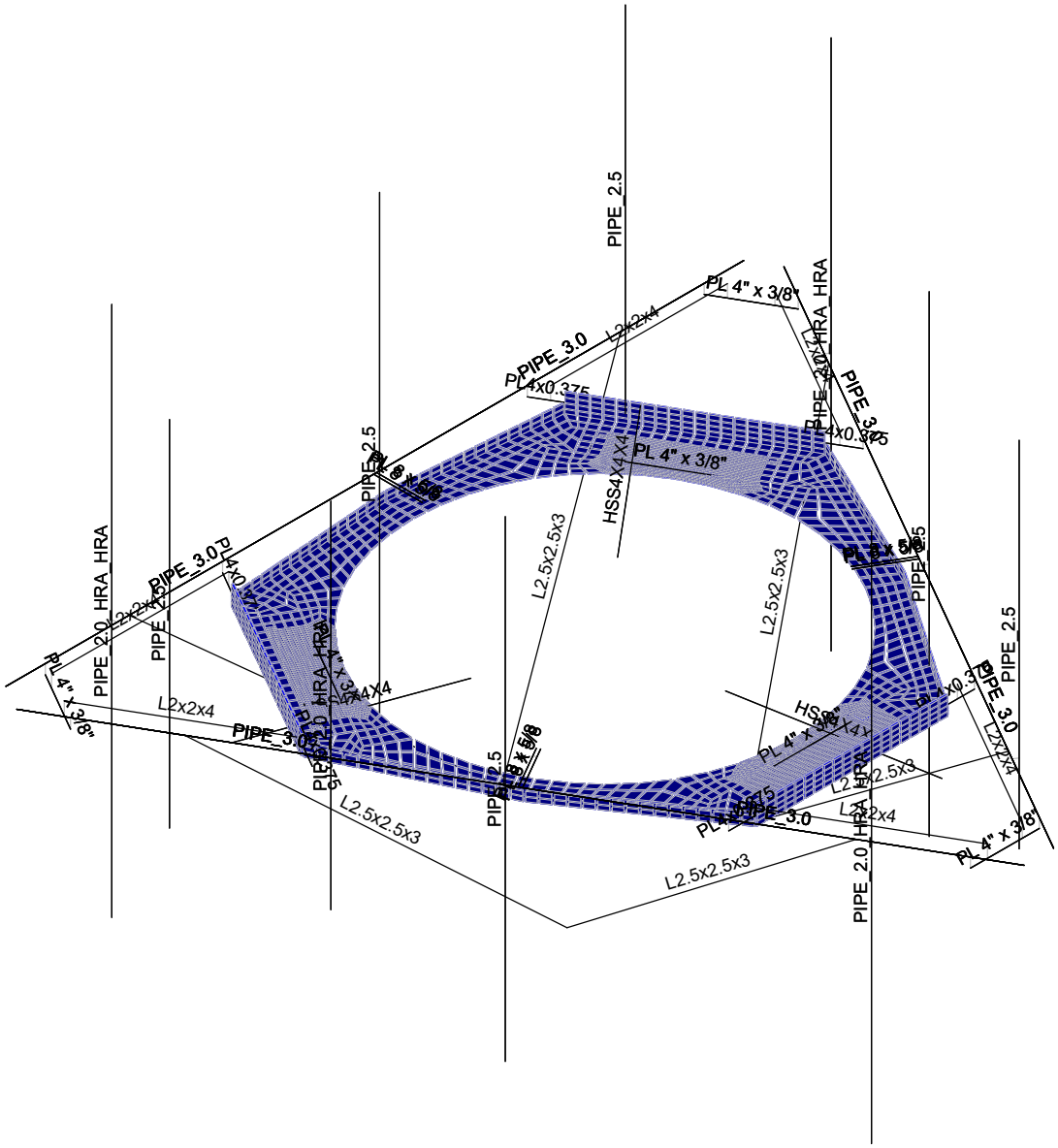
Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 4
SPC		June 18, 2019 at 11:19 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...



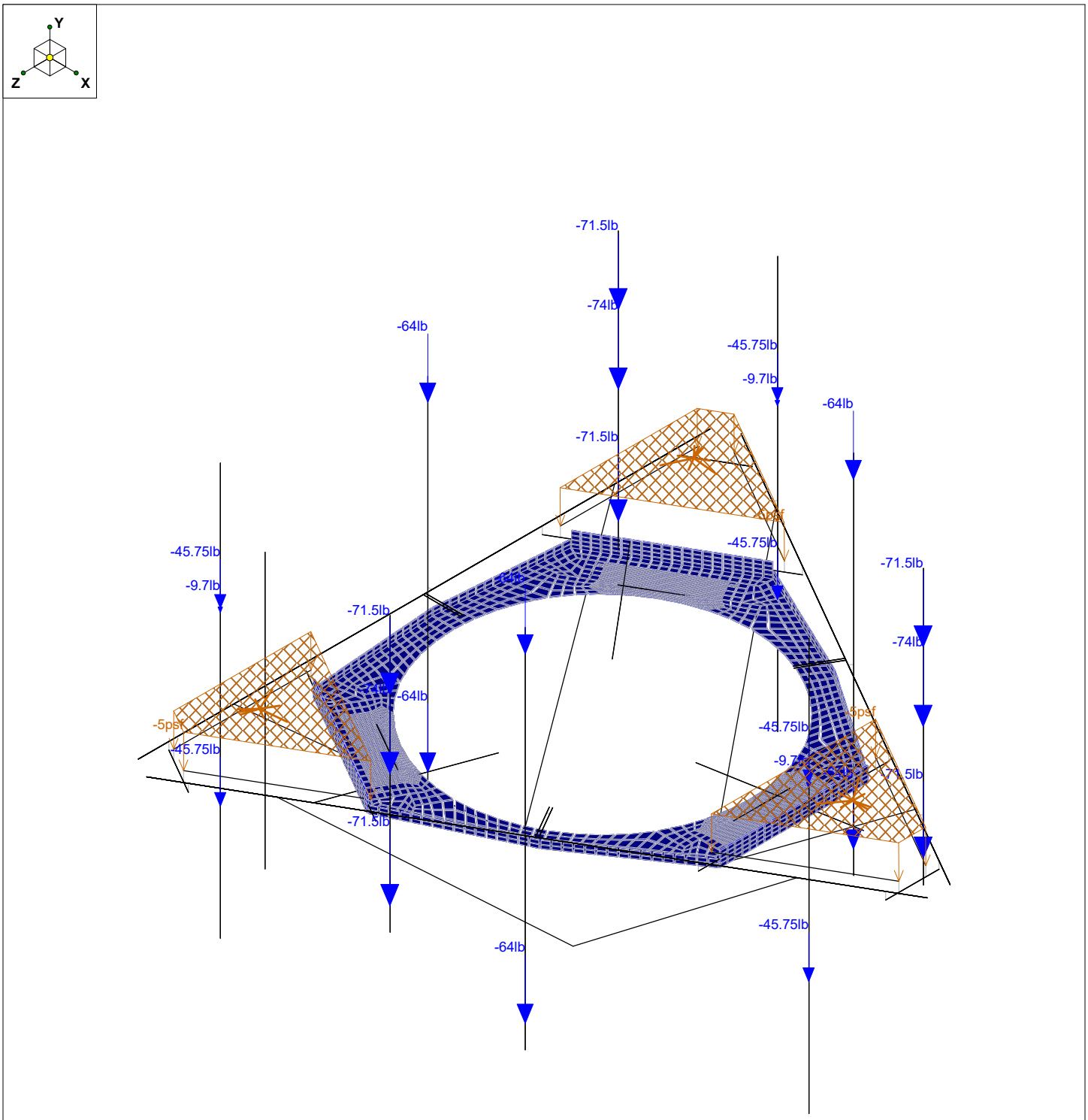
Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 5
SPC		June 18, 2019 at 11:20 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...



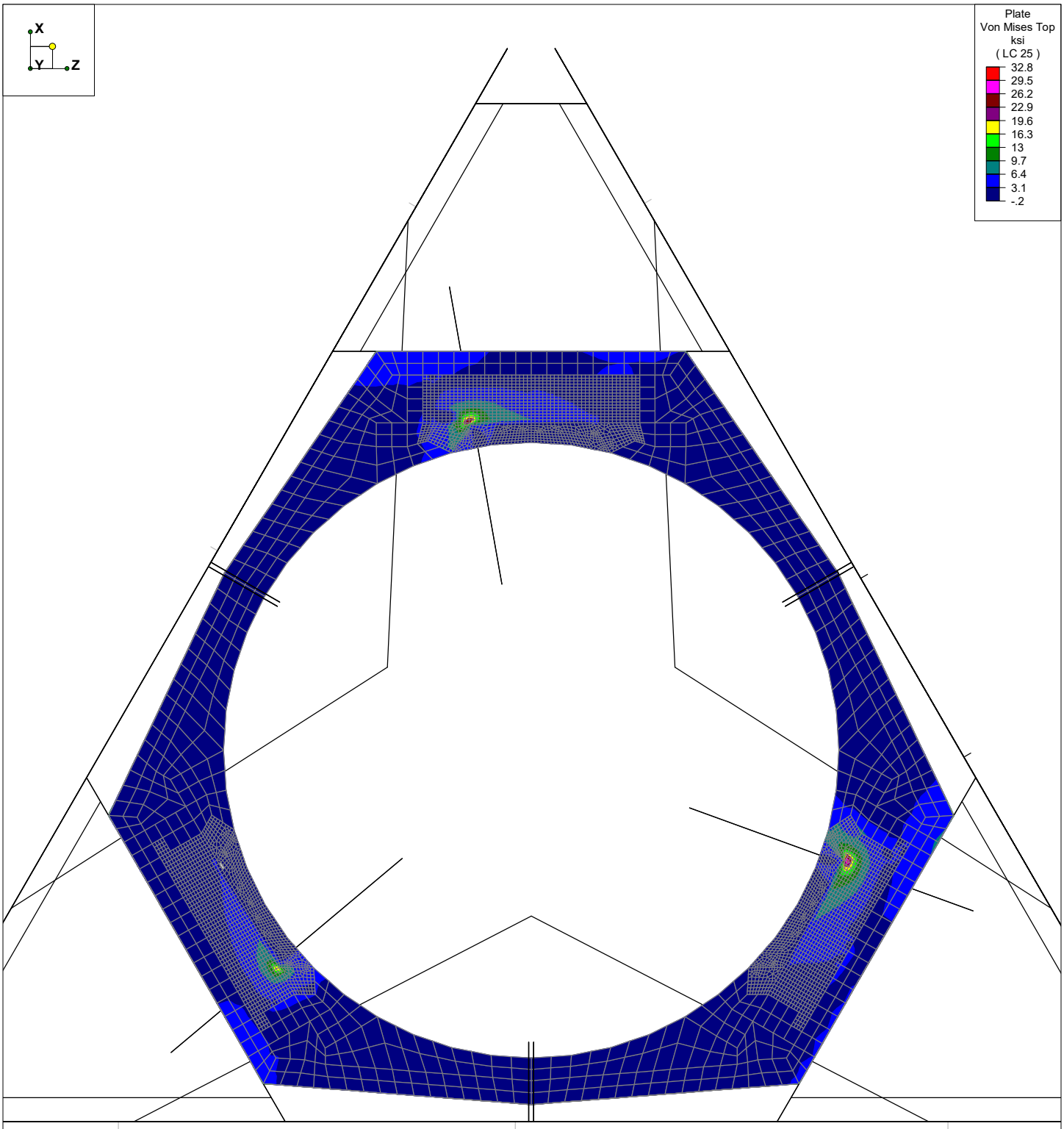
Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 6
SPC		June 18, 2019 at 11:21 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...



Loads: BLC 1, Dead
Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 7
SPC		June 18, 2019 at 11:22 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...



Results for LC 25, 1.2 D + 1.0 Di + 1.0 Wi @ 300

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 8
SPC		June 18, 2019 at 11:24 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B 42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.B 46	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M12	N17	N27			PL 4" x 3/8"	None	None	A36 Gr.36	Typical
2	M15	N6	N23			PL 4" x 3/8"	None	None	A36 Gr.36	Typical
3	M17	N31	N19			PL 4" x 3/8"	None	None	A36 Gr.36	Typical
4	M30A	N747A	N488A			PIPE_3.0	None	None	A53 Gr.B	Typical
5	M28B	N17	N751A			RIGID	None	None	RIGID	Typical
6	M29A	N32	N752A			RIGID	None	None	RIGID	Typical
7	M30B	N11	N750A			RIGID	None	None	RIGID	Typical
8	M31A	N6	N749A			RIGID	None	None	RIGID	Typical
9	M33	N98	N97		270	L2x2x4	None	None	A36 Gr.36	Typical
10	M34	N99	N100		270	L2x2x4	None	None	A36 Gr.36	Typical
11	M35	N102	N101		270	L2x2x4	None	None	A36 Gr.36	Typical
12	M36	N103	N104		270	L2x2x4	None	None	A36 Gr.36	Typical
13	M37	N106	N105		270	L2x2x4	None	None	A36 Gr.36	Typical
14	M38	N107	N108		270	L2x2x4	None	None	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
15	M39	N37	N99			RIGID	None	None	RIGID	Typical
16	M40	N38	N100			RIGID	None	None	RIGID	Typical
17	M41	N28	N105			RIGID	None	None	RIGID	Typical
18	M42	N29	N106			RIGID	None	None	RIGID	Typical
19	M43	N34	N108			RIGID	None	None	RIGID	Typical
20	M44	N33	N107			RIGID	None	None	RIGID	Typical
21	M45	N20	N101			RIGID	None	None	RIGID	Typical
22	M46	N21	N102			RIGID	None	None	RIGID	Typical
23	M47	N26	N104			RIGID	None	None	RIGID	Typical
24	M48	N25	N103			RIGID	None	None	RIGID	Typical
25	M49	N9	N97			RIGID	None	None	RIGID	Typical
26	M50	N10	N98			RIGID	None	None	RIGID	Typical
27	M46A	N109	N110			PL 8 x 5/8	None	None	A36 Gr.36	Typical
28	M47A	N111	N112			PL 8 x 5/8	None	None	A36 Gr.36	Typical
29	M49A	N120	N489A			PIPE_3.0	None	None	A53 Gr.B	Typical
30	M50A	N23	N124			RIGID	None	None	RIGID	Typical
31	M51	N24	N125			RIGID	None	None	RIGID	Typical
32	M52	N22	N123			RIGID	None	None	RIGID	Typical
33	M53	N19	N122			RIGID	None	None	RIGID	Typical
34	M54	N126	N127			PL 8 x 5/8	None	None	A36 Gr.36	Typical
35	M55	N128	N129			PL 8 x 5/8	None	None	A36 Gr.36	Typical
36	M58	N137	N487A			PIPE_3.0	None	None	A53 Gr.B	Typical
37	M59	N31	N141			RIGID	None	None	RIGID	Typical
38	M60	N32A	N142			RIGID	None	None	RIGID	Typical
39	M61	N30	N140			RIGID	None	None	RIGID	Typical
40	M62	N27	N139			RIGID	None	None	RIGID	Typical
41	M63	N143	N144			PL 8 x 5/8	None	None	A36 Gr.36	Typical
42	M64	N145	N146			PL 8 x 5/8	None	None	A36 Gr.36	Typical
43	M58A	N138B	N137A			RIGID	None	None	RIGID	Typical
44	M59A	N141A	N140A			RIGID	None	None	RIGID	Typical
45	M62A	N146A	N145A			RIGID	None	None	RIGID	Typical
46	M63A	N148	N147			RIGID	None	None	RIGID	Typical
47	M66	N154	N153			RIGID	None	None	RIGID	Typical
48	M67A	N156	N155			RIGID	None	None	RIGID	Typical
49	M118	N487A	N138			PIPE_3.0	None	None	A53 Gr.B	Typical
50	M119	N488A	N748A			PIPE_3.0	None	None	A53 Gr.B	Typical
51	M120	N489A	N121A			PIPE_3.0	None	None	A53 Gr.B	Typical
52	M58B	N103A	N101A			RIGID	None	None	RIGID	Typical
53	M60A	N106A	N104B			RIGID	None	None	RIGID	Typical
54	M64A	N114	N112A			RIGID	None	None	RIGID	Typical
55	C3	N113A	N112B			PIPE_2.5	None	None	A53 Gr.B	Typical
56	C1	N115A	N114A			PIPE_2.0_HR...	None	None	A53 Gr.B	Typical
57	M66A	N118	N116			RIGID	None	None	RIGID	Typical
58	M68	N122A	N120A			RIGID	None	None	RIGID	Typical
59	B4	N125A	N124B			PIPE_2.5	None	None	A53 Gr.B	Typical
60	B1	N127A	N126A			PIPE_2.0_HR...	None	None	A53 Gr.B	Typical
61	M72	N130	N128A			RIGID	None	None	RIGID	Typical
62	M74	N134A	N132			RIGID	None	None	RIGID	Typical
63	A3	N137B	N136			PIPE_2.5	None	None	A53 Gr.B	Typical
64	A1	N139A	N138A			PIPE_2.0_HR...	None	None	A53 Gr.B	Typical
65	B3	N141C	N140B			PIPE_2.0_HR...	None	None	A53 Gr.B	Typical
66	M79	N144A	N142A			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
67	C2	N147A	N146B			PIPE 2.5	None	None	A53 Gr.B	Typical
68	M82	N150	N148A			RIGID	None	None	RIGID	Typical
69	B2	N153A	N152			PIPE 2.5	None	None	A53 Gr.B	Typical
70	M85	N156A	N154A			RIGID	None	None	RIGID	Typical
71	A2	N159	N158			PIPE 2.5	None	None	A53 Gr.B	Typical
72	M93A	N449A	N450A			HSS4X4X4	None	None	A500 Gr.B...	Typical
73	M113B	N5840A	N5841A			HSS4X4X4	None	None	A500 Gr.B...	Typical
74	M116B	N5845A	N5846A			HSS4X4X4	None	None	A500 Gr.B...	Typical
75	M106	N5821A	N5820A		90	L2.5x2.5x3	None	None	A36 Gr.36	Typical
76	M107B	N5822A	N5820A		180	L2.5x2.5x3	None	None	A36 Gr.36	Typical
77	M108A	N5824A	N5828B		90	L2.5x2.5x3	None	None	A36 Gr.36	Typical
78	M109	N5825A	N5828B		180	L2.5x2.5x3	None	None	A36 Gr.36	Typical
79	M110	N5827A	N5826A		90	L2.5x2.5x3	None	None	A36 Gr.36	Typical
80	M111A	N5828A	N5826A		180	L2.5x2.5x3	None	None	A36 Gr.36	Typical
81	M32	N756B	N39			RIGID	None	None	RIGID	Typical
82	M100A	N470	N469		90	PL 4" x 3/8"	None	None	A36 Gr.36	Typical
83	M102	N450	N447			RIGID	None	None	RIGID	Typical
84	M103	N203	N464A			RIGID	None	None	RIGID	Typical
85	M105	N327	N468B			RIGID	None	None	RIGID	Typical
86	M107	N450	N472B			RIGID	None	None	RIGID	Typical
87	M108	N447	N471B			RIGID	None	None	RIGID	Typical
88	M111	N446A	N5837A			RIGID	None	None	RIGID	Typical
89	M112	N5838A	N5837A			RIGID	None	None	RIGID	Typical
90	M114	N5839A	N5842A			RIGID	None	None	RIGID	Typical
91	M115A	N5843A	N5842A			RIGID	None	None	RIGID	Typical
92	M117B	N5844A	N5847A			RIGID	None	None	RIGID	Typical
93	M118C	N5848A	N5847A			RIGID	None	None	RIGID	Typical
94	M100	N448A	N447A		90	PL 4" x 3/8"	None	None	A36 Gr.36	Typical
95	M101	N203	N200			RIGID	None	None	RIGID	Typical
96	M103A	N200	N463A			RIGID	None	None	RIGID	Typical
97	M104	N459A	N458A		90	PL 4" x 3/8"	None	None	A36 Gr.36	Typical
98	M105A	N327	N324			RIGID	None	None	RIGID	Typical
99	M107A	N324	N467B			RIGID	None	None	RIGID	Typical
100	M115B	N485	N11			PL4x0.375	None	None	A36 Gr.36	Typical
101	M116A	N227A	N32A			PL4x0.375	None	None	A36 Gr.36	Typical
102	M117	N253	N22			PL4x0.375	None	None	A36 Gr.36	Typical
103	M118A	N350	N32			PL4x0.375	None	None	A36 Gr.36	Typical
104	M119B	N362	N30			PL4x0.375	None	None	A36 Gr.36	Typical
105	M120B	N473	N24			PL4x0.375	None	None	A36 Gr.36	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M12						Yes	** NA **			None
2	M15						Yes	** NA **			None
3	M17						Yes	** NA **			None
4	M30A						Yes	** NA **			None
5	M28B						Yes	** NA **			None
6	M29A						Yes	** NA **			None
7	M30B						Yes	** NA **			None
8	M31A						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
9	M33						Yes	** NA **			None
10	M34						Yes	** NA **			None
11	M35						Yes	** NA **			None
12	M36						Yes	** NA **			None
13	M37						Yes	** NA **			None
14	M38						Yes	** NA **			None
15	M39						Yes	** NA **			None
16	M40						Yes	** NA **			None
17	M41						Yes	** NA **			None
18	M42						Yes	** NA **			None
19	M43						Yes	** NA **			None
20	M44						Yes	** NA **			None
21	M45						Yes	** NA **			None
22	M46						Yes	** NA **			None
23	M47						Yes	** NA **			None
24	M48						Yes	** NA **			None
25	M49						Yes	** NA **			None
26	M50						Yes	** NA **			None
27	M46A						Yes	** NA **			None
28	M47A						Yes	** NA **			None
29	M49A						Yes	** NA **			None
30	M50A						Yes	** NA **			None
31	M51						Yes	** NA **			None
32	M52						Yes	** NA **			None
33	M53						Yes	** NA **			None
34	M54						Yes	** NA **			None
35	M55						Yes	** NA **			None
36	M58						Yes	** NA **			None
37	M59						Yes	** NA **			None
38	M60						Yes	** NA **			None
39	M61						Yes	** NA **			None
40	M62						Yes	** NA **			None
41	M63						Yes	** NA **			None
42	M64						Yes	** NA **			None
43	M58A						Yes	** NA **			None
44	M59A						Yes	** NA **			None
45	M62A						Yes	** NA **			None
46	M63A						Yes	** NA **			None
47	M66						Yes	** NA **			None
48	M67A						Yes	** NA **			None
49	M118						Yes	** NA **			None
50	M119						Yes	** NA **			None
51	M120						Yes	** NA **			None
52	M58B						Yes	** NA **			None
53	M60A						Yes	** NA **			None
54	M64A						Yes	** NA **			None
55	C3						Yes	** NA **			None
56	C1						Yes	** NA **			None
57	M66A						Yes	** NA **			None
58	M68						Yes	** NA **			None
59	B4						Yes	** NA **			None
60	B1						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
61	M72						Yes	** NA **			None
62	M74						Yes	** NA **			None
63	A3						Yes	** NA **			None
64	A1						Yes	** NA **			None
65	B3						Yes	** NA **			None
66	M79						Yes	** NA **			None
67	C2						Yes	** NA **			None
68	M82						Yes	** NA **			None
69	B2						Yes	** NA **			None
70	M85						Yes	** NA **			None
71	A2						Yes	** NA **			None
72	M93A						Yes	** NA **			None
73	M113B						Yes	** NA **			None
74	M116B						Yes	** NA **			None
75	M106	BenPIN					Yes	** NA **			None
76	M107B	BenPIN					Yes	** NA **			None
77	M108A	BenPIN					Yes	** NA **			None
78	M109	BenPIN					Yes	** NA **			None
79	M110	BenPIN					Yes	** NA **			None
80	M111A	BenPIN					Yes	** NA **			None
81	M32						Yes	** NA **			None
82	M100A						Yes	** NA **			None
83	M102						Yes	** NA **			None
84	M103						Yes	** NA **			None
85	M105						Yes	** NA **			None
86	M107						Yes	** NA **			None
87	M108						Yes	** NA **			None
88	M111						Yes	** NA **			None
89	M112						Yes	** NA **			None
90	M114						Yes	** NA **			None
91	M115A						Yes	** NA **			None
92	M117B						Yes	** NA **			None
93	M118C						Yes	** NA **			None
94	M100						Yes	** NA **			None
95	M101						Yes	** NA **			None
96	M103A						Yes	** NA **			None
97	M104						Yes	** NA **			None
98	M105A						Yes	** NA **			None
99	M107A						Yes	** NA **			None
100	M115B						Yes	** NA **			None
101	M116A						Yes	** NA **			None
102	M117						Yes	** NA **			None
103	M118A						Yes	** NA **			None
104	M119B						Yes	** NA **			None
105	M120B						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M12	PL 4" x 3/8"	14									Lateral
2	M15	PL 4" x 3/8"	14									Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
3	M17	PL 4" x 3/8"	14									Lateral
4	M30A	PIPE_3.0	75									Lateral
5	M33	L2x2x4	36									Lateral
6	M34	L2x2x4	36									Lateral
7	M35	L2x2x4	36									Lateral
8	M36	L2x2x4	36									Lateral
9	M37	L2x2x4	36									Lateral
10	M38	L2x2x4	36									Lateral
11	M46A	PL 8 x 5/8	10									Lateral
12	M47A	PL 8 x 5/8	10									Lateral
13	M49A	PIPE_3.0	75									Lateral
14	M54	PL 8 x 5/8	10									Lateral
15	M55	PL 8 x 5/8	10									Lateral
16	M58	PIPE_3.0	75									Lateral
17	M63	PL 8 x 5/8	10									Lateral
18	M64	PL 8 x 5/8	10									Lateral
19	M118	PIPE_3.0	75									Lateral
20	M119	PIPE_3.0	75									Lateral
21	M120	PIPE_3.0	75									Lateral
22	C3	PIPE_2.5	72									Lateral
23	C1	PIPE_2.0_...	108									Lateral
24	B4	PIPE_2.5	72									Lateral
25	B1	PIPE_2.0_...	108									Lateral
26	A3	PIPE_2.5	72									Lateral
27	A1	PIPE_2.0_...	108									Lateral
28	B3	PIPE_2.0_...	72									Lateral
29	C2	PIPE_2.5	96									Lateral
30	B2	PIPE_2.5	96									Lateral
31	A2	PIPE_2.5	96									Lateral
32	M93A	HSS4X4X4	38									Lateral
33	M113B	HSS4X4X4	38									Lateral
34	M116B	HSS4X4X4	38									Lateral
35	M106	L2.5x2.5x3	70.458									Lateral
36	M107B	L2.5x2.5x3	70.458									Lateral
37	M108A	L2.5x2.5x3	70.458									Lateral
38	M109	L2.5x2.5x3	70.458									Lateral
39	M110	L2.5x2.5x3	70.458									Lateral
40	M111A	L2.5x2.5x3	70.458									Lateral
41	M100A	PL 4" x 3/8"	16									Lateral
42	M100	PL 4" x 3/8"	16									Lateral
43	M104	PL 4" x 3/8"	16									Lateral
44	M115B	PL4x0.375	5.5									Lateral
45	M116A	PL4x0.375	5.5									Lateral
46	M117	PL4x0.375	5.5									Lateral
47	M118A	PL4x0.375	5.5									Lateral
48	M119B	PL4x0.375	5.5									Lateral
49	M120B	PL4x0.375	5.5									Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	None		-1.1			30		3	
2	Live	None								
3	Wind 0	None					60	80		
4	Wind 30	None					60	80		
5	Wind 60	None					60	80		
6	Wind 90	None					60	80		
7	Wind 120	None					60	80		
8	Wind 150	None					60	80		
9	Ice Load	None					30	40	3	
10	Ice 0	None					60	80		
11	Ice 30	None					60	80		
12	Ice 60	None					60	80		
13	Ice 90	None					60	80		
14	Ice 120	None					60	80		
15	Ice 150	None					60	80		
16	Lm	None				1				
17	Lv	None				1				
18	BLC 1 Transient Area...	None						30		
19	BLC 9 Transient Area...	None						30		

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4 D	Y...	Y		1	1.4																				
2	1.2 D + 1.6 L	Y...	Y		1	1.2	2	1.6																		
3	1.2 D + 1.0 Wo @ 0	Y...	Y		1	1.2	3	1																		
4	1.2 D + 1.0 Wo @ 30	Y...	Y		1	1.2	4	1																		
5	1.2 D + 1.0 Wo @ 60	Y...	Y		1	1.2	5	1																		
6	1.2 D + 1.0 Wo @ 90	Y...	Y		1	1.2	6	1																		
7	1.2 D + 1.0 Wo @ 120	Y...	Y		1	1.2	7	1																		
8	1.2 D + 1.0 Wo @ 150	Y...	Y		1	1.2	8	1																		
9	1.2 D + 1.0 Wo @ 180	Y...	Y		1	1.2	3	-1																		
10	1.2 D + 1.0 Wo @ 210	Y...	Y		1	1.2	4	-1																		
11	1.2 D + 1.0 Wo @ 240	Y...	Y		1	1.2	5	-1																		
12	1.2 D + 1.0 Wo @ 270	Y...	Y		1	1.2	6	-1																		
13	1.2 D + 1.0 Wo @ 300	Y...	Y		1	1.2	7	-1																		
14	1.2 D + 1.0 Wo @ 330	Y...	Y		1	1.2	8	-1																		
15	1.2 D + 1.0 Di + 1.0 Wi @ 0	Y...	Y		1	1.2	9	1	10	1																
16	1.2 D + 1.0 Di + 1.0 Wi @ 30	Y...	Y		1	1.2	9	1	11	1																
17	1.2 D + 1.0 Di + 1.0 Wi @ 60	Y...	Y		1	1.2	9	1	12	1																
18	1.2 D + 1.0 Di + 1.0 Wi @ 90	Y...	Y		1	1.2	9	1	13	1																
19	1.2 D + 1.0 Di + 1.0 Wi @ 120	Y...	Y		1	1.2	9	1	14	1																
20	1.2 D + 1.0 Di + 1.0 Wi @ 150	Y...	Y		1	1.2	9	1	15	1																
21	1.2 D + 1.0 Di + 1.0 Wi @ 180	Y...	Y		1	1.2	9	1	10	-1																
22	1.2 D + 1.0 Di + 1.0 Wi @ 210	Y...	Y		1	1.2	9	1	11	-1																
23	1.2 D + 1.0 Di + 1.0 Wi @ 240	Y...	Y		1	1.2	9	1	12	-1																
24	1.2 D + 1.0 Di + 1.0 Wi @ 270	Y...	Y		1	1.2	9	1	13	-1																
25	1.2 D + 1.0 Di + 1.0 Wi @ 300	Y...	Y		1	1.2	9	1	14	-1																
26	1.2 D + 1.0 Di + 1.0 Wi @ 330	Y...	Y		1	1.2	9	1	15	-1																
27	1.2 D + 1.5 Lm + 1.0 Wm @ 0	Y...	Y		1	1.2	3	.053	16	1.5																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
28	1.2 D + 1.5 Lm + 1.0 Wm @ 30	Y...	Y		1	1.2	4	.053	16	1.5															
29	1.2 D + 1.5 Lm + 1.0 Wm @ 60	Y...	Y		1	1.2	5	.053	16	1.5															
30	1.2 D + 1.5 Lm + 1.0 Wm @ 90	Y...	Y		1	1.2	6	.053	16	1.5															
31	1.2 D + 1.5 Lm + 1.0 Wm @ 120	Y...	Y		1	1.2	7	.053	16	1.5															
32	1.2 D + 1.5 Lm + 1.0 Wm @ 150	Y...	Y		1	1.2	8	.053	16	1.5															
33	1.2 D + 1.5 Lm + 1.0 Wm @ 180	Y...	Y		1	1.2	3	-.0...	16	1.5															
34	1.2 D + 1.5 Lm + 1.0 Wm @ 210	Y...	Y		1	1.2	4	-.0...	16	1.5															
35	1.2 D + 1.5 Lm + 1.0 Wm @ 240	Y...	Y		1	1.2	5	-.0...	16	1.5															
36	1.2 D + 1.5 Lm + 1.0 Wm @ 270	Y...	Y		1	1.2	6	-.0...	16	1.5															
37	1.2 D + 1.5 Lm + 1.0 Wm @ 300	Y...	Y		1	1.2	7	-.0...	16	1.5															
38	1.2 D + 1.5 Lm + 1.0 Wm @ 330	Y...	Y		1	1.2	8	-.0...	16	1.5															
39	1.2 D + 1.5 Lv	Y...	Y		1	1.2	17	1.5																	
40	1.2 D + 1.0 Di + 1.0 Wi @ 0_APP	Y...	Y		1	1.2	9	1	10	1															

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-in]	LC	MY [k-in]	LC	MZ [k-in]	LC
1	N449A	max	2156.627	12	671.579	40	3345.761	4	-.357	4	29.472	13	1.94	6
2		min	-2522.5...	6	166.916	9	-2377.0...	10	-11.826	22	-28.554	7	-6.579	12
3	N5840A	max	3802.645	12	623.725	23	2378.319	3	4.817	3	31.586	9	16.916	39
4		min	-3072.5...	6	79.124	5	-2607.9...	9	-4.618	9	-29.554	3	.791	12
5	N5845A	max	2034.301	12	582.814	20	2638.055	14	9.696	26	29.551	5	1.419	5
6		min	-2582.2...	6	85.008	13	-3108.5...	8	.012	8	-27.198	11	-6.388	24
7	N5820A	max	58.831	6	2326.768	24	331.456	5	0	40	0	40	0	40
8		min	-1321.8...	25	-297.95	6	-728.957	11	0	1	0	1	0	1
9	N5826A	max	969.966	3	2441.865	16	274.618	11	0	40	0	40	0	40
10		min	-378.284	9	-398.981	10	-1238.4...	17	0	1	0	1	0	1
11	N5828B	max	955.01	9	2613.142	20	1292.285	19	0	40	0	40	0	40
12		min	-372.935	3	-202.535	14	-96.959	13	0	1	0	1	0	1
13	Totals:	max	7670.132	12	8237.45	40	7415.258	3						
14		min	-7670.1...	6	3413.977	9	-7415.2...	9						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[in]	LC	Shear Ch...	Loc...	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y...	phi*Mn z-z [...	Cb	Eqn
1	A2	PIPE_2.5	.549	48	11	.038	48		11	30038.461	50715	43.155	43.155	1.386	H1-1b
2	C2	PIPE_2.5	.549	48	7	.038	48		7	30038.461	50715	43.155	43.155	1.386	H1-1b
3	B2	PIPE_2.5	.549	48	3	.038	48		3	30038.461	50715	43.155	43.155	1.316	H1-1b
4	M15	PL 4" x 3...	.460	10.5	11	.429	3.5	y	5	20148.333	48600	4.556	48.6	1.832	H1-1b
5	M104	PL 4" x 3...	.458	.333	3	.517	.333	y	23	15512.055	48600	4.556	48.6	2.871	H1-1b
6	M100	PL 4" x 3...	.456	.333	7	.566	.333	y	40	15512.055	48600	4.556	48.6	2.857	H1-1b
7	M12	PL 4" x 3...	.450	3.5	3	.409	3.5	y	3	20148.333	48600	4.556	48.6	1.657	H1-1b
8	M100A	PL 4" x 3...	.443	.333	11	.475	.333	y	19	15512.055	48600	4.556	48.6	2.873	H1-1b
9	M119B	PL4x0.375	.414	5.5	4	.372	0	y	3	42424.657	48600	4.556	48.6	1.289	H1-1b
10	M116A	PL4x0.375	.395	5.5	12	.452	0	y	26	42424.657	48600	4.556	48.6	1.361	H1-1b
11	M115B	PL4x0.375	.387	5.5	12	.392	0	y	11	42424.657	48600	4.556	48.6	1.281	H1-1b
12	M120B	PL4x0.375	.374	5.5	14	.389	0	y	7	42424.657	48600	4.556	48.6	1.331	H1-1b
13	M118A	PL4x0.375	.373	5.5	6	.410	0	y	11	42424.657	48600	4.556	48.6	1.305	H1-1b
14	M117	PL4x0.375	.371	5.5	8	.350	0	y	7	42424.657	48600	4.556	48.6	1.323	H1-1b
15	B3	PIPE_2....	.350	26.25	3	.037	26....		3	20866.733	32130	22.459	22.459	1.686	H1-1b
16	M107B	L2.5x2.5x3	.311	33.761	11	.015	70....	z	11	9525.78	29192.4	10.471	18.488	1.134	H2-1

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Ch...	Loc[in]	LC	Shear Ch...	Loc...	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y...	phi*Mn z-z [...	Cb	Eqn
17	M108A	L2.5x2.5x3	.309	33.761	9	.013	70....	y	3	9525.814	29192.4	10.471	18.487	1.134	H2-1
18	M111A	L2.5x2.5x3	.305	33.761	3	.014	70....	z	3	9525.794	29192.4	10.471	18.488	1.134	H2-1
19	M110	L2.5x2.5x3	.297	33.761	5	.013	70....	y	11	9525.779	29192.4	10.471	18.485	1.134	H2-1
20	M58	PIPE_3.0	.293	72.656	16	.115	43....		9	52901.431	65205	68.985	68.985	2.111	H1-1b
21	M109	L2.5x2.5x3	.287	33.761	7	.012	70....	z	7	9525.765	29192.4	10.471	18.489	1.134	H2-1
22	M17	PL 4" x 3...	.287	3.5	7	.357	10.5	y	13	20148.333	48600	4.556	48.6	2.288	H1-1b
23	M118	PIPE_3.0	.276	0	40	.111	31....		7	52901.431	65205	68.985	68.985	2.779	H1-1b
24	A1	PIPE_2....	.275	52.875	5	.027	52....		5	12143.947	32130	22.459	22.459	1.873	H1-1b
25	B1	PIPE_2....	.275	52.875	9	.027	52....		9	12143.947	32130	22.459	22.459	1.368	H1-1b
26	C1	PIPE_2....	.275	52.875	5	.027	52....		5	12143.947	32130	22.459	22.459	1.872	H1-1b
27	A3	PIPE_2.5	.271	16.5	11	.025	16.5		11	37773.818	50715	43.155	43.155	1.791	H1-1b
28	C3	PIPE_2.5	.271	16.5	7	.025	16.5		7	37773.818	50715	43.155	43.155	1.79	H1-1b
29	M106	L2.5x2.5x3	.262	33.761	13	.012	70....	y	7	9525.787	29192.4	10.471	18.485	1.134	H2-1
30	M33	L2x2x4	.260	0	11	.023	0	y	14	19394.312	30585.6	8.291	18.836	1.272	H2-1
31	M49A	PIPE_3.0	.251	72.656	20	.123	8.5...		13	52901.431	65205	68.985	68.985	2.522	H1-1b
32	M30A	PIPE_3.0	.247	72.656	23	.133	8.5...		5	52901.431	65205	68.985	68.985	2.579	H1-1b
33	M37	L2x2x4	.243	0	3	.025	0	y	6	19394.312	30585.6	8.291	18.886	1.296	H2-1
34	M120	PIPE_3.0	.239	0	19	.112	31....		11	52901.431	65205	68.985	68.985	2.617	H1-1b
35	M36	L2x2x4	.236	36	14	.019	0	z	40	19394.312	30585.6	8.291	18.922	1.591	H2-1
36	M119	PIPE_3.0	.234	0	23	.108	31....		3	52901.431	65205	68.985	68.985	2.747	H1-1b
37	M34	L2x2x4	.234	36	6	.018	36	y	5	19394.312	30585.6	8.291	18.922	1.538	H2-1
38	M38	L2x2x4	.225	36	10	.024	0	z	23	19394.312	30585.6	8.291	18.922	1.626	H2-1
39	M35	L2x2x4	.208	0	7	.022	0	y	10	19394.312	30585.6	8.291	18.922	1.345	H2-1
40	M113B	HSS4X4...	.189	0	9	.100	0	z	9	133783.978	139518	194.166	194.166	3.052	H1-1b
41	M93A	HSS4X4...	.180	0	13	.093	0	z	13	133783.978	139518	194.166	194.166	2.981	H1-1b
42	M116B	HSS4X4...	.173	0	5	.093	0	z	5	133783.978	139518	194.166	194.166	2.955	H1-1b
43	B4	PIPE_2.5	.044	16.5	3	.004	16.5		3	37773.818	50715	43.155	43.155	1.391	H1-1b
44	M54	PL 8 x 5/8	.014	0	12	.015	2.0...	y	19	137809.489	162000	25.313	324	4.759	H1-1b
45	M55	PL 8 x 5/8	.014	0	5	.013	0	y	19	137809.489	162000	25.313	324	4.756	H1-1b
46	M64	PL 8 x 5/8	.013	0	12	.015	0	y	40	137809.489	162000	25.313	324	4.716	H1-1b
47	M63	PL 8 x 5/8	.013	0	7	.018	2.0...	y	38	137809.489	162000	25.313	324	4.73	H1-1b
48	M47A	PL 8 x 5/8	.012	0	9	.013	0	y	23	137809.489	162000	25.313	324	4.709	H1-1b
49	M46A	PL 8 x 5/8	.012	0	3	.015	2.0...	y	23	137809.489	162000	25.313	324	4.774	H1-1b

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Project # A37519-1593.003.7191
By SPC
Date: 06/18/19
v0.1, Effective 07/10/18

MOUNT TO TOWER CONNECTION CHECKS

REACTIONS - LC9 N5840A

Px=	2.60792	Kip
Py=	0.26812	Kip
(Axial)Pz=	0.19607	Kip
Mx=	5.576	Kip-in
My=	31.586	Kip-in
(Torque)Mz=	4.618	Kip-in

Number of Bolts	=	4	
Plate Size	b=	10	in
	d=	10	in
Edge distance for Bolts	=	1.5	in
Bolt group centroid y-coordinate, Yc		5	in
Bolt group centroid x-coordinate, Xc		5	in
Load eccentricity in x-direction, ex		0	in
Load eccentricity in y-direction, ey		0	in
Total Moment including load eccentricity ΣMx=		5.576	Kips-in
Total Moment including load eccentricity ΣMy=		31.586	Kips-in
Total Moment including load eccentricity ΣMz=		4.618	Kips-in

WELD CHECKS

Standoff Member Type		Square	
Width	=	4	in
Depth (only for square members)	=	4	in
Assumed Weld Size	=	0.3750	
Total Forces in X direction	=	0.434	kips
Total Forces in Y direction	=	0.142	kips
Total Forces in Z direction	=	1.75	kips
Resultant	=	1.81	kips
Φ*Fw (Kip/in)/16" weld	=	1.392	
Capacity used		21.70%	

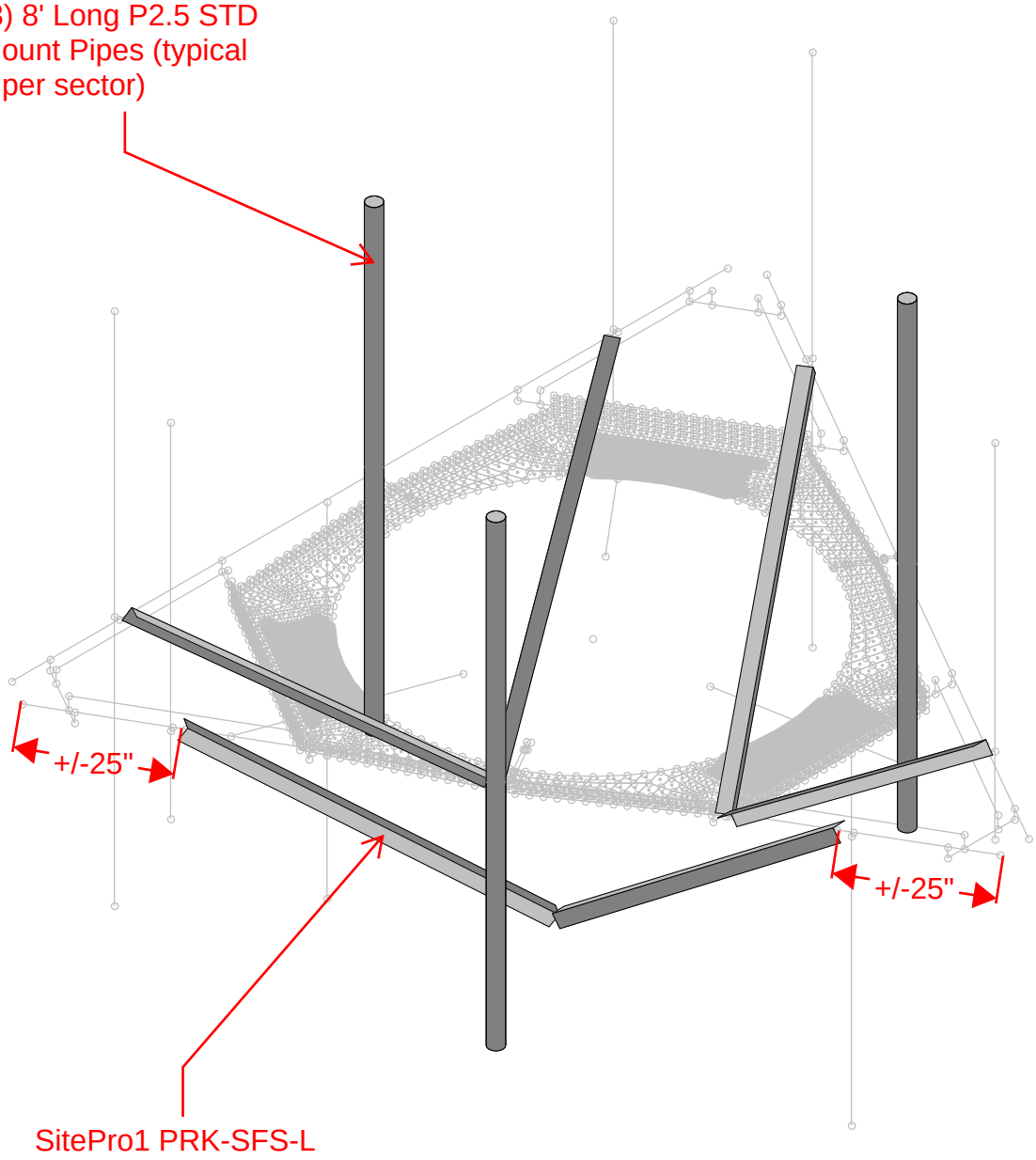
BOLT CHECKS

Tension Reaction	2.70	kip
Shear Reaction	0.85	kip
Bolt Type	A325N	
Bolt Diameter	0.625	in
Tensile Strength	20.7	kips
Shear Strength	12.4	kips
Reduced Tensile Strength	-	kips
Tensile Capacity Used	13.1%	
Shear Capacity Used	6.8%	

Note: Tension reduction not required if tension or shear capacity < 30%

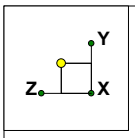
APPENDIX D

SUPPLEMENTAL MODIFICATION INFORMATION

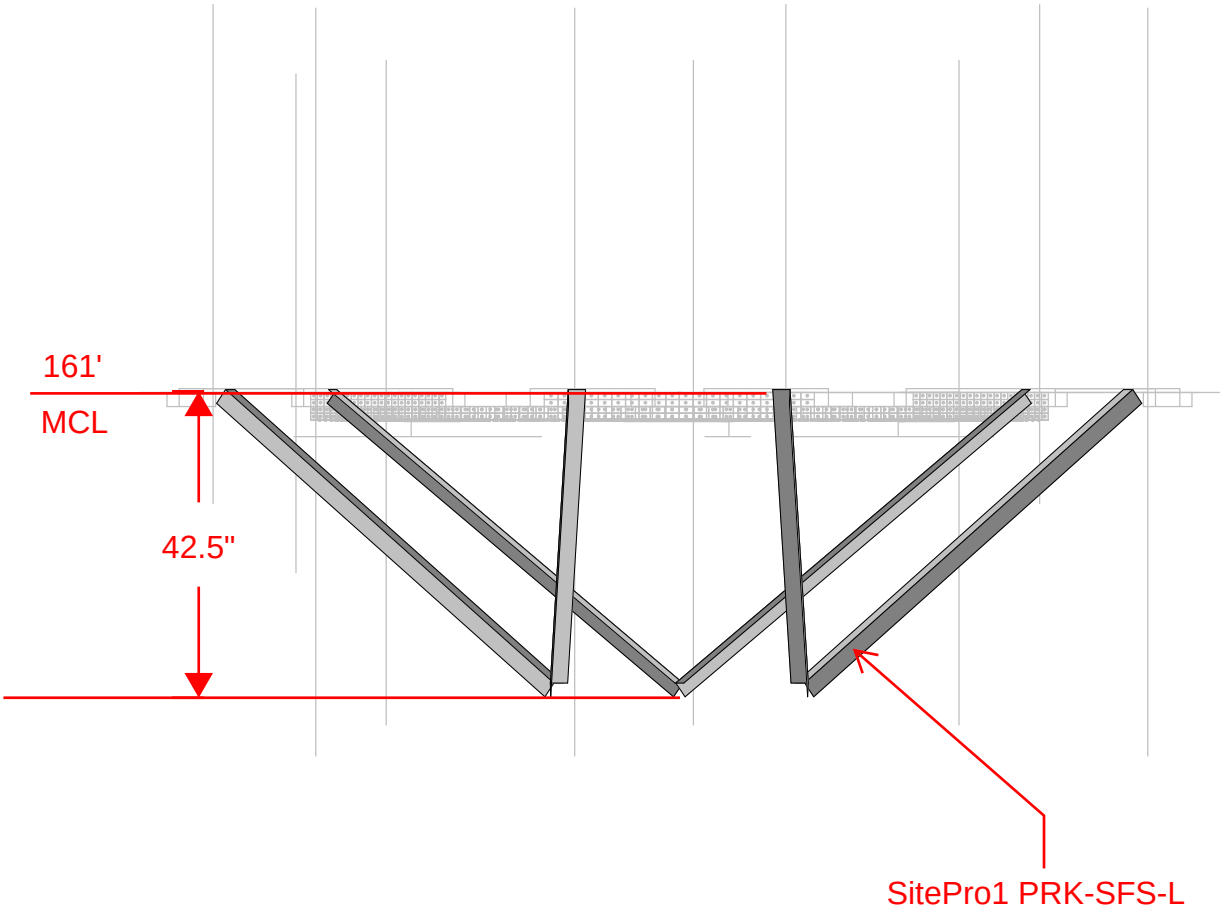


Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 9
SPC		June 19, 2019 at 9:25 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...



Modification Drawing 2 of 2

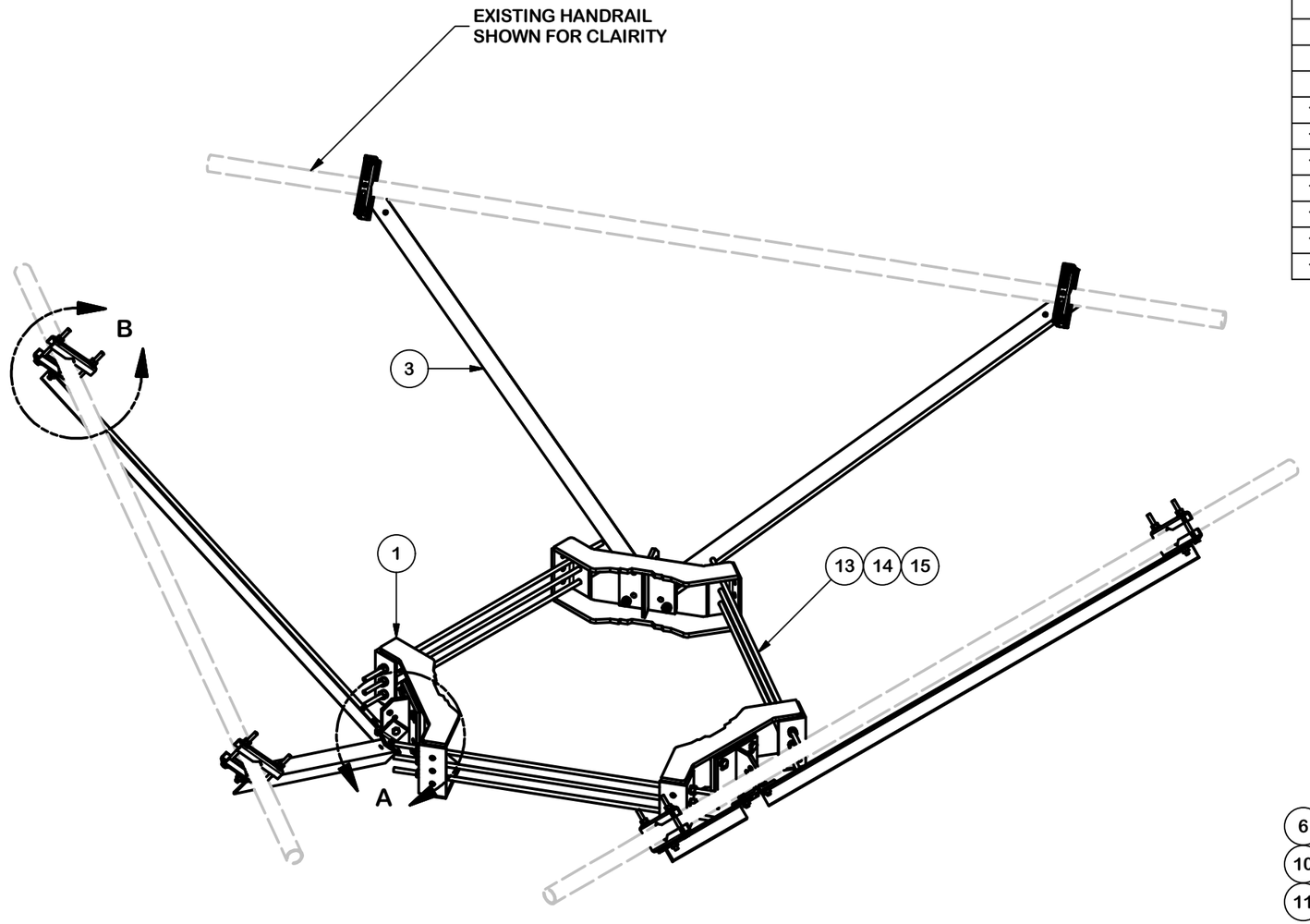


Envelope Only Solution

Paul J. Ford & Company	BU 876391 / Columbia/Deojay	SK - 10
SPC		June 18, 2019 at 11:36 AM
37519-1593.003.7191		37519-1593.003.7191_WindLoad.r...

APPENDIX E

MANUFACTURER DRAWINGS (FOR REFERENCE ONLY)



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	3	X-TBW	T-BRACKET WELDMENT		13.60	40.80
3	6	X-254924	DIAGONAL ANGLE - SITE PRO 1	72 in	19.71	118.24
4	12	X-STU	STIFF ARM CHANNEL BRACKET	8 1/2 in	1.37	16.46
5	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
6	12	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1/2 in	0.15	1.77
7	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
8	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
9	24	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	0.82
10	27	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.38
11	27	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.93
12	12	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
13	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	0.40	3.59
13	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	0.40	3.59
14	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
15	30	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	3.90
					TOTAL WT. #	642.04

DETAIL A

DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/25/2017

REVISION HISTORY

TOLERANCE NOTES

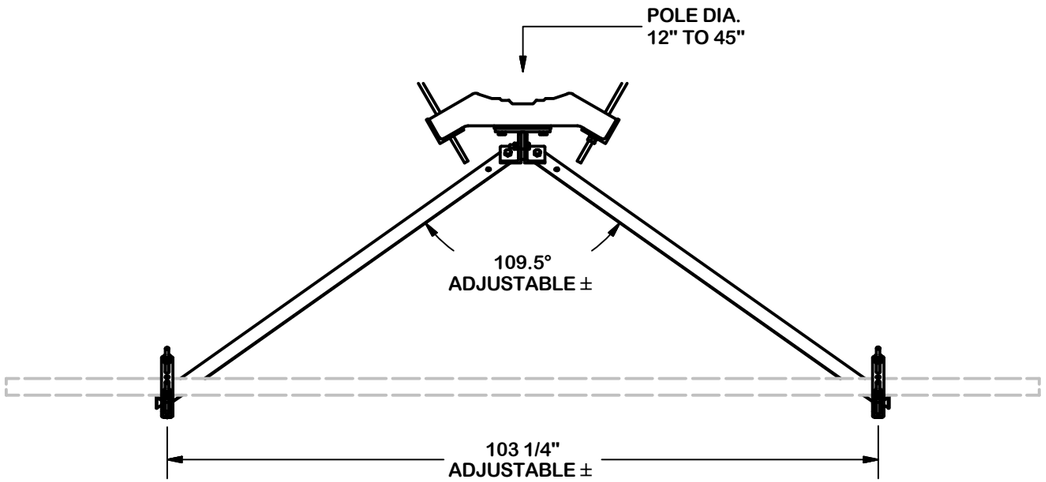
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

DESCRIPTION: HANDRAIL REINFORCEMENT KIT (LONG)

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS-L

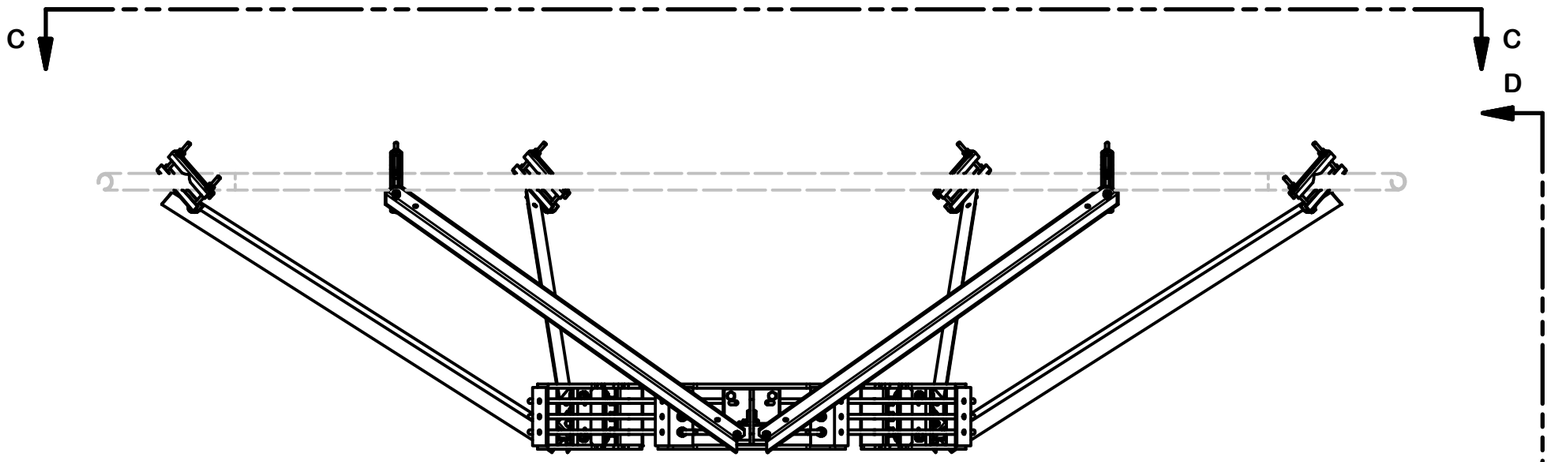
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 9/8/2017	PRK-SFS-L

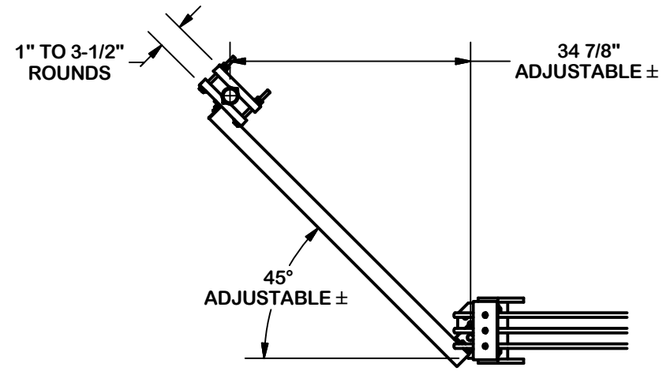
SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX



PARTIAL VIEW C-C

VERTICAL POSITION





PARTIAL VIEW D-D

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/25/2017

REVISION HISTORY

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 ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

DESCRIPTION: HANDRAIL REINFORCEMENT KIT (LONG)

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS-L

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 9/8/2017	PRK-SFS-L

Exhibit F

Power Density/RF Emissions Report

Transcom Engineering, Inc.

Wireless Network Design and Deployment

Radio Frequency Emissions Analysis Report

T-MOBILE Existing Facility

Site ID: CT11503A

Sprint Columbia Rt 6
14 Thompson Hill Road
Columbia, CT 06237

May 23, 2019

Transcom Engineering Project Number: 737001-0037

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**10.96 %**

May 23, 2019

T-MOBILE
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 6009

Emissions Analysis for Site: **CT11503A – Sprint Columbia Rt 6**

Transcom Engineering, Inc ("Transcom") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **14 Thompson Hill Road, Columbia, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **14 Thompson Hill Road, Columbia, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	2	60
GSM	1900 MHz (PCS)	1	15
UMTS	2100 MHz (AWS)	1	40
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Ericsson AIR32 B66A / B2A	160
A	2	Ericsson AIR21 B2A/B4P	160
A	3	RFS APXVAARR24_43-U-NA20	160
B	1	Ericsson AIR32 B66A / B2A	160
B	2	Ericsson AIR21 B2A/B4P	160
B	3	RFS APXVAARR24_43-U-NA20	160
C	1	Ericsson AIR32 B66A / B2A	160
C	2	Ericsson AIR21 B2A/B4P	160
C	3	RFS APXVAARR24_43-U-NA20	160

Table 2: Antenna Data

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

Cable losses were factored in the calculations for this site. Since all **2100 MHz (AWS) UMTS** radios are ground mounted the following cable loss values were used. For each ground mounted **2100 MHz (AWS) UMTS** radio there was **2.23 dB** of cable loss calculated into the system gains / losses for this site. These values were calculated based upon the manufacturers specifications for **210 feet** of **1-5/8”** coax.

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	1.63
Antenna A2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	2	55	1,514.80	0.23
Antenna A3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.88
						Sector A Composite MPE%	**2.74**
Antenna B1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	1.63
Antenna B2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	2	55	1,514.80	0.23
Antenna B3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.88
						Sector B Composite MPE%	**2.74**
Antenna C1	Ericsson AIR32 B66A / B2A	1900 MHz (PCS) / 2100 MHz (AWS)	15.85	6	280	10,768.57	1.63
Antenna C2	Ericsson AIR21 B2A/B4P	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	2	55	1,514.80	0.23
Antenna C3	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.88
						Sector C Composite MPE%	**2.74**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**2.74 %**
AT&T	3.79 %
Sprint	1.82 %
Verizon Wireless	2.61 %
Site Total MPE %:	**10.96 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	2.74 %
T-MOBILE Sector B Total:	2.74 %
T-MOBILE Sector C Total:	2.74 %
Site Total:	10.96 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) UMTS	4	1,538.37	160	9.33	1900 MHz (PCS)	1000	0.93%
T-Mobile 2100 MHz (AWS) LTE	2	2,307.55	160	7.00	2100 MHz (AWS)	1000	0.70%
T-Mobile 1900 MHz (PCS) GSM	1	583.57	160	0.88	1900 MHz (PCS)	1000	0.09%
T-Mobile 2100 MHz (AWS) UMTS	1	931.24	160	1.41	2100 MHz (AWS)	1000	0.14%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	160	2.39	600 MHz	400	0.60%
T-Mobile 700 MHz LTE	2	432.54	160	1.31	700 MHz	467	0.28%
						Total:	**2.74%**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

The anticipated maximum composite contributions from the T-MOBILE facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-MOBILE Sector	Power Density Value (%)
Sector A:	2.74 %
Sector B:	2.74 %
Sector C:	2.74 %
T-MOBILE Maximum Total (per sector):	2.74 %
Site Total:	10.96 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.96 %** 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.

Scott Heffernan
RF Engineering Director
Transcom Engineering, Inc
PO Box 1048
Sterling, MA 01564