



Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

January 17, 2021

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

RE: Tower Share Application
92 Weston Street, Hartford CT 06103
Latitude: 41.786750
Longitude: -72.662361
Site#: 876325_Crown_Dish

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 92 Weston Street, Hartford, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 5G MHz antenna and six (6) RRUs, at the 54-foot level of the existing 110-foot monopole tower, one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Kimley Horn dated January 11, 2022 Exhibit C. Also included is a structural analysis prepared by Black & Veatch, dated October 8, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the City of Hartford, permit No. 964785E, dated November 26, 1995. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Mayor Luke Bronin, Elected Official for the City of Hartford, Aimee Chambers-McKay, Director of Planning, as well as the tower owner (Crown Castle) and property owner (Freeport Realty V LLC)

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the tower is 110-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 54-feet.
2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.



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

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 69.97% as evidenced by Exhibit F.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit D.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this monopole tower in Hartford. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit G, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 54-foot level of the existing 110-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading. Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing monopole tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Hartford.

Sincerely,

Denise Sabo

Denise Sabo

Mobile: 203-435-3640

Fax: 413-521-0558

Office: 4 Angela's Way, Burlington CT 06013

Email: denise@northeastsitesolutions.com



NSS

NORTHEAST
SITE SOLUTIONS

Turnkey Wireless Development

Attachments cc:

Luke Bronin, Mayor
City of Hartford
550 Main Street, Room 200 Hartford, CT 06103

Aimee Chambers-McKay, AICP- Director of Planning
City of Hartford
250 Constitution Plaza, 4th Floor Hartford, CT 06103

Freeport Realty V LLC
337 Freeport Street, Boston MA 02122

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval

CT03X0064

BUILDING PERMIT

DEPARTMENT OF LICENSES & INSPECTIONS CITY OF HARTFORD

Appl. Nbr. 964013 Permit Nbr. 964785 E
THE APPLICANT NAMED BELOW IS HEREBY GRANTED PERMISSION TO
PERFORM WORK AS DESCRIBED HEREIN AT:
0000 0092 WESTON ST

FLOOR: 0 0 0

CONDO:

IN ACCORDANCE WITH THE APPLICATION AND PLANS APPROVED BY
THE DEPARTMENT OF LICENSES AND INSPECTIONS.

Joseph Hewes
Building Official

Date 11/26/96

OWNER: WESTON SQUARE ASSOCIATES
ADDRESS: ONE HARTFORD SQUARE
NEW BRITAIN, CT 06051

APPLICANT: MIKE EVANCHICK
SPRINT SPECTRUM LP
9 BARNES INDUSTRIAL RD
WALLINGFORD, CT 06492

294-5600

ESTIMATED COST: \$ 98000.

Application Date: 10/08/96

Fee: 1568.00

DESCRIPTION OF JOB:

INSTALLATION OF 110 FT MONOPOLE WITH 6 ANTENNAS
AND ASSOCIATED INFRASTRUCTURE.

PARCEL ID.: NOT FOUND

Exhibit B

Property Card

Unofficial Property Record Card - Hartford, CT

General Property Data

Parcel ID **286-173-007**
 Prior Parcel ID
 Property Owner **FREEPORT REALTY V LLC**
 Mailing Address **337 FREEPORT ST**
 City **BOSTON**
 Mailing State **MA** Zip **02122**
 ParcelZoning **ID-1**

Account Number
 Property Location **92 WESTON ST**
 Property Use **WAREHOUSE**
 Most Recent Sale Date **9/20/2019**
 Legal Reference **07527-0278**
 Grantor **NEPREO INC**
 Sale Price **0**
 Land Area **187,334.453 acres**

Current Property Assessment

Card 1 Value Building Value **586,040** Xtra Features Value **59,780** Land Value **842,170** Total Value **1,487,990**

Building Description

Building Style **OFFICE/WHS**
 # of Living Units **0**
 Year Built **1978**
 Building Grade **Average**
 Building Condition **N/A**
 Finished Area (SF) **N/A**
 Number Rooms **0**
 # of 3/4 Baths **0**

Foundation Type **Concrete**
 Frame Type **Steel**
 Roof Structure **FLAT**
 Roof Cover **Metal**
 Siding **Brick**
 Interior Walls **DRYWALL**
 # of Bedrooms **0**
 # of 1/2 Baths **0**

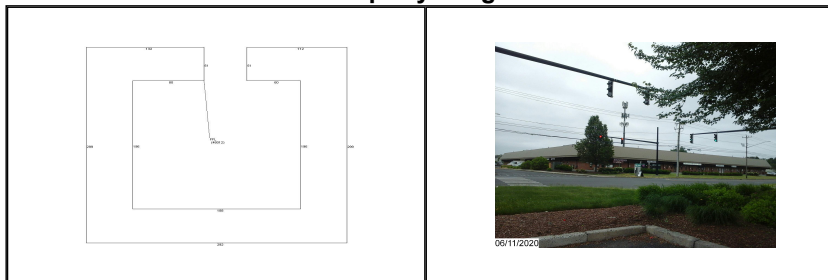
Flooring Type **COMBINATION**
 Basement Floor **N/A**
 Heating Type **Warm Air**
 Heating Fuel **Gas**
 Air Conditioning **30%**
 # of Bsmt Garages **0**
 # of Full Baths **0**
 # of Other Fixtures **0**

Legal Description

Narrative Description of Property

This property contains 187,334.453 acres of land mainly classified as WAREHOUSE with a(n) OFFICE/WHS style building, built about 1978 , having Brick exterior and Metal roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

Property Images



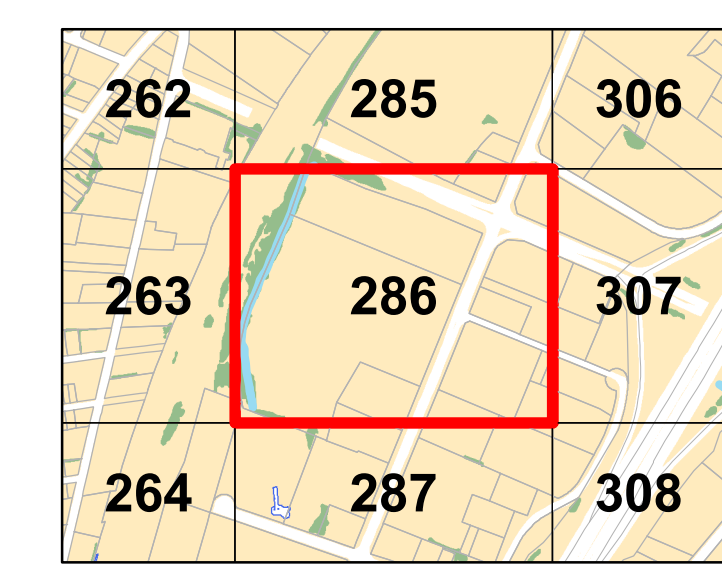
Disclaimer: This information is believed to be correct but is subject to change and is not warranted.



City of Hartford Assessor Map

Legend

▲ Parcel ID	161507165 Parcel ID
◆ Duplicate Parcel ID	7500 sf or Ac Parcel Area
■ Exempt ID	88 Street Address
■ Building ID	11-19 Condo Lot Range
○ Parcels	11D Condo Unit
□ Tax Map Grid	○ Driveway and Parking Lot Paved
— City Boundary Line	○ Driveway and Parking Lot Unpaved
■ Building	○ Sidewalk
■ Foundation	○ Stairs and Ramps
■ Greenhouse	○ Runway
■ Cement Pad	○ Bridge
■ Deck	○ Road Edge Paved
■ Patio	○ Road Edge Unpaved
■ Pool	○ Wharf and Pier
■ Tunnel	○ Tank
■ Trail	○ Golf Course
■ Railroad	○ Fairway
■ Fence	○ Green
■ Ruins	○ Sand Trap
● Coniferous Tree	○ Tee
● Deciduous Tree	○ Swamp
● Hedge and Brush	○ Water
● Treeline	○ River or Stream

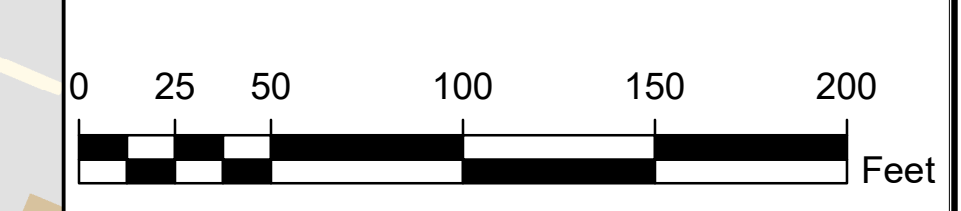


DISCLAIMER:
The planimetric information depicted on this map was compiled by The Sanborn Map Company and is based on an aerial flight performed in April 2015. In addition, the City's GIS staff has been updating limited planimetric features based on information on file in various City departments. The parcel and property information depicted on this map has been compiled from recorded deeds, maps, assessor records, and other public records on file in the City of Hartford. The intent of this map is to depict a graphical representation of real property information relative to the planimetric features for the City of Hartford and is subject to change as a more accurate survey may disclose.

The City of Hartford and the mapping company assume no legal responsibility for the information contained in this data.

THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY.
Horizontal Datum: Connecticut State Plane Coordinates (NAD 83 feet)

Date: October 1, 2019



1 inch = 50 feet

Map Sheet 286

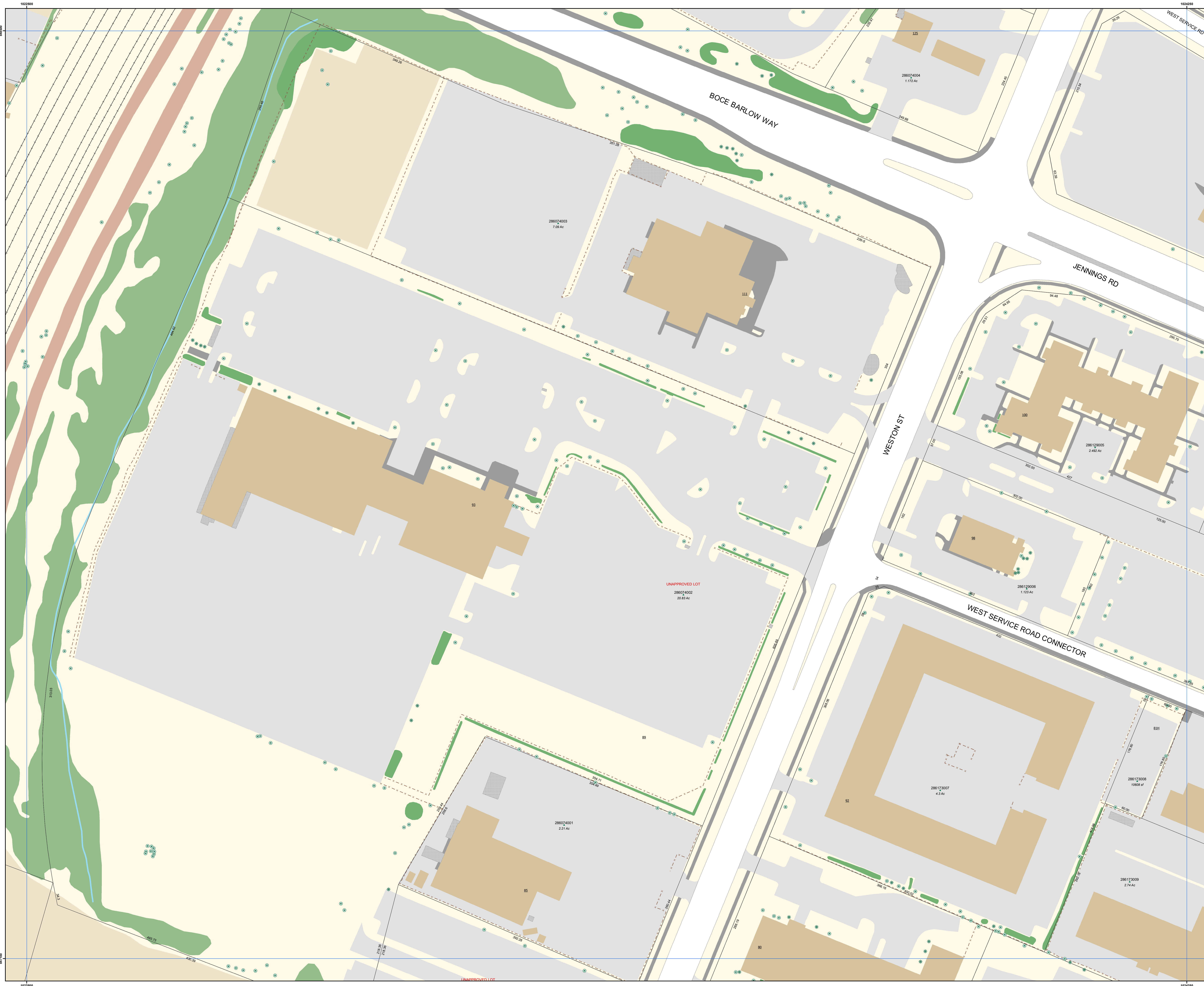


Exhibit C

Construction Drawings



DISH Wireless L.L.C. SITE ID:

BOBDL00079A

DISH Wireless L.L.C. SITE ADDRESS:

**92 WESTON ST
HARTFORD, CT 06103**

SCOPE OF WORK	
THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:	
TOWER SCOPE OF WORK:	
<ul style="list-style-type: none"> • INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR) • INSTALL (1) PROPOSED ANTENNA PLATFORM MOUNT • INSTALL PROPOSED JUMPERS • INSTALL (6) PROPOSED RRUs (2 PER SECTOR) • INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP) • INSTALL (1) PROPOSED HYBRID CABLE 	
GROUND SCOPE OF WORK:	
<ul style="list-style-type: none"> • INSTALL (1) PROPOSED METAL PLATFORM • INSTALL (1) PROPOSED ICE BRIDGE • INSTALL (1) PROPOSED PPC CABINET • INSTALL (1) PROPOSED EQUIPMENT CABINET • INSTALL (1) PROPOSED POWER CONDUIT • INSTALL (1) PROPOSED TELCO CONDUIT • INSTALL (1) PROPOSED TELCO-FIBER BOX • INSTALL (1) PROPOSED GPS UNIT • INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED) • INSTALL (1) PROPOSED FIBER NID (IF REQUIRED) • INSTALL (1) PROPOSED METER SOCKET 	

SITE INFORMATION	PROJECT DIRECTORY
PROPERTY OWNER: FREEPORT REALTY V LLC ADDRESS: 20 WESTBOROUGH DR. C/O BOARDWALK REALTY ASSOCIATES LLC. WEST HARTFORD, CT 06107 TOWER TYPE: MONOPOLE CROWN CASTLE SITE ID: 876325 CROWN CASTLE APP NUMBER: 556614 COUNTY: HARTFORD LATITUDE (NAD 83): 41° 47' 12.30" N 41.786750° LONGITUDE (NAD 83): 72° 39' 44.42" W -72.662361° ZONING JURISDICTION: CONNECTICUT SITTING COUNCIL ZONING DISTRICT: ID-1 PARCEL NUMBER: 286-173-007 OCCUPANCY GROUP: U CONSTRUCTION TYPE: II-B POWER COMPANY: NORTHEAST UTILITIES TELEPHONE COMPANY: LIGHTOWER	APPLICANT: DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120 TOWER OWNER: CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377 SITE DESIGNER: KIMLEY-HORN & ASSOCIATES 3875 EMBASSY PKWY, SUITE 280 AKRON, OH 44333 (216) 505-7771 COA #: PEC.0000738 SITE ACQUISITION: VICTOR NUNEZ VICTOR.NUNEZ@CROWNCastle.COM CONSTRUCTION MANAGER: CHAD WILCOX CHAD.WILCOX@DISH.COM RF ENGINEER: BOSSENER CHARLES BOSSENER.CHARLES@DISH.COM



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
XQD	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
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O	01/10/2022	REVISED PER CLIENT

A&E PROJECT NUMBER
KHCLC-17043

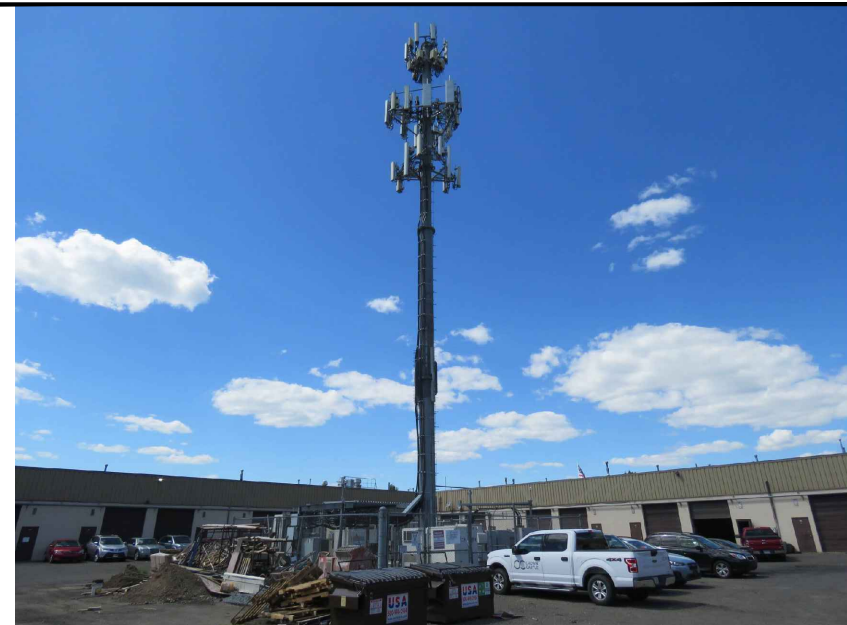
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

SITE PHOTO



UNDERGROUND SERVICE ALERT CBYD 811
 UTILITY NOTIFICATION CENTER OF CONNECTICUT
 (800) 922-4455
 WWW.CBYD.COM

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

DIRECTIONS 01/11/22

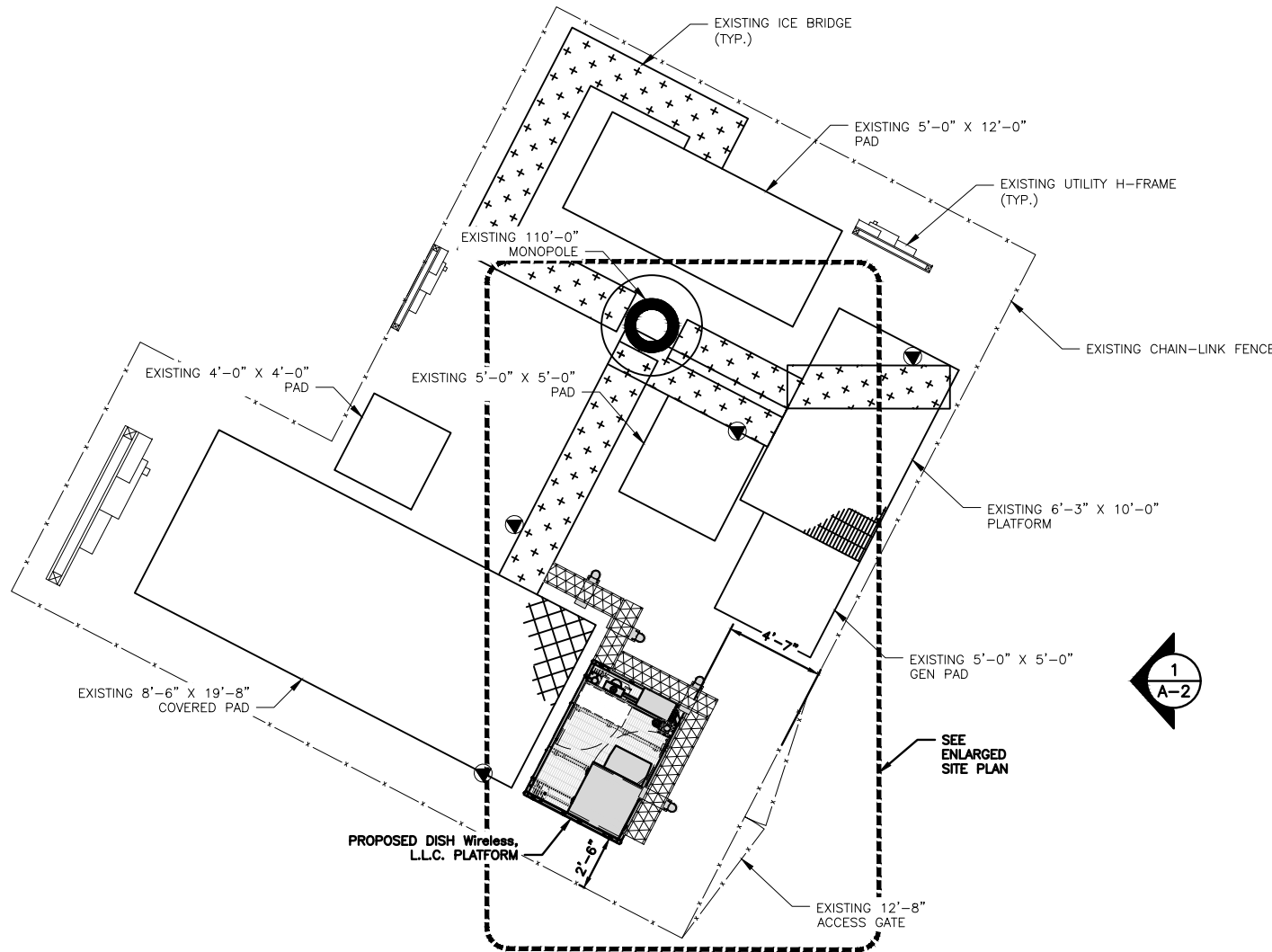
DIRECTIONS FROM HARTFORD-BRAINARD AIRPORT: Exp. 01/31/22
 x GET ON WHITEHEAD HWY FROM RESERVE RD, VAN DYKE AVE AND SHELDON ST
 x DRIVE ALONG REVEREND MOODY OPAS
 x DRIVE TO YOUR DESTINATION

VICINITY MAP

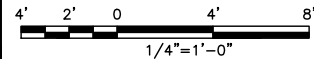


NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



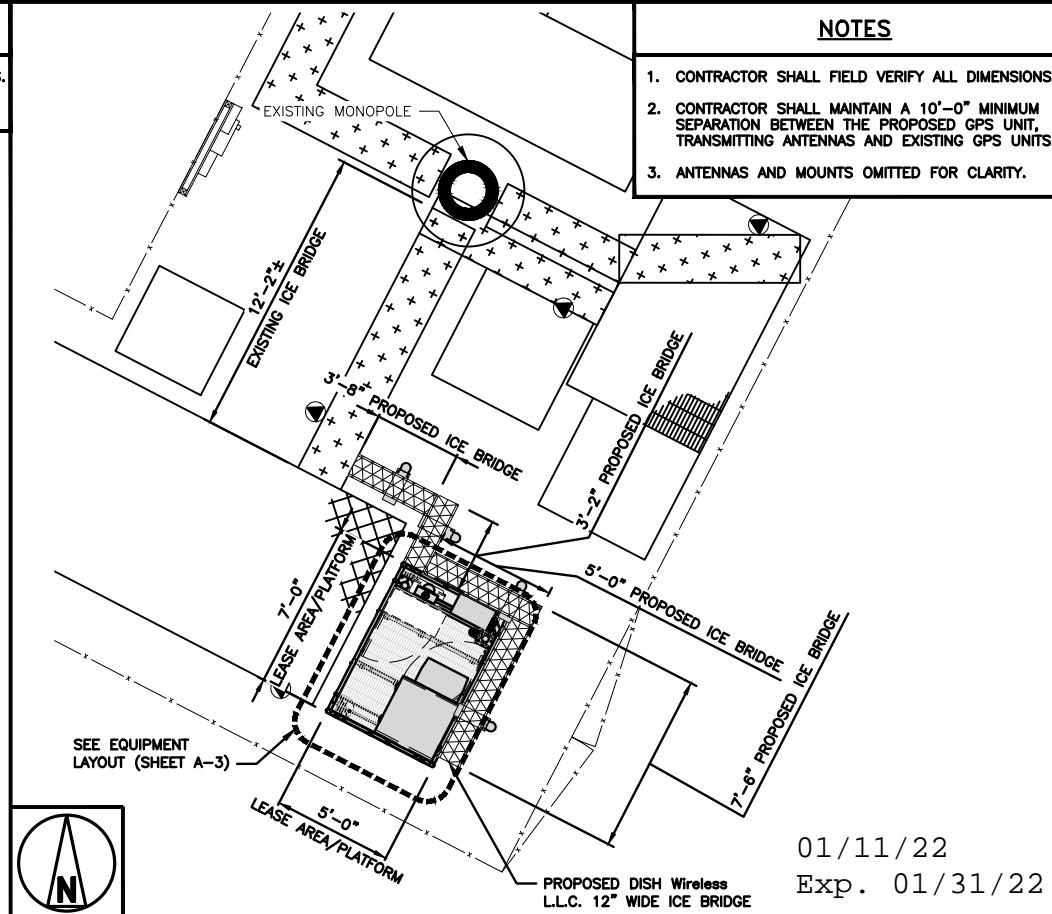
OVERALL SITE PLAN



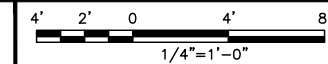
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NOTES

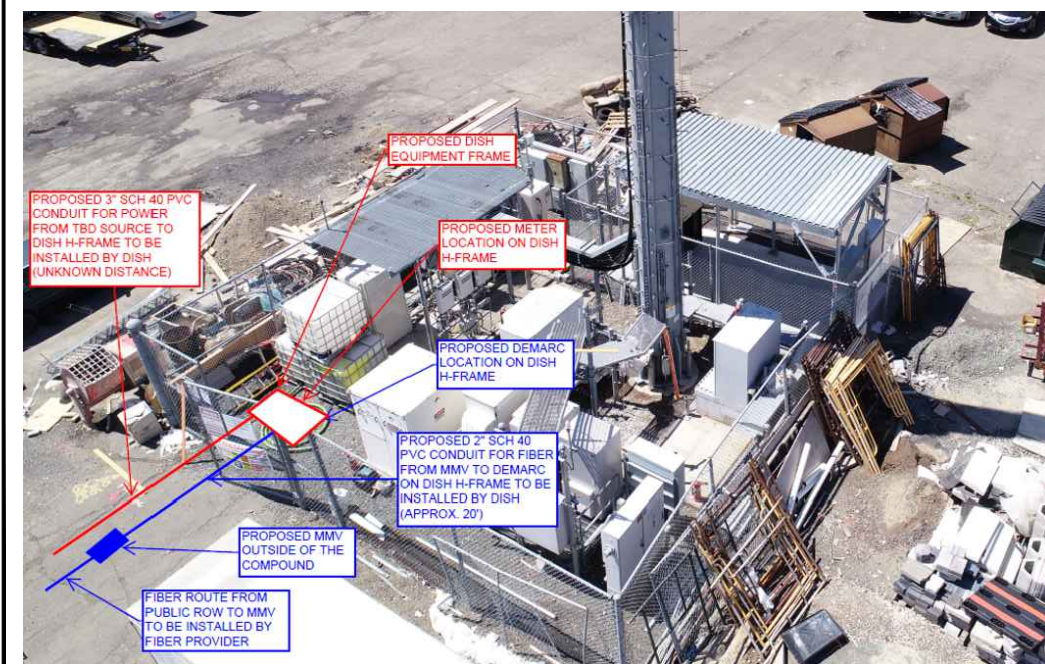
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN



2



OVERALL UTILITY ROUTE PLAN

NO SCALE

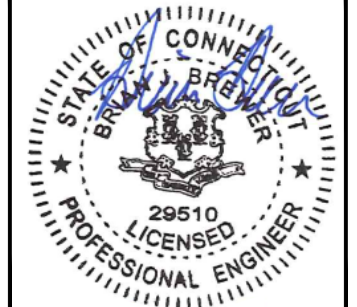
3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601



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DRAWN BY:	CHECKED BY:	APPROVED BY:
XQD	MCK	MCK

RFDS REV #: ---

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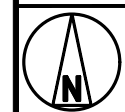
DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
OVERALL AND ENLARGED
SITE PLAN

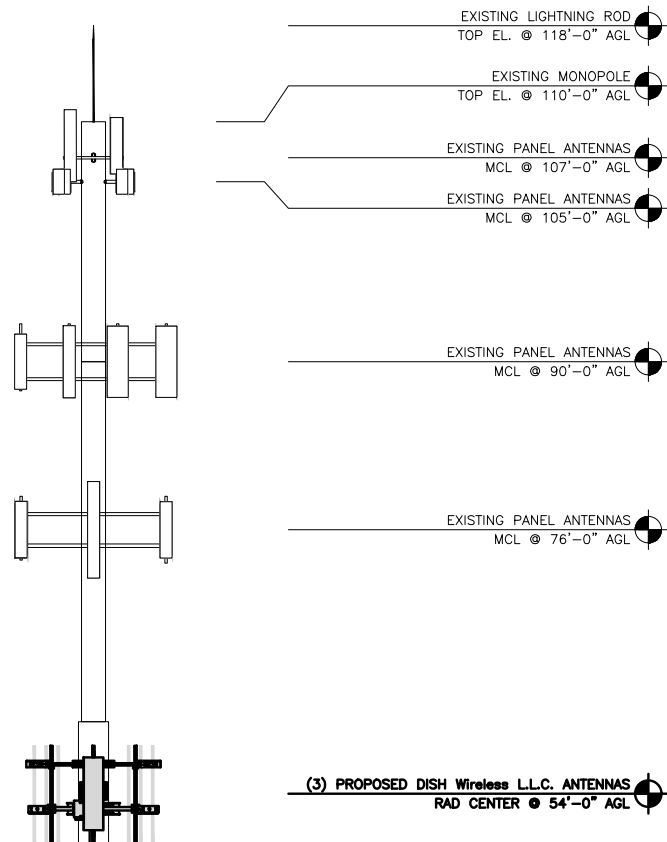
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A-1

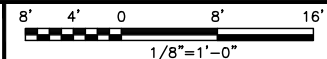


NOTES

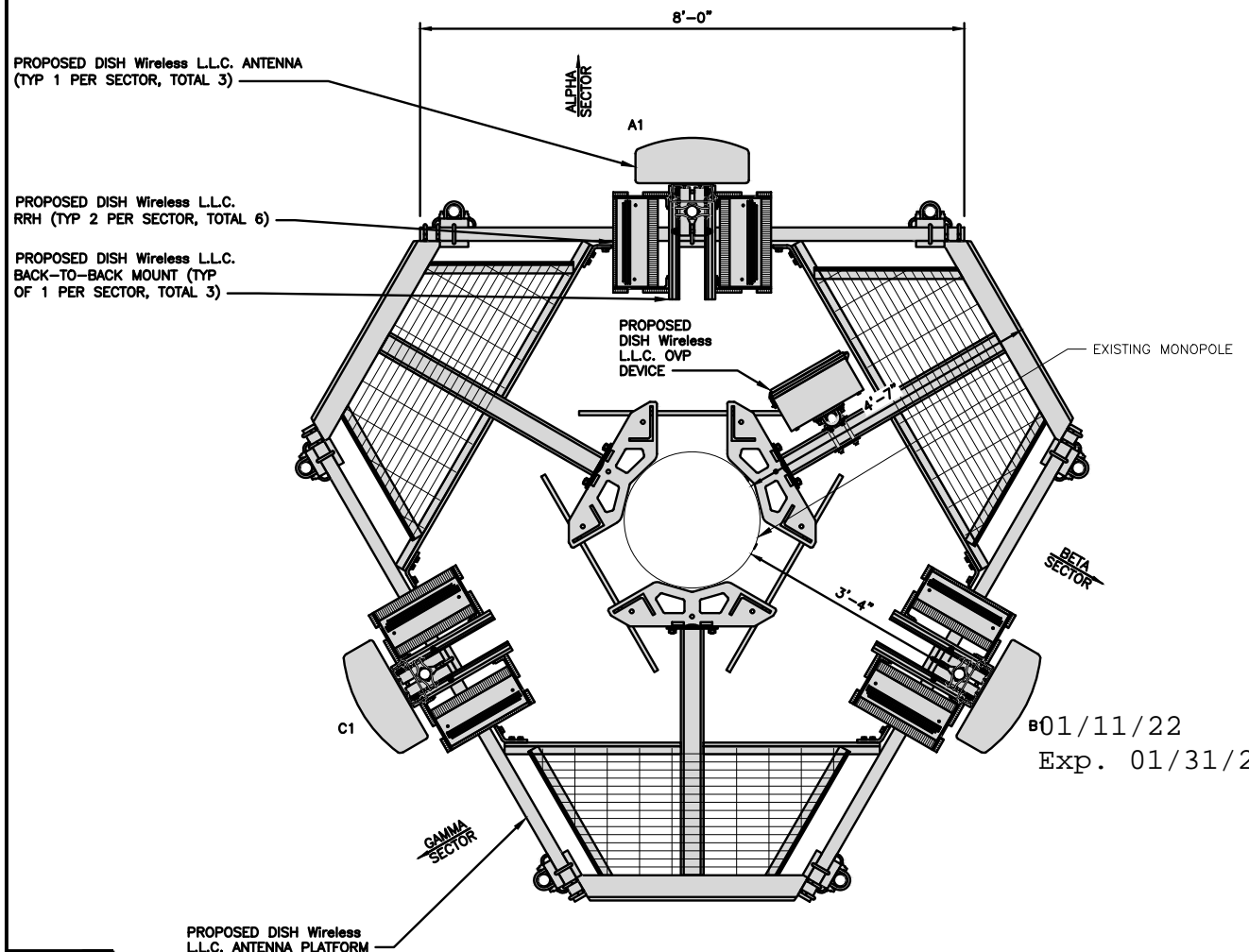
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



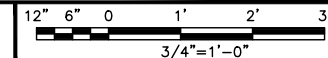
PROPOSED EAST ELEVATION



1



ANTENNA LAYOUT



2

SECTOR	POSITION	ANTENNA					TRANSMISSION CABLE	
		EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	0°	54'-0"	(1) HIGH-CAPACITY HYBRID CABLE (115'-0" LONG)
BETA	B1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	120°	54'-0"	
GAMMA	C1	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	240°	54'-0"	

SECTOR	POSITION	RRH		NOTES
		MANUFACTURER - MODEL NUMBER	TECHNOLOGY	
ALPHA	A1	FUJITSU - TA08025-B604	5G	1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS. 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.
	A1	FUJITSU - TA08025-B605	5G	
BETA	B1	FUJITSU - TA08025-B604	5G	
	B1	FUJITSU - TA08025-B605	5G	
GAMMA	C1	FUJITSU - TA08025-B604	5G	
	C1	FUJITSU - TA08025-B605	5G	

ANTENNA SCHEDULE

NO SCALE

3



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LITTLETON, CO 80120



COA #: PEC.0000738
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RALEIGH, NC 27601



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PROJECT INFORMATION
BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

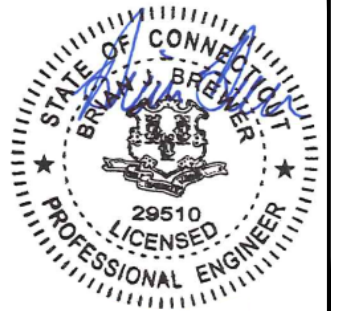
SHEET NUMBER
A-2



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601



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92 WESTON ST
HARTFORD, CT 06103

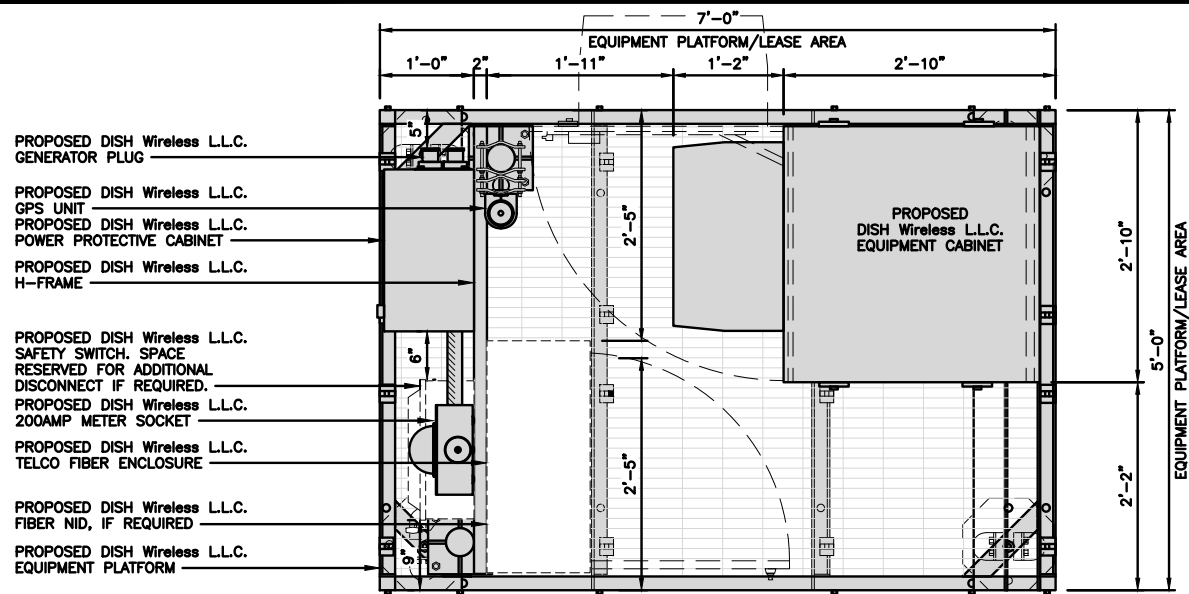
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

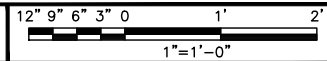
A-3

NOTES

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY



PLATFORM EQUIPMENT PLAN

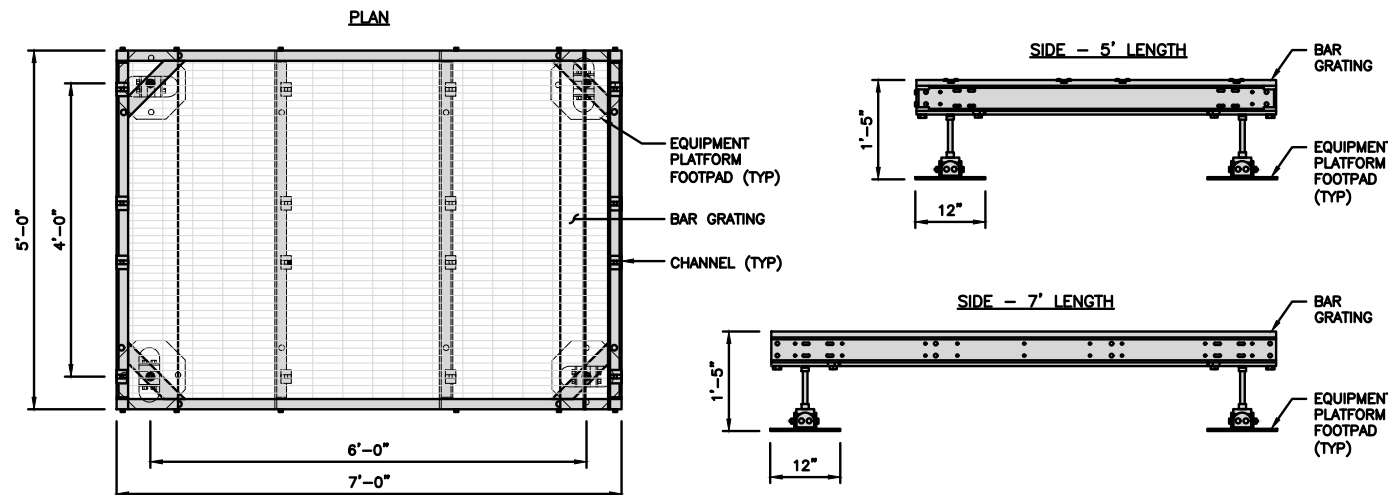


1

**COMMSCOPE MTC4045LP
5X7 PLATFORM**

DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

- NOTE:**
1. GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"
2. PLATFORM TO BE LEVEL WITHIN 1"



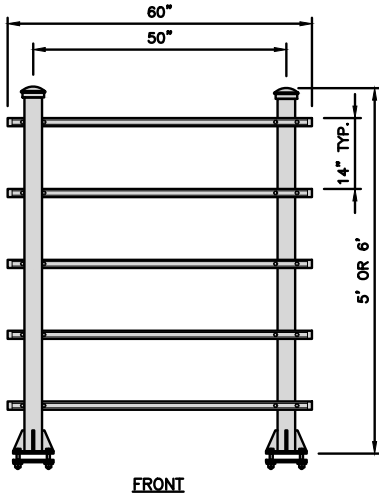
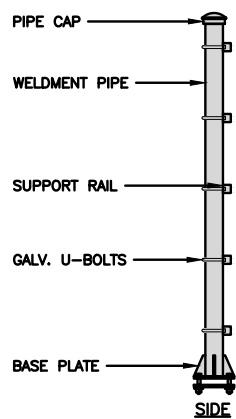
PLATFORM DETAIL

NO SCALE 2

**COMMSCOPE MTC4045HFLD
H-FRAME**

UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs

- NOTE:**
OR DISH Wireless L.L.C. APPROVED EQUIVALENT



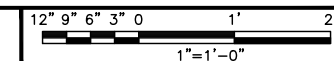
H-FRAME DETAIL

NO SCALE 3

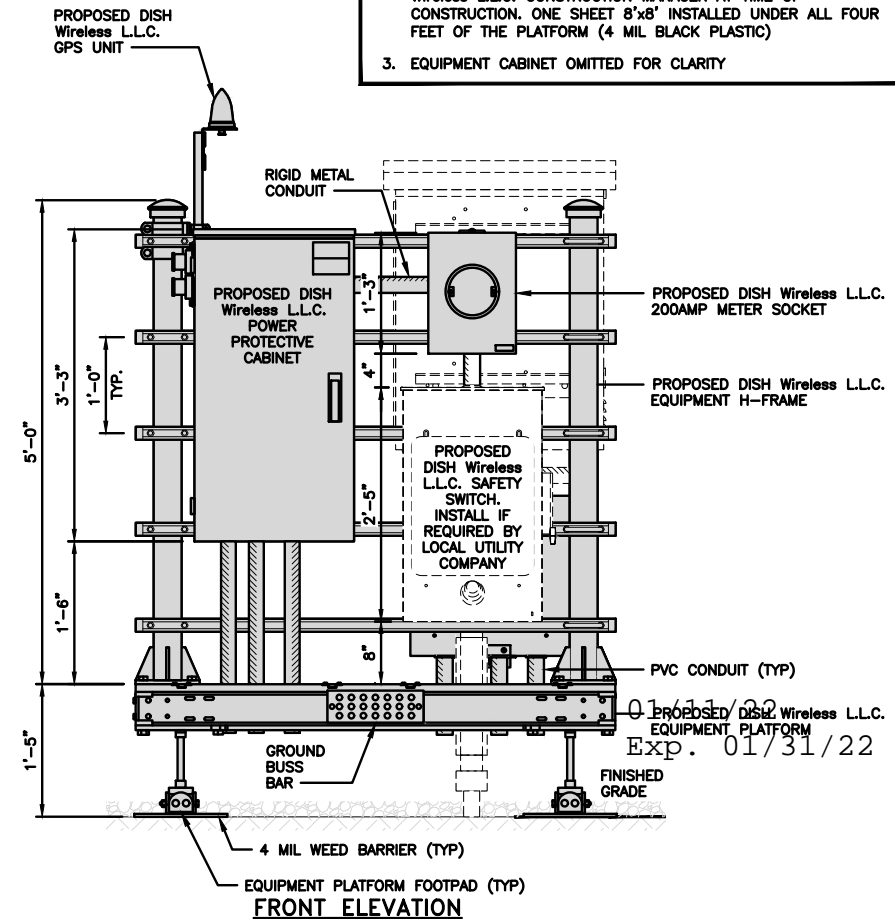
NOT USED

NO SCALE 4

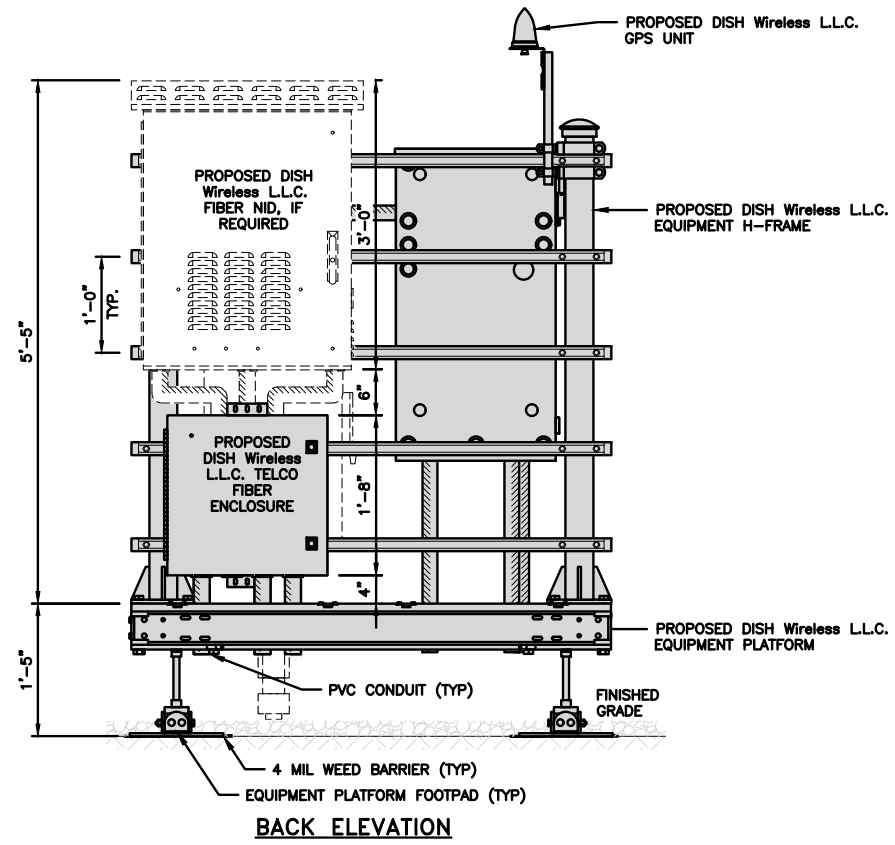
H-FRAME EQUIPMENT ELEVATION



5

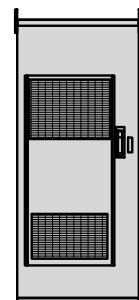
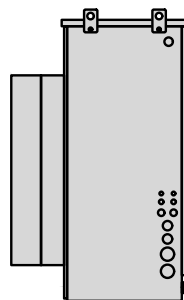
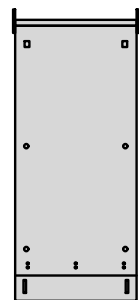
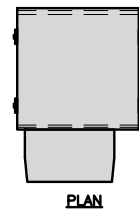


FRONT ELEVATION



BACK ELEVATION

CHARLES INDUSTRY HEX CUBE-PM639155N4	
DIMENSIONS (HxWxD)	74"x32"x32"
POWER PLANT	-48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 lbs



BACK

SIDE

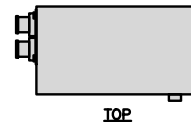
FRONT

CABINET DETAIL

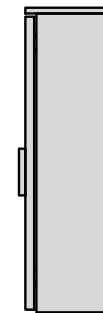
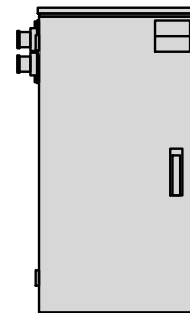
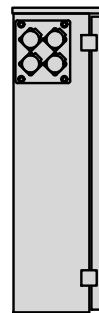
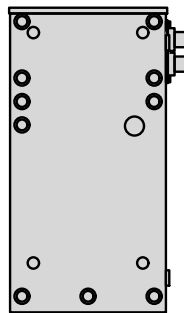
NO SCALE

1

RAYCAP PPC RDIAC-2465-P-240-MTS	
ENCLOSURE DIMENSIONS (HxWxD)	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G



TOP



BACK

SIDE

FRONT

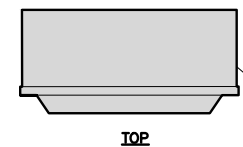
SIDE

POWER PROTECTION CABINET (PPC) DETAIL

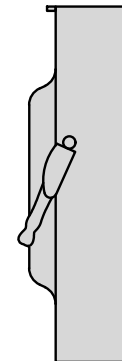
NO SCALE

2

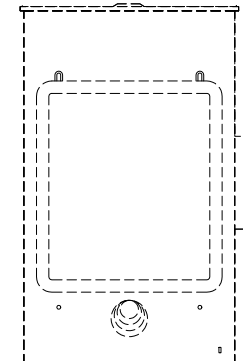
SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875



TOP



SIDE



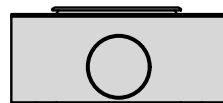
FRONT

SAFETY SWITCH DETAIL

NO SCALE

3

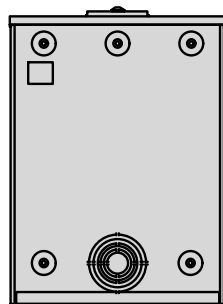
EATON METER SOCKET UNRRS213BEUSE	
METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x6"
MAIN AMPERE RATING	200A
WEIGHT	18 LBS



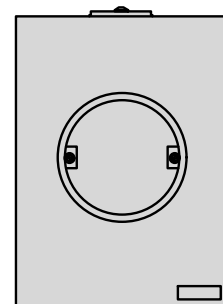
PLAN



SIDE



BACK



FRONT

METER SOCKET DETAIL

NO SCALE

4

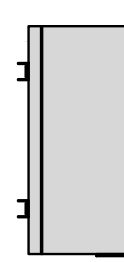
CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



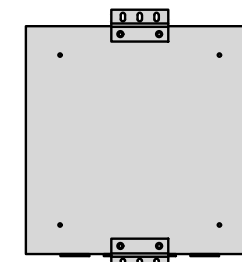
01/11/22

Exp. 01/31/22

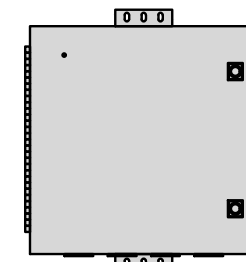
FRONT



SIDE



BACK



FRONT

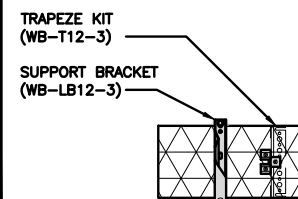
FIBER TELCO ENCLOSURE DETAIL

NO SCALE

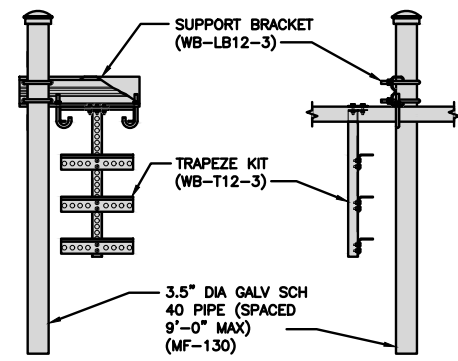
6

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

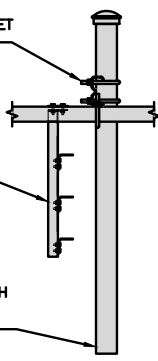
INCLUDED PRODUCTS:	WB-T12-3 TRAPEZE KIT, 3 RUNGS
	WB-LB12-3 SUPPORT BRACKET
	MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"



PLAN



FRONT

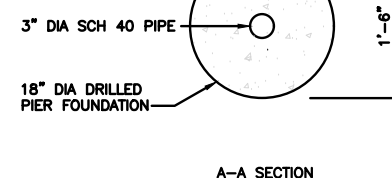
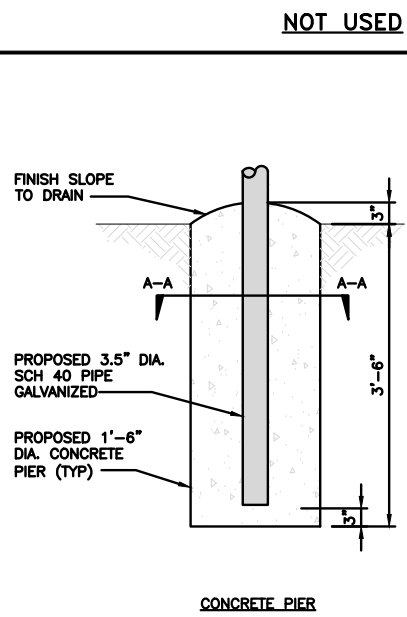


SIDE

ICE BRIDGE DETAIL

NO SCALE

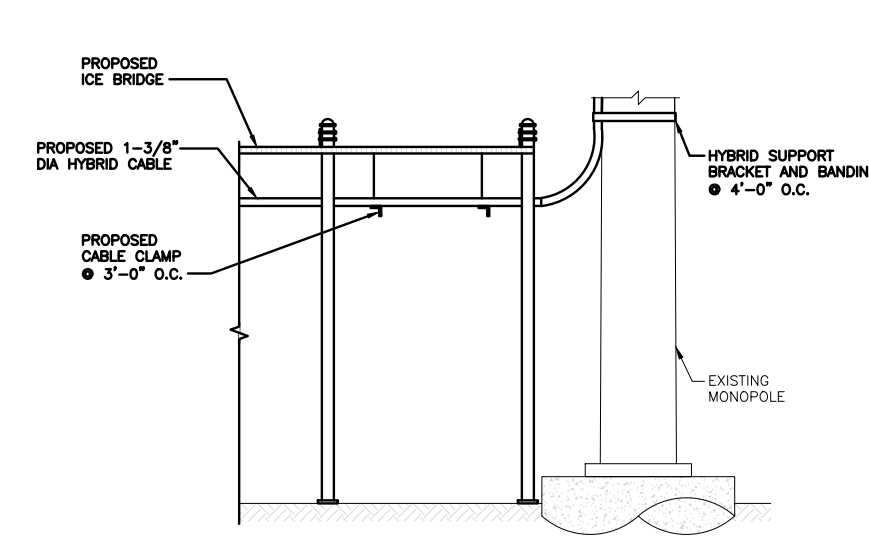
7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

9

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn

COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601



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

DRAWN BY:	CHECKED BY:	APPROVED BY:
XQD	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	10/15/2021	ISSUED FOR REVIEW
B	12/27/2021	ISSUED FOR CONSTRUCTION
0	01/10/2022	REVISED PER CLIENT

A&E PROJECT NUMBER
KHCLC-17043

DISH Wireless L.L.C.
PROJECT INFORMATION

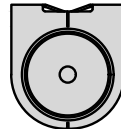
BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
EQUIPMENT DETAILS

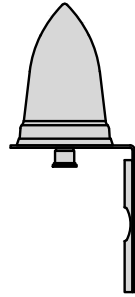
SHEET NUMBER

A-4

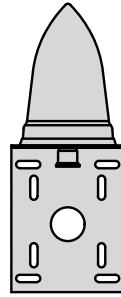
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



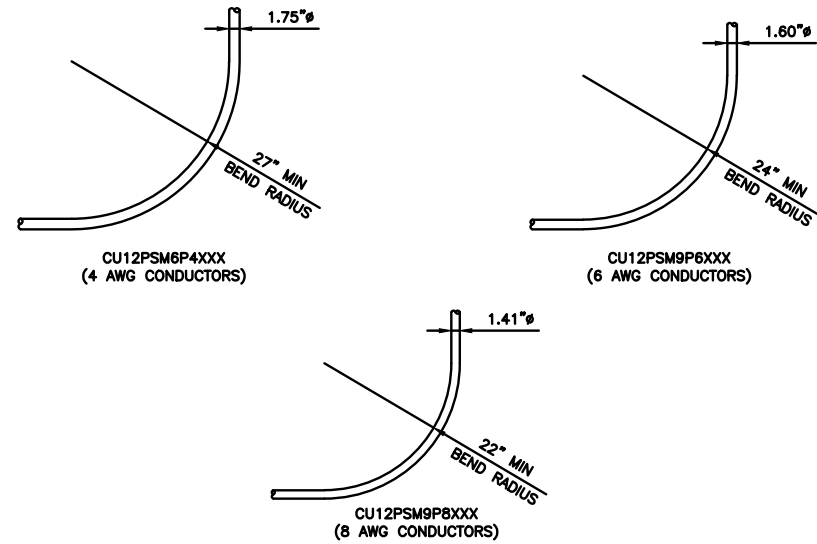
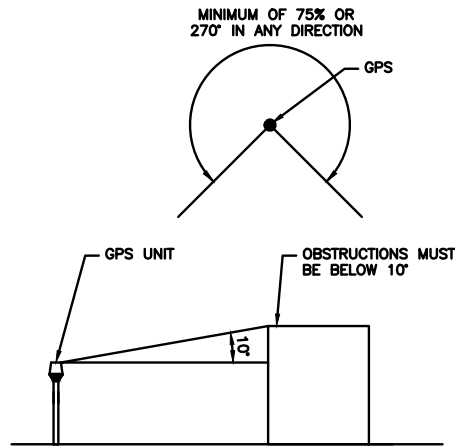
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUSES

NO SCALE

3

01/11/22
Exp. 01/31/22



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DRAWN BY: XQD
CHECKED BY: MCK
APPROVED BY: MCK

RFDS REV #: ---

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

A-5

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

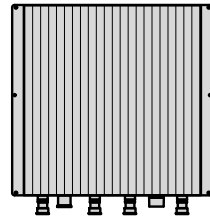
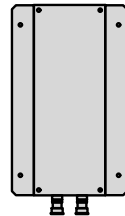
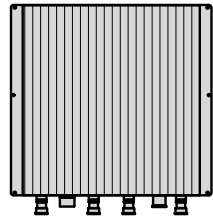
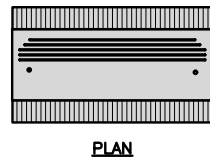
8

NOT USED

NO SCALE

9

FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

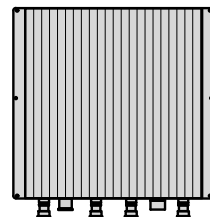
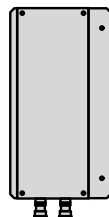
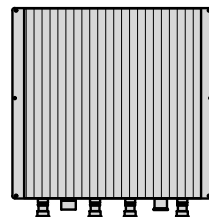
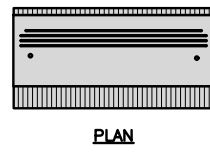


BACK

SIDE

FRONT

FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



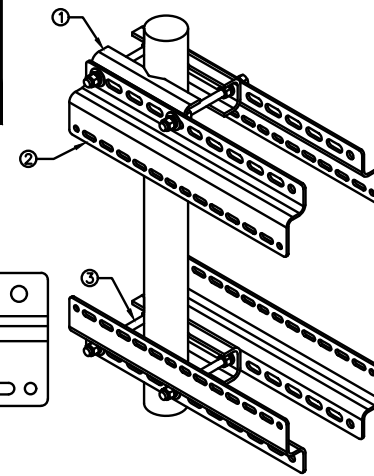
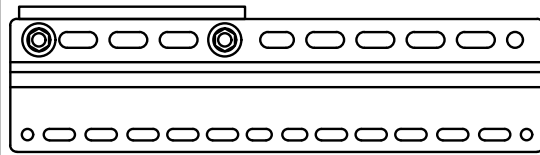
BACK

SIDE

FRONT

SABRE DOUBLE Z-BRACKET C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH DETAIL

NO SCALE

1

RRH DETAIL

NO SCALE

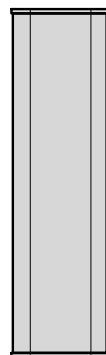
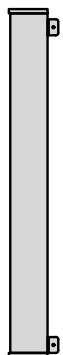
2

RRH MOUNT DETAIL

NO SCALE

3

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	82.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



BACK

SIDE

FRONT

ANTENNA DETAIL

NO SCALE

4

NOT USED

NO SCALE

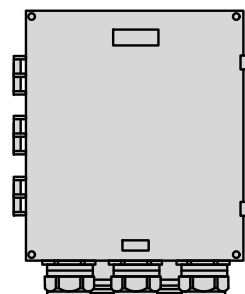
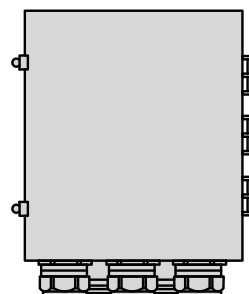
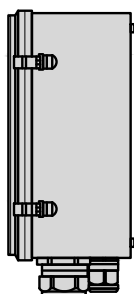
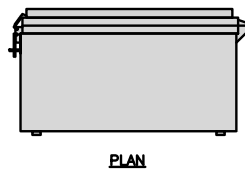
5

ANTENNA BRACKET DETAIL

NO SCALE

6

RAYCAP RDIC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



SIDE

BACK

FRONT

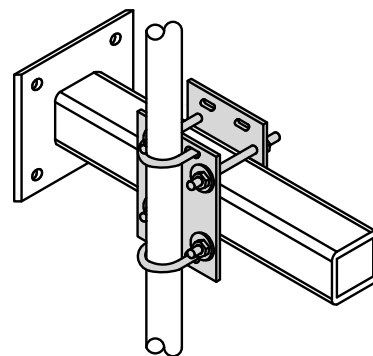
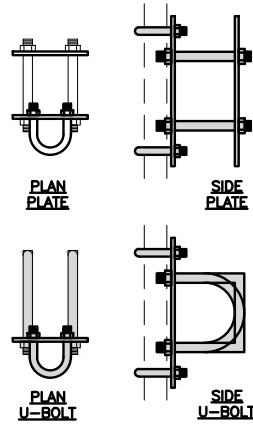
SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



PLAN U-BOLT

SIDE U-BOLT

PLAN U-BOLT

SIDE U-BOLT

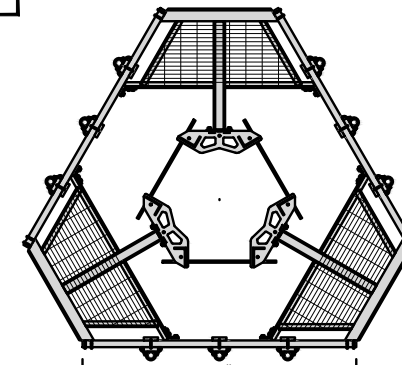
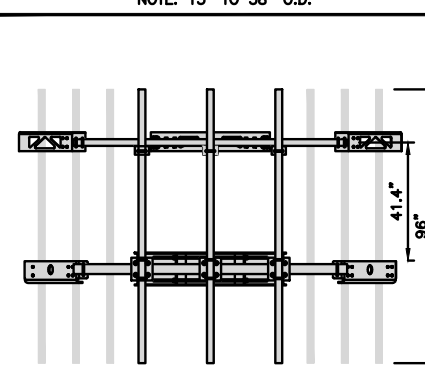
RRH/OVP MOUNT DETAIL

NO SCALE

8

COMMSCOPE MC-PK8-DSH	
FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	

NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT



ANTENNA PLATFORM DETAIL

NO SCALE

9



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601



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DRAWN BY: CHECKED BY: APPROVED BY:

XQD MCK MCK

RFDS REV #: ---

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KHCLC-17043

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

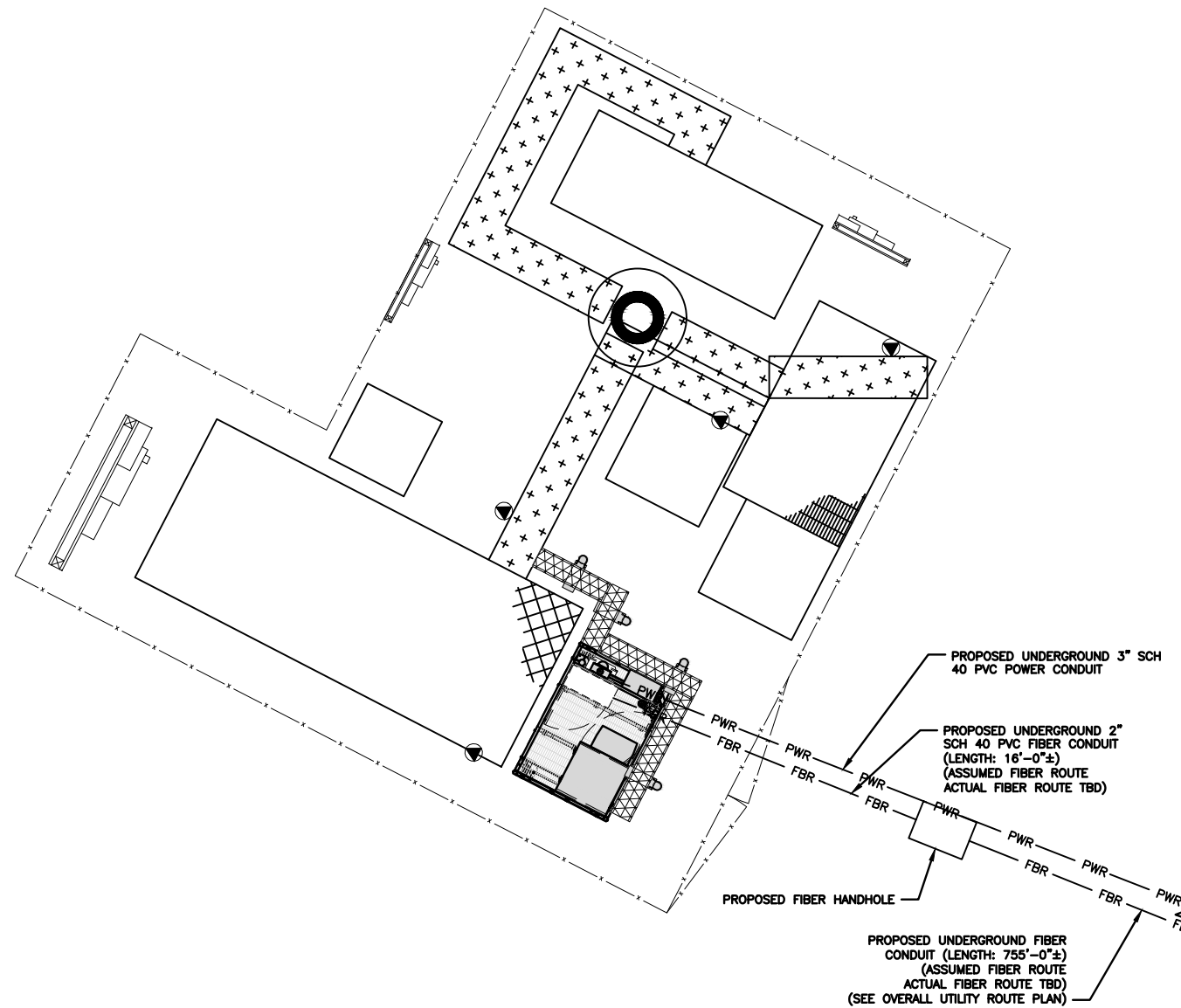
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

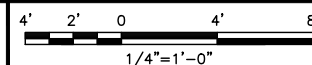
A-6

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. THE GROUND LEASE PROVIDES BROAD/BLANKET UTILITY RIGHTS. "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 ARE BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS NOT AN OPTION, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN



1

DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND -48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY -48V.

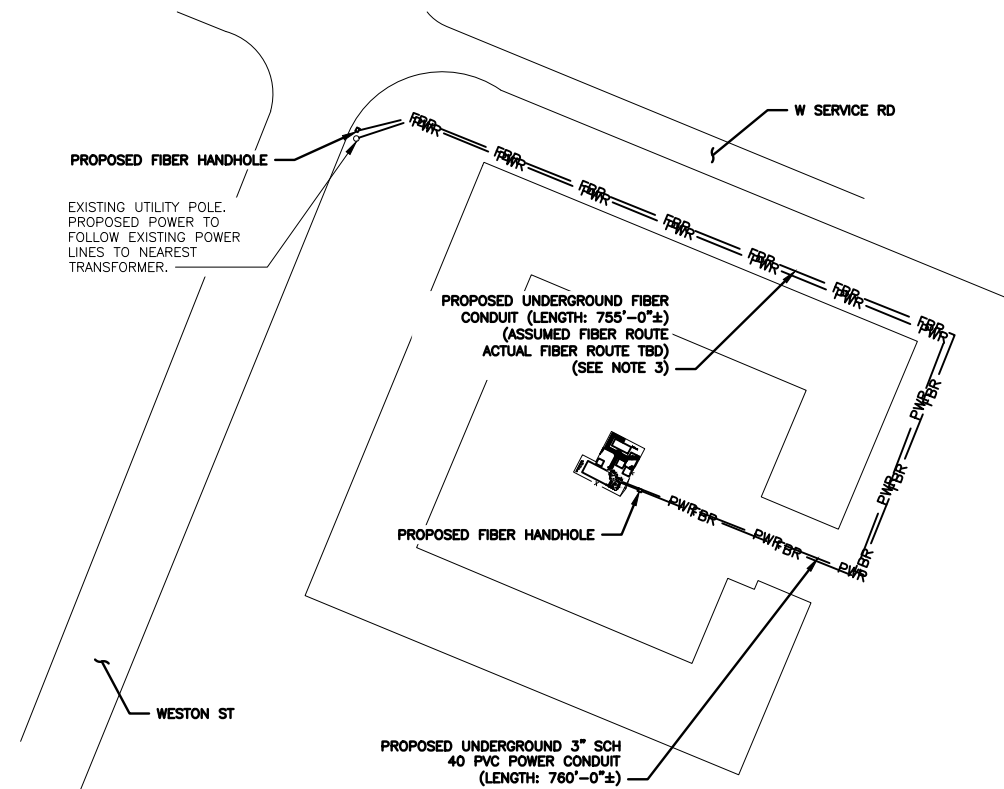
1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
2. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
3. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
5. CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
6. CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
7. CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
9. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, AND EQUIPMENT CABINETS.
10. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
11. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST-CONSTRUCTION EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS-BUILT PANEL SCHEDULE AND SITE DRAWINGS.
13. ALL TRENCHES IN COMPOUND TO BE HAND DUG

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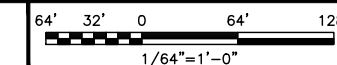
ELECTRICAL NOTES

NO SCALE

2



OVERALL UTILITY ROUTE PLAN



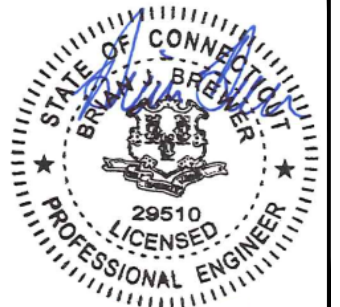
3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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RALEIGH, NC 27601



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XQD	MCK	MCK

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DISH Wireless L.L.C.
PROJECT INFORMATION

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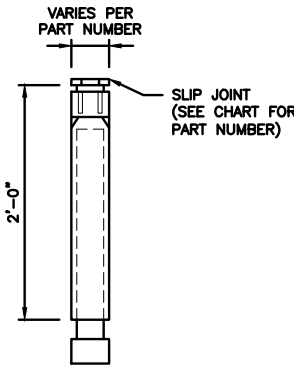
SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

CARLON EXPANSION FITTINGS

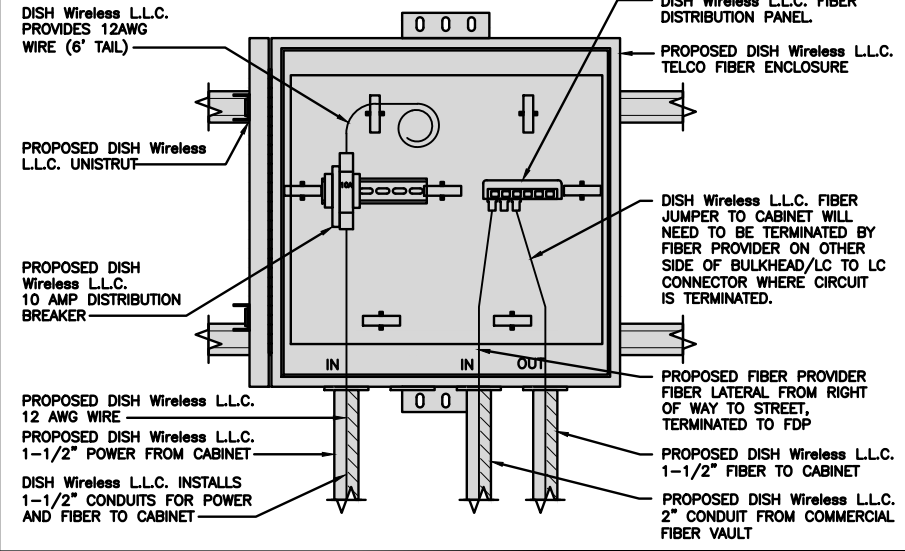
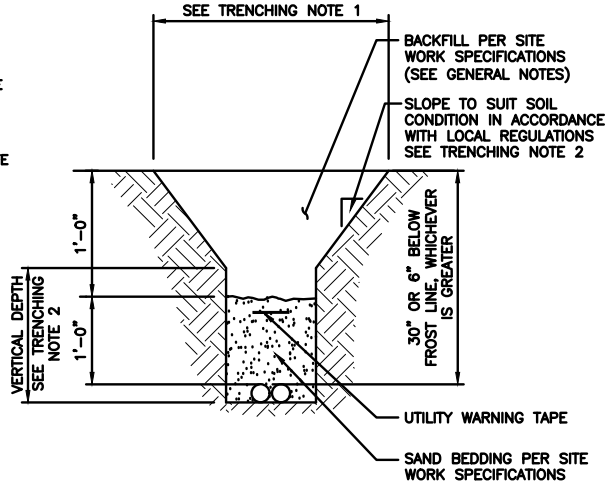
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"



NOTE: CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

TRENCHING NOTES

- CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
- TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
- ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.



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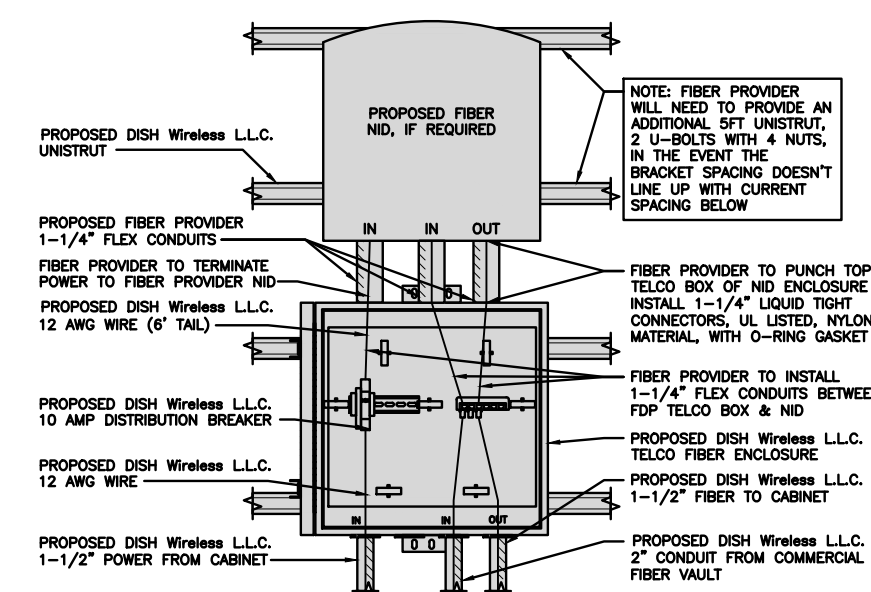
SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2

EXPANSION JOINT DETAIL NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

DARK TELCO BOX - INTERIOR WIRING LAYOUT NO SCALE 3



LIT TELCO BOX - INTERIOR WIRING LAYOUT (OPTIONAL) NO SCALE 4

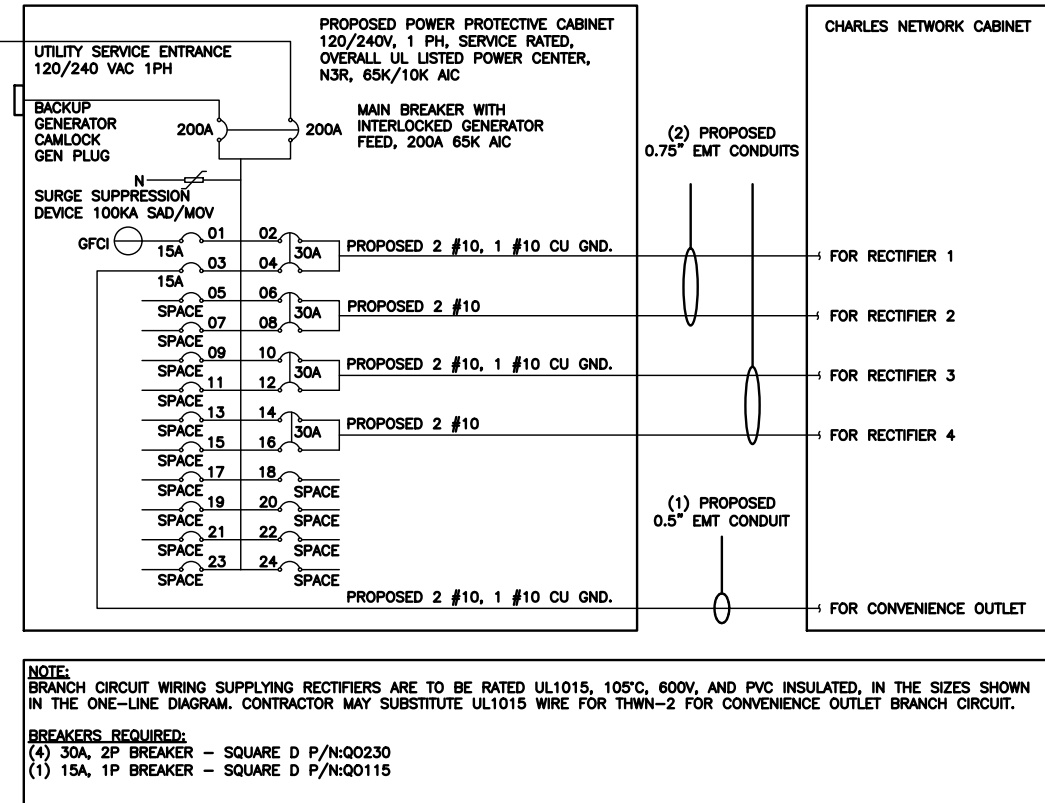
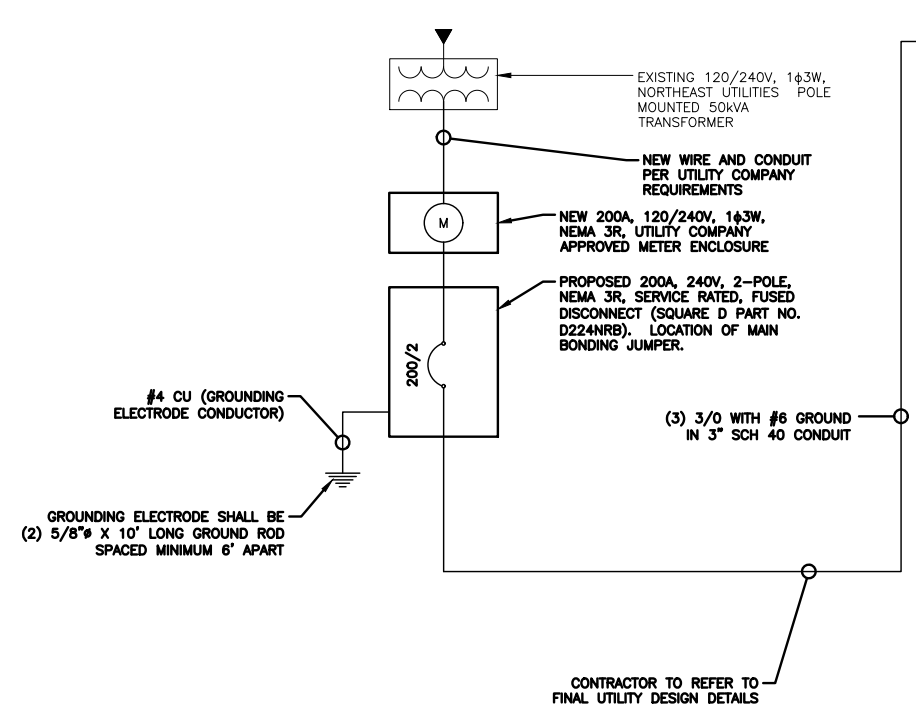
NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9



NOTES

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUIT AND FEEDERS COMPLY WITH THE NEC (LISTED ON T-1) ARTICLE 210.19(A)(1) FPN NO. 4.

THE (2) CONDUITS WITH (4) CURRENT CARRYING CONDUCTORS EACH, SHALL APPLY THE ADJUSTMENT FACTOR OF 80% PER 2014/17 NEC TABLE 310.15(B)(3)(a) OR 2020 NEC TABLE 310.15(C)(1) FOR UL1015 WIRE.

#12 FOR 15A-20A/1P BREAKER: 0.8 x 30A = 24.0A
#10 FOR 25A-30A/2P BREAKER: 0.8 x 40A = 32.0A
#8 FOR 35A-40A/2P BREAKER: 0.8 x 55A = 44.0A
#6 FOR 45A-60A/2P BREAKER: 0.8 x 75A = 60.0A

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.
0.5" CONDUIT - 0.122 SQ. IN AREA
0.75" CONDUIT - 0.213 SQ. IN AREA
2.0" CONDUIT - 1.316 SQ. IN AREA
3.0" CONDUIT - 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.
#10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
#10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.0633 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.
#10 - 0.0266 SQ. IN X 4 = 0.1064 SQ. IN
#10 - 0.0082 SQ. IN X 1 = 0.0082 SQ. IN <BARE GROUND
TOTAL = 0.1146 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (5) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.
3/0 - 0.2679 SQ. IN X 3 = 0.8037 SQ. IN
#6 - 0.0507 SQ. IN X 1 = 0.0507 SQ. IN <GROUND
TOTAL = 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

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HARTFORD, CT 06103

SHEET TITLE
ELECTRICAL ONE-LINE, FAULT
CALCS & PANEL SCHEDULE

SHEET NUMBER

E-3

PPC ONE-LINE DIAGRAM

NO SCALE 1

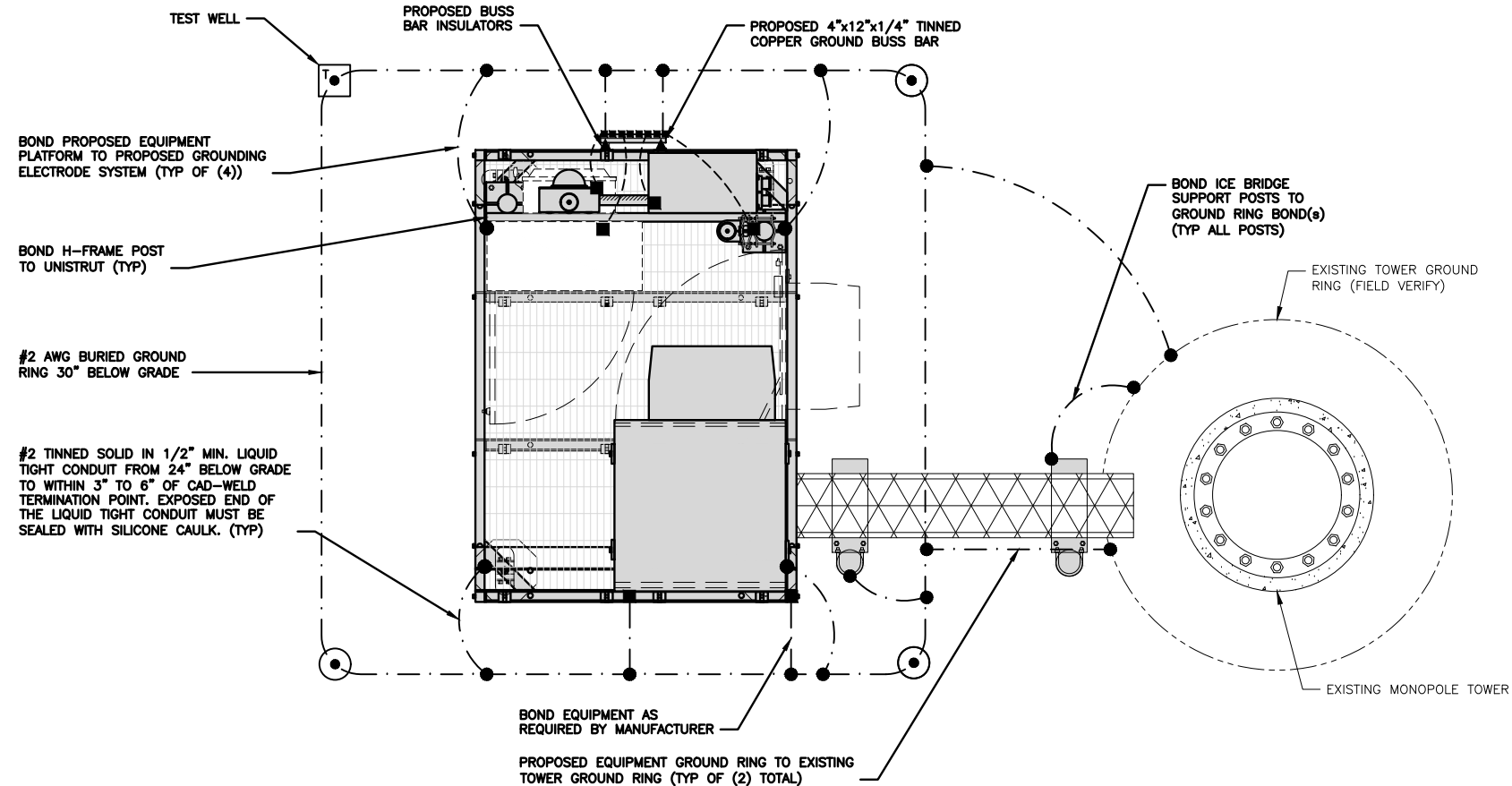
PROPOSED CHARLES PANEL SCHEDULE										
LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED
	L1	L2						L1	L2	
PPC GFCI OUTLET	180	180	15A	1	A	2	30A	2880	2880	ABB/GE INFINITY RECTIFIER 1
CHARLES GFCI OUTLET	180	180	15A	3	B	4	30A	2880	2880	ABB/GE INFINITY RECTIFIER 2
-SPACE-				5	A	6	30A	2880	2880	ABB/GE INFINITY RECTIFIER 3
-SPACE-				7	B	8	30A	2880	2880	ABB/GE INFINITY RECTIFIER 4
-SPACE-				9	A	10				-SPACE-
-SPACE-				11	B	12				-SPACE-
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS			180	180				11520	11520	
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1		L2		VOLTAGE AMPS			
MB RATING: 65,000 AIC			11700		11700		98			
			98		98		AMPS			
			98		98		MAX AMPS			
			123		123		MAX 125%			

PANEL SCHEDULE

NO SCALE 2

NOT USED

NO SCALE 3

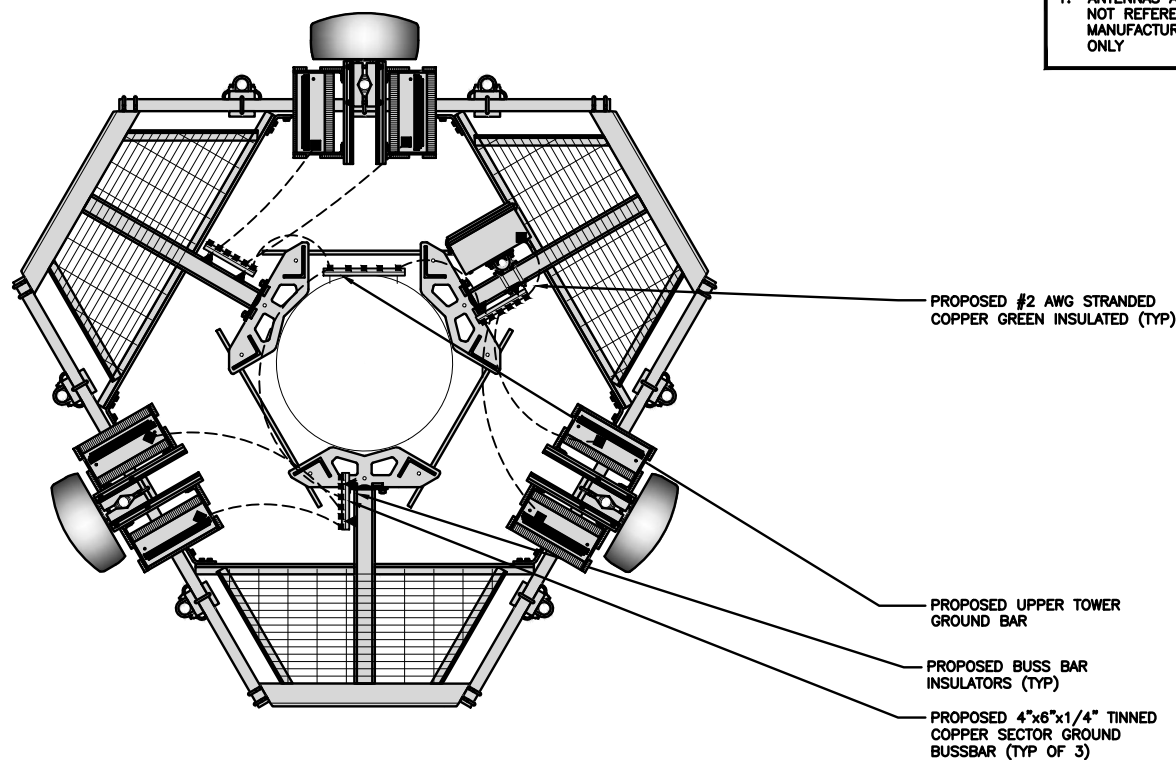


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1

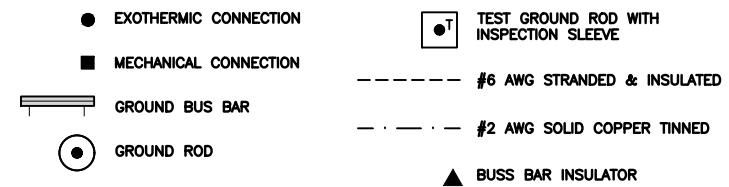
NOTES

1. ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE ONLY



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2



GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

- EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING. 01/11/22
- GROUND ROD:** UL LISTED COPPER CLAD STEEL MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
- CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
- HATCH PLATE GROUND BAR:** BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
- EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
- TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- INTERIOR UNIT BONDS:** METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.
- FENCE AND GATE GROUNDING:** METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
- EXTERIOR UNIT BONDS:** METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE
- ICE BRIDGE SUPPORTS:** EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.
- DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR**
- TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH Wireless L.L.C. GROUNDING NOTES.**

GROUNDING KEY NOTES

NO SCALE 3



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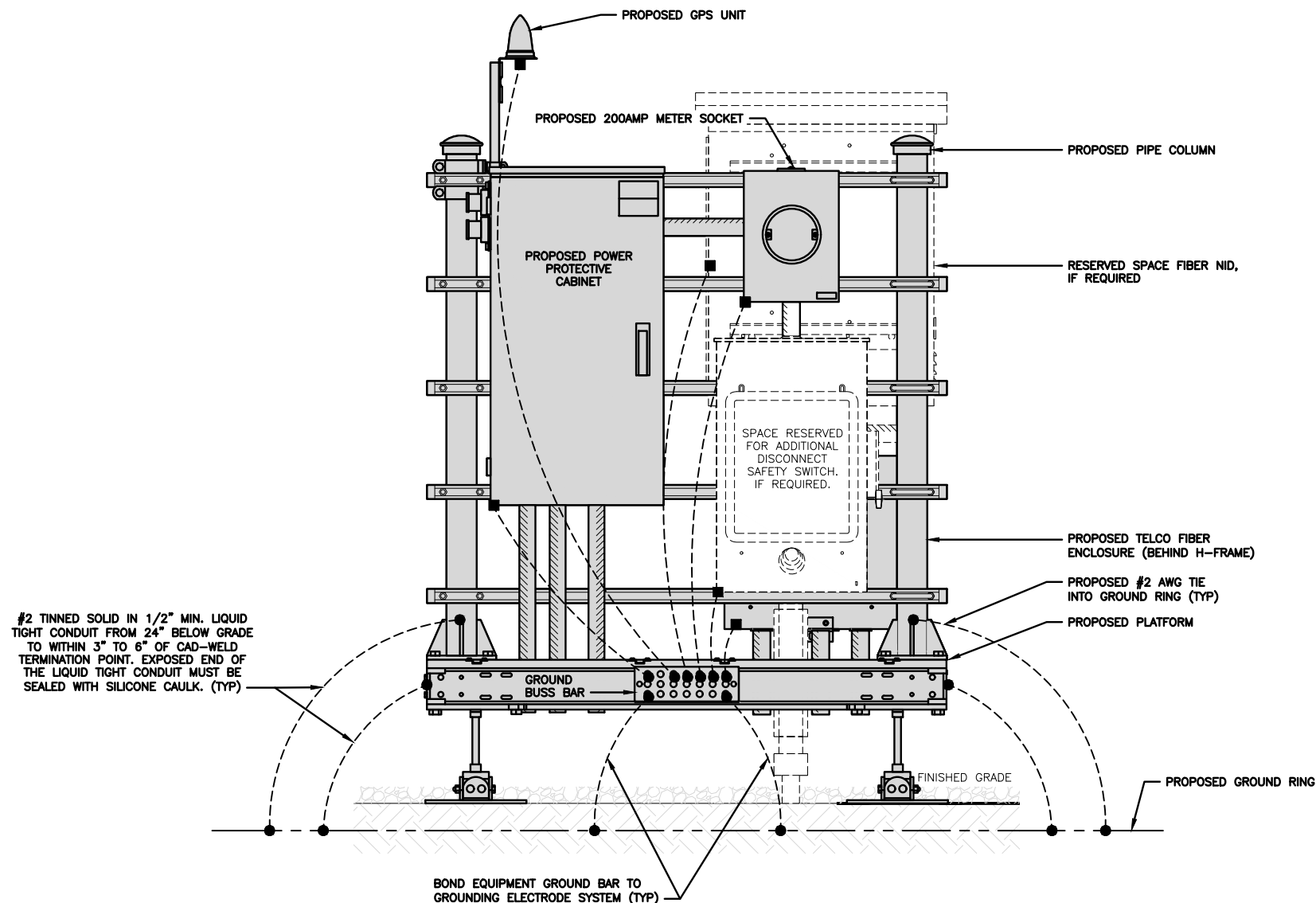
SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

G-1

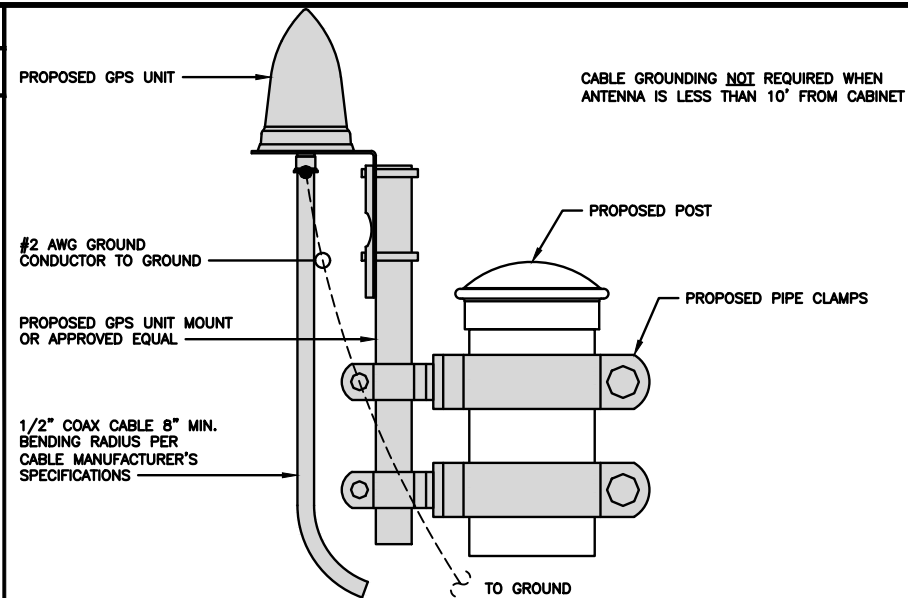
NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY



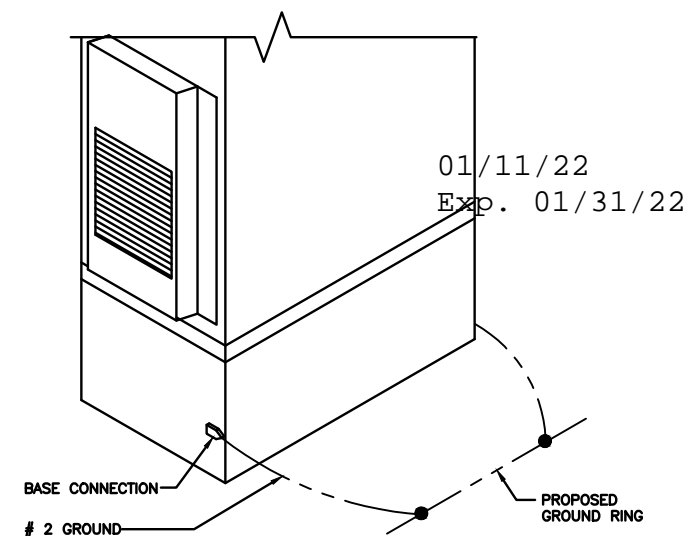
H-FRAME GROUNDING DETAIL

NO SCALE 1



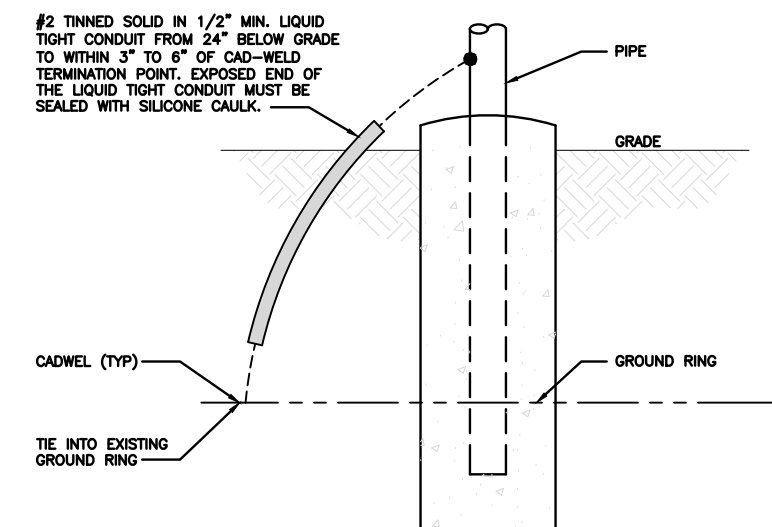
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



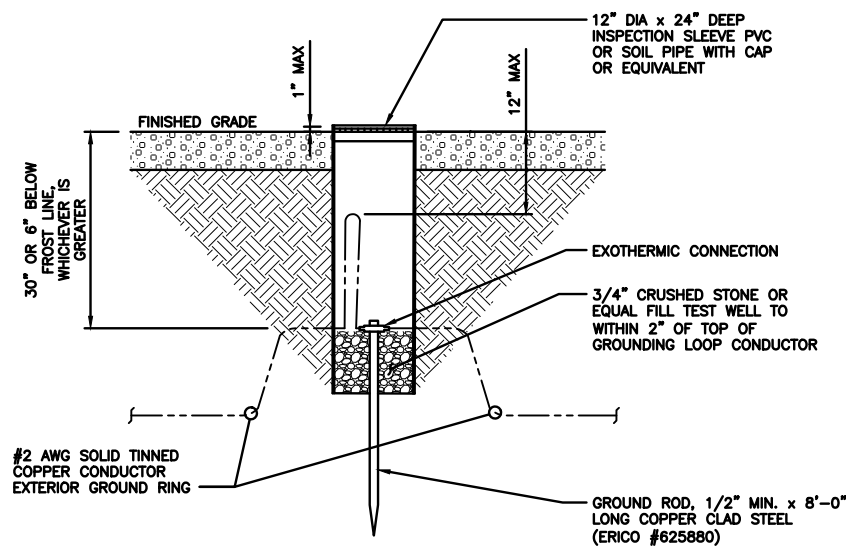
OUTDOOR CABINET GROUNDING

NO SCALE 3



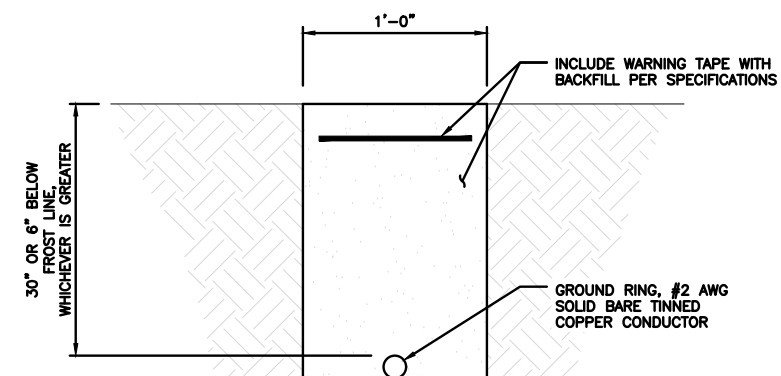
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6

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Kimley Horn

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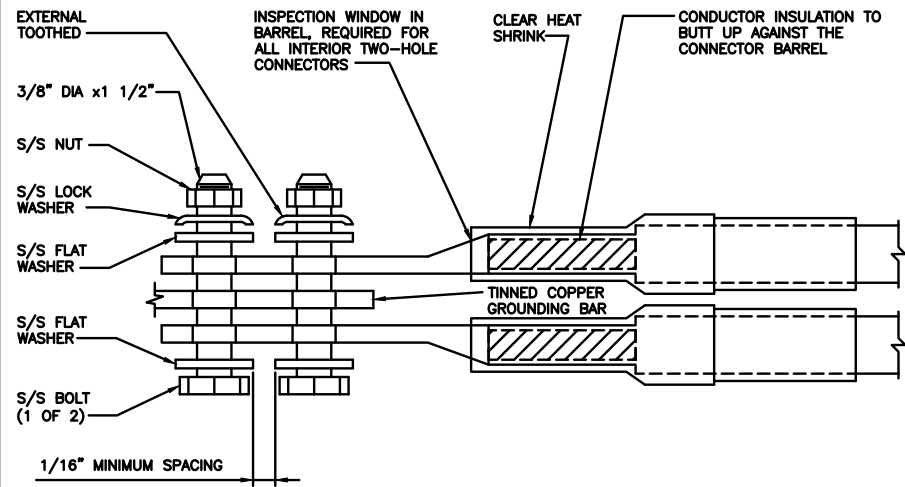
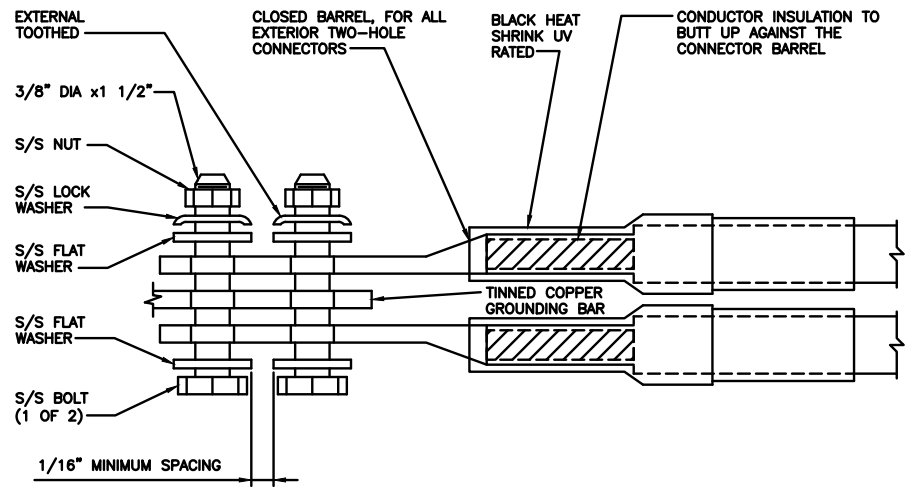
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SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER

G-2

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.
6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).



TYPICAL GROUNDING NOTES

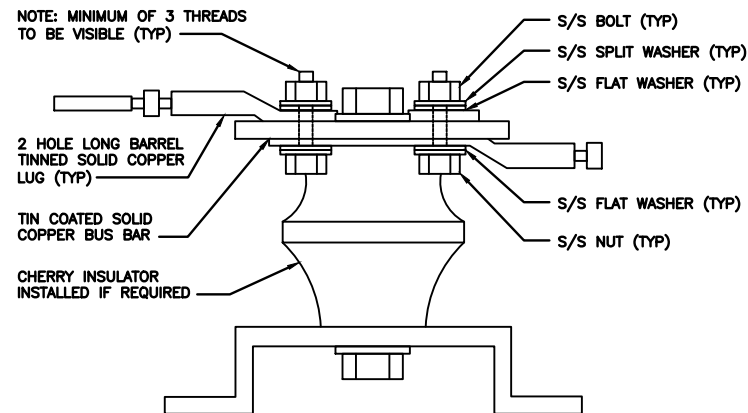
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9

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A&E PROJECT NUMBER
KHCLC-17043

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER

G-3

HYBRID/DISCREET CABLES

3/4" TAPE WIDTHS WITH 3/4" SPACING

LOW-BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) - OPTIONAL PER MARKET
ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BAND)

ALPHA RRH				BETA RRH				GAMMA RRH			
PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT	PORT 1 + SLANT	PORT 2 - SLANT	PORT 3 + SLANT	PORT 4 - SLANT
RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
	WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE		WHITE (-) PORT	ORANGE	ORANGE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

MID-BAND RRH
(AWS BANDS N66+N70)
ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)

RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE		WHITE (-) PORT	PURPLE	PURPLE
			WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS.
EXAMPLE 1 - HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND
MID-BANDS.
EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS
CBRS ONLY, ALL SECTORS.
EXAMPLE 3 - MAIN COAX WITH GROUND
MOUNTED RRHS.

EXAMPLE 1	EXAMPLE 2	EXAMPLE 3 COAX #1 (ALPHA)	COAX #2 (ALPHA)
RED	RED	RED	RED
BLUE	BLUE		
GREEN	GREEN		
ORANGE	YELLOW		
PURPLE			

FIBER JUMPERS TO RRHS

LOW-BAND HHR FIBER CABLES HAVE SECTOR
STRIPE ONLY.

LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE

POWER CABLES TO RRHS

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY.

LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE

RET MOTORS AT ANTENNAS

RET CONTROL IS HANDLED BY THE MID-BAND
RRH WHEN ONE SET OF RET PORTS EXIST ON
ANTENNA.
SEPARATE RET CABLES ARE USED WHEN
ANTENNA PORTS PROVIDE INPUTS FOR BOTH
LOW AND MID BANDS.

ANTENNA 1 MID BAND		ANTENNA 1 LOW BAND		ANTENNA 1 MID BAND		ANTENNA 1 LOW BAND	
IN	IN	IN	IN	IN	IN	IN	IN
RED	RED	RED	RED	BLUE	BLUE	GREEN	GREEN
PURPLE	ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE	ORANGE

MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5-2 INCH WHITE WRAP
WITH THE AZIMUTH COLOR OVERLAPPING IN THE
MIDDLE.
ADD ADDITIONAL SECTOR COLOR BANDS FOR
EACH ADDITIONAL MW RADIO.
MICROWAVE CABLES WILL REQUIRE P-TOUCH
LABELS INSIDE THE CABINET TO IDENTIFY THE
LOCAL AND REMOTE SITE ID'S.

FORWARD AZIMUTH OF 0-120 DEGREES		FORWARD AZIMUTH OF 120-240 DEGREES		FORWARD AZIMUTH OF 240-359 DEGREES	
PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	RED	BLUE	WHITE	GREEN	GREEN
	WHITE	WHITE	WHITE	WHITE	WHITE

RF CABLE COLOR CODES

1

LOW BANDS (N71+N26)
OPTIONAL - (N29)

ORANGE

AWS
(N66+N70+H-BLOCK)

PURPLE

CBRS TECH
(3 GHz)

YELLOW

NEGATIVE SLANT PORT
ON ANT/RRH

WHITE

ALPHA SECTOR

RED

BETA SECTOR

BLUE

GAMMA SECTOR

GREEN

COLOR IDENTIFIER

2

01/11/22
Exp. 01/31/22

NOT USED

3

NOT USED

4



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601



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OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

DRAWN BY: XQD
CHECKED BY: MCK
APPROVED BY: MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

REV	DATE	DESCRIPTION
A	10/15/2021	ISSUED FOR REVIEW
B	12/27/2021	ISSUED FOR CONSTRUCTION
D	01/10/2022	REVISED PER CLIENT

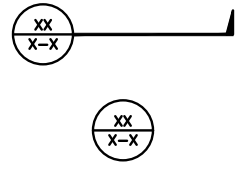
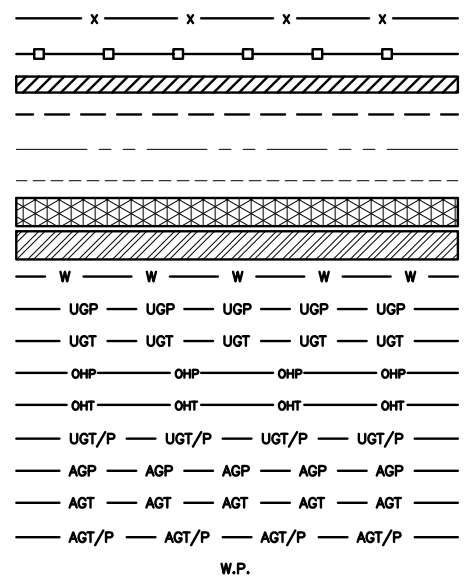
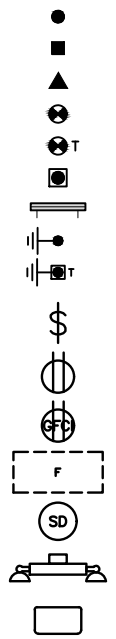
A&E PROJECT NUMBER
KHCLC-17043

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1

EXOTHERMIC CONNECTION
 MECHANICAL CONNECTION
 BUSS BAR INSULATOR
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 EXOTHERMIC WITH INSPECTION SLEEVE
 GROUNDING BAR
 GROUND ROD
 TEST GROUND ROD WITH INSPECTION SLEEVE
 SINGLE POLE SWITCH
 DUPLEX RECEPTACLE
 DUPLEX GFCI RECEPTACLE
 FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8
 SMOKE DETECTION (DC)
 EMERGENCY LIGHTING (DC)
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
 LED-1-25A400/51K-SR4-120-PE-DBBTXD
 CHAIN LINK FENCE
 WOOD/WROUGHT IRON FENCE
 WALL STRUCTURE
 LEASE AREA
 PROPERTY LINE (PL)
 SETBACKS
 ICE BRIDGE
 CABLE TRAY
 WATER LINE
 UNDERGROUND POWER
 UNDERGROUND TELCO
 OVERHEAD POWER
 OVERHEAD TELCO
 UNDERGROUND TELCO/POWER
 ABOVE GROUND POWER
 ABOVE GROUND TELCO
 ABOVE GROUND TELCO/POWER
 WORKPOINT



SECTION REFERENCE
 DETAIL REFERENCE

LEGEND

AB ANCHOR BOLT
 ABV ABOVE
 AC ALTERNATING CURRENT
 ADDL ADDITIONAL
 AFF ABOVE FINISHED FLOOR
 AFG ABOVE FINISHED GRADE
 AGL ABOVE GROUND LEVEL
 AIC AMPERAGE INTERRUPTION CAPACITY
 ALUM ALUMINUM
 ALT ALTERNATE
 ANT ANTENNA
 APPROX APPROXIMATE
 ARCH ARCHITECTURAL
 ATS AUTOMATIC TRANSFER SWITCH
 AWG AMERICAN WIRE GAUGE
 BATT BATTERY
 BLDG BUILDING
 BLK BLOCK
 BLKG BLOCKING
 BM BEAM
 BTC BARE TINNED COPPER CONDUCTOR
 BOF BOTTOM OF FOOTING
 CAB CABINET
 CANT CANTILEVERED
 CHG CHARGING
 CLG CEILING
 CLR CLEAR
 COL COLUMN
 COMM COMMON
 CONC CONCRETE
 CONSTR CONSTRUCTION
 DBL DOUBLE
 DC DIRECT CURRENT
 DEPT DEPARTMENT
 DF DOUGLAS FIR
 DIA DIAMETER
 DIAG DIAGONAL
 DIM DIMENSION
 DWG DRAWING
 DWL DOWEL
 EA EACH
 EC ELECTRICAL CONDUCTOR
 EL ELEVATION
 ELEC ELECTRICAL
 EMT ELECTRICAL METALLIC TUBING
 ENG ENGINEER
 EQ EQUAL
 EXP EXPANSION
 EXT EXTERIOR
 EW EACH WAY
 FAB FABRICATION
 FF FINISH FLOOR
 FG FINISH GRADE
 FIF FACILITY INTERFACE FRAME
 FIN FINISH(ED)
 FLR FLOOR
 FDN FOUNDATION
 FOC FACE OF CONCRETE
 FOM FACE OF MASONRY
 FOS FACE OF STUD
 FOW FACE OF WALL
 FS FINISH SURFACE
 FT FOOT
 FTG FOOTING
 GA GAUGE
 GEN GENERATOR
 GFCI GROUND FAULT CIRCUIT INTERRUPTER
 GLB GLUE LAMINATED BEAM
 GLV GALVANIZED
 GPS GLOBAL POSITIONING SYSTEM
 GND GROUND
 GSM GLOBAL SYSTEM FOR MOBILE
 HDG HOT DIPPED GALVANIZED
 HDR HEADER
 HGR HANGER
 HVAC HEAT/VENTILATION/AIR CONDITIONING
 HT HEIGHT
 IGR INTERIOR GROUND RING

IN INCH
 INT INTERIOR
 LB(S) POUND(S)
 LF LINEAR FEET
 LTE LONG TERM EVOLUTION
 MAS MASONRY
 MAX MAXIMUM
 MB MACHINE BOLT
 MECH MECHANICAL
 MFR MANUFACTURER
 MGB MASTER GROUND BAR
 MIN MINIMUM
 MISC MISCELLANEOUS
 MTL METAL
 MTS MANUAL TRANSFER SWITCH
 MW MICROWAVE
 NEC NATIONAL ELECTRIC CODE
 NM NEWTON METERS
 NO. NUMBER
 # NUMBER
 NTS NOT TO SCALE
 OC ON-CENTER
 OSHA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
 OPNG OPENING
 P/C PRECAST CONCRETE
 PCS PERSONAL COMMUNICATION SERVICES
 PCU PRIMARY CONTROL UNIT
 PRC PRIMARY RADIO CABINET
 PP POLARIZING PRESERVING
 PSF POUNDS PER SQUARE FOOT
 PSI POUNDS PER SQUARE INCH
 PT PRESSURE TREATED
 PWR POWER CABINET
 QTY QUANTITY
 RAD RADIUS
 RECT RECTIFIER
 REF REFERENCE
 REINF REINFORCEMENT
 REQ'D REQUIRED
 RET REMOTE ELECTRIC TILT
 RF RADIO FREQUENCY
 RMC RIGID METALLIC CONDUIT
 RRH REMOTE RADIO HEAD
 RRU REMOTE RADIO UNIT
 RWY RACEWAY
 SCH SCHEDULE
 SHT SHEET
 SIAD SMART INTEGRATED ACCESS DEVICE
 SIM SIMILAR
 SPEC SPECIFICATION
 SQ SQUARE
 SS STAINLESS STEEL
 STD STANDARD
 STL STEEL
 TEMP TEMPORARY
 THK THICKNESS
 TMA TOWER MOUNTED AMPLIFIER
 TN TOE NAIL
 TOA TOP OF ANTENNA
 TOC TOP OF CURB
 TOF TOP OF FOUNDATION
 TOP TOP OF PLATE (PARAPET)
 TOS TOP OF STEEL
 TOW TOP OF WALL
 TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION
 TYP TYPICAL
 UG UNDERGROUND
 UL UNDERWRITERS LABORATORY
 UNO UNLESS NOTED OTHERWISE
 UMTS UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
 UPS UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
 VIF VERIFIED IN FIELD
 W WIDE
 W/ WITH
 WD WOOD
 WP WEATHERPROOF
 WT WEIGHT

ABBREVIATIONS

01/11/22
 Exp. 01/31/22



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CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
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 KHCLC-17043

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 PROJECT INFORMATION
 BOBDL00079A
 92 WESTON ST
 HARTFORD, CT 06103

SHEET TITLE
 LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

- NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.
- "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER 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 DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
- 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.
- 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 DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, 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).
- ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
- IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- 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.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
- 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.
- ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
- 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.
- 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 DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
- 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.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
- 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:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER:DISH Wireless L.L.C.
TOWER OWNER:TOWER OWNER
- 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.
- 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.
- 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.
- 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.
- 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 CARRIER POC AND TOWER OWNER.
- 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.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- 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 TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
- CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, 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.
- 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 DISH Wireless L.L.C. AND TOWER OWNER
- 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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RALEIGH, NC 27601



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XQD	MCK	MCK

RFDS REV #: ---

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A&E PROJECT NUMBER
KHCL-17043

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
- CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
- ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
 #4 BARS AND SMALLER 40 ksi
 #5 BARS AND LARGER 60 ksi
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 - CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 BARS AND LARGER 2"
 - #5 BARS AND SMALLER 1-1/2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLAB AND WALLS 3/4"
 - BEAMS AND COLUMNS 1-1/2"
- A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
 - ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
 - ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY 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.
- 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.
- 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).
- PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
- TIE WRAPS ARE NOT ALLOWED.
- 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.
- 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.
- POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
- 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.
- 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).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
- ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

- ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
- WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
- SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
- 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.
- 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 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
- 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.
- 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.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY. 01/11/22
- 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.
- INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C."
- ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



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A&E PROJECT NUMBER
KHCLC-17043

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

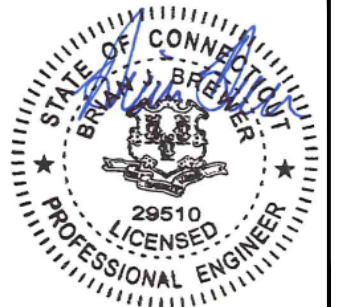
1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (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). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.



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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00079A
92 WESTON ST
HARTFORD, CT 06103

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

Exhibit D

Structural Analysis Report

Date: **October 08, 2021**



Black and Veatch Corp.
6800 W. 115th St., Suite 2292
Overland Park, KS 66211
(913) 458-6909

Subject: **Structural Analysis Report**

Carrier Designation: **DISH Network Co-Locate**
Site Number: BOBDL00079A
Site Name: CT-CCI-T-876325

Crown Castle Designation: **BU Number:** 876325
Site Name: WESTON SQUARE
JDE Job Number: 650069
Work Order Number: 2018292
Order Number: 556614 Rev. 0

Engineering Firm Designation: **Black and Veatch Corp. Project Number:** 406642

Site Data: **92 Weston Street, Hartford, Hartford County, CT**
Latitude 41° 47' 12.3", Longitude -72° 39' 44.42"
110 Foot - Monopole Tower

Black and Veatch Corp. 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 - 99.8%

This analysis utilizes an ultimate 3-second gust wind speed of 117 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria

Structural analysis prepared by: Shaun Donley / Jumpon Uea-areevorakul

Respectfully submitted by:

Ping Jiang, P.E.
Professional Engineer



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1) INTRODUCTION

This tower is a 110 ft Monopole tower designed by Rohn Industries, Inc.

The tower has been modified multiple times in the past to accommodate additional loading.

The tower has been modified per reinforcement drawings prepared by B&T Engineering, Inc., in December of 2008. Reinforcement consists of addition of reinforcement plates from 0.5' - 10.5', additional anchor rods and base plate stiffeners. Refer to Post Modification Inspection Report by B&T Engineering, Inc. in November of 2009. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in May of 2012. Reinforcement consists of addition of reinforcement plates from 30.5' - 40.5' and bridge stiffeners at 30'. Refer to Modification Inspection Report by Tower Engineering Professionals, Inc. in October of 2012. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in February of 2013. Reinforcement consists of addition of reinforcement plates from 6' - 21' and transition stiffeners. Refer to Modification Inspection Report by Tower Engineering Professionals, Inc. in August of 2013. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Paul J. Ford and Company, in February of 2017. Reinforcement consists of addition of reinforcement plates from 4.5' - 26.5', jump plates at 30' and additional foundation reinforcement. Refer to Modification Inspection Report by Engineered Tower Solutions, PLLC. in August of 2017. This modification has been considered effective in this analysis.

The tower was later modified per reinforcement drawings prepared by Black & Veatch Corp, in January of 2020. Reinforcement consists of removing existing base plate grout, addition of anchor rods with bracket at elevation 0' and removing existing bracket and installing new anchor rods with bracket at elevation 0'. Refer to Modification Inspection Report by Engineered Tower Solutions, PLLC. in August of 2017. This modification has been considered effective in this analysis.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	117 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)
54.0	54.0	1	tower mounts	Commscope MC-PK8-DSH	1	1-3/8
		1	raycap	RDIDC-9181-PF-48		
		3	fujitsu	TA08025-B604		
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		

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)
107.0	108.0	3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	3	1-5/8
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	Radio 4480_TMOV2		
		3	rfs celwave	APXVAALL24_43-U-NA20_TMO w/ Mount Pipe		
	107.0	1	Site Pro 1	RMQP-xxx + HRK12 12.5' Platform with Handrails		
105.0	105.0	3	alcatel lucent	800MHZ 2X50W RRH W/FILTER	-	-
		6	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ		
		1	cci tower mounts (v2.1)	T-Arm Mount [4' TA 702-3]		
		3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
90.0	91.0	3	ericsson	AIR 6419 B77G w/ Mount Pipe	4 4 3 4	7/8 13/16 3/8 Conduit
		3	ericsson	AIR 6449 N77 w/ Mount Pipe		
	90.0	3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 4449 B5/B12		
		1	sitepro1	RMQLP-4120-H10		
		3	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		3	ericsson	RRUS 32 B66A		
		3	ericsson	RRUS 4415 B25		
		3	ericsson	RRUS E2 B29		
		3	quintel technology	QD6616-7 w/ Mount Pipe		
		4	raycap	DC6-48-60-18-8F		
76.0	76.0	3	commscope	SDX1926Q-43	6 3	7/8 1-5/8
		3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25		
		1	Site Pro 1	RMQP-xxx + HRK12 12.5' Platform with Handrails		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
64.0	64.0	1	perfect vision	PV-VPP12M-HR-B	2	1-7/8
		3	commscope	BSAMNT-SBS-1-2 (Mount Bracket)		
		6	commscope	NHH-65B-R2B		
		2	raycap	RVZDC-6627-PF-48		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		3	samsung telecommunications	20W CBRS		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2192540	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1615433	CCISITES
4-TOWER MANUFACTURER DRAWINGS	1615400	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	2356066	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3187227	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	3667858	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	6702634	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	8892341	CCISITES
4-POST-MODIFICATION INSPECTION	6996864	CCISITES
4-POST-MODIFICATION INSPECTION	4075332	CCISITES
4-POST-MODIFICATION INSPECTION	3355603	CCISITES
4-POST-MODIFICATION INSPECTION	2561266	CCISITES
4-POST-MODIFICATION INSPECTION	9756042	CCISITES

3.1) Analysis Method

tnxTower (version 8.1.1.0), 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. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are presented in Appendix C.

3.2) Assumptions

- 1) Tower and structures were maintained in accordance with the TIA-222 Standard.
- 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. Black and Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

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

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP24x24x0.25	Pole	3.1%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	9.6%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	16.4%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	23.5%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	24.3%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	33.4%	Pass
80 - 75	Pole	TP24x24x0.375	Pole	43.7%	Pass
75 - 70	Pole	TP24x24x0.375	Pole	55.8%	Pass
70 - 65	Pole	TP24x24x0.375	Pole	68.1%	Pass
65 - 60	Pole	TP24x24x0.375	Pole	82.6%	Pass
60 - 55	Pole	TP30x30x0.375	Pole	64.4%	Pass
55 - 50	Pole	TP30x30x0.375	Pole	75.6%	Pass
50 - 45	Pole	TP30x30x0.375	Pole	86.9%	Pass
45 - 40	Pole	TP30x30x0.375	Pole	98.3%	Pass
40 - 39.33	Pole	TP30x30x0.375	Pole	99.8%	Pass
39.33 - 39.08	Pole + Reinf.	TP30x30x0.4875	Pole	78.3%	Pass
39.08 - 34.08	Pole + Reinf.	TP30x30x0.4875	Pole	87.3%	Pass
34.08 - 30	Pole + Reinf.	TP30x30x0.4875	Pole	94.9%	Pass
30 - 29.75	Pole	TP30x30x0.5	Pole	88.7%	Pass
29.75 - 25	Pole	TP30x30x0.5	Pole	97.0%	Pass
25 - 24.75	Pole + Reinf.	TP30x30x0.5563	Pole	87.6%	Pass
24.75 - 19.75	Pole + Reinf.	TP30x30x0.5563	Pole	95.6%	Pass
19.75 - 18.58	Pole + Reinf.	TP30x30x0.5563	Pole	97.5%	Pass
18.58 - 18.33	Pole + Reinf.	TP30x30x0.6875	Pole	84.7%	Pass
18.33 - 13.33	Pole + Reinf.	TP30x30x0.6875	Pole	91.8%	Pass
13.33 - 8.42	Pole + Reinf.	TP30x30x0.6875	Pole	98.9%	Pass
8.42 - 8.07	Pole + Reinf.	TP30x30x1.3	Reinf. 1 Bolt Shear	67.6%	Pass
8.07 - 7.83	Pole + Reinf.	TP30x30x1.2	Pole	56.6%	Pass
7.83 - 6	Pole + Reinf.	TP30x30x1.2	Pole	58.1%	Pass
6 - 5.75	Pole + Reinf.	TP30x30x1.15	Reinf. 1 Tension Rupture	66.7%	Pass
5.75 - 2	Pole + Reinf.	TP30x30x1.15	Reinf. 1 Tension Rupture	70.4%	Pass
2 - 1.75	Pole + Reinf.	TP30x30x1.6	Reinf. 4 Weldment	69.0%	Pass
1.75 - 0	Pole + Reinf.	TP30x30x0.875	Pole	88.8%	Pass
				Summary	
			Pole	99.8%	Pass
			Reinforcement	88.5%	Pass
			Overall	99.8%	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Bolts	90	13.5	Pass
	Flange Plate		23.5	Pass
1,2	Flange Bolts	60	43.7	Pass
	Flange Plate		82.6	Pass
1	Bridge Stiffeners	30	47.0	Pass
	Jump Plates		64.0	Pass
	Flange Bolts		20.5	Pass
	Flange Plate		19.6	Pass
1	Anchor Rods (Original)	0	73.8	Pass
1,3	Anchor Bolts (Existing Modification)		99.2	Pass
1	Base Plate		66.5	Pass
1	Base Foundation (Structure)	0	92.2	Pass
	Base Foundation (Soil Interaction)		26.5	Pass

Structure Rating (max from all components) =	99.8%
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Notes:

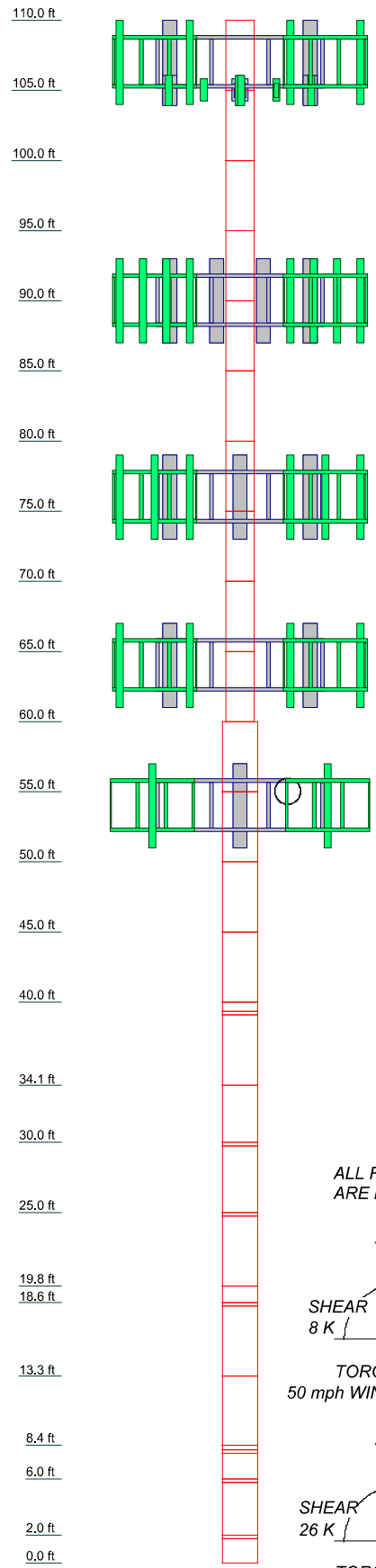
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity. Rating per TIA-222-H Section 15.5.
- 2) Flange plates are assumed to have the same capacity as their respective splice bolts or shaft.
- 3) The anchor rod brackets were analyzed previously and found not to govern the design. The anchor rods will control the design.

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

1	P24x0.25	5.00	0.3
2	P24x0.25	5.00	0.3
3	P24x0.25	5.00	0.3
4	P24x0.25	5.00	0.3
5	P24x0.375	5.00	0.5
6	P24x0.375	5.00	0.5
7	P24x0.375	5.00	0.5
8	P24x0.375	5.00	0.5
9	P24x0.375	5.00	0.5
10	P24x0.375	5.00	0.5
11	P30x0.375	5.00	0.6
12	P30x0.375	5.00	0.6
13	P30x0.375	5.00	0.6
14	P30x0.375	5.00	0.6
15	P30x0.375	5.00	0.6
16	P30x0.375	5.00	0.6
17	P30x0.375	5.00	0.7
18	P30x0.375	5.00	0.6
19	P30x0.375	5.00	0.0
20	P30x0.375	5.00	0.7
21	P30x0.375	5.00	0.1
22	P30x0.375	5.00	1.1
23	P30x0.375	5.00	0.3
24	P30x0.375	5.00	1.4
25	P30x0.375	5.00	0.3
26	P30x0.375	4.91	1.4
27	P30x0.375	4.91	1.4
28	P30x0.375	4.91	1.4
29	P30x0.375	4.91	1.4
30	P30x0.375	4.91	1.4
31	P30x0.375	4.91	1.2
32	P30x0.375	4.91	1.2
33	P30x0.375	4.91	1.2
34	P30x0.375	4.91	1.2
35	P30x0.375	4.91	1.2
36	P30x0.375	4.91	1.2
37	P30x0.375	4.91	1.2
38	P30x0.375	4.91	1.2
39	P30x0.375	4.91	1.2
40	P30x0.375	4.91	1.2
41	P30x0.375	4.91	1.2
42	P30x0.375	4.91	1.2
43	P30x0.375	4.91	1.2
44	P30x0.375	4.91	1.2
45	P30x0.375	4.91	1.2
46	P30x0.375	4.91	1.2
47	P30x0.375	4.91	1.2
48	P30x0.375	4.91	1.2
49	P30x0.375	4.91	1.2
50	P30x0.375	4.91	1.2
51	P30x0.375	4.91	1.2
52	P30x0.375	4.91	1.2
53	P30x0.375	4.91	1.2
54	P30x0.375	4.91	1.2
55	P30x0.375	4.91	1.2
56	P30x0.375	4.91	1.2
57	P30x0.375	4.91	1.2
58	P30x0.375	4.91	1.2
59	P30x0.375	4.91	1.2
60	P30x0.375	4.91	1.2
61	P30x0.375	4.91	1.2
62	P30x0.375	4.91	1.2
63	P30x0.375	4.91	1.2
64	P30x0.375	4.91	1.2
65	P30x0.375	4.91	1.2
66	P30x0.375	4.91	1.2
67	P30x0.375	4.91	1.2
68	P30x0.375	4.91	1.2
69	P30x0.375	4.91	1.2
70	P30x0.375	4.91	1.2
71	P30x0.375	4.91	1.2
72	P30x0.375	4.91	1.2
73	P30x0.375	4.91	1.2
74	P30x0.375	4.91	1.2
75	P30x0.375	4.91	1.2
76	P30x0.375	4.91	1.2
77	P30x0.375	4.91	1.2
78	P30x0.375	4.91	1.2
79	P30x0.375	4.91	1.2
80	P30x0.375	4.91	1.2
81	P30x0.375	4.91	1.2
82	P30x0.375	4.91	1.2
83	P30x0.375	4.91	1.2
84	P30x0.375	4.91	1.2
85	P30x0.375	4.91	1.2
86	P30x0.375	4.91	1.2
87	P30x0.375	4.91	1.2
88	P30x0.375	4.91	1.2
89	P30x0.375	4.91	1.2
90	P30x0.375	4.91	1.2
91	P30x0.375	4.91	1.2
92	P30x0.375	4.91	1.2
93	P30x0.375	4.91	1.2
94	P30x0.375	4.91	1.2
95	P30x0.375	4.91	1.2
96	P30x0.375	4.91	1.2
97	P30x0.375	4.91	1.2
98	P30x0.375	4.91	1.2
99	P30x0.375	4.91	1.2
100	P30x0.375	4.91	1.2

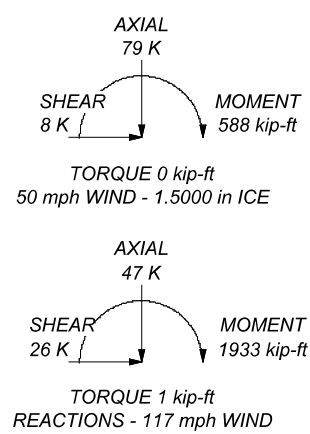


MATERIAL STRENGTH					
GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 117 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 0.00 ft
8. TOWER RATING: 99.8%

ALL REACTIONS ARE FACTORED



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FAX:

Job: **WESTON SQUARE (BU# 876325)**
Project: **406642 (876325.2018292)**
Client: Crown Castle
Code: TIA-222-H
Path:
Drawn by: Jumpon Uea-areevorakul
Date: 10/08/21
App'd:
Scale: NTS
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:

- Tower is located in Hartford County, Connecticut.
- Tower base elevation above sea level: 10.00 ft.
- Basic wind speed of 117 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
- Maximum demand-capacity ratio is: 1.05.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs	Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	110.00-105.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L2	105.00-100.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L3	100.00-95.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L4	95.00-90.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L5	90.00-85.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L6	85.00-80.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L7	80.00-75.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L8	75.00-70.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L9	70.00-65.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L10	65.00-60.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L11	60.00-55.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L12	55.00-50.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L13	50.00-45.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L14	45.00-40.00	5.00	P30x0.375	A53-B-42 (42 ksi)	
L15	40.00-39.33	0.67	P30x0.375	A53-B-42 (42 ksi)	
L16	39.33-39.08	0.25	P30x0.4875	A53-B-42 (42 ksi)	
L17	39.08-34.08	5.00	P30x0.4875	A53-B-42 (42 ksi)	
L18	34.08-30.00	4.08	P30x0.4875	A53-B-42 (42 ksi)	
L19	30.00-29.75	0.25	P30x0.5	A53-B-42 (42 ksi)	
L20	29.75-25.00	4.75	P30x0.5	A53-B-42 (42 ksi)	
L21	25.00-24.75	0.25	P30x0.55625	A53-B-42 (42 ksi)	
L22	24.75-19.75	5.00	P30x0.55625	A53-B-42 (42 ksi)	
L23	19.75-18.58	1.17	P30x0.55625	A53-B-42 (42 ksi)	
L24	18.58-18.33	0.25	P30x0.6875	A53-B-42 (42 ksi)	
L25	18.33-13.33	5.00	P30x0.6875	A53-B-42 (42 ksi)	
L26	13.33-8.42	4.91	P30x0.6875	A53-B-42 (42 ksi)	
L27	8.42-8.07	0.35	P30x1.3	A53-B-42 (42 ksi)	
L28	8.07-7.83	0.24	P30x1.2	A53-B-42 (42 ksi)	
L29	7.83-6.00	1.83	P30x1.2	A53-B-42 (42 ksi)	
L30	6.00-5.75	0.25	P30x1.15	A53-B-42 (42 ksi)	
L31	5.75-2.00	3.75	P30x1.15	A53-B-42 (42 ksi)	
L32	2.00-1.75	0.25	P30x1.6	A53-B-42 (42 ksi)	
L33	1.75-0.00	1.75	P30x0.875	A53-B-42 (42 ksi)	

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	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
ft	ft ²	in							
L1 110.00-105.00				1	1	1			
L2 105.00-100.00				1	1	1			
L3 100.00-95.00				1	1	1			
L4 95.00-90.00				1	1	1			
L5 90.00-85.00				1	1	1			
L6 85.00-80.00				1	1	1			
L7 80.00-75.00				1	1	1			
L8 75.00-70.00				1	1	1			
L9 70.00-65.00				1	1	1			
L10 65.00-60.00				1	1	1			
L11 60.00-55.00				1	1	1			
L12 55.00-50.00				1	1	1			
L13 50.00-45.00				1	1	1			
L14 45.00-40.00				1	1	1			
L15 40.00-39.33				1	1	1			
L16 39.33-39.08				1	1	0.965972			
L17 39.08-34.08				1	1	0.965972			
L18 34.08-30.00				1	1	0.965972			
L19 30.00-29.75				1	1	1			
L20 29.75-25.00				1	1	1			
L21 25.00-24.75				1	1	1.25043			
L22 24.75-19.75				1	1	1.25043			
L23 19.75-18.58				1	1	1.25043			
L24 18.58-18.33				1	1	1.28397			
L25 18.33-13.33				1	1	1.28397			
L26 13.33-8.42				1	1	1.28397			
L27 8.42-8.07				1	1	0.929056			
L28 8.07-7.83				1	1	1.00298			
L29 7.83-6.00				1	1	1.00298			
L30 6.00-5.75				1	1	0.872082			
L31 5.75-2.00				1	1	0.872082			
L32 2.00-1.75				1	1	0.820624			
L33 1.75-0.00				1	1	0.906659			

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
Safety Line 3/8	B	No	Surface Ar (CaAa)	110.00 - 3.00	1	1	0.000 0.017	0.3750		0.22

FB-L98B-034-XXX(3/8)	A	No	Surface Ar (CaAa)	90.00 - 0.00	2	2	-0.500 0.010	0.0000		0.06
PWRT-608-S(13/16)	A	No	Surface Ar (CaAa)	90.00 - 0.00	4	4	-0.500 0.010	0.0000		0.62
PWRT-606-S(7/8)	A	No	Surface Ar (CaAa)	90.00 - 0.00	4	4	-0.500 0.010	0.0000		0.89
3" Flexible Conduit	A	No	Surface Ar (CaAa)	90.00 - 0.00	4	4	-0.500 0.010	3.0000		0.30

810921-001(7/8)	B	No	Surface Ar (CaAa)	76.00 - 0.00	6	6	-0.500 -0.232	1.1120		0.40
HCS 6X12 4AWG(1-5/8)	A	No	Surface Ar (CaAa)	76.00 - 0.00	1	1	0.433 0.500	1.6600		2.40
HCS 6X12 4AWG(1-5/8)	B	No	Surface Ar (CaAa)	76.00 - 0.00	1	1	-0.232 -0.165	1.6600		2.40

HB158-U12S24-160-LI(1-7/8)	C	No	Surface Ar (CaAa)	64.00 - 0.00	2	2	-0.500 -0.350	1.9760		3.20
CU12PSM9P8XXX(1-3/8)	C	No	Surface Ar (CaAa)	54.00 - 0.00	1	1	-0.100 -0.050	1.4110		1.66

*** Existing Modifications ***										
Aero Channel MP305	A	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	B	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	C	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	C	No	Surface Af (CaAa)	10.50 - 0.50	1	1	0.000 0.000	5.3125	14.8400	0.00

Aero Channel MP303	A	No	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	B	No	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0625	11.2600	0.00
Aero Channel MP303	C	No	Surface Af (CaAa)	40.50 - 30.50	1	1	0.000 0.000	4.0625	11.2600	0.00

Aero Channel MP305	A	No	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	B	No	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3125	14.8400	0.00
Aero Channel MP305	C	No	Surface Af (CaAa)	21.00 - 6.00	1	1	0.000 0.000	5.3125	14.8400	0.00

CCI-SFP-045100	A	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	B	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	C	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00
CCI-SFP-045100	C	No	Surface Af (CaAa)	26.50 - 4.50	1	1	0.000 0.000	4.5000	11.0000	0.00

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} ft ² /ft	Weight plf

HB158-21U6S24-xxM_TMO(1-5/8)	C	No	No	Inside Pole	107.00 - 0.00	3	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
							2" Ice	0.00	2.50
FB-L98B-034-XXX(3/8)	A	No	No	Inside Pole	90.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
HCS 6X12 4AWG(1-5/8)	B	No	No	Inside Pole	76.00 - 0.00	1	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40
							1" Ice	0.00	2.40
							2" Ice	0.00	2.40

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01
L2	105.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L3	100.00-95.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L4	95.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L5	90.00-85.00	A	0.000	0.000	6.000	0.000	0.04
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L6	85.00-80.00	A	0.000	0.000	6.000	0.000	0.04
		B	0.000	0.000	0.188	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L7	80.00-75.00	A	0.000	0.000	6.166	0.000	0.04
		B	0.000	0.000	1.021	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.04
L8	75.00-70.00	A	0.000	0.000	6.830	0.000	0.05
		B	0.000	0.000	4.354	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.04
L9	70.00-65.00	A	0.000	0.000	6.830	0.000	0.05
		B	0.000	0.000	4.354	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.04
L10	65.00-60.00	A	0.000	0.000	6.830	0.000	0.05
		B	0.000	0.000	4.354	0.000	0.04
		C	0.000	0.000	1.581	0.000	0.06
L11	60.00-55.00	A	0.000	0.000	6.830	0.000	0.05
		B	0.000	0.000	4.354	0.000	0.04
		C	0.000	0.000	1.976	0.000	0.07
L12	55.00-50.00	A	0.000	0.000	6.830	0.000	0.05
		B	0.000	0.000	4.354	0.000	0.04
		C	0.000	0.000	2.540	0.000	0.08
L13	50.00-45.00	A	0.000	0.000	6.830	0.000	0.05
		B	0.000	0.000	4.354	0.000	0.04
		C	0.000	0.000	2.682	0.000	0.08
L14	45.00-40.00	A	0.000	0.000	7.169	0.000	0.05
		B	0.000	0.000	4.692	0.000	0.04

Tower Section	Tower Elevation	Face	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		ft ²	ft ²	ft ²	ft ²	K
L15	40.00-39.33	C	0.000	0.000	3.020	0.000	0.08
		A	0.000	0.000	1.369	0.000	0.01
		B	0.000	0.000	1.037	0.000	0.00
L16	39.33-39.08	C	0.000	0.000	0.813	0.000	0.01
		A	0.000	0.000	0.511	0.000	0.00
		B	0.000	0.000	0.387	0.000	0.00
L17	39.08-34.08	C	0.000	0.000	0.303	0.000	0.00
		A	0.000	0.000	10.215	0.000	0.05
		B	0.000	0.000	7.739	0.000	0.04
L18	34.08-30.00	C	0.000	0.000	6.067	0.000	0.08
		A	0.000	0.000	7.997	0.000	0.04
		B	0.000	0.000	5.976	0.000	0.03
L19	30.00-29.75	C	0.000	0.000	4.612	0.000	0.06
		A	0.000	0.000	0.342	0.000	0.00
		B	0.000	0.000	0.218	0.000	0.00
L20	29.75-25.00	C	0.000	0.000	0.134	0.000	0.00
		A	0.000	0.000	7.614	0.000	0.05
		B	0.000	0.000	5.261	0.000	0.04
L21	25.00-24.75	C	0.000	0.000	4.797	0.000	0.07
		A	0.000	0.000	0.529	0.000	0.00
		B	0.000	0.000	0.405	0.000	0.00
L22	24.75-19.75	C	0.000	0.000	0.509	0.000	0.00
		A	0.000	0.000	11.687	0.000	0.05
		B	0.000	0.000	9.210	0.000	0.04
L23	19.75-18.58	C	0.000	0.000	11.288	0.000	0.08
		A	0.000	0.000	3.512	0.000	0.01
		B	0.000	0.000	2.932	0.000	0.01
L24	18.58-18.33	C	0.000	0.000	3.418	0.000	0.02
		A	0.000	0.000	0.750	0.000	0.00
		B	0.000	0.000	0.627	0.000	0.00
L25	18.33-13.33	C	0.000	0.000	0.730	0.000	0.00
		A	0.000	0.000	15.007	0.000	0.05
		B	0.000	0.000	12.531	0.000	0.04
L26	13.33-8.42	C	0.000	0.000	14.609	0.000	0.08
		A	0.000	0.000	16.456	0.000	0.05
		B	0.000	0.000	14.024	0.000	0.04
L27	8.42-8.07	C	0.000	0.000	17.783	0.000	0.08
		A	0.000	0.000	1.340	0.000	0.00
		B	0.000	0.000	1.166	0.000	0.00
L28	8.07-7.83	C	0.000	0.000	1.601	0.000	0.01
		A	0.000	0.000	0.919	0.000	0.00
		B	0.000	0.000	0.800	0.000	0.00
L29	7.83-6.00	C	0.000	0.000	1.098	0.000	0.00
		A	0.000	0.000	7.005	0.000	0.02
		B	0.000	0.000	6.098	0.000	0.01
L30	6.00-5.75	C	0.000	0.000	8.371	0.000	0.03
		A	0.000	0.000	0.736	0.000	0.00
		B	0.000	0.000	0.612	0.000	0.00
L31	5.75-2.00	C	0.000	0.000	0.922	0.000	0.00
		A	0.000	0.000	9.159	0.000	0.04
		B	0.000	0.000	7.264	0.000	0.03
L32	2.00-1.75	C	0.000	0.000	10.084	0.000	0.06
		A	0.000	0.000	0.548	0.000	0.00
		B	0.000	0.000	0.415	0.000	0.00
L33	1.75-0.00	C	0.000	0.000	0.547	0.000	0.00
		A	0.000	0.000	3.423	0.000	0.02
		B	0.000	0.000	2.491	0.000	0.01
		C	0.000	0.000	3.004	0.000	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
L1	110.00-105.00	A	1.435	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.622	0.000	0.02

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L2	105.00-100.00	C		0.000	0.000	0.000	0.000	0.01
		A	1.428	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.616	0.000	0.02
L3	100.00-95.00	C		0.000	0.000	0.000	0.000	0.04
		A	1.421	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.608	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.04
L4	95.00-90.00	A	1.413	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	1.601	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.04
L5	90.00-85.00	A	1.406	0.000	0.000	14.528	0.000	0.17
		B		0.000	0.000	1.593	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.04
L6	85.00-80.00	A	1.397	0.000	0.000	14.487	0.000	0.17
		B		0.000	0.000	1.585	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.04
L7	80.00-75.00	A	1.389	0.000	0.000	14.887	0.000	0.18
		B		0.000	0.000	3.201	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.04
L8	75.00-70.00	A	1.379	0.000	0.000	16.606	0.000	0.21
		B		0.000	0.000	9.671	0.000	0.13
		C		0.000	0.000	0.000	0.000	0.04
L9	70.00-65.00	A	1.370	0.000	0.000	16.548	0.000	0.20
		B		0.000	0.000	9.639	0.000	0.13
		C		0.000	0.000	0.000	0.000	0.04
L10	65.00-60.00	A	1.359	0.000	0.000	16.485	0.000	0.20
		B		0.000	0.000	9.605	0.000	0.13
		C		0.000	0.000	3.335	0.000	0.09
L11	60.00-55.00	A	1.348	0.000	0.000	16.417	0.000	0.20
		B		0.000	0.000	9.568	0.000	0.13
		C		0.000	0.000	4.155	0.000	0.11
L12	55.00-50.00	A	1.336	0.000	0.000	16.344	0.000	0.20
		B		0.000	0.000	9.528	0.000	0.13
		C		0.000	0.000	5.772	0.000	0.13
L13	50.00-45.00	A	1.322	0.000	0.000	16.264	0.000	0.20
		B		0.000	0.000	9.485	0.000	0.13
		C		0.000	0.000	6.151	0.000	0.14
L14	45.00-40.00	A	1.308	0.000	0.000	16.599	0.000	0.20
		B		0.000	0.000	9.860	0.000	0.13
		C		0.000	0.000	6.541	0.000	0.14
L15	40.00-39.33	A	1.299	0.000	0.000	2.726	0.000	0.03
		B		0.000	0.000	1.827	0.000	0.02
		C		0.000	0.000	1.383	0.000	0.02
L16	39.33-39.08	A	1.297	0.000	0.000	1.017	0.000	0.01
		B		0.000	0.000	0.681	0.000	0.01
		C		0.000	0.000	0.516	0.000	0.01
L17	39.08-34.08	A	1.288	0.000	0.000	20.279	0.000	0.23
		B		0.000	0.000	13.594	0.000	0.16
		C		0.000	0.000	10.294	0.000	0.18
L18	34.08-30.00	A	1.271	0.000	0.000	16.036	0.000	0.18
		B		0.000	0.000	10.619	0.000	0.13
		C		0.000	0.000	7.940	0.000	0.14
L19	30.00-29.75	A	1.262	0.000	0.000	0.795	0.000	0.01
		B		0.000	0.000	0.465	0.000	0.01
		C		0.000	0.000	0.301	0.000	0.01
L20	29.75-25.00	A	1.251	0.000	0.000	16.547	0.000	0.19
		B		0.000	0.000	10.292	0.000	0.13
		C		0.000	0.000	8.692	0.000	0.15
L21	25.00-24.75	A	1.239	0.000	0.000	1.038	0.000	0.01
		B		0.000	0.000	0.710	0.000	0.01
		C		0.000	0.000	0.797	0.000	0.01
L22	24.75-19.75	A	1.226	0.000	0.000	22.053	0.000	0.23
		B		0.000	0.000	15.540	0.000	0.17
		C		0.000	0.000	17.278	0.000	0.22
L23	19.75-18.58	A	1.208	0.000	0.000	6.106	0.000	0.06
		B		0.000	0.000	4.594	0.000	0.05
		C		0.000	0.000	5.000	0.000	0.06
L24	18.58-18.33	A	1.203	0.000	0.000	1.303	0.000	0.01
		B		0.000	0.000	0.980	0.000	0.01

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _A A _A In Face	C _A A _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
		C		0.000	0.000	1.067	0.000	0.01
L25	18.33-13.33	A	1.185	0.000	0.000	25.923	0.000	0.26
		B		0.000	0.000	19.523	0.000	0.19
		C		0.000	0.000	21.261	0.000	0.25
L26	13.33-8.42	A	1.141	0.000	0.000	27.107	0.000	0.26
		B		0.000	0.000	20.940	0.000	0.20
		C		0.000	0.000	24.626	0.000	0.27
L27	8.42-8.07	A	1.110	0.000	0.000	2.106	0.000	0.02
		B		0.000	0.000	1.672	0.000	0.02
		C		0.000	0.000	2.126	0.000	0.02
L28	8.07-7.83	A	1.106	0.000	0.000	1.442	0.000	0.01
		B		0.000	0.000	1.146	0.000	0.01
		C		0.000	0.000	1.457	0.000	0.02
L29	7.83-6.00	A	1.091	0.000	0.000	10.952	0.000	0.10
		B		0.000	0.000	8.704	0.000	0.08
		C		0.000	0.000	11.072	0.000	0.11
L30	6.00-5.75	A	1.073	0.000	0.000	1.216	0.000	0.01
		B		0.000	0.000	0.911	0.000	0.01
		C		0.000	0.000	1.234	0.000	0.01
L31	5.75-2.00	A	1.029	0.000	0.000	15.597	0.000	0.15
		B		0.000	0.000	10.874	0.000	0.11
		C		0.000	0.000	13.555	0.000	0.16
L32	2.00-1.75	A	0.957	0.000	0.000	0.937	0.000	0.01
		B		0.000	0.000	0.591	0.000	0.01
		C		0.000	0.000	0.732	0.000	0.01
L33	1.75-0.00	A	0.887	0.000	0.000	5.933	0.000	0.06
		B		0.000	0.000	3.604	0.000	0.04
		C		0.000	0.000	4.121	0.000	0.06

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L1	110.00-105.00	0.3231	-0.1789	1.1487	-0.6362
L2	105.00-100.00	0.3231	-0.1789	1.1449	-0.6341
L3	100.00-95.00	0.3231	-0.1789	1.1410	-0.6319
L4	95.00-90.00	0.3231	-0.1789	1.1368	-0.6296
L5	90.00-85.00	-6.2510	-0.1547	-4.4556	-0.2961
L6	85.00-80.00	-6.2510	-0.1547	-4.4561	-0.2954
L7	80.00-75.00	-5.5415	-1.0155	-4.0040	-0.8777
L8	75.00-70.00	-3.5078	-3.4832	-2.6479	-2.6250
L9	70.00-65.00	-3.5078	-3.4832	-2.6486	-2.6247
L10	65.00-60.00	-2.3888	-2.5242	-1.7824	-1.8740
L11	60.00-55.00	-2.4561	-2.7160	-1.8571	-2.0133
L12	55.00-50.00	-2.3255	-2.2313	-1.7433	-1.5493
L13	50.00-45.00	-2.2939	-2.1141	-1.7162	-1.4377
L14	45.00-40.00	-2.1898	-2.0181	-1.6821	-1.4090
L15	40.00-39.33	-1.5548	-1.4329	-1.4236	-1.1924
L16	39.33-39.08	-1.5548	-1.4329	-1.4235	-1.1924
L17	39.08-34.08	-1.5548	-1.4329	-1.4234	-1.1922
L18	34.08-30.00	-1.6187	-1.4918	-1.4537	-1.2174
L19	30.00-29.75	-2.2939	-2.1141	-1.7185	-1.4391
L20	29.75-25.00	-1.8776	-1.0272	-1.5565	-0.9371
L21	25.00-24.75	-1.1055	0.2923	-1.2837	-0.1171
L22	24.75-19.75	-1.0240	0.2707	-1.2169	-0.1096
L23	19.75-18.58	-0.8386	0.2217	-1.0520	-0.0931
L24	18.58-18.33	-0.8386	0.2217	-1.0517	-0.0926
L25	18.33-13.33	-0.8386	0.2217	-1.0508	-0.0908
L26	13.33-8.42	-0.7409	0.6207	-0.9603	0.2299
L27	8.42-8.07	-0.6395	1.0346	-0.8597	0.5890
L28	8.07-7.83	-0.6395	1.0346	-0.8594	0.5897
L29	7.83-6.00	-0.6395	1.0346	-0.8585	0.5924
L30	6.00-5.75	-0.7839	1.2682	-1.0094	0.7012
L31	5.75-2.00	-0.9639	0.7938	-1.2318	0.2610

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L32	2.00-1.75	-1.1214	0.4908	-1.5066	0.0569
L33	1.75-0.00	-1.2644	0.0881	-1.6252	-0.2476

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	1	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L2	1	Safety Line 3/8	100.00 - 105.00	1.0000	1.0000
L3	1	Safety Line 3/8	95.00 - 100.00	1.0000	1.0000
L4	1	Safety Line 3/8	90.00 - 95.00	1.0000	1.0000
L5	1	Safety Line 3/8	85.00 - 90.00	1.0000	1.0000
L5	7	FB-L98B-034-XXX(3/8)	85.00 - 90.00	1.0000	1.0000
L5	9	PWRT-608-S(13/16)	85.00 - 90.00	1.0000	1.0000
L5	10	PWRT-606-S(7/8)	85.00 - 90.00	1.0000	1.0000
L5	11	3" Flexible Conduit	85.00 - 90.00	1.0000	1.0000
L6	1	Safety Line 3/8	80.00 - 85.00	1.0000	1.0000
L6	7	FB-L98B-034-XXX(3/8)	80.00 - 85.00	1.0000	1.0000
L6	9	PWRT-608-S(13/16)	80.00 - 85.00	1.0000	1.0000
L6	10	PWRT-606-S(7/8)	80.00 - 85.00	1.0000	1.0000
L6	11	3" Flexible Conduit	80.00 - 85.00	1.0000	1.0000
L7	1	Safety Line 3/8	75.00 - 80.00	1.0000	1.0000
L7	7	FB-L98B-034-XXX(3/8)	75.00 - 80.00	1.0000	1.0000
L7	9	PWRT-608-S(13/16)	75.00 - 80.00	1.0000	1.0000
L7	10	PWRT-606-S(7/8)	75.00 - 80.00	1.0000	1.0000
L7	11	3" Flexible Conduit	75.00 - 80.00	1.0000	1.0000
L7	22	810921-001(7/8)	75.00 - 76.00	1.0000	1.0000
L7	23	HCS 6X12 4AWG(1-5/8)	75.00 - 76.00	1.0000	1.0000
L7	24	HCS 6X12 4AWG(1-5/8)	75.00 - 76.00	1.0000	1.0000
L8	1	Safety Line 3/8	70.00 - 75.00	1.0000	1.0000
L8	7	FB-L98B-034-XXX(3/8)	70.00 - 75.00	1.0000	1.0000
L8	9	PWRT-608-S(13/16)	70.00 - 75.00	1.0000	1.0000
L8	10	PWRT-606-S(7/8)	70.00 - 75.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L8	11	3" Flexible Conduit	70.00 - 75.00	1.0000	1.0000
L8	22	810921-001(7/8)	70.00 - 75.00	1.0000	1.0000
L8	23	HCS 6X12 4AWG(1-5/8)	70.00 - 75.00	1.0000	1.0000
L8	24	HCS 6X12 4AWG(1-5/8)	70.00 - 75.00	1.0000	1.0000
L9	1	Safety Line 3/8	65.00 - 70.00	1.0000	1.0000
L9	7	FB-L98B-034-XXX(3/8)	65.00 - 70.00	1.0000	1.0000
L9	9	PWRT-608-S(13/16)	65.00 - 70.00	1.0000	1.0000
L9	10	PWRT-606-S(7/8)	65.00 - 70.00	1.0000	1.0000
L9	11	3" Flexible Conduit	65.00 - 70.00	1.0000	1.0000
L9	22	810921-001(7/8)	65.00 - 70.00	1.0000	1.0000
L9	23	HCS 6X12 4AWG(1-5/8)	65.00 - 70.00	1.0000	1.0000
L9	24	HCS 6X12 4AWG(1-5/8)	65.00 - 70.00	1.0000	1.0000
L10	1	Safety Line 3/8	60.00 - 65.00	1.0000	1.0000
L10	7	FB-L98B-034-XXX(3/8)	60.00 - 65.00	1.0000	1.0000
L10	9	PWRT-608-S(13/16)	60.00 - 65.00	1.0000	1.0000
L10	10	PWRT-606-S(7/8)	60.00 - 65.00	1.0000	1.0000
L10	11	3" Flexible Conduit	60.00 - 65.00	1.0000	1.0000
L10	22	810921-001(7/8)	60.00 - 65.00	1.0000	1.0000
L10	23	HCS 6X12 4AWG(1-5/8)	60.00 - 65.00	1.0000	1.0000
L10	24	HCS 6X12 4AWG(1-5/8)	60.00 - 65.00	1.0000	1.0000
L10	27	HB158-U12S24-160-LI(1-7/8)	60.00 - 64.00	1.0000	1.0000
L11	1	Safety Line 3/8	55.00 - 60.00	1.0000	1.0000
L11	7	FB-L98B-034-XXX(3/8)	55.00 - 60.00	1.0000	1.0000
L11	9	PWRT-608-S(13/16)	55.00 - 60.00	1.0000	1.0000
L11	10	PWRT-606-S(7/8)	55.00 - 60.00	1.0000	1.0000
L11	11	3" Flexible Conduit	55.00 - 60.00	1.0000	1.0000
L11	22	810921-001(7/8)	55.00 - 60.00	1.0000	1.0000
L11	23	HCS 6X12 4AWG(1-5/8)	55.00 - 60.00	1.0000	1.0000
L11	24	HCS 6X12 4AWG(1-5/8)	55.00 - 60.00	1.0000	1.0000
L11	27	HB158-U12S24-160-LI(1-7/8)	55.00 - 60.00	1.0000	1.0000
L12	1	Safety Line 3/8	50.00 - 55.00	1.0000	1.0000
L12	7	FB-L98B-034-XXX(3/8)	50.00 - 55.00	1.0000	1.0000
L12	9	PWRT-608-S(13/16)	50.00 - 55.00	1.0000	1.0000
L12	10	PWRT-606-S(7/8)	50.00 - 55.00	1.0000	1.0000
L12	11	3" Flexible Conduit	50.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			55.00		
L12	22	810921-001(7/8)	50.00 -	1.0000	1.0000
			55.00		
L12	23	HCS 6X12 4AWG(1-5/8)	50.00 -	1.0000	1.0000
			55.00		
L12	24	HCS 6X12 4AWG(1-5/8)	50.00 -	1.0000	1.0000
			55.00		
L12	27	HB158-U12S24-160-LI(1-7/8)	50.00 -	1.0000	1.0000
			55.00		
L12	29	CU12PSM9P8XXX(1-3/8)	50.00 -	1.0000	1.0000
			54.00		
L13	1	Safety Line 3/8	45.00 -	1.0000	1.0000
			50.00		
L13	7	FB-L98B-034-XXX(3/8)	45.00 -	1.0000	1.0000
			50.00		
L13	9	PWRT-608-S(13/16)	45.00 -	1.0000	1.0000
			50.00		
L13	10	PWRT-606-S(7/8)	45.00 -	1.0000	1.0000
			50.00		
L13	11	3" Flexible Conduit	45.00 -	1.0000	1.0000
			50.00		
L13	22	810921-001(7/8)	45.00 -	1.0000	1.0000
			50.00		
L13	23	HCS 6X12 4AWG(1-5/8)	45.00 -	1.0000	1.0000
			50.00		
L13	24	HCS 6X12 4AWG(1-5/8)	45.00 -	1.0000	1.0000
			50.00		
L13	27	HB158-U12S24-160-LI(1-7/8)	45.00 -	1.0000	1.0000
			50.00		
L13	29	CU12PSM9P8XXX(1-3/8)	45.00 -	1.0000	1.0000
			50.00		
L14	1	Safety Line 3/8	40.00 -	1.0000	1.0000
			45.00		
L14	7	FB-L98B-034-XXX(3/8)	40.00 -	1.0000	1.0000
			45.00		
L14	9	PWRT-608-S(13/16)	40.00 -	1.0000	1.0000
			45.00		
L14	10	PWRT-606-S(7/8)	40.00 -	1.0000	1.0000
			45.00		
L14	11	3" Flexible Conduit	40.00 -	1.0000	1.0000
			45.00		
L14	22	810921-001(7/8)	40.00 -	1.0000	1.0000
			45.00		
L14	23	HCS 6X12 4AWG(1-5/8)	40.00 -	1.0000	1.0000
			45.00		
L14	24	HCS 6X12 4AWG(1-5/8)	40.00 -	1.0000	1.0000
			45.00		
L14	27	HB158-U12S24-160-LI(1-7/8)	40.00 -	1.0000	1.0000
			45.00		
L14	29	CU12PSM9P8XXX(1-3/8)	40.00 -	1.0000	1.0000
			45.00		
L14	37	Aero Channel MP303	40.00 -	1.0000	1.0000
			40.50		
L14	38	Aero Channel MP303	40.00 -	1.0000	1.0000
			40.50		
L14	39	Aero Channel MP303	40.00 -	1.0000	1.0000
			40.50		
L15	1	Safety Line 3/8	39.33 -	1.0000	1.0000
			40.00		
L15	7	FB-L98B-034-XXX(3/8)	39.33 -	1.0000	1.0000
			40.00		
L15	9	PWRT-608-S(13/16)	39.33 -	1.0000	1.0000
			40.00		
L15	10	PWRT-606-S(7/8)	39.33 -	1.0000	1.0000
			40.00		
L15	11	3" Flexible Conduit	39.33 -	1.0000	1.0000
			40.00		
L15	22	810921-001(7/8)	39.33 -	1.0000	1.0000
			40.00		

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L15	23	HCS 6X12 4AWG(1-5/8)	39.33 - 40.00	1.0000	1.0000
L15	24	HCS 6X12 4AWG(1-5/8)	39.33 - 40.00	1.0000	1.0000
L15	27	HB158-U12S24-160-LI(1-7/8)	39.33 - 40.00	1.0000	1.0000
L15	29	CU12PSM9P8XXX(1-3/8)	39.33 - 40.00	1.0000	1.0000
L15	37	Aero Channel MP303	39.33 - 40.00	1.0000	1.0000
L15	38	Aero Channel MP303	39.33 - 40.00	1.0000	1.0000
L15	39	Aero Channel MP303	39.33 - 40.00	1.0000	1.0000
L16	1	Safety Line 3/8	39.08 - 39.33	1.0000	1.0000
L16	7	FB-L98B-034-XXX(3/8)	39.08 - 39.33	1.0000	1.0000
L16	9	PWRT-608-S(13/16)	39.08 - 39.33	1.0000	1.0000
L16	10	PWRT-606-S(7/8)	39.08 - 39.33	1.0000	1.0000
L16	11	3" Flexible Conduit	39.08 - 39.33	1.0000	1.0000
L16	22	810921-001(7/8)	39.08 - 39.33	1.0000	1.0000
L16	23	HCS 6X12 4AWG(1-5/8)	39.08 - 39.33	1.0000	1.0000
L16	24	HCS 6X12 4AWG(1-5/8)	39.08 - 39.33	1.0000	1.0000
L16	27	HB158-U12S24-160-LI(1-7/8)	39.08 - 39.33	1.0000	1.0000
L16	29	CU12PSM9P8XXX(1-3/8)	39.08 - 39.33	1.0000	1.0000
L16	37	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L16	38	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L16	39	Aero Channel MP303	39.08 - 39.33	1.0000	1.0000
L17	1	Safety Line 3/8	34.08 - 39.08	1.0000	1.0000
L17	7	FB-L98B-034-XXX(3/8)	34.08 - 39.08	1.0000	1.0000
L17	9	PWRT-608-S(13/16)	34.08 - 39.08	1.0000	1.0000
L17	10	PWRT-606-S(7/8)	34.08 - 39.08	1.0000	1.0000
L17	11	3" Flexible Conduit	34.08 - 39.08	1.0000	1.0000
L17	22	810921-001(7/8)	34.08 - 39.08	1.0000	1.0000
L17	23	HCS 6X12 4AWG(1-5/8)	34.08 - 39.08	1.0000	1.0000
L17	24	HCS 6X12 4AWG(1-5/8)	34.08 - 39.08	1.0000	1.0000
L17	27	HB158-U12S24-160-LI(1-7/8)	34.08 - 39.08	1.0000	1.0000
L17	29	CU12PSM9P8XXX(1-3/8)	34.08 - 39.08	1.0000	1.0000
L17	37	Aero Channel MP303	34.08 - 39.08	1.0000	1.0000
L17	38	Aero Channel MP303	34.08 - 39.08	1.0000	1.0000
L17	39	Aero Channel MP303	34.08 - 39.08	1.0000	1.0000
L18	1	Safety Line 3/8	30.00 - 34.08	1.0000	1.0000
L18	7	FB-L98B-034-XXX(3/8)	30.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L18	9	PWRT-608-S(13/16)	34.08 30.00 - 34.08	1.0000	1.0000
L18	10	PWRT-606-S(7/8)	30.00 - 34.08	1.0000	1.0000
L18	11	3" Flexible Conduit	30.00 - 34.08	1.0000	1.0000
L18	22	810921-001(7/8)	30.00 - 34.08	1.0000	1.0000
L18	23	HCS 6X12 4AWG(1-5/8)	30.00 - 34.08	1.0000	1.0000
L18	24	HCS 6X12 4AWG(1-5/8)	30.00 - 34.08	1.0000	1.0000
L18	27	HB158-U12S24-160-LI(1-7/8)	30.00 - 34.08	1.0000	1.0000
L18	29	CU12PSM9P8XXX(1-3/8)	30.00 - 34.08	1.0000	1.0000
L18	37	Aero Channel MP303	30.50 - 34.08	1.0000	1.0000
L18	38	Aero Channel MP303	30.50 - 34.08	1.0000	1.0000
L18	39	Aero Channel MP303	30.50 - 34.08	1.0000	1.0000
L19	1	Safety Line 3/8	29.75 - 30.00	1.0000	1.0000
L19	7	FB-L98B-034-XXX(3/8)	29.75 - 30.00	1.0000	1.0000
L19	9	PWRT-608-S(13/16)	29.75 - 30.00	1.0000	1.0000
L19	10	PWRT-606-S(7/8)	29.75 - 30.00	1.0000	1.0000
L19	11	3" Flexible Conduit	29.75 - 30.00	1.0000	1.0000
L19	22	810921-001(7/8)	29.75 - 30.00	1.0000	1.0000
L19	23	HCS 6X12 4AWG(1-5/8)	29.75 - 30.00	1.0000	1.0000
L19	24	HCS 6X12 4AWG(1-5/8)	29.75 - 30.00	1.0000	1.0000
L19	27	HB158-U12S24-160-LI(1-7/8)	29.75 - 30.00	1.0000	1.0000
L19	29	CU12PSM9P8XXX(1-3/8)	29.75 - 30.00	1.0000	1.0000
L20	1	Safety Line 3/8	25.00 - 29.75	1.0000	1.0000
L20	7	FB-L98B-034-XXX(3/8)	25.00 - 29.75	1.0000	1.0000
L20	9	PWRT-608-S(13/16)	25.00 - 29.75	1.0000	1.0000
L20	10	PWRT-606-S(7/8)	25.00 - 29.75	1.0000	1.0000
L20	11	3" Flexible Conduit	25.00 - 29.75	1.0000	1.0000
L20	22	810921-001(7/8)	25.00 - 29.75	1.0000	1.0000
L20	23	HCS 6X12 4AWG(1-5/8)	25.00 - 29.75	1.0000	1.0000
L20	24	HCS 6X12 4AWG(1-5/8)	25.00 - 29.75	1.0000	1.0000
L20	27	HB158-U12S24-160-LI(1-7/8)	25.00 - 29.75	1.0000	1.0000
L20	29	CU12PSM9P8XXX(1-3/8)	25.00 - 29.75	1.0000	1.0000
L20	45	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	46	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L20	47	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L20	48	CCI-SFP-045100	25.00 - 26.50	1.0000	1.0000
L21	1	Safety Line 3/8	24.75 - 25.00	1.0000	1.0000
L21	7	FB-L98B-034-XXX(3/8)	24.75 - 25.00	1.0000	1.0000
L21	9	PWRT-608-S(13/16)	24.75 - 25.00	1.0000	1.0000
L21	10	PWRT-606-S(7/8)	24.75 - 25.00	1.0000	1.0000
L21	11	3" Flexible Conduit	24.75 - 25.00	1.0000	1.0000
L21	22	810921-001(7/8)	24.75 - 25.00	1.0000	1.0000
L21	23	HCS 6X12 4AWG(1-5/8)	24.75 - 25.00	1.0000	1.0000
L21	24	HCS 6X12 4AWG(1-5/8)	24.75 - 25.00	1.0000	1.0000
L21	27	HB158-U12S24-160-LI(1-7/8)	24.75 - 25.00	1.0000	1.0000
L21	29	CU12PSM9P8XXX(1-3/8)	24.75 - 25.00	1.0000	1.0000
L21	45	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L21	46	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L21	47	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L21	48	CCI-SFP-045100	24.75 - 25.00	1.0000	1.0000
L22	1	Safety Line 3/8	19.75 - 24.75	1.0000	1.0000
L22	7	FB-L98B-034-XXX(3/8)	19.75 - 24.75	1.0000	1.0000
L22	9	PWRT-608-S(13/16)	19.75 - 24.75	1.0000	1.0000
L22	10	PWRT-606-S(7/8)	19.75 - 24.75	1.0000	1.0000
L22	11	3" Flexible Conduit	19.75 - 24.75	1.0000	1.0000
L22	22	810921-001(7/8)	19.75 - 24.75	1.0000	1.0000
L22	23	HCS 6X12 4AWG(1-5/8)	19.75 - 24.75	1.0000	1.0000
L22	24	HCS 6X12 4AWG(1-5/8)	19.75 - 24.75	1.0000	1.0000
L22	27	HB158-U12S24-160-LI(1-7/8)	19.75 - 24.75	1.0000	1.0000
L22	29	CU12PSM9P8XXX(1-3/8)	19.75 - 24.75	1.0000	1.0000
L22	41	Aero Channel MP305	19.75 - 21.00	1.0000	1.0000
L22	42	Aero Channel MP305	19.75 - 21.00	1.0000	1.0000
L22	43	Aero Channel MP305	19.75 - 21.00	1.0000	1.0000
L22	45	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L22	46	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L22	47	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L22	48	CCI-SFP-045100	19.75 - 24.75	1.0000	1.0000
L23	1	Safety Line 3/8	18.58 - 19.75	1.0000	1.0000
L23	7	FB-L98B-034-XXX(3/8)	18.58 - 19.75	1.0000	1.0000
L23	9	PWRT-608-S(13/16)	18.58 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			19.75		
L23	10	PWRT-606-S(7/8)	18.58 -	1.0000	1.0000
			19.75		
L23	11	3" Flexible Conduit	18.58 -	1.0000	1.0000
			19.75		
L23	22	810921-001(7/8)	18.58 -	1.0000	1.0000
			19.75		
L23	23	HCS 6X12 4AWG(1-5/8)	18.58 -	1.0000	1.0000
			19.75		
L23	24	HCS 6X12 4AWG(1-5/8)	18.58 -	1.0000	1.0000
			19.75		
L23	27	HB158-U12S24-160-LI(1-7/8)	18.58 -	1.0000	1.0000
			19.75		
L23	29	CU12PSM9P8XXX(1-3/8)	18.58 -	1.0000	1.0000
			19.75		
L23	41	Aero Channel MP305	18.58 -	1.0000	1.0000
			19.75		
L23	42	Aero Channel MP305	18.58 -	1.0000	1.0000
			19.75		
L23	43	Aero Channel MP305	18.58 -	1.0000	1.0000
			19.75		
L23	45	CCI-SFP-045100	18.58 -	1.0000	1.0000
			19.75		
L23	46	CCI-SFP-045100	18.58 -	1.0000	1.0000
			19.75		
L23	47	CCI-SFP-045100	18.58 -	1.0000	1.0000
			19.75		
L23	48	CCI-SFP-045100	18.58 -	1.0000	1.0000
			19.75		
L24	1	Safety Line 3/8	18.33 -	1.0000	1.0000
			18.58		
L24	7	FB-L98B-034-XXX(3/8)	18.33 -	1.0000	1.0000
			18.58		
L24	9	PWRT-608-S(13/16)	18.33 -	1.0000	1.0000
			18.58		
L24	10	PWRT-606-S(7/8)	18.33 -	1.0000	1.0000
			18.58		
L24	11	3" Flexible Conduit	18.33 -	1.0000	1.0000
			18.58		
L24	22	810921-001(7/8)	18.33 -	1.0000	1.0000
			18.58		
L24	23	HCS 6X12 4AWG(1-5/8)	18.33 -	1.0000	1.0000
			18.58		
L24	24	HCS 6X12 4AWG(1-5/8)	18.33 -	1.0000	1.0000
			18.58		
L24	27	HB158-U12S24-160-LI(1-7/8)	18.33 -	1.0000	1.0000
			18.58		
L24	29	CU12PSM9P8XXX(1-3/8)	18.33 -	1.0000	1.0000
			18.58		
L24	41	Aero Channel MP305	18.33 -	1.0000	1.0000
			18.58		
L24	42	Aero Channel MP305	18.33 -	1.0000	1.0000
			18.58		
L24	43	Aero Channel MP305	18.33 -	1.0000	1.0000
			18.58		
L24	45	CCI-SFP-045100	18.33 -	1.0000	1.0000
			18.58		
L24	46	CCI-SFP-045100	18.33 -	1.0000	1.0000
			18.58		
L24	47	CCI-SFP-045100	18.33 -	1.0000	1.0000
			18.58		
L24	48	CCI-SFP-045100	18.33 -	1.0000	1.0000
			18.58		
L25	1	Safety Line 3/8	13.33 -	1.0000	1.0000
			18.33		
L25	7	FB-L98B-034-XXX(3/8)	13.33 -	1.0000	1.0000
			18.33		
L25	9	PWRT-608-S(13/16)	13.33 -	1.0000	1.0000
			18.33		

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L25	10	PWRT-606-S(7/8)	13.33 - 18.33	1.0000	1.0000
L25	11	3" Flexible Conduit	13.33 - 18.33	1.0000	1.0000
L25	22	810921-001(7/8)	13.33 - 18.33	1.0000	1.0000
L25	23	HCS 6X12 4AWG(1-5/8)	13.33 - 18.33	1.0000	1.0000
L25	24	HCS 6X12 4AWG(1-5/8)	13.33 - 18.33	1.0000	1.0000
L25	27	HB158-U12S24-160-LI(1-7/8)	13.33 - 18.33	1.0000	1.0000
L25	29	CU12PSM9P8XXX(1-3/8)	13.33 - 18.33	1.0000	1.0000
L25	41	Aero Channel MP305	13.33 - 18.33	1.0000	1.0000
L25	42	Aero Channel MP305	13.33 - 18.33	1.0000	1.0000
L25	43	Aero Channel MP305	13.33 - 18.33	1.0000	1.0000
L25	45	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	46	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	47	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L25	48	CCI-SFP-045100	13.33 - 18.33	1.0000	1.0000
L26	1	Safety Line 3/8	8.42 - 13.33	1.0000	1.0000
L26	7	FB-L98B-034-XXX(3/8)	8.42 - 13.33	1.0000	1.0000
L26	9	PWRT-608-S(13/16)	8.42 - 13.33	1.0000	1.0000
L26	10	PWRT-606-S(7/8)	8.42 - 13.33	1.0000	1.0000
L26	11	3" Flexible Conduit	8.42 - 13.33	1.0000	1.0000
L26	22	810921-001(7/8)	8.42 - 13.33	1.0000	1.0000
L26	23	HCS 6X12 4AWG(1-5/8)	8.42 - 13.33	1.0000	1.0000
L26	24	HCS 6X12 4AWG(1-5/8)	8.42 - 13.33	1.0000	1.0000
L26	27	HB158-U12S24-160-LI(1-7/8)	8.42 - 13.33	1.0000	1.0000
L26	29	CU12PSM9P8XXX(1-3/8)	8.42 - 13.33	1.0000	1.0000
L26	32	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	33	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	34	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	35	Aero Channel MP305	8.42 - 10.50	1.0000	1.0000
L26	41	Aero Channel MP305	8.42 - 13.33	1.0000	1.0000
L26	42	Aero Channel MP305	8.42 - 13.33	1.0000	1.0000
L26	43	Aero Channel MP305	8.42 - 13.33	1.0000	1.0000
L26	45	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	46	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	47	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L26	48	CCI-SFP-045100	8.42 - 13.33	1.0000	1.0000
L27	1	Safety Line 3/8	8.07 - 8.42	1.0000	1.0000
L27	7	FB-L98B-034-XXX(3/8)	8.07 - 8.42	1.0000	1.0000
L27	9	PWRT-608-S(13/16)	8.07 - 8.42	1.0000	1.0000
L27	10	PWRT-606-S(7/8)	8.07 - 8.42	1.0000	1.0000
L27	11	3" Flexible Conduit	8.07 - 8.42	1.0000	1.0000
L27	22	810921-001(7/8)	8.07 - 8.42	1.0000	1.0000
L27	23	HCS 6X12 4AWG(1-5/8)	8.07 - 8.42	1.0000	1.0000
L27	24	HCS 6X12 4AWG(1-5/8)	8.07 - 8.42	1.0000	1.0000
L27	27	HB158-U12S24-160-LI(1-7/8)	8.07 - 8.42	1.0000	1.0000
L27	29	CU12PSM9P8XXX(1-3/8)	8.07 - 8.42	1.0000	1.0000
L27	32	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	33	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	34	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	35	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	41	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	42	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	43	Aero Channel MP305	8.07 - 8.42	1.0000	1.0000
L27	45	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L27	46	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	47	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L27	48	CCI-SFP-045100	8.07 - 8.42	1.0000	1.0000
L28	1	Safety Line 3/8	7.83 - 8.07	1.0000	1.0000
L28	7	FB-L98B-034-XXX(3/8)	7.83 - 8.07	1.0000	1.0000
L28	9	PWRT-608-S(13/16)	7.83 - 8.07	1.0000	1.0000
L28	10	PWRT-606-S(7/8)	7.83 - 8.07	1.0000	1.0000
L28	11	3" Flexible Conduit	7.83 - 8.07	1.0000	1.0000
L28	22	810921-001(7/8)	7.83 - 8.07	1.0000	1.0000
L28	23	HCS 6X12 4AWG(1-5/8)	7.83 - 8.07	1.0000	1.0000
L28	24	HCS 6X12 4AWG(1-5/8)	7.83 - 8.07	1.0000	1.0000
L28	27	HB158-U12S24-160-LI(1-7/8)	7.83 - 8.07	1.0000	1.0000
L28	29	CU12PSM9P8XXX(1-3/8)	7.83 - 8.07	1.0000	1.0000
L28	32	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	33	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	34	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	35	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	41	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	42	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	43	Aero Channel MP305	7.83 - 8.07	1.0000	1.0000
L28	45	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	46	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	47	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L28	48	CCI-SFP-045100	7.83 - 8.07	1.0000	1.0000
L29	1	Safety Line 3/8	6.00 - 7.83	1.0000	1.0000
L29	7	FB-L98B-034-XXX(3/8)	6.00 - 7.83	1.0000	1.0000
L29	9	PWRT-608-S(13/16)	6.00 - 7.83	1.0000	1.0000
L29	10	PWRT-606-S(7/8)	6.00 - 7.83	1.0000	1.0000
L29	11	3" Flexible Conduit	6.00 - 7.83	1.0000	1.0000
L29	22	810921-001(7/8)	6.00 - 7.83	1.0000	1.0000
L29	23	HCS 6X12 4AWG(1-5/8)	6.00 - 7.83	1.0000	1.0000
L29	24	HCS 6X12 4AWG(1-5/8)	6.00 - 7.83	1.0000	1.0000
L29	27	HB158-U12S24-160-LI(1-7/8)	6.00 - 7.83	1.0000	1.0000
L29	29	CU12PSM9P8XXX(1-3/8)	6.00 - 7.83	1.0000	1.0000
L29	32	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	33	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	34	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	35	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	41	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	42	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	43	Aero Channel MP305	6.00 - 7.83	1.0000	1.0000
L29	45	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	46	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	47	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L29	48	CCI-SFP-045100	6.00 - 7.83	1.0000	1.0000
L30	1	Safety Line 3/8	5.75 - 6.00	1.0000	1.0000
L30	7	FB-L98B-034-XXX(3/8)	5.75 - 6.00	1.0000	1.0000
L30	9	PWRT-608-S(13/16)	5.75 - 6.00	1.0000	1.0000
L30	10	PWRT-606-S(7/8)	5.75 - 6.00	1.0000	1.0000
L30	11	3" Flexible Conduit	5.75 - 6.00	1.0000	1.0000
L30	22	810921-001(7/8)	5.75 - 6.00	1.0000	1.0000
L30	23	HCS 6X12 4AWG(1-5/8)	5.75 - 6.00	1.0000	1.0000
L30	24	HCS 6X12 4AWG(1-5/8)	5.75 - 6.00	1.0000	1.0000
L30	27	HB158-U12S24-160-LI(1-7/8)	5.75 - 6.00	1.0000	1.0000
L30	29	CU12PSM9P8XXX(1-3/8)	5.75 - 6.00	1.0000	1.0000
L30	32	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	33	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	34	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	35	Aero Channel MP305	5.75 - 6.00	1.0000	1.0000
L30	45	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	46	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	47	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L30	48	CCI-SFP-045100	5.75 - 6.00	1.0000	1.0000
L31	1	Safety Line 3/8	3.00 - 5.75	1.0000	1.0000
L31	7	FB-L98B-034-XXX(3/8)	2.00 - 5.75	1.0000	1.0000
L31	9	PWRT-608-S(13/16)	2.00 - 5.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L31	10	PWRT-606-S(7/8)	2.00 - 5.75	1.0000	1.0000
L31	11	3" Flexible Conduit	2.00 - 5.75	1.0000	1.0000
L31	22	810921-001(7/8)	2.00 - 5.75	1.0000	1.0000
L31	23	HCS 6X12 4AWG(1-5/8)	2.00 - 5.75	1.0000	1.0000
L31	24	HCS 6X12 4AWG(1-5/8)	2.00 - 5.75	1.0000	1.0000
L31	27	HB158-U12S24-160-LI(1-7/8)	2.00 - 5.75	1.0000	1.0000
L31	29	CU12PSM9P8XXX(1-3/8)	2.00 - 5.75	1.0000	1.0000
L31	32	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	33	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	34	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	35	Aero Channel MP305	2.00 - 5.75	1.0000	1.0000
L31	45	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	46	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	47	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L31	48	CCI-SFP-045100	4.50 - 5.75	1.0000	1.0000
L32	7	FB-L98B-034-XXX(3/8)	1.75 - 2.00	1.0000	1.0000
L32	9	PWRT-608-S(13/16)	1.75 - 2.00	1.0000	1.0000
L32	10	PWRT-606-S(7/8)	1.75 - 2.00	1.0000	1.0000
L32	11	3" Flexible Conduit	1.75 - 2.00	1.0000	1.0000
L32	22	810921-001(7/8)	1.75 - 2.00	1.0000	1.0000
L32	23	HCS 6X12 4AWG(1-5/8)	1.75 - 2.00	1.0000	1.0000
L32	24	HCS 6X12 4AWG(1-5/8)	1.75 - 2.00	1.0000	1.0000
L32	27	HB158-U12S24-160-LI(1-7/8)	1.75 - 2.00	1.0000	1.0000
L32	29	CU12PSM9P8XXX(1-3/8)	1.75 - 2.00	1.0000	1.0000
L32	32	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L32	33	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L32	34	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L32	35	Aero Channel MP305	1.75 - 2.00	1.0000	1.0000
L33	7	FB-L98B-034-XXX(3/8)	0.00 - 1.75	1.0000	1.0000
L33	9	PWRT-608-S(13/16)	0.00 - 1.75	1.0000	1.0000
L33	10	PWRT-606-S(7/8)	0.00 - 1.75	1.0000	1.0000
L33	11	3" Flexible Conduit	0.00 - 1.75	1.0000	1.0000
L33	22	810921-001(7/8)	0.00 - 1.75	1.0000	1.0000
L33	23	HCS 6X12 4AWG(1-5/8)	0.00 - 1.75	1.0000	1.0000
L33	24	HCS 6X12 4AWG(1-5/8)	0.00 - 1.75	1.0000	1.0000
L33	27	HB158-U12S24-160-LI(1-7/8)	0.00 - 1.75	1.0000	1.0000
L33	29	CU12PSM9P8XXX(1-3/8)	0.00 - 1.75	1.0000	1.0000
L33	32	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000
L33	33	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000
L33	34	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000
L33	35	Aero Channel MP305	0.50 - 1.75	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L14	37	Aero Channel MP303	40.00 - 40.50	Auto	1.0000
L14	38	Aero Channel MP303	40.00 - 40.50	Auto	1.0000
L14	39	Aero Channel MP303	40.00 - 40.50	Auto	1.0000
L15	37	Aero Channel MP303	39.33 - 40.00	Auto	1.0000
L15	38	Aero Channel MP303	39.33 - 40.00	Auto	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L15	39	Aero Channel MP303	39.33 - 40.00	Auto	1.0000
L16	37	Aero Channel MP303	39.08 - 39.33	Auto	1.0000
L16	38	Aero Channel MP303	39.08 - 39.33	Auto	1.0000
L16	39	Aero Channel MP303	39.08 - 39.33	Auto	1.0000
L17	37	Aero Channel MP303	34.08 - 39.08	Auto	1.0000
L17	38	Aero Channel MP303	34.08 - 39.08	Auto	1.0000
L17	39	Aero Channel MP303	34.08 - 39.08	Auto	1.0000
L18	37	Aero Channel MP303	30.50 - 34.08	Auto	1.0000
L18	38	Aero Channel MP303	30.50 - 34.08	Auto	1.0000
L18	39	Aero Channel MP303	30.50 - 34.08	Auto	1.0000
L20	45	CCI-SFP-045100	25.00 - 26.50	Auto	1.0000
L20	46	CCI-SFP-045100	25.00 - 26.50	Auto	1.0000
L20	47	CCI-SFP-045100	25.00 - 26.50	Auto	1.0000
L20	48	CCI-SFP-045100	25.00 - 26.50	Auto	1.0000
L21	45	CCI-SFP-045100	24.75 - 25.00	Auto	1.0000
L21	46	CCI-SFP-045100	24.75 - 25.00	Auto	1.0000
L21	47	CCI-SFP-045100	24.75 - 25.00	Auto	1.0000
L21	48	CCI-SFP-045100	24.75 - 25.00	Auto	1.0000
L22	41	Aero Channel MP305	19.75 - 21.00	Auto	1.0000
L22	42	Aero Channel MP305	19.75 - 21.00	Auto	1.0000
L22	43	Aero Channel MP305	19.75 - 21.00	Auto	1.0000
L22	45	CCI-SFP-045100	19.75 - 24.75	Auto	1.0000
L22	46	CCI-SFP-045100	19.75 - 24.75	Auto	1.0000
L22	47	CCI-SFP-045100	19.75 - 24.75	Auto	1.0000
L22	48	CCI-SFP-045100	19.75 - 24.75	Auto	1.0000
L23	41	Aero Channel MP305	18.58 - 19.75	Auto	1.0000
L23	42	Aero Channel MP305	18.58 - 19.75	Auto	1.0000
L23	43	Aero Channel MP305	18.58 - 19.75	Auto	1.0000
L23	45	CCI-SFP-045100	18.58 - 19.75	Auto	1.0000
L23	46	CCI-SFP-045100	18.58 - 19.75	Auto	1.0000
L23	47	CCI-SFP-045100	18.58 - 19.75	Auto	1.0000
L23	48	CCI-SFP-045100	18.58 - 19.75	Auto	1.0000
L24	41	Aero Channel MP305	18.33 - 18.58	Auto	1.0000
L24	42	Aero Channel MP305	18.33 - 18.58	Auto	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L24	43	Aero Channel MP305	18.33 - 18.58	Auto	1.0000
L24	45	CCI-SFP-045100	18.33 - 18.58	Auto	1.0000
L24	46	CCI-SFP-045100	18.33 - 18.58	Auto	1.0000
L24	47	CCI-SFP-045100	18.33 - 18.58	Auto	1.0000
L24	48	CCI-SFP-045100	18.33 - 18.58	Auto	1.0000
L25	41	Aero Channel MP305	13.33 - 18.33	Auto	1.0000
L25	42	Aero Channel MP305	13.33 - 18.33	Auto	1.0000
L25	43	Aero Channel MP305	13.33 - 18.33	Auto	1.0000
L25	45	CCI-SFP-045100	13.33 - 18.33	Auto	1.0000
L25	46	CCI-SFP-045100	13.33 - 18.33	Auto	1.0000
L25	47	CCI-SFP-045100	13.33 - 18.33	Auto	1.0000
L25	48	CCI-SFP-045100	13.33 - 18.33	Auto	1.0000
L26	32	Aero Channel MP305	8.42 - 10.50	Auto	1.0000
L26	33	Aero Channel MP305	8.42 - 10.50	Auto	1.0000
L26	34	Aero Channel MP305	8.42 - 10.50	Auto	1.0000
L26	35	Aero Channel MP305	8.42 - 10.50	Auto	1.0000
L26	41	Aero Channel MP305	8.42 - 13.33	Auto	1.0000
L26	42	Aero Channel MP305	8.42 - 13.33	Auto	1.0000
L26	43	Aero Channel MP305	8.42 - 13.33	Auto	1.0000
L26	45	CCI-SFP-045100	8.42 - 13.33	Auto	1.0000
L26	46	CCI-SFP-045100	8.42 - 13.33	Auto	1.0000
L26	47	CCI-SFP-045100	8.42 - 13.33	Auto	1.0000
L26	48	CCI-SFP-045100	8.42 - 13.33	Auto	1.0000
L27	32	Aero Channel MP305	8.07 - 8.42	Auto	1.0000
L27	33	Aero Channel MP305	8.07 - 8.42	Auto	1.0000
L27	34	Aero Channel MP305	8.07 - 8.42	Auto	1.0000
L27	35	Aero Channel MP305	8.07 - 8.42	Auto	1.0000
L27	41	Aero Channel MP305	8.07 - 8.42	Auto	1.0000
L27	42	Aero Channel MP305	8.07 - 8.42	Auto	1.0000
L27	43	Aero Channel MP305	8.07 - 8.42	Auto	1.0000
L27	45	CCI-SFP-045100	8.07 - 8.42	Auto	1.0000
L27	46	CCI-SFP-045100	8.07 - 8.42	Auto	1.0000
L27	47	CCI-SFP-045100	8.07 - 8.42	Auto	1.0000
L27	48	CCI-SFP-045100	8.07 - 8.42	Auto	1.0000
L28	32	Aero Channel MP305	7.83 - 8.07	Auto	1.0000
L28	33	Aero Channel MP305	7.83 - 8.07	Auto	1.0000
L28	34	Aero Channel MP305	7.83 - 8.07	Auto	1.0000
L28	35	Aero Channel MP305	7.83 - 8.07	Auto	1.0000
L28	41	Aero Channel MP305	7.83 - 8.07	Auto	1.0000
L28	42	Aero Channel MP305	7.83 - 8.07	Auto	1.0000
L28	43	Aero Channel MP305	7.83 - 8.07	Auto	1.0000
L28	45	CCI-SFP-045100	7.83 - 8.07	Auto	1.0000
L28	46	CCI-SFP-045100	7.83 - 8.07	Auto	1.0000
L28	47	CCI-SFP-045100	7.83 - 8.07	Auto	1.0000
L28	48	CCI-SFP-045100	7.83 - 8.07	Auto	1.0000
L29	32	Aero Channel MP305	6.00 - 7.83	Auto	1.0000
L29	33	Aero Channel MP305	6.00 - 7.83	Auto	1.0000
L29	34	Aero Channel MP305	6.00 - 7.83	Auto	1.0000
L29	35	Aero Channel MP305	6.00 - 7.83	Auto	1.0000
L29	41	Aero Channel MP305	6.00 - 7.83	Auto	1.0000
L29	42	Aero Channel MP305	6.00 - 7.83	Auto	1.0000
L29	43	Aero Channel MP305	6.00 - 7.83	Auto	1.0000
L29	45	CCI-SFP-045100	6.00 - 7.83	Auto	1.0000
L29	46	CCI-SFP-045100	6.00 - 7.83	Auto	1.0000
L29	47	CCI-SFP-045100	6.00 - 7.83	Auto	1.0000
L29	48	CCI-SFP-045100	6.00 - 7.83	Auto	1.0000

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L30	32	Aero Channel MP305	5.75 - 6.00	Auto	1.0000
L30	33	Aero Channel MP305	5.75 - 6.00	Auto	1.0000
L30	34	Aero Channel MP305	5.75 - 6.00	Auto	1.0000
L30	35	Aero Channel MP305	5.75 - 6.00	Auto	1.0000
L30	45	CCI-SFP-045100	5.75 - 6.00	Auto	1.0000
L30	46	CCI-SFP-045100	5.75 - 6.00	Auto	1.0000
L30	47	CCI-SFP-045100	5.75 - 6.00	Auto	1.0000
L30	48	CCI-SFP-045100	5.75 - 6.00	Auto	1.0000
L31	32	Aero Channel MP305	2.00 - 5.75	Auto	1.0000
L31	33	Aero Channel MP305	2.00 - 5.75	Auto	1.0000
L31	34	Aero Channel MP305	2.00 - 5.75	Auto	1.0000
L31	35	Aero Channel MP305	2.00 - 5.75	Auto	1.0000
L31	45	CCI-SFP-045100	4.50 - 5.75	Auto	1.0000
L31	46	CCI-SFP-045100	4.50 - 5.75	Auto	1.0000
L31	47	CCI-SFP-045100	4.50 - 5.75	Auto	1.0000
L31	48	CCI-SFP-045100	4.50 - 5.75	Auto	1.0000
L32	32	Aero Channel MP305	1.75 - 2.00	Auto	1.0000
L32	33	Aero Channel MP305	1.75 - 2.00	Auto	1.0000
L32	34	Aero Channel MP305	1.75 - 2.00	Auto	1.0000
L32	35	Aero Channel MP305	1.75 - 2.00	Auto	1.0000
L33	32	Aero Channel MP305	0.50 - 1.75	Auto	1.0000
L33	33	Aero Channel MP305	0.50 - 1.75	Auto	1.0000
L33	34	Aero Channel MP305	0.50 - 1.75	Auto	1.0000
L33	35	Aero Channel MP305	0.50 - 1.75	Auto	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Site Pro 1 RMQP-xxx + HRK12 12.5' Platform with Handrails	C	None		0.00	107.00	No Ice	21.17	19.65	1.49
						1/2" Ice	25.84	24.18	1.83
						Ice	30.51	28.79	2.29
						1" Ice	39.85	37.77	2.85
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	107.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						Ice	6.02	3.38	0.23
						1" Ice	6.90	4.12	0.35
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	107.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						Ice	6.02	3.38	0.23
						1" Ice	6.90	4.12	0.35
						2" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	107.00	No Ice	5.19	2.71	0.13
						1/2" Ice	5.59	3.04	0.17
						Ice	6.02	3.38	0.23
						1" Ice	6.90	4.12	0.35
						2" Ice			
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	107.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31
						Ice	16.23	8.25	0.45
						1" Ice	17.82	9.67	0.78
						2" Ice			
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	B	From Leg	4.00 0.00	0.00	107.00	No Ice	14.69	6.87	0.18
						1/2" Ice	15.46	7.55	0.31

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			1.00				Ice	16.23	8.25	0.45
							1" Ice	17.82	9.67	0.78
							2" Ice			
APXVAALL24_43-U-NA20_TMO w/ Mount Pipe	C	From Leg	4.00	0.00	107.00	No Ice	14.69	6.87	0.18	
			0.00			1/2"	15.46	7.55	0.31	
			1.00			Ice	16.23	8.25	0.45	
						1" Ice	17.82	9.67	0.78	
						2" Ice				
Radio 4480_TMOV2	A	From Leg	4.00	0.00	107.00	No Ice	2.88	1.40	0.08	
			0.00			1/2"	3.09	1.56	0.10	
			1.00			Ice	3.31	1.73	0.13	
						1" Ice	3.78	2.09	0.19	
						2" Ice				
Radio 4480_TMOV2	B	From Leg	4.00	0.00	107.00	No Ice	2.88	1.40	0.08	
			0.00			1/2"	3.09	1.56	0.10	
			1.00			Ice	3.31	1.73	0.13	
						1" Ice	3.78	2.09	0.19	
						2" Ice				
Radio 4480_TMOV2	C	From Leg	4.00	0.00	107.00	No Ice	2.88	1.40	0.08	
			0.00			1/2"	3.09	1.56	0.10	
			1.00			Ice	3.31	1.73	0.13	
						1" Ice	3.78	2.09	0.19	
						2" Ice				
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00	0.00	107.00	No Ice	2.14	1.69	0.11	
			0.00			1/2"	2.32	1.85	0.13	
			1.00			Ice	2.51	2.02	0.16	
						1" Ice	2.91	2.39	0.22	
						2" Ice				
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00	0.00	107.00	No Ice	2.14	1.69	0.11	
			0.00			1/2"	2.32	1.85	0.13	
			1.00			Ice	2.51	2.02	0.16	
						1" Ice	2.91	2.39	0.22	
						2" Ice				
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00	0.00	107.00	No Ice	2.14	1.69	0.11	
			0.00			1/2"	2.32	1.85	0.13	
			1.00			Ice	2.51	2.02	0.16	
						1" Ice	2.91	2.39	0.22	
						2" Ice				
(2) 6'x2" Mount Pipe	A	From Leg	4.00	0.00	107.00	No Ice	1.43	1.43	0.02	
			0.00			1/2"	1.92	1.92	0.03	
			0.00			Ice	2.29	2.29	0.05	
						1" Ice	3.06	3.06	0.09	
						2" Ice				
(2) 6'x2" Mount Pipe	B	From Leg	4.00	0.00	107.00	No Ice	1.43	1.43	0.02	
			0.00			1/2"	1.92	1.92	0.03	
			0.00			Ice	2.29	2.29	0.05	
						1" Ice	3.06	3.06	0.09	
						2" Ice				
(2) 6'x2" Mount Pipe	C	From Leg	4.00	0.00	107.00	No Ice	1.43	1.43	0.02	
			0.00			1/2"	1.92	1.92	0.03	
			0.00			Ice	2.29	2.29	0.05	
						1" Ice	3.06	3.06	0.09	
						2" Ice				

T-Arm Mount [4' TA 702-3]	C	None		0.00	105.00	No Ice	1.90	1.90	0.27	
						1/2"	2.33	2.33	0.35	
						Ice	2.79	2.79	0.44	
						1" Ice	3.89	3.89	0.69	
						2" Ice				
(3) 1'x2" Mount Pipe	A	From Leg	2.00	0.00	105.00	No Ice	0.15	0.15	0.00	
			0.00			1/2"	0.22	0.22	0.01	
			0.00			Ice	0.30	0.30	0.01	
						1" Ice	0.50	0.50	0.02	
						2" Ice				
(3) 1'x2" Mount Pipe	B	From Leg	2.00	0.00	105.00	No Ice	0.15	0.15	0.00	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral					
			0.00			1/2"	0.22	0.22	0.01
			0.00			Ice	0.30	0.30	0.01
						1" Ice	0.50	0.50	0.02
						2" Ice			
(3) 1'x2" Mount Pipe	C	From Leg	2.00	0.00	105.00	No Ice	0.15	0.15	0.00
			0.00			1/2"	0.22	0.22	0.01
			0.00			Ice	0.30	0.30	0.01
						1" Ice	0.50	0.50	0.02
						2" Ice			
800MHZ 2X50W RRH W/FILTER	A	From Leg	2.00	0.00	105.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			0.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			
800MHZ 2X50W RRH W/FILTER	B	From Leg	2.00	0.00	105.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			0.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			
800MHZ 2X50W RRH W/FILTER	C	From Leg	2.00	0.00	105.00	No Ice	2.06	1.93	0.06
			0.00			1/2"	2.24	2.11	0.09
			0.00			Ice	2.43	2.29	0.11
						1" Ice	2.83	2.68	0.17
						2" Ice			
(2) PCS 1900MHZ 4X45W-65MHZ	A	From Leg	2.00	0.00	105.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
(2) PCS 1900MHZ 4X45W-65MHZ	B	From Leg	2.00	0.00	105.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
(2) PCS 1900MHZ 4X45W-65MHZ	C	From Leg	2.00	0.00	105.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
IBC1900BB-1	A	From Leg	2.00	0.00	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			0.00			Ice	1.22	0.66	0.04
						1" Ice	1.51	0.89	0.06
						2" Ice			
IBC1900BB-1	B	From Leg	2.00	0.00	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			0.00			Ice	1.22	0.66	0.04
						1" Ice	1.51	0.89	0.06
						2" Ice			
IBC1900BB-1	C	From Leg	2.00	0.00	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			0.00			Ice	1.22	0.66	0.04
						1" Ice	1.51	0.89	0.06
						2" Ice			
IBC1900HG-2A	A	From Leg	2.00	0.00	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			0.00			Ice	1.22	0.66	0.04
						1" Ice	1.51	0.89	0.06
						2" Ice			
IBC1900HG-2A	B	From Leg	2.00	0.00	105.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			0.00			Ice	1.22	0.66	0.04
						1" Ice	1.51	0.89	0.06
						2" Ice			
IBC1900HG-2A	C	From Leg	2.00	0.00	105.00	No Ice	0.97	0.46	0.02

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			0.00				1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
							1" Ice	1.51	0.89	0.06
							2" Ice			

SitePro1 RMQLP-4120-H10	C	None		0.00	90.00	No Ice	21.41	21.41	1.60	
						1/2"	26.62	26.62	2.06	
						Ice	31.66	31.66	2.60	
						1" Ice	41.38	41.38	3.96	
						2" Ice				
6'x2" Mount Pipe	A	From Leg	1.00	0.00	90.00	No Ice	1.43	1.43	0.02	
			0.00			1/2"	1.92	1.92	0.03	
			0.00			Ice	2.29	2.29	0.05	
						1" Ice	3.06	3.06	0.09	
						2" Ice				
6'x2" Mount Pipe	B	From Leg	1.00	0.00	90.00	No Ice	1.43	1.43	0.02	
			0.00			1/2"	1.92	1.92	0.03	
			0.00			Ice	2.29	2.29	0.05	
						1" Ice	3.06	3.06	0.09	
						2" Ice				
6'x2" Mount Pipe	C	From Leg	1.00	0.00	90.00	No Ice	1.43	1.43	0.02	
			0.00			1/2"	1.92	1.92	0.03	
			0.00			Ice	2.29	2.29	0.05	
						1" Ice	3.06	3.06	0.09	
						2" Ice				
AIR 6449 N77 w/ Mount Pipe	A	From Leg	4.00	0.00	90.00	No Ice	3.65	2.72	0.11	
			0.00			1/2"	3.99	3.03	0.15	
			1.00			Ice	4.35	3.36	0.20	
						1" Ice	5.11	4.05	0.31	
						2" Ice				
AIR 6449 N77 w/ Mount Pipe	B	From Leg	4.00	0.00	90.00	No Ice	3.65	2.72	0.11	
			0.00			1/2"	3.99	3.03	0.15	
			1.00			Ice	4.35	3.36	0.20	
						1" Ice	5.11	4.05	0.31	
						2" Ice				
AIR 6449 N77 w/ Mount Pipe	C	From Leg	4.00	0.00	90.00	No Ice	3.65	2.72	0.11	
			0.00			1/2"	3.99	3.03	0.15	
			1.00			Ice	4.35	3.36	0.20	
						1" Ice	5.11	4.05	0.31	
						2" Ice				
QD6616-7 w/ Mount Pipe	A	From Leg	4.00	0.00	90.00	No Ice	13.82	8.46	0.16	
			0.00			1/2"	14.43	9.66	0.26	
			0.00			Ice	15.00	10.55	0.37	
						1" Ice	16.18	12.35	0.62	
						2" Ice				
QD6616-7 w/ Mount Pipe	B	From Leg	4.00	0.00	90.00	No Ice	13.82	8.46	0.16	
			0.00			1/2"	14.43	9.66	0.26	
			0.00			Ice	15.00	10.55	0.37	
						1" Ice	16.18	12.35	0.62	
						2" Ice				
QD6616-7 w/ Mount Pipe	C	From Leg	4.00	0.00	90.00	No Ice	13.82	8.46	0.16	
			0.00			1/2"	14.43	9.66	0.26	
			0.00			Ice	15.00	10.55	0.37	
						1" Ice	16.18	12.35	0.62	
						2" Ice				
AIR 6419 B77G w/ Mount Pipe	A	From Leg	4.00	0.00	90.00	No Ice	4.32	2.49	0.08	
			0.00			1/2"	4.74	2.84	0.11	
			1.00			Ice	5.17	3.21	0.15	
						1" Ice	6.09	4.00	0.24	
						2" Ice				
AIR 6419 B77G w/ Mount Pipe	B	From Leg	4.00	0.00	90.00	No Ice	4.32	2.49	0.08	
			0.00			1/2"	4.74	2.84	0.11	
			1.00			Ice	5.17	3.21	0.15	
						1" Ice	6.09	4.00	0.24	
						2" Ice				

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
AIR 6419 B77G w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	90.00	No Ice	4.32	2.49	0.08
			0.00				1/2"	4.74	2.84	0.11
			1.00				Ice	5.17	3.21	0.15
							1" Ice	6.09	4.00	0.24
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00	0.00	0.00	90.00	No Ice	11.96	5.97	0.11
			0.00				1/2"	12.70	6.63	0.20
			0.00				Ice	13.46	7.30	0.30
							1" Ice	15.02	8.69	0.53
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00	0.00	0.00	90.00	No Ice	11.96	5.97	0.11
			0.00				1/2"	12.70	6.63	0.20
			0.00				Ice	13.46	7.30	0.30
							1" Ice	15.02	8.69	0.53
DMP65R-BU6D w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	90.00	No Ice	11.96	5.97	0.11
			0.00				1/2"	12.70	6.63	0.20
			0.00				Ice	13.46	7.30	0.30
							1" Ice	15.02	8.69	0.53
RRUS E2 B29	A	From Leg	4.00	0.00	0.00	90.00	No Ice	3.15	1.29	0.05
			0.00				1/2"	3.36	1.44	0.08
			0.00				Ice	3.59	1.60	0.10
							1" Ice	4.07	1.95	0.17
RRUS E2 B29	B	From Leg	4.00	0.00	0.00	90.00	No Ice	3.15	1.29	0.05
			0.00				1/2"	3.36	1.44	0.08
			0.00				Ice	3.59	1.60	0.10
							1" Ice	4.07	1.95	0.17
RRUS E2 B29	C	From Leg	4.00	0.00	0.00	90.00	No Ice	3.15	1.29	0.05
			0.00				1/2"	3.36	1.44	0.08
			0.00				Ice	3.59	1.60	0.10
							1" Ice	4.07	1.95	0.17
DC6-48-60-18-8F	A	From Leg	4.00	0.00	0.00	90.00	No Ice	0.92	0.92	0.02
			0.00				1/2"	1.46	1.46	0.04
			0.00				Ice	1.64	1.64	0.06
							1" Ice	2.04	2.04	0.11
RRUS 4449 B5/B12	A	From Leg	4.00	0.00	0.00	90.00	No Ice	1.97	1.41	0.07
			0.00				1/2"	2.14	1.56	0.09
			0.00				Ice	2.33	1.73	0.11
							1" Ice	2.72	2.07	0.16
RRUS 4449 B5/B12	B	From Leg	4.00	0.00	0.00	90.00	No Ice	1.97	1.41	0.07
			0.00				1/2"	2.14	1.56	0.09
			0.00				Ice	2.33	1.73	0.11
							1" Ice	2.72	2.07	0.16
RRUS 4449 B5/B12	C	From Leg	4.00	0.00	0.00	90.00	No Ice	1.97	1.41	0.07
			0.00				1/2"	2.14	1.56	0.09
			0.00				Ice	2.33	1.73	0.11
							1" Ice	2.72	2.07	0.16
RRUS 32 B30	A	From Leg	4.00	0.00	0.00	90.00	No Ice	2.69	1.57	0.06
			0.00				1/2"	2.91	1.76	0.08
			0.00				Ice	3.14	1.95	0.10
							1" Ice	3.61	2.35	0.16
RRUS 32 B30	B	From Leg	4.00	0.00	0.00	90.00	No Ice	2.69	1.57	0.06
			0.00				1/2"	2.91	1.76	0.08
			0.00				Ice	3.14	1.95	0.10
							1" Ice	3.61	2.35	0.16
RRUS 32 B30		From Leg	4.00	0.00	0.00	90.00	No Ice	2.69	1.57	0.06
			0.00				1/2"	2.91	1.76	0.08
			0.00				Ice	3.14	1.95	0.10
							1" Ice	3.61	2.35	0.16

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
RRUS 32 B30	C	From Leg	4.00		0.00	90.00	No Ice	2.69	1.57	0.06
			0.00				1/2"	2.91	1.76	0.08
			0.00				Ice	3.14	1.95	0.10
							1" Ice	3.61	2.35	0.16
RRUS 32 B66A	A	From Leg	4.00		0.00	90.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.09	1.97	0.08
			0.00				Ice	3.32	2.17	0.10
							1" Ice	3.81	2.59	0.16
RRUS 32 B66A	B	From Leg	4.00		0.00	90.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.09	1.97	0.08
			0.00				Ice	3.32	2.17	0.10
							1" Ice	3.81	2.59	0.16
RRUS 32 B66A	C	From Leg	4.00		0.00	90.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.09	1.97	0.08
			0.00				Ice	3.32	2.17	0.10
							1" Ice	3.81	2.59	0.16
RRUS 4415 B25	A	From Leg	4.00		0.00	90.00	No Ice	1.64	0.68	0.04
			0.00				1/2"	1.80	0.79	0.06
			0.00				Ice	1.97	0.91	0.07
							1" Ice	2.33	1.18	0.11
RRUS 4415 B25	B	From Leg	4.00		0.00	90.00	No Ice	1.64	0.68	0.04
			0.00				1/2"	1.80	0.79	0.06
			0.00				Ice	1.97	0.91	0.07
							1" Ice	2.33	1.18	0.11
RRUS 4415 B25	C	From Leg	4.00		0.00	90.00	No Ice	1.64	0.68	0.04
			0.00				1/2"	1.80	0.79	0.06
			0.00				Ice	1.97	0.91	0.07
							1" Ice	2.33	1.18	0.11
DC6-48-60-18-8F	A	From Leg	4.00		0.00	90.00	No Ice	0.92	0.92	0.02
			0.00				1/2"	1.46	1.46	0.04
			0.00				Ice	1.64	1.64	0.06
							1" Ice	2.04	2.04	0.11
DC6-48-60-18-8F	B	From Leg	4.00		0.00	90.00	No Ice	0.92	0.92	0.02
			0.00				1/2"	1.46	1.46	0.04
			0.00				Ice	1.64	1.64	0.06
							1" Ice	2.04	2.04	0.11
DC6-48-60-18-8F	C	From Leg	4.00		0.00	90.00	No Ice	0.92	0.92	0.02
			0.00				1/2"	1.46	1.46	0.04
			0.00				Ice	1.64	1.64	0.06
							1" Ice	2.04	2.04	0.11

Site Pro 1 RMQP-xxx + HRK12 12.5' Platform with Handrails	C	None			0.00	76.00	No Ice	21.17	19.65	1.49
							1/2"	25.84	24.18	1.83
							Ice	30.51	28.79	2.29
							1" Ice	39.85	37.77	2.85
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Face	4.00		0.00	76.00	No Ice	14.69	6.87	0.19
			0.00				1/2"	15.46	7.55	0.31
			0.00				Ice	16.23	8.25	0.46
							1" Ice	17.82	9.67	0.79
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Face	4.00		0.00	76.00	No Ice	14.69	6.87	0.19
			0.00				1/2"	15.46	7.55	0.31
			0.00				Ice	16.23	8.25	0.46
							1" Ice	17.82	9.67	0.79

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Face	4.00	0.00	76.00	0.00	2" Ice	14.69	6.87	0.19
			0.00	0.00			No Ice	15.46	7.55	0.31
			0.00	0.00			1/2"	16.23	8.25	0.46
							Ice	17.82	9.67	0.79
							1" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Face	4.00	0.00	76.00	0.00	2" Ice	5.19	2.71	0.13
			0.00	0.00			No Ice	5.59	3.04	0.17
			0.00	0.00			1/2"	6.02	3.38	0.23
							Ice	6.90	4.12	0.35
							1" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Face	4.00	0.00	76.00	0.00	2" Ice	5.19	2.71	0.13
			0.00	0.00			No Ice	5.59	3.04	0.17
			0.00	0.00			1/2"	6.02	3.38	0.23
							Ice	6.90	4.12	0.35
							1" Ice			
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Face	4.00	0.00	76.00	0.00	2" Ice	5.19	2.71	0.13
			0.00	0.00			No Ice	5.59	3.04	0.17
			0.00	0.00			1/2"	6.02	3.38	0.23
							Ice	6.90	4.12	0.35
							1" Ice			
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Face	4.00	0.00	76.00	0.00	2" Ice	3.76	3.15	0.19
			0.00	0.00			No Ice	4.12	3.49	0.25
			0.00	0.00			1/2"	4.48	3.84	0.32
							Ice	5.24	4.58	0.48
							1" Ice			
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Face	4.00	0.00	76.00	0.00	2" Ice	3.76	3.15	0.19
			0.00	0.00			No Ice	4.12	3.49	0.25
			0.00	0.00			1/2"	4.48	3.84	0.32
							Ice	5.24	4.58	0.48
							1" Ice			
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Face	4.00	0.00	76.00	0.00	2" Ice	3.76	3.15	0.19
			0.00	0.00			No Ice	4.12	3.49	0.25
			0.00	0.00			1/2"	4.48	3.84	0.32
							Ice	5.24	4.58	0.48
							1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	A	From Face	4.00	0.00	76.00	0.00	2" Ice	1.97	1.59	0.07
			0.00	0.00			No Ice	2.15	1.75	0.09
			0.00	0.00			1/2"	2.33	1.92	0.12
							Ice	2.72	2.28	0.17
							1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	B	From Face	4.00	0.00	76.00	0.00	2" Ice	1.97	1.59	0.07
			0.00	0.00			No Ice	2.15	1.75	0.09
			0.00	0.00			1/2"	2.33	1.92	0.12
							Ice	2.72	2.28	0.17
							1" Ice			
RADIO 4449 B71 B85A_T-MOBILE	C	From Face	4.00	0.00	76.00	0.00	2" Ice	1.97	1.59	0.07
			0.00	0.00			No Ice	2.15	1.75	0.09
			0.00	0.00			1/2"	2.33	1.92	0.12
							Ice	2.72	2.28	0.17
							1" Ice			
RRUS 4415 B25	A	From Face	4.00	0.00	76.00	0.00	2" Ice	1.64	0.68	0.04
			0.00	0.00			No Ice	1.80	0.79	0.06
			0.00	0.00			1/2"	1.97	0.91	0.07
							Ice	2.33	1.18	0.11
							1" Ice			
RRUS 4415 B25	B	From Face	4.00	0.00	76.00	0.00	2" Ice	1.64	0.68	0.04
			0.00	0.00			No Ice	1.80	0.79	0.06
			0.00	0.00			1/2"	1.97	0.91	0.07
							Ice	2.33	1.18	0.11
							1" Ice			
RRUS 4415 B25	C	From Face	4.00	0.00	76.00	0.00	2" Ice	1.64	0.68	0.04
			0.00	0.00			No Ice	1.80	0.79	0.06
			0.00	0.00			1/2"	1.97	0.91	0.07
							Ice	2.33	1.18	0.11
							1" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
SDX1926Q-43	A	From Face	4.00	0.00	0.00	0.00	76.00	2" Ice			
			0.00	0.00	0.00			No Ice	0.24	0.10	0.01
								1/2"	0.31	0.14	0.01
								Ice	0.38	0.19	0.01
SDX1926Q-43	B	From Face	4.00	0.00	0.00	0.00	76.00	1" Ice	0.55	0.32	0.02
			0.00	0.00	0.00			2" Ice			
								No Ice	0.24	0.10	0.01
								1/2"	0.31	0.14	0.01
SDX1926Q-43	C	From Face	4.00	0.00	0.00	0.00	76.00	Ice	0.38	0.19	0.01
			0.00	0.00	0.00			1" Ice	0.55	0.32	0.02
								2" Ice			
								No Ice	0.24	0.10	0.01
KRY 112 144/1	A	From Face	4.00	0.00	0.00	0.00	76.00	1/2"	0.31	0.14	0.01
			0.00	0.00	0.00			Ice	0.38	0.19	0.01
								1" Ice	0.55	0.32	0.02
								2" Ice			
KRY 112 144/1	B	From Face	4.00	0.00	0.00	0.00	76.00	No Ice	0.24	0.10	0.01
			0.00	0.00	0.00			1/2"	0.31	0.14	0.01
								Ice	0.38	0.19	0.01
								1" Ice	0.55	0.32	0.02
KRY 112 144/1	C	From Face	4.00	0.00	0.00	0.00	76.00	2" Ice			
			0.00	0.00	0.00			No Ice	0.35	0.17	0.01
								1/2"	0.43	0.23	0.01
								Ice	0.51	0.30	0.02
KRY 112 144/1	B	From Face	4.00	0.00	0.00	0.00	76.00	1" Ice	0.70	0.46	0.03
			0.00	0.00	0.00			2" Ice			
								No Ice	0.35	0.17	0.01
								1/2"	0.43	0.23	0.01
KRY 112 144/1	C	From Face	4.00	0.00	0.00	0.00	76.00	Ice	0.51	0.30	0.02
			0.00	0.00	0.00			1" Ice	0.70	0.46	0.03
								2" Ice			
								No Ice	0.35	0.17	0.01
*** PV-VPP12M-HR-B	C	None				0.00	64.00	1/2"	0.43	0.23	0.01
								Ice	0.51	0.30	0.02
								1" Ice	0.70	0.46	0.03
								2" Ice			
(3) 8'x2" Mount Pipe	A	From Face	4.00	0.00	0.00	0.00	64.00	No Ice	17.09	17.09	1.50
			0.00	0.00	0.00			1/2"	21.47	21.47	1.88
								Ice	25.72	25.72	2.35
								1" Ice	33.96	33.96	3.52
(3) 8'x2" Mount Pipe	B	From Face	4.00	0.00	0.00	0.00	64.00	2" Ice			
			0.00	0.00	0.00			No Ice	1.90	1.90	0.03
								1/2"	2.73	2.73	0.04
								Ice	3.40	3.40	0.06
(3) 8'x2" Mount Pipe	C	From Face	4.00	0.00	0.00	0.00	64.00	1" Ice	4.40	4.40	0.12
			0.00	0.00	0.00			2" Ice			
								No Ice	1.90	1.90	0.03
								1/2"	2.73	2.73	0.04
8'x2" Mount Pipe	A	From Face	4.00	0.00	0.00	0.00	64.00	Ice	3.40	3.40	0.06
			0.00	0.00	0.00			1" Ice	4.40	4.40	0.12
								2" Ice			
								No Ice	0.47	1.90	0.03
8'x2" Mount Pipe	B	From Face	4.00	0.00	0.00	0.00	64.00	1/2"	0.68	2.73	0.04
			0.00	0.00	0.00			Ice	0.85	3.40	0.06
								1" Ice	1.10	4.40	0.12
								2" Ice			
8'x2" Mount Pipe	C	From Face	4.00	0.00	0.00	0.00	64.00	No Ice	0.47	1.90	0.03
			0.00	0.00	0.00			1/2"	0.68	2.73	0.04
								Ice	0.85	3.40	0.06
								1" Ice	1.10	4.40	0.12
8'x2" Mount Pipe	A	From Face	4.00	0.00	0.00	0.00	64.00	2" Ice			
			0.00	0.00	0.00			No Ice	0.47	1.90	0.03
								1/2"	0.68	2.73	0.04
								Ice	0.85	3.40	0.06
8'x2" Mount Pipe	B	From Face	4.00	0.00	0.00	0.00	64.00	1" Ice	1.10	4.40	0.12
			0.00	0.00	0.00			2" Ice			
								No Ice	0.47	1.90	0.03
								1/2"	0.68	2.73	0.04
8'x2" Mount Pipe	C	From Face	4.00	0.00	0.00	0.00	64.00	Ice	0.85	3.40	0.06
			0.00	0.00	0.00			1" Ice	1.10	4.40	0.12
								2" Ice			
								No Ice	0.47	1.90	0.03
8'x2" Mount Pipe	A	From Face	4.00	0.00	0.00	0.00	64.00	1/2"	0.68	2.73	0.04
			0.00	0.00	0.00			Ice	0.85	3.40	0.06
								1" Ice	1.10	4.40	0.12
								2" Ice			
8'x2" Mount Pipe	B	From Face	4.00	0.00	0.00	0.00	64.00	No Ice	0.47	1.90	0.03
			0.00	0.00	0.00			1/2"	0.68	2.73	0.04
								Ice	0.85	3.40	0.06
								1" Ice	1.10	4.40	0.12
8'x2" Mount Pipe	C	From Face	4.00	0.00	0.00	0.00	64.00	2" Ice			
			0.00	0.00	0.00			No Ice	0.47	1.90	0.03
								1/2"	0.68	2.73	0.04
								Ice	0.85	3.40	0.06

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
							1" Ice	1.10	4.40	0.12
BSAMNT-SBS-1-2 (Mount Bracket)	A	From Face	4.00	0.00	64.00		2" Ice	0.00	0.00	0.03
							No Ice	0.00	0.00	0.05
							1/2" Ice	0.00	0.00	0.07
							1" Ice	0.00	0.00	0.11
BSAMNT-SBS-1-2 (Mount Bracket)	B	From Face	4.00	0.00	64.00		2" Ice	0.00	0.00	0.03
							No Ice	0.00	0.00	0.05
							1/2" Ice	0.00	0.00	0.07
							1" Ice	0.00	0.00	0.11
BSAMNT-SBS-1-2 (Mount Bracket)	C	From Face	4.00	0.00	64.00		2" Ice	0.00	0.00	0.03
							No Ice	0.00	0.00	0.05
							1/2" Ice	0.00	0.00	0.07
							1" Ice	0.00	0.00	0.11
(2) NHH-65B-R2B	A	From Face	4.00	0.00	64.00		2" Ice	4.16	2.49	0.04
							No Ice	4.56	2.88	0.09
							1/2" Ice	4.98	3.27	0.15
							1" Ice	5.84	4.08	0.28
(2) NHH-65B-R2B	B	From Face	4.00	0.00	64.00		2" Ice	4.16	2.49	0.04
							No Ice	4.56	2.88	0.09
							1/2" Ice	4.98	3.27	0.15
							1" Ice	5.84	4.08	0.28
(2) NHH-65B-R2B	C	From Face	4.00	0.00	64.00		2" Ice	4.16	2.49	0.04
							No Ice	4.56	2.88	0.09
							1/2" Ice	4.98	3.27	0.15
							1" Ice	5.84	4.08	0.28
RVZDC-6627-PF-48	B	From Face	4.00	0.00	64.00		2" Ice	3.79	2.51	0.03
							No Ice	4.04	2.73	0.06
							1/2" Ice	4.30	2.95	0.10
							1" Ice	4.84	3.42	0.18
RVZDC-6627-PF-48	C	From Face	4.00	0.00	64.00		2" Ice	3.79	2.51	0.03
							No Ice	4.04	2.73	0.06
							1/2" Ice	4.30	2.95	0.10
							1" Ice	4.84	3.42	0.18
RFV01U-D1A	A	From Face	4.00	0.00	64.00		2" Ice	1.88	1.25	0.08
							No Ice	2.05	1.39	0.10
							1/2" Ice	2.22	1.54	0.12
							1" Ice	2.60	1.86	0.18
RFV01U-D1A	B	From Face	4.00	0.00	64.00		2" Ice	1.88	1.25	0.08
							No Ice	2.05	1.39	0.10
							1/2" Ice	2.22	1.54	0.12
							1" Ice	2.60	1.86	0.18
RFV01U-D1A	C	From Face	4.00	0.00	64.00		2" Ice	1.88	1.25	0.08
							No Ice	2.05	1.39	0.10
							1/2" Ice	2.22	1.54	0.12
							1" Ice	2.60	1.86	0.18
RFV01U-D2A	A	From Face	4.00	0.00	64.00		2" Ice	1.88	1.01	0.07
							No Ice	2.05	1.14	0.09
							1/2" Ice	2.22	1.28	0.11
							1" Ice	2.60	1.59	0.15
RFV01U-D2A	B	From Face	4.00	0.00	64.00		2" Ice	1.88	1.01	0.07
							No Ice	2.05	1.14	0.09
							1/2" Ice	2.22	1.28	0.11
							1" Ice	2.22	1.28	0.11

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
RFV01U-D2A	C	From Face	4.00	0.00	0.00	0.00	64.00	1" Ice	2.60	1.59	0.15
								2" Ice	1.88	1.01	0.07
								No Ice	2.05	1.14	0.09
								1/2" Ice	2.22	1.28	0.11
								1" Ice	2.60	1.59	0.15
20W CBRS	A	From Face	4.00	0.00	0.00	0.00	64.00	2" Ice	0.86	0.42	0.02
								No Ice	0.98	0.51	0.03
								1/2" Ice	1.10	0.61	0.03
								1" Ice	1.37	0.83	0.06
								2" Ice	1.37	0.83	0.06
20W CBRS	B	From Face	4.00	0.00	0.00	0.00	64.00	No Ice	0.86	0.42	0.02
								1/2" Ice	0.98	0.51	0.03
								1" Ice	1.10	0.61	0.03
								1" Ice	1.37	0.83	0.06
								2" Ice	1.37	0.83	0.06
20W CBRS	C	From Face	4.00	0.00	0.00	0.00	64.00	No Ice	0.86	0.42	0.02
								1/2" Ice	0.98	0.51	0.03
								1" Ice	1.10	0.61	0.03
								1" Ice	1.37	0.83	0.06
								2" Ice	1.37	0.83	0.06

Commscope MC-PK8-DSH	C	None					54.00	No Ice	34.24	34.24	1.75
								1/2" Ice	62.95	62.95	2.10
								1" Ice	91.66	91.66	2.45
								1" Ice	149.08	149.08	3.15
								2" Ice	149.08	149.08	3.15
(2) 8'x2" Mount Pipe	A	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	1.90	1.90	0.03
								1/2" Ice	2.73	2.73	0.04
								1" Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice	4.40	4.40	0.12
(2) 8'x2" Mount Pipe	B	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	1.90	1.90	0.03
								1/2" Ice	2.73	2.73	0.04
								1" Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice	4.40	4.40	0.12
(2) 8'x2" Mount Pipe	C	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	1.90	1.90	0.03
								1/2" Ice	2.73	2.73	0.04
								1" Ice	3.40	3.40	0.06
								1" Ice	4.40	4.40	0.12
								2" Ice	4.40	4.40	0.12
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	8.01	4.23	0.11
								1/2" Ice	8.52	4.69	0.19
								1" Ice	9.04	5.16	0.29
								1" Ice	10.11	6.12	0.52
								2" Ice	10.11	6.12	0.52
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	8.01	4.23	0.11
								1/2" Ice	8.52	4.69	0.19
								1" Ice	9.04	5.16	0.29
								1" Ice	10.11	6.12	0.52
								2" Ice	10.11	6.12	0.52
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	8.01	4.23	0.11
								1/2" Ice	8.52	4.69	0.19
								1" Ice	9.04	5.16	0.29
								1" Ice	10.11	6.12	0.52
								2" Ice	10.11	6.12	0.52
TA08025-B605	A	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	0.00	1.13	0.08
								1/2" Ice	0.00	1.27	0.09
								1" Ice	0.00	1.41	0.11
								1" Ice	0.00	1.72	0.16
								2" Ice	0.00	1.72	0.16
TA08025-B605	B	From Leg	4.00	0.00	0.00	0.00	54.00	No Ice	0.00	1.13	0.08
								1/2" Ice	0.00	1.27	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.00			Ice	0.00	1.41	0.11
						1" Ice	0.00	1.72	0.16
						2" Ice			
TA08025-B605	C	From Leg	4.00	0.00	54.00	No Ice	0.00	1.13	0.08
			0.00			1/2"	0.00	1.27	0.09
			0.00			Ice	0.00	1.41	0.11
						1" Ice	0.00	1.72	0.16
						2" Ice			
TA08025-B604	A	From Leg	4.00	0.00	54.00	No Ice	0.00	0.98	0.06
			0.00			1/2"	0.00	1.11	0.08
			0.00			Ice	0.00	1.25	0.10
						1" Ice	0.00	1.55	0.15
						2" Ice			
TA08025-B604	B	From Leg	4.00	0.00	54.00	No Ice	0.00	0.98	0.06
			0.00			1/2"	0.00	1.11	0.08
			0.00			Ice	0.00	1.25	0.10
						1" Ice	0.00	1.55	0.15
						2" Ice			
TA08025-B604	C	From Leg	4.00	0.00	54.00	No Ice	0.00	0.98	0.06
			0.00			1/2"	0.00	1.11	0.08
			0.00			Ice	0.00	1.25	0.10
						1" Ice	0.00	1.55	0.15
						2" Ice			
RDIDC-9181-PF-48	B	From Leg	4.00	0.00	54.00	No Ice	2.01	1.17	0.02
			0.00			1/2"	2.19	1.31	0.04
			0.00			Ice	2.37	1.46	0.06
						1" Ice	2.76	1.78	0.11
						2" Ice			

*** Flange Modifications ***									
Bridge Stiffener 72" x 1.25" x 11"	A	From Face	0.00	0.00	30.00	No Ice	1.13	8.99	0.28
			0.00			1/2"	2.07	9.70	0.33
			0.00			Ice	3.02	10.41	0.37
						1" Ice	5.02	11.89	0.46
						2" Ice			
Bridge Stiffener 72" x 1.25" x 11"	B	From Face	0.00	0.00	30.00	No Ice	1.13	8.99	0.28
			0.00			1/2"	2.07	9.70	0.33
			0.00			Ice	3.02	10.41	0.37
						1" Ice	5.02	11.89	0.46
						2" Ice			
Bridge Stiffener 72" x 1.25" x 11"	C	From Face	0.00	0.00	30.00	No Ice	1.13	8.99	0.28
			0.00			1/2"	2.07	9.70	0.33
			0.00			Ice	3.02	10.41	0.37
						1" Ice	5.02	11.89	0.46
						2" Ice			

Jump Plate 116" x 6.25" x 1"	A	From Face	0.00	0.00	30.00	No Ice	8.99	7.79	1.07
			0.00			1/2"	10.52	8.74	1.15
			0.00			Ice	12.07	9.70	1.20
						1" Ice	15.25	11.66	1.32
						2" Ice			
Jump Plate 116" x 6.25" x 1"	B	From Face	0.00	0.00	30.00	No Ice	8.99	7.79	1.07
			0.00			1/2"	10.52	8.74	1.15
			0.00			Ice	12.07	9.70	1.20
						1" Ice	15.25	11.66	1.32
						2" Ice			
Jump Plate 116" x 6.25" x 1"	C	From Face	0.00	0.00	30.00	No Ice	8.99	7.79	1.07
			0.00			1/2"	10.52	8.74	1.15
			0.00			Ice	12.07	9.70	1.20
						1" Ice	15.25	11.66	1.32
						2" Ice			

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
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	110 - 105	Pole	Max Tension	45	0.00	0.00	0.00
			Max. Compression	26	-7.83	-0.01	0.01
			Max. Mx	8	-3.79	-10.36	0.00
			Max. My	2	-3.79	-0.00	10.36
			Max. Vy	20	-4.03	10.36	0.00
			Max. Vx	14	4.03	-0.00	-10.36

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L2	105 - 100	Pole	Max. Torque	6			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.89	-0.03	0.03
			Max. Mx	8	-5.27	-36.65	0.00
			Max. My	14	-5.26	-0.00	-36.65
			Max. Vy	20	-5.41	36.64	0.00
			Max. Vx	14	5.41	-0.00	-36.65
L3	100 - 95	Pole	Max. Torque	6			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.55	-0.04	0.04
			Max. Mx	8	-5.67	-64.41	0.01
			Max. My	14	-5.67	-0.00	-64.42
			Max. Vy	20	-5.70	64.41	0.00
			Max. Vx	14	5.70	-0.00	-64.42
L4	95 - 90	Pole	Max. Torque	6			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-12.21	-0.05	0.06
			Max. Mx	8	-6.09	-93.63	0.01
			Max. My	14	-6.08	-0.01	-93.64
			Max. Vy	20	-5.99	93.62	0.00
			Max. Vx	14	5.99	-0.01	-93.64
L5	90 - 85	Pole	Max. Torque	6			-0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.38	0.10	0.58
			Max. Mx	20	-11.07	151.62	0.13
			Max. My	2	-11.07	0.03	151.79
			Max. Vy	20	-11.60	151.62	0.13
			Max. Vx	14	11.63	0.03	-151.52
L6	85 - 80	Pole	Max. Torque	20			-0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.41	0.26	0.70
			Max. Mx	20	-11.74	210.37	0.16
			Max. My	2	-11.73	0.06	210.68
			Max. Vy	20	-11.88	210.37	0.16
			Max. Vx	14	11.93	0.07	-210.36
L7	80 - 75	Pole	Max. Torque	20			-0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.16	0.40	0.83
			Max. Mx	20	-16.24	273.81	0.18
			Max. My	2	-16.23	0.09	274.36
			Max. Vy	20	-15.49	273.81	0.18
			Max. Vx	14	15.55	0.10	-274.00
L8	75 - 70	Pole	Max. Torque	20			-0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.34	0.49	1.03
			Max. Mx	20	-16.99	351.87	0.23
			Max. My	2	-16.99	0.11	352.74
			Max. Vy	20	-15.73	351.87	0.23
			Max. Vx	14	15.80	0.13	-352.30
L9	70 - 65	Pole	Max. Torque	20			-0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.52	0.58	1.21
			Max. Mx	20	-17.77	431.07	0.27
			Max. My	2	-17.76	0.14	432.31
			Max. Vy	20	-15.95	431.07	0.27
			Max. Vx	14	16.03	0.15	-431.79
L10	65 - 60	Pole	Max. Torque	20			-0.17
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.68	0.08	0.98
			Max. Mx	20	-21.74	522.09	0.14
			Max. My	2	-21.74	-0.05	523.85
			Max. Vy	20	-18.88	522.09	0.14
			Max. Vx	14	18.98	0.12	-523.49
L11	60 - 55	Pole	Max. Torque	14			0.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.12	0.19	1.09
			Max. Mx	20	-22.70	617.11	0.05
			Max. My	2	-22.69	-0.11	619.33
Max. Vy	20	-19.14	617.11	0.05			

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L12	55 - 50	Pole	Max. Vx	14	19.24	0.24	-618.98
			Max. Torque	14			0.36
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.23	-0.08	0.96
			Max. Mx	8	-26.77	-723.66	0.38
			Max. My	2	-26.76	-0.23	726.24
			Max. Vy	20	-21.97	723.63	-0.05
			Max. Vx	14	22.04	0.21	-726.05
L13	50 - 45	Pole	Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.69	0.03	1.03
			Max. Mx	20	-27.77	834.02	-0.10
			Max. My	2	-27.77	-0.23	836.83
			Max. Vy	20	-22.20	834.02	-0.10
			Max. Vx	14	22.23	0.27	-836.66
			Max. Torque	14			0.53
L14	45 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.16	0.13	1.10
			Max. Mx	20	-28.79	945.43	-0.14
			Max. My	2	-28.79	-0.23	948.27
			Max. Vy	20	-22.39	945.43	-0.14
			Max. Vx	14	22.39	0.34	-948.14
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
L15	40 - 39.33	Pole	Max. Compression	26	-55.37	0.14	1.11
			Max. Mx	20	-28.93	960.44	-0.14
			Max. My	2	-28.93	-0.23	963.26
			Max. Vy	20	-22.41	960.44	-0.14
			Max. Vx	14	22.44	0.35	-963.15
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.45	0.15	1.11
L16	39.33 - 39.08	Pole	Max. Mx	20	-29.00	966.04	-0.14
			Max. My	2	-29.00	-0.24	968.86
			Max. Vy	20	-22.42	966.04	-0.14
			Max. Vx	14	22.45	0.35	-968.76
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.20	0.25	1.18
			Max. Mx	20	-30.18	1078.70	-0.18
L17	39.08 - 34.08	Pole	Max. My	14	-30.17	0.42	-1082.08
			Max. Vy	20	-22.65	1078.70	-0.18
			Max. Vx	14	22.89	0.42	-1082.08
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.60	0.33	1.23
			Max. Mx	20	-31.16	1171.40	-0.22
			Max. My	14	-31.15	0.47	-1175.63
L18	34.08 - 30	Pole	Max. Vy	20	-22.81	1171.40	-0.22
			Max. Vx	14	22.99	0.47	-1175.63
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.37	0.34	1.24
			Max. Mx	20	-36.09	1177.14	-0.22
			Max. My	14	-36.09	0.47	-1181.41
			Max. Vy	20	-22.96	1177.14	-0.22
L19	30 - 29.75	Pole	Max. Vx	14	23.15	0.47	-1181.41
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.99	0.43	1.28
			Max. Mx	20	-37.29	1286.45	-0.26
			Max. My	14	-37.28	0.53	-1291.47
			Max. Vy	20	-23.08	1286.45	-0.26
			Max. Vx	14	23.22	0.53	-1291.47
L20	29.75 - 25	Pole	Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.10	0.44	1.29
			Max. Mx	20	-37.29	1286.45	-0.26
L21	25 - 24.75	Pole	Max. My	14	-37.28	0.53	-1291.47
			Max. Vy	20	-23.08	1286.45	-0.26
			Max. Vx	14	23.22	0.53	-1291.47
			Max. Torque	14			0.53
L21	25 - 24.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.10	0.44	1.29

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L22	24.75 - 19.75	Pole	Max. Mx	20	-37.39	1292.22	-0.26
			Max. My	14	-37.38	0.54	-1297.27
			Max. Vy	20	-23.08	1292.22	-0.26
			Max. Vx	14	23.22	0.54	-1297.27
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.30	0.53	1.30
			Max. Mx	20	-39.01	1408.70	-0.30
			Max. My	14	-39.01	0.60	-1414.10
			Max. Vy	20	-23.52	1408.70	-0.30
L23	19.75 - 18.58	Pole	Max. Vx	14	23.53	0.60	-1414.10
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.83	0.56	1.30
			Max. Mx	20	-39.39	1436.26	-0.31
			Max. My	14	-39.39	0.62	-1441.65
			Max. Vy	20	-23.62	1436.26	-0.31
			Max. Vx	14	23.61	0.62	-1441.65
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
L24	18.58 - 18.33	Pole	Max. Compression	26	-68.96	0.56	1.30
			Max. Mx	20	-39.50	1442.16	-0.31
			Max. My	14	-39.50	0.62	-1447.55
			Max. Vy	20	-23.63	1442.16	-0.31
			Max. Vx	14	23.60	0.62	-1447.55
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.58	0.66	1.32
			Max. Mx	20	-41.47	1561.37	-0.35
			Max. My	14	-41.47	0.68	-1566.29
L25	18.33 - 13.33	Pole	Max. Vy	20	-24.07	1561.37	-0.35
			Max. Vx	14	23.92	0.68	-1566.29
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.19	0.75	1.31
			Max. Mx	20	-43.42	1680.50	-0.39
			Max. My	14	-43.43	0.75	-1684.27
			Max. Vy	20	-24.50	1680.50	-0.39
			Max. Vx	14	24.19	0.75	-1684.27
			Max. Torque	14			0.53
L26	13.33 - 8.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.42	0.75	1.30
			Max. Mx	20	-43.61	1689.07	-0.39
			Max. My	14	-43.62	0.75	-1692.73
			Max. Vy	20	-24.51	1689.07	-0.39
			Max. Vx	14	24.19	0.75	-1692.73
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.58	0.76	1.30
			Max. Mx	20	-43.74	1694.96	-0.40
L27	8.42 - 8.07	Pole	Max. My	14	-43.74	0.76	-1698.54
			Max. Vy	20	-24.54	1694.96	-0.40
			Max. Vx	14	24.21	0.76	-1698.54
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.77	0.79	1.29
			Max. Mx	20	-44.64	1740.05	-0.41
			Max. My	14	-44.64	0.78	-1742.96
			Max. Vy	20	-24.77	1740.05	-0.41
			Max. Vx	14	24.37	0.78	-1742.96
L28	8.07 - 7.83	Pole	Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.91	0.79	1.28
			Max. Mx	20	-44.76	1746.24	-0.41
			Max. My	14	-44.76	0.78	-1749.05
			Max. Vy	20	-24.77	1740.05	-0.41
			Max. Vx	14	24.37	0.78	-1742.96
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.91	0.79	1.28
L29	7.83 - 6	Pole	Max. Mx	20	-44.76	1746.24	-0.41
			Max. My	14	-44.76	0.78	-1749.05
			Max. Vy	20	-24.77	1740.05	-0.41
			Max. Vx	14	24.37	0.78	-1742.96
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.91	0.79	1.28
			Max. Mx	20	-44.76	1746.24	-0.41
			Max. My	14	-44.76	0.78	-1749.05
			Max. Vy	20	-24.77	1740.05	-0.41
L30	6 - 5.75	Pole	Max. Vx	14	24.37	0.78	-1742.96
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.91	0.79	1.28
			Max. Mx	20	-44.76	1746.24	-0.41
			Max. My	14	-44.76	0.78	-1749.05
			Max. Vy	20	-24.77	1740.05	-0.41
			Max. Vx	14	24.37	0.78	-1742.96
			Max. Torque	14			0.53
			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
L31	5.75 - 2	Pole	Max. Vy	20	-24.77	1746.24	-0.41
			Max. Vx	14	24.36	0.78	-1749.05
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.90	0.86	1.27
			Max. Mx	20	-46.36	1839.74	-0.44
			Max. My	14	-46.37	0.83	-1840.80
			Max. Vy	20	-25.11	1839.74	-0.44
L32	2 - 1.75	Pole	Max. Vx	14	24.60	0.83	-1840.80
			Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.05	0.87	1.27
			Max. Mx	20	-46.51	1846.02	-0.44
			Max. My	14	-46.51	0.83	-1846.95
			Max. Vy	20	-25.12	1846.02	-0.44
			Max. Vx	14	24.59	0.83	-1846.95
L33	1.75 - 0	Pole	Max. Torque	14			0.53
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.79	0.90	1.28
			Max. Mx	20	-47.12	1890.08	-0.46
			Max. My	14	-47.12	0.86	-1890.04
			Max. Vy	20	-25.27	1890.08	-0.46
			Max. Vx	14	24.70	0.86	-1890.04
			Max. Torque	14			0.53

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	28	78.79	-3.79	6.56
	Max. H _x	20	47.15	25.22	-0.01
	Max. H _z	2	47.15	-0.01	24.35
	Max. M _x	2	1878.16	-0.01	24.35
	Max. M _z	8	1889.48	-25.22	0.01
	Max. Torsion	14	0.53	0.01	-24.65
	Min. Vert	19	35.36	20.65	-11.93
	Min. H _x	8	47.15	-25.22	0.01
	Min. H _z	14	47.15	0.01	-24.65
	Min. M _x	14	-1890.04	0.01	-24.65
	Min. M _z	20	-1890.08	25.22	-0.01
	Min. Torsion	2	-0.53	-0.01	24.35

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	39.29	0.00	0.00	-0.07	0.24	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	47.15	0.01	-24.35	-1878.16	-0.25	0.53
0.9 Dead+1.0 Wind 0 deg - No Ice	35.36	0.01	-24.35	-1851.17	-0.32	0.52
1.2 Dead+1.0 Wind 30 deg - No Ice	47.15	13.12	-22.73	-1674.46	-966.39	0.41
0.9 Dead+1.0 Wind 30 deg - No Ice	35.36	13.12	-22.73	-1650.76	-952.80	0.41
1.2 Dead+1.0 Wind 60 deg - No Ice	47.15	21.39	-12.35	-943.02	-1631.78	0.38
0.9 Dead+1.0 Wind 60 deg - No Ice	35.36	21.39	-12.35	-929.51	-1608.52	0.38

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
1.2 Dead+1.0 Wind 90 deg - No Ice	47.15	25.22	-0.01	-0.65	-1889.48	0.19
0.9 Dead+1.0 Wind 90 deg - No Ice	35.36	25.22	-0.01	-0.61	-1862.59	0.19
1.2 Dead+1.0 Wind 120 deg - No Ice	47.15	20.71	11.96	934.99	-1619.31	-0.14
0.9 Dead+1.0 Wind 120 deg - No Ice	35.36	20.71	11.96	921.56	-1596.09	-0.14
1.2 Dead+1.0 Wind 150 deg - No Ice	47.15	12.44	21.55	1645.16	-948.94	-0.33
0.9 Dead+1.0 Wind 150 deg - No Ice	35.36	12.44	21.55	1621.65	-935.44	-0.33
1.2 Dead+1.0 Wind 180 deg - No Ice	47.15	-0.01	24.65	1890.04	0.86	-0.53
0.9 Dead+1.0 Wind 180 deg - No Ice	35.36	-0.01	24.65	1863.02	0.77	-0.52
1.2 Dead+1.0 Wind 210 deg - No Ice	47.15	-13.05	22.61	1672.73	966.11	-0.41
0.9 Dead+1.0 Wind 210 deg - No Ice	35.36	-13.05	22.61	1649.09	952.37	-0.41
1.2 Dead+1.0 Wind 240 deg - No Ice	47.15	-20.65	11.93	932.92	1615.23	-0.38
0.9 Dead+1.0 Wind 240 deg - No Ice	35.36	-20.65	11.93	919.52	1591.91	-0.38
1.2 Dead+1.0 Wind 270 deg - No Ice	47.15	-25.22	0.01	0.46	1890.08	-0.19
0.9 Dead+1.0 Wind 270 deg - No Ice	35.36	-25.22	0.01	0.48	1863.04	-0.19
1.2 Dead+1.0 Wind 300 deg - No Ice	47.15	-21.45	-12.39	-945.16	1637.20	0.14
0.9 Dead+1.0 Wind 300 deg - No Ice	35.36	-21.45	-12.39	-931.62	1613.73	0.14
1.2 Dead+1.0 Wind 330 deg - No Ice	47.15	-12.63	-21.89	-1650.45	952.50	0.33
0.9 Dead+1.0 Wind 330 deg - No Ice	35.36	-12.63	-21.89	-1626.87	938.83	0.33
1.2 Dead+1.0 Ice+1.0 Temp	78.79	-0.00	-0.00	-1.28	0.90	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	78.79	0.00	-7.19	-580.54	0.83	0.14
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	78.79	3.79	-6.56	-509.63	-292.46	0.08
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	78.79	6.24	-3.61	-291.19	-500.72	0.08
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	78.79	7.44	-0.00	-1.54	-581.15	0.02
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	78.79	6.21	3.58	287.88	-500.15	-0.06
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	78.79	3.68	6.38	501.78	-289.45	-0.09
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	78.79	-0.00	7.19	577.70	1.06	-0.14
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	78.79	-3.78	6.54	506.51	294.20	-0.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	78.79	-6.21	3.59	288.07	502.15	-0.08
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	78.79	-7.44	0.00	-1.31	583.04	-0.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	78.79	-6.24	-3.60	-291.00	502.50	0.06
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	78.79	-3.70	-6.41	-504.89	291.50	0.09
Dead+Wind 0 deg - Service	39.29	0.00	-6.04	-461.70	0.11	0.13
Dead+Wind 30 deg - Service	39.29	3.25	-5.63	-411.69	-237.39	0.10
Dead+Wind 60 deg - Service	39.29	5.30	-3.06	-231.85	-400.93	0.09
Dead+Wind 90 deg - Service	39.29	6.25	-0.00	-0.21	-464.27	0.04
Dead+Wind 120 deg - Service	39.29	5.13	2.96	229.76	-397.84	-0.04
Dead+Wind 150 deg - Service	39.29	3.08	5.34	404.34	-233.08	-0.08

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
Dead+Wind 180 deg - Service	39.29	-0.00	6.11	464.52	0.38	-0.13
Dead+Wind 210 deg - Service	39.29	-3.23	5.60	411.15	237.67	-0.10
Dead+Wind 240 deg - Service	39.29	-5.12	2.96	229.25	397.19	-0.09
Dead+Wind 270 deg - Service	39.29	-6.25	0.00	0.06	464.77	-0.04
Dead+Wind 300 deg - Service	39.29	-5.32	-3.07	-232.38	402.61	0.04
Dead+Wind 330 deg - Service	39.29	-3.13	-5.43	-405.76	234.31	0.08

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-39.29	0.00	0.00	39.29	0.00	0.000%
2	0.01	-47.15	-24.35	-0.01	47.15	24.35	0.000%
3	0.01	-35.36	-24.35	-0.01	35.36	24.35	0.000%
4	13.12	-47.15	-22.73	-13.12	47.15	22.73	0.000%
5	13.12	-35.36	-22.73	-13.12	35.36	22.73	0.000%
6	21.39	-47.15	-12.35	-21.39	47.15	12.35	0.000%
7	21.39	-35.36	-12.35	-21.39	35.36	12.35	0.000%
8	25.22	-47.15	-0.01	-25.22	47.15	0.01	0.000%
9	25.22	-35.36	-0.01	-25.22	35.36	0.01	0.000%
10	20.71	-47.15	11.96	-20.71	47.15	-11.96	0.000%
11	20.71	-35.36	11.96	-20.71	35.36	-11.96	0.000%
12	12.44	-47.15	21.55	-12.44	47.15	-21.55	0.000%
13	12.44	-35.36	21.55	-12.44	35.36	-21.55	0.000%
14	-0.01	-47.15	24.65	0.01	47.15	-24.65	0.000%
15	-0.01	-35.36	24.65	0.01	35.36	-24.65	0.000%
16	-13.05	-47.15	22.61	13.05	47.15	-22.61	0.000%
17	-13.05	-35.36	22.61	13.05	35.36	-22.61	0.000%
18	-20.65	-47.15	11.93	20.65	47.15	-11.93	0.000%
19	-20.65	-35.36	11.93	20.65	35.36	-11.93	0.000%
20	-25.22	-47.15	0.01	25.22	47.15	-0.01	0.000%
21	-25.22	-35.36	0.01	25.22	35.36	-0.01	0.000%
22	-21.45	-47.15	-12.39	21.45	47.15	12.39	0.000%
23	-21.45	-35.36	-12.39	21.45	35.36	12.39	0.000%
24	-12.63	-47.15	-21.89	12.63	47.15	21.89	0.000%
25	-12.63	-35.36	-21.89	12.63	35.36	21.89	0.000%
26	0.00	-78.79	0.00	0.00	78.79	0.00	0.000%
27	0.00	-78.79	-7.19	-0.00	78.79	7.19	0.000%
28	3.79	-78.79	-6.56	-3.79	78.79	6.56	0.000%
29	6.24	-78.79	-3.61	-6.24	78.79	3.61	0.000%
30	7.44	-78.79	-0.00	-7.44	78.79	0.00	0.000%
31	6.21	-78.79	3.58	-6.21	78.79	-3.58	0.000%
32	3.68	-78.79	6.38	-3.68	78.79	-6.38	0.000%
33	-0.00	-78.79	7.19	0.00	78.79	-7.19	0.000%
34	-3.78	-78.79	6.54	3.78	78.79	-6.54	0.000%
35	-6.21	-78.79	3.59	6.21	78.79	-3.59	0.000%
36	-7.44	-78.79	0.00	7.44	78.79	-0.00	0.000%
37	-6.24	-78.79	-3.60	6.24	78.79	3.60	0.000%
38	-3.70	-78.79	-6.41	3.70	78.79	6.41	0.000%
39	0.00	-39.29	-6.04	-0.00	39.29	6.04	0.000%
40	3.25	-39.29	-5.63	-3.25	39.29	5.63	0.000%
41	5.30	-39.29	-3.06	-5.30	39.29	3.06	0.000%
42	6.25	-39.29	-0.00	-6.25	39.29	0.00	0.000%
43	5.13	-39.29	2.96	-5.13	39.29	-2.96	0.000%
44	3.08	-39.29	5.34	-3.08	39.29	-5.34	0.000%
45	-0.00	-39.29	6.11	0.00	39.29	-6.11	0.000%
46	-3.23	-39.29	5.60	3.23	39.29	-5.60	0.000%
47	-5.12	-39.29	2.96	5.12	39.29	-2.96	0.000%
48	-6.25	-39.29	0.00	6.25	39.29	-0.00	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
49	-5.32	-39.29	-3.07	5.32	39.29	3.07	0.000%
50	-3.13	-39.29	-5.43	3.13	39.29	5.43	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	5	0.0000001	0.00029632
3	Yes	5	0.0000001	0.00012684
4	Yes	6	0.0000001	0.00053429
5	Yes	6	0.0000001	0.00018327
6	Yes	6	0.0000001	0.00051136
7	Yes	6	0.0000001	0.00017604
8	Yes	5	0.0000001	0.00023107
9	Yes	5	0.0000001	0.00008729
10	Yes	6	0.0000001	0.00051221
11	Yes	6	0.0000001	0.00017667
12	Yes	6	0.0000001	0.00052910
13	Yes	6	0.0000001	0.00018208
14	Yes	5	0.0000001	0.00028972
15	Yes	5	0.0000001	0.00012302
16	Yes	6	0.0000001	0.00052343
17	Yes	6	0.0000001	0.00017924
18	Yes	6	0.0000001	0.00051636
19	Yes	6	0.0000001	0.00017841
20	Yes	5	0.0000001	0.00023261
21	Yes	5	0.0000001	0.00008829
22	Yes	6	0.0000001	0.00052019
23	Yes	6	0.0000001	0.00017915
24	Yes	6	0.0000001	0.00052033
25	Yes	6	0.0000001	0.00017860
26	Yes	4	0.0000001	0.00005054
27	Yes	6	0.0000001	0.00064852
28	Yes	6	0.0000001	0.00074553
29	Yes	6	0.0000001	0.00074056
30	Yes	6	0.0000001	0.00064536
31	Yes	6	0.0000001	0.00073486
32	Yes	6	0.0000001	0.00073614
33	Yes	6	0.0000001	0.00064310
34	Yes	6	0.0000001	0.00074016
35	Yes	6	0.0000001	0.00073766
36	Yes	6	0.0000001	0.00064692
37	Yes	6	0.0000001	0.00074270
38	Yes	6	0.0000001	0.00074242
39	Yes	4	0.0000001	0.00075714
40	Yes	5	0.0000001	0.00014783
41	Yes	5	0.0000001	0.00013752
42	Yes	4	0.0000001	0.00073626
43	Yes	5	0.0000001	0.00013748
44	Yes	5	0.0000001	0.00014544
45	Yes	4	0.0000001	0.00075749
46	Yes	5	0.0000001	0.00014126
47	Yes	5	0.0000001	0.00014088
48	Yes	4	0.0000001	0.00073689
49	Yes	5	0.0000001	0.00014222
50	Yes	5	0.0000001	0.00014006

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	17.6361	40	1.24	0.00
L2	105 - 100	16.3407	40	1.24	0.00
L3	100 - 95	15.0486	40	1.23	0.00
L4	95 - 90	13.7666	40	1.22	0.00
L5	90 - 85	12.5026	40	1.20	0.00
L6	85 - 80	11.2608	40	1.17	0.00
L7	80 - 75	10.0476	40	1.14	0.00
L8	75 - 70	8.8741	40	1.10	0.00
L9	70 - 65	7.7525	40	1.04	0.00
L10	65 - 60	6.6971	40	0.97	0.00
L11	60 - 55	5.7234	40	0.89	0.00
L12	55 - 50	4.8224	40	0.83	0.00
L13	50 - 45	3.9807	40	0.77	0.00
L14	45 - 40	3.2084	40	0.70	0.00
L15	40 - 39.33	2.5161	40	0.62	0.00
L16	39.33 - 39.08	2.4300	40	0.61	0.00
L17	39.08 - 34.08	2.3983	40	0.60	0.00
L18	34.08 - 30	1.8030	40	0.53	0.00
L19	30 - 29.75	1.3767	40	0.47	0.00
L20	29.75 - 25	1.3525	40	0.46	0.00
L21	25 - 24.75	0.9336	40	0.38	0.00
L22	24.75 - 19.75	0.9139	40	0.38	0.00
L23	19.75 - 18.58	0.5651	40	0.29	0.00
L24	18.58 - 18.33	0.4967	40	0.27	0.00
L25	18.33 - 13.33	0.4828	40	0.26	0.00
L26	13.33 - 8.42	0.2462	40	0.19	0.00
L27	8.42 - 8.07	0.0971	40	0.10	0.00
L28	8.07 - 7.83	0.0897	40	0.10	0.00
L29	7.83 - 6	0.0847	40	0.10	0.00
L30	6 - 5.75	0.0514	40	0.08	0.00
L31	5.75 - 2	0.0475	40	0.07	0.00
L32	2 - 1.75	0.0066	40	0.03	0.00
L33	1.75 - 0	0.0051	40	0.03	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.00	Site Pro 1 RMQP-xxx + HRK12 12.5' Platform with Handrails	40	16.8587	1.24	0.00	92413
105.00	T-Arm Mount [4' TA 702-3]	40	16.3407	1.24	0.00	92413
90.00	SitePro1 RMQLP-4120-H10	40	12.5026	1.20	0.00	13473
76.00	Site Pro 1 RMQP-xxx + HRK12 12.5' Platform with Handrails	40	9.1051	1.11	0.00	6064
64.00	PV-VPP12M-HR-B	40	6.4958	0.95	0.00	3659
54.00	Commscope MC-PK8-DSH	40	4.6492	0.82	0.00	5016
30.00	Bridge Stiffener 72" x 1.25" x 11"	40	1.3767	0.47	0.00	3454

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 105	71.7921	4	5.05	0.00
L2	105 - 100	66.5211	4	5.04	0.00
L3	100 - 95	61.2633	4	5.02	0.00
L4	95 - 90	56.0470	4	4.96	0.00
L5	90 - 85	50.9033	4	4.88	0.00
L6	85 - 80	45.8500	4	4.79	0.00
L7	80 - 75	40.9126	4	4.65	0.00

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L8	75 - 70	36.1360	4	4.48	0.00
L9	70 - 65	31.5701	4	4.25	0.00
L10	65 - 60	27.2736	4	3.96	0.00
L11	60 - 55	23.3084	4	3.61	0.00
L12	55 - 50	19.6393	4	3.40	0.00
L13	50 - 45	16.2112	4	3.15	0.00
L14	45 - 40	13.0657	4	2.86	0.00
L15	40 - 39.33	10.2462	4	2.52	0.00
L16	39.33 - 39.08	9.8955	4	2.48	0.00
L17	39.08 - 34.08	9.7663	4	2.46	0.00
L18	34.08 - 30	7.3418	4	2.16	0.00
L19	30 - 29.75	5.6057	4	1.90	0.00
L20	29.75 - 25	5.5069	4	1.88	0.00
L21	25 - 24.75	3.8010	4	1.55	0.00
L22	24.75 - 19.75	3.7205	4	1.53	0.00
L23	19.75 - 18.58	2.3003	4	1.18	0.00
L24	18.58 - 18.33	2.0219	4	1.09	0.00
L25	18.33 - 13.33	1.9651	4	1.08	0.00
L26	13.33 - 8.42	1.0019	4	0.76	0.00
L27	8.42 - 8.07	0.3950	4	0.42	0.00
L28	8.07 - 7.83	0.3648	4	0.40	0.00
L29	7.83 - 6	0.3448	4	0.39	0.00
L30	6 - 5.75	0.2093	4	0.31	0.00
L31	5.75 - 2	0.1932	4	0.30	0.00
L32	2 - 1.75	0.0267	4	0.12	0.00
L33	1.75 - 0	0.0206	4	0.11	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
107.00	Site Pro 1 RMQP-xxx + HRK12 12.5' Platform with Handrails	4	68.6289	5.05	0.00	22981
105.00	T-Arm Mount [4' TA 702-3]	4	66.5211	5.04	0.00	22981
90.00	SitePro1 RMQLP-4120-H10	4	50.9033	4.88	0.00	3346
76.00	Site Pro 1 RMQP-xxx + HRK12 12.5' Platform with Handrails	4	37.0761	4.52	0.00	1507
64.00	PV-VPP12M-HR-B	4	26.4538	3.89	0.00	906
54.00	Commscope MC-PK8-DSH	4	18.9342	3.35	0.00	1239
30.00	Bridge Stiffener 72" x 1.25" x 11"	4	5.6057	1.90	0.00	849

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L1	110 - 105 (1)	P24x0.25	5.00	0.00	0.0	18,653	-3.79	662.26	0.006
L2	105 - 100 (2)	P24x0.25	5.00	0.00	0.0	18,653	-5.26	662.26	0.008
L3	100 - 95 (3)	P24x0.25	5.00	0.00	0.0	18,653	-5.67	662.26	0.009
L4	95 - 90 (4)	P24x0.25	5.00	0.00	0.0	18,653	-6.08	662.26	0.009
L5	90 - 85 (5)	P24x0.375	5.00	0.00	0.0	27,832	-11.06	1052.07	0.011

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L6	85 - 80 (6)	P24x0.375	5.00	0.00	0.0	27.832	-11.72	1052.07	0.011
L7	80 - 75 (7)	P24x0.375	5.00	0.00	0.0	27.832	-16.22	1052.07	0.015
L8	75 - 70 (8)	P24x0.375	5.00	0.00	0.0	27.832	-16.97	1052.07	0.016
L9	70 - 65 (9)	P24x0.375	5.00	0.00	0.0	27.832	-17.75	1052.07	0.017
L10	65 - 60 (10)	P24x0.375	5.00	0.00	0.0	27.832	-21.72	1052.07	0.021
L11	60 - 55 (11)	P30x0.375	5.00	0.00	0.0	34.901	-22.67	1311.06	0.017
L12	55 - 50 (12)	P30x0.375	5.00	0.00	0.0	34.901	-26.74	1311.06	0.020
L13	50 - 45 (13)	P30x0.375	5.00	0.00	0.0	34.901	-27.74	1311.06	0.021
L14	45 - 40 (14)	P30x0.375	5.00	0.00	0.0	34.901	-28.77	1311.06	0.022
L15	40 - 39.33 (15)	P30x0.375	0.67	0.00	0.0	34.901	-28.91	1311.06	0.022
L16	39.33 - 39.08 (16)	P30x0.4875	0.25	0.00	0.0	45.199	-28.98	1708.53	0.017
L17	39.08 - 34.08 (17)	P30x0.4875	5.00	0.00	0.0	45.199	-30.16	1708.53	0.018
L18	34.08 - 30 (18)	P30x0.4875	4.08	0.00	0.0	45.199	-31.11	1708.53	0.018
L19	30 - 29.75 (19)	P30x0.5	0.25	0.00	0.0	46.338	-36.05	1751.60	0.021
L20	29.75 - 25 (20)	P30x0.5	4.75	0.00	0.0	46.338	-37.25	1751.60	0.021
L21	25 - 24.75 (21)	P30x0.55625	0.25	0.00	0.0	51.453	-37.35	1944.93	0.019
L22	24.75 - 19.75 (22)	P30x0.55625	5.00	0.00	0.0	51.453	-38.98	1944.93	0.020
L23	19.75 - 18.58 (23)	P30x0.55625	1.17	0.00	0.0	51.453	-39.36	1944.93	0.020
L24	18.58 - 18.33 (24)	P30x0.6875	0.25	0.00	0.0	63.310	-39.48	2393.14	0.016
L25	18.33 - 13.33 (25)	P30x0.6875	5.00	0.00	0.0	63.310	-41.45	2393.14	0.017
L26	13.33 - 8.42 (26)	P30x0.6875	4.91	0.00	0.0	63.310	-43.41	2393.14	0.018
L27	8.42 - 8.07 (27)	P30x1.3	0.35	0.00	0.0	117.21	-43.60	4430.64	0.010
L28	8.07 - 7.83 (28)	P30x1.2	0.24	0.00	0.0	108.57	-43.72	4104.08	0.011
L29	7.83 - 6 (29)	P30x1.2	1.83	0.00	0.0	108.57	-44.63	4104.08	0.011
L30	6 - 5.75 (30)	P30x1.15	0.25	0.00	0.0	104.23	-44.75	3939.90	0.011
L31	5.75 - 2 (31)	P30x1.15	3.75	0.00	0.0	104.23	-46.36	3939.90	0.012
L32	2 - 1.75 (32)	P30x1.6	0.25	0.00	0.0	142.75	-46.51	5396.10	0.009
L33	1.75 - 0 (33)	P30x0.875	1.75	0.00	0.0	80.061	-47.12	3026.33	0.016

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	110 - 105 (1)	P24x0.25	10.37	396.68	0.026	0.00	396.68	0.000
L2	105 - 100 (2)	P24x0.25	36.68	396.68	0.092	0.00	396.68	0.000

Section No.	Elevation ft	Size	M_{ux}	ϕM_{nx}	Ratio	M_{uy}	ϕM_{ny}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L3	100 - 95 (3)	P24x0.25	64.47	396.68	0.163	0.00	396.68	0.000
L4	95 - 90 (4)	P24x0.25	93.71	396.68	0.236	0.00	396.68	0.000
L5	90 - 85 (5)	P24x0.375	151.90	623.72	0.244	0.00	623.72	0.000
L6	85 - 80 (6)	P24x0.375	210.92	623.72	0.338	0.00	623.72	0.000
L7	80 - 75 (7)	P24x0.375	274.81	623.72	0.441	0.00	623.72	0.000
L8	75 - 70 (8)	P24x0.375	353.52	623.72	0.567	0.00	623.72	0.000
L9	70 - 65 (9)	P24x0.375	433.59	623.72	0.695	0.00	623.72	0.000
L10	65 - 60 (10)	P24x0.375	525.64	623.72	0.843	0.00	623.72	0.000
L11	60 - 55 (11)	P30x0.375	621.84	947.86	0.656	0.00	947.86	0.000
L12	55 - 50 (12)	P30x0.375	729.64	947.86	0.770	0.00	947.86	0.000
L13	50 - 45 (13)	P30x0.375	841.33	947.86	0.888	0.00	947.86	0.000
L14	45 - 40 (14)	P30x0.375	954.02	947.86	1.007	0.00	947.86	0.000
L15	40 - 39.33 (15)	P30x0.375	969.20	947.86	1.023	0.00	947.86	0.000
L16	39.33 - 39.08 (16)	P30x0.4875	974.87	1273.78	0.765	0.00	1273.78	0.000
L17	39.08 - 34.08 (17)	P30x0.4875	1088.79	1273.78	0.855	0.00	1273.78	0.000
L18	34.08 - 30 (18)	P30x0.4875	1184.75	1273.78	0.930	0.00	1273.78	0.000
L19	30 - 29.75 (19)	P30x0.5	1190.72	1311.10	0.908	0.00	1311.10	0.000
L20	29.75 - 25 (20)	P30x0.5	1304.65	1311.10	0.995	0.00	1311.10	0.000
L21	25 - 24.75 (21)	P30x0.55625	1310.67	1481.77	0.885	0.00	1481.77	0.000
L22	24.75 - 19.75 (22)	P30x0.55625	1432.03	1481.77	0.966	0.00	1481.77	0.000
L23	19.75 - 18.58 (23)	P30x0.55625	1460.75	1481.77	0.986	0.00	1481.77	0.000
L24	18.58 - 18.33 (24)	P30x0.6875	1466.90	1861.09	0.788	0.00	1861.09	0.000
L25	18.33 - 13.33 (25)	P30x0.6875	1591.10	1861.09	0.855	0.00	1861.09	0.000
L26	13.33 - 8.42 (26)	P30x0.6875	1715.20	1861.09	0.922	0.00	1861.09	0.000
L27	8.42 - 8.07 (27)	P30x1.3	1724.13	3375.32	0.511	0.00	3375.32	0.000
L28	8.07 - 7.83 (28)	P30x1.2	1730.26	3137.10	0.552	0.00	3137.10	0.000
L29	7.83 - 6 (29)	P30x1.2	1777.21	3137.10	0.567	0.00	3137.10	0.000
L30	6 - 5.75 (30)	P30x1.15	1783.65	3016.68	0.591	0.00	3016.68	0.000
L31	5.75 - 2 (31)	P30x1.15	1880.96	3016.68	0.624	0.00	3016.68	0.000
L32	2 - 1.75 (32)	P30x1.6	1887.49	4069.37	0.464	0.00	4069.37	0.000
L33	1.75 - 0 (33)	P30x0.875	1933.33	2338.73	0.827	0.00	2338.73	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	ϕV_n	Ratio	Actual	ϕT_n	Ratio
			V_u K	K	$\frac{V_u}{\phi V_n}$	T_u kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	110 - 105 (1)	P24x0.25	4.03	201.86	0.020	0.00	324.23	0.000
L2	105 - 100 (2)	P24x0.25	5.41	201.86	0.027	0.00	324.23	0.000
L3	100 - 95 (3)	P24x0.25	5.71	201.86	0.028	0.00	324.23	0.000
L4	95 - 90 (4)	P24x0.25	5.99	201.86	0.030	0.00	324.23	0.000
L5	90 - 85 (5)	P24x0.375	11.64	315.62	0.037	0.08	655.57	0.000
L6	85 - 80 (6)	P24x0.375	11.96	315.62	0.038	0.08	655.57	0.000
L7	80 - 75 (7)	P24x0.375	15.59	315.62	0.049	0.08	655.57	0.000
L8	75 - 70 (8)	P24x0.375	15.88	315.62	0.050	0.08	655.57	0.000
L9	70 - 65 (9)	P24x0.375	16.14	315.62	0.051	0.08	655.57	0.000
L10	65 - 60 (10)	P24x0.375	19.10	315.62	0.061	0.29	655.57	0.000
L11	60 - 55 (11)	P30x0.375	19.39	395.78	0.049	0.29	994.73	0.000
L12	55 - 50 (12)	P30x0.375	22.24	395.78	0.056	0.39	994.73	0.000
L13	50 - 45 (13)	P30x0.375	22.46	395.78	0.057	0.39	994.73	0.000
L14	45 - 40 (14)	P30x0.375	22.65	395.78	0.057	0.39	994.73	0.000
L15	40 - 39.33	P30x0.375	22.67	395.78	0.057	0.39	994.73	0.000

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 $\frac{T_u}{\phi T_n}$
L16	(15) 39.33 - 39.08	P30x0.4875	22.68	512.56	0.044	0.39	1329.93	0.000
L17	(16) 39.08 - 34.08	P30x0.4875	22.91	512.56	0.045	0.39	1329.93	0.000
L18	(17) 34.08 - 30	P30x0.4875	23.78	512.56	0.046	0.47	1329.93	0.000
L19	(18) 30 - 29.75	P30x0.5	23.94	525.48	0.046	0.46	1362.88	0.000
L20	(19) 29.75 - 25	P30x0.5	24.07	525.48	0.046	0.46	1362.88	0.000
L21	(20) 25 - 24.75	P30x0.55625	24.07	583.48	0.041	0.46	1510.43	0.000
L22	(21) 24.75 - 19.75	P30x0.55625	24.52	583.48	0.042	0.45	1510.43	0.000
L23	(22) 19.75 - 18.58	P30x0.55625	24.63	583.48	0.042	0.45	1510.43	0.000
L24	(23) 18.58 - 18.33	P30x0.6875	24.63	717.94	0.034	0.44	1850.21	0.000
L25	(24) 18.33 - 13.33	P30x0.6875	25.09	717.94	0.035	0.44	1850.21	0.000
L26	(25) 13.33 - 8.42	P30x0.6875	25.52	717.94	0.036	0.43	1850.21	0.000
L27	(26) 8.42 - 8.07	P30x1.3	25.53	1329.19	0.019	0.43	3353.90	0.000
L28	(27) 8.07 - 7.83	P30x1.2	25.56	1231.22	0.021	0.43	3117.52	0.000
L29	(28) 7.83 - 6 (29)	P30x1.2	25.80	1231.22	0.021	0.43	3117.52	0.000
L30	(30) 6 - 5.75 (30)	P30x1.15	25.79	1181.97	0.022	0.43	2998.00	0.000
L31	(31) 5.75 - 2 (31)	P30x1.15	26.14	1181.97	0.022	0.42	2998.00	0.000
L32	(32) 2 - 1.75 (32)	P30x1.6	26.14	1618.83	0.016	0.42	4042.03	0.000
L33	(33) 1.75 - 0 (33)	P30x0.875	26.29	907.90	0.029	0.42	2324.78	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	110 - 105 (1)	0.006	0.026	0.000	0.020	0.000	0.032	1.050	4.8.2
L2	105 - 100 (2)	0.008	0.092	0.000	0.027	0.000	0.101	1.050	4.8.2
L3	100 - 95 (3)	0.009	0.163	0.000	0.028	0.000	0.172	1.050	4.8.2
L4	95 - 90 (4)	0.009	0.236	0.000	0.030	0.000	0.246	1.050	4.8.2
L5	90 - 85 (5)	0.011	0.244	0.000	0.037	0.000	0.255	1.050	4.8.2
L6	85 - 80 (6)	0.011	0.338	0.000	0.038	0.000	0.351	1.050	4.8.2
L7	80 - 75 (7)	0.015	0.441	0.000	0.049	0.000	0.458	1.050	4.8.2
L8	75 - 70 (8)	0.016	0.567	0.000	0.050	0.000	0.585	1.050	4.8.2
L9	70 - 65 (9)	0.017	0.695	0.000	0.051	0.000	0.715	1.050	4.8.2
L10	65 - 60 (10)	0.021	0.843	0.000	0.061	0.000	0.867	1.050	4.8.2
L11	60 - 55 (11)	0.017	0.656	0.000	0.049	0.000	0.676	1.050	4.8.2
L12	55 - 50 (12)	0.020	0.770	0.000	0.056	0.000	0.793	1.050	4.8.2
L13	50 - 45 (13)	0.021	0.888	0.000	0.057	0.000	0.912	1.050	4.8.2
L14	45 - 40 (14)	0.022	1.007	0.000	0.057	0.000	1.032	1.050	4.8.2
L15	40 - 39.33 (15)	0.022	1.023	0.000	0.057	0.000	1.048	1.050	4.8.2
L16	39.33 - 39.08 (16)	0.017	0.765	0.000	0.044	0.000	0.784	1.050	4.8.2
L17	39.08 - 34.08 (17)	0.018	0.855	0.000	0.045	0.000	0.874	1.050	4.8.2
L18	34.08 - 30 (18)	0.018	0.930	0.000	0.046	0.000	0.951	1.050	4.8.2
L19	30 - 29.75 (19)	0.021	0.908	0.000	0.046	0.000	0.931	1.050	4.8.2
L20	29.75 - 25 (20)	0.021	0.995	0.000	0.046	0.000	1.018	1.050	4.8.2
L21	25 - 24.75 (21)	0.019	0.885	0.000	0.041	0.000	0.905	1.050	4.8.2

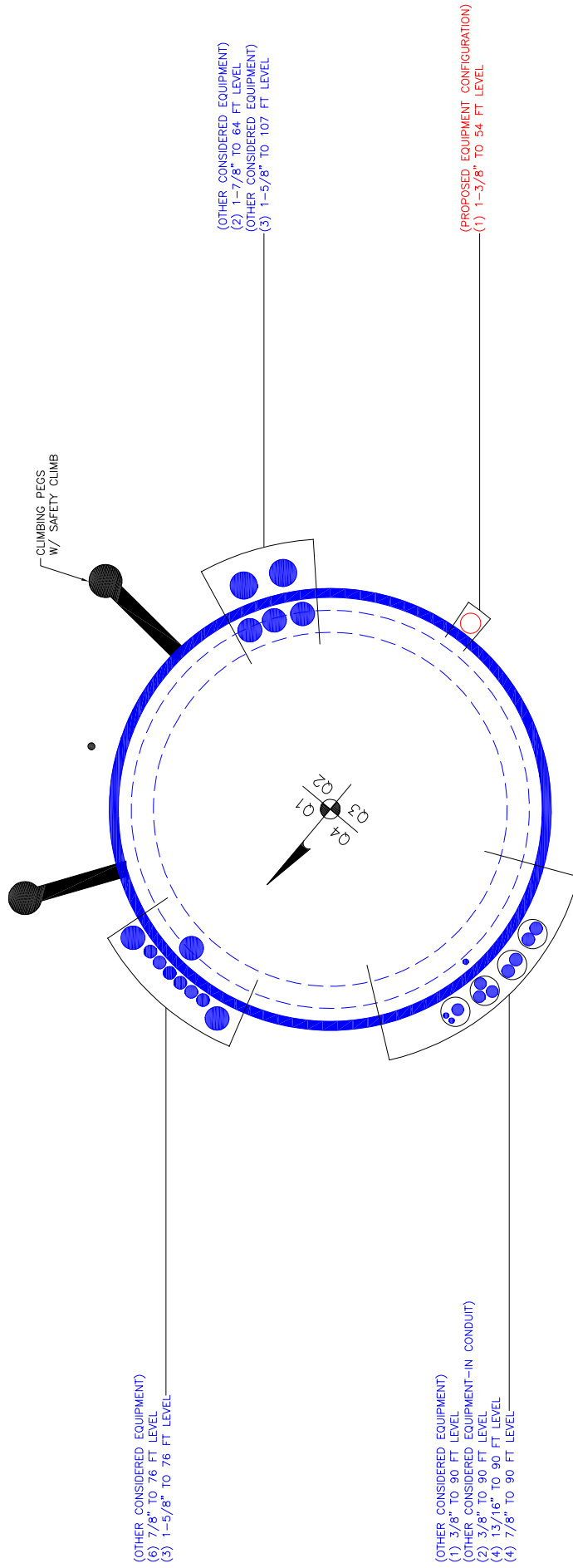
Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
L22	24.75 - 19.75 (22)	0.020	0.966	0.000	0.042	0.000	0.988	1.050	4.8.2
L23	19.75 - 18.58 (23)	0.020	0.986	0.000	0.042	0.000	1.008	1.050	4.8.2
L24	18.58 - 18.33 (24)	0.016	0.788	0.000	0.034	0.000	0.806	1.050	4.8.2
L25	18.33 - 13.33 (25)	0.017	0.855	0.000	0.035	0.000	0.873	1.050	4.8.2
L26	13.33 - 8.42 (26)	0.018	0.922	0.000	0.036	0.000	0.941	1.050	4.8.2
L27	8.42 - 8.07 (27)	0.010	0.511	0.000	0.019	0.000	0.521	1.050	4.8.2
L28	8.07 - 7.83 (28)	0.011	0.552	0.000	0.021	0.000	0.563	1.050	4.8.2
L29	7.83 - 6 (29)	0.011	0.567	0.000	0.021	0.000	0.578	1.050	4.8.2
L30	6 - 5.75 (30)	0.011	0.591	0.000	0.022	0.000	0.603	1.050	4.8.2
L31	5.75 - 2 (31)	0.012	0.624	0.000	0.022	0.000	0.636	1.050	4.8.2
L32	2 - 1.75 (32)	0.009	0.464	0.000	0.016	0.000	0.473	1.050	4.8.2
L33	1.75 - 0 (33)	0.016	0.827	0.000	0.029	0.000	0.843	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	110 - 105	Pole	P24x0.25	1	-3.79	695.38	3.1	Pass	
L2	105 - 100	Pole	P24x0.25	2	-5.26	695.38	9.6	Pass	
L3	100 - 95	Pole	P24x0.25	3	-5.67	695.38	16.4	Pass	
L4	95 - 90	Pole	P24x0.25	4	-6.08	695.38	23.5	Pass	
L5	90 - 85	Pole	P24x0.375	5	-11.06	1104.67	24.3	Pass	
L6	85 - 80	Pole	P24x0.375	6	-11.72	1104.67	33.4	Pass	
L7	80 - 75	Pole	P24x0.375	7	-16.22	1104.67	43.7	Pass	
L8	75 - 70	Pole	P24x0.375	8	-16.97	1104.67	55.8	Pass	
L9	70 - 65	Pole	P24x0.375	9	-17.75	1104.67	68.1	Pass	
L10	65 - 60	Pole	P24x0.375	10	-21.72	1104.67	82.6	Pass	
L11	60 - 55	Pole	P30x0.375	11	-22.67	1376.61	64.4	Pass	
L12	55 - 50	Pole	P30x0.375	12	-26.74	1376.61	75.6	Pass	
L13	50 - 45	Pole	P30x0.375	13	-27.74	1376.61	86.9	Pass	
L14	45 - 40	Pole	P30x0.375	14	-28.77	1376.61	98.3	Pass	
L15	40 - 39.33	Pole	P30x0.375	15	-28.91	1376.61	99.8	Pass	
L16	39.33 - 39.08	Pole	P30x0.4875	16	-28.98	1793.96	74.7	Pass	
L17	39.08 - 34.08	Pole	P30x0.4875	17	-30.16	1793.96	83.3	Pass	
L18	34.08 - 30	Pole	P30x0.4875	18	-31.11	1793.96	90.5	Pass	
L19	30 - 29.75	Pole	P30x0.5	19	-36.05	1839.18	88.7	Pass	
L20	29.75 - 25	Pole	P30x0.5	20	-37.25	1839.18	97.0	Pass	
L21	25 - 24.75	Pole	P30x0.55625	21	-37.35	2042.18	86.2	Pass	
L22	24.75 - 19.75	Pole	P30x0.55625	22	-38.98	2042.18	94.1	Pass	
L23	19.75 - 18.58	Pole	P30x0.55625	23	-39.36	2042.18	96.0	Pass	
L24	18.58 - 18.33	Pole	P30x0.6875	24	-39.48	2512.80	76.8	Pass	
L25	18.33 - 13.33	Pole	P30x0.6875	25	-41.45	2512.80	83.2	Pass	
L26	13.33 - 8.42	Pole	P30x0.6875	26	-43.41	2512.80	89.6	Pass	
L27	8.42 - 8.07	Pole	P30x1.3	27	-43.60	4652.17	49.6	Pass	
L28	8.07 - 7.83	Pole	P30x1.2	28	-43.72	4309.28	53.6	Pass	
L29	7.83 - 6	Pole	P30x1.2	29	-44.63	4309.28	55.0	Pass	
L30	6 - 5.75	Pole	P30x1.15	30	-44.75	4136.89	57.4	Pass	
L31	5.75 - 2	Pole	P30x1.15	31	-46.36	4136.89	60.6	Pass	
L32	2 - 1.75	Pole	P30x1.6	32	-46.51	5665.90	45.0	Pass	
L33	1.75 - 0	Pole	P30x0.875	33	-47.12	3177.65	80.3	Pass	
							Summary		
							Pole (L15)	99.8	Pass
							RATING =	99.8	Pass

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	110	20		0	24	24	0.25		A53-B-42
2	90	30		0	24.00	24	0.375		A53-B-42
3	60	30		0	30.00	30	0.375		A53-B-42
4	30	30		0	30.00	30	0.5		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	8.08	plate	MP3-05 (Bottom Weld)	4	45	135	225	315														
2	30	39.33	channel	MP3-03 (1.1875in)	3					105	225	345											
3	8.42	18.58	channel	MP3-05 (1.1875in)	3								0	90	270								
4	0	2	plate	TS 7"x1.25"	3										110	248	345						
5	6	25	plate	CCI-SFP-045100	4													70	110	250	290		
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	5.33	2.09	11.1397	1.045	Welded	n/a	PC 8.8 - M20 (100)	29.000	18.000	8.527	1.1875	A572-65
2	4.06	1.57	2.92	0.59	PC 8.8 - M20 (100)	14	PC 8.8 - M20 (100)	14.000	18.000	2.545	1.1875	A572-65
3	5.33	2.09	5.65	0.79	PC 8.8 - M20 (100)	29	PC 8.8 - M20 (100)	29.000	18.000	5.025	1.1875	A572-65
4	1.25	7	8.75	3.5	Welded	n/a	Welded	n/a	0.000	8.750	0.0000	A572-65
5	4.5	1	4.5	0.5	PC 8.8 - M20 (100)	18	PC 8.8 - M20 (100)	18.000	20.000	3.250	1.1875	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
MP3-05 (Bottom Weld)	Top	10	N	3	2	-	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	70	None	-	-	-	-	12	0.375	-
TS 7"x1.25"	Top	-	-	-	-	80	None	-	-	-	-	18	0.375	-
	Bottom	-	-	-	-	80	CJP Groove	12.5	0.625	45	0.625	-	-	-

TNX Geometry Input

Increment (ft): [Export to TNX](#)

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	110 - 105	5		0	24.000	24.000	0.25	A53-B-42	1.000
2	105 - 100	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	100 - 95	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	95 - 90	5	0	0	24.000	24.000	0.25	A53-B-42	1.000
5	90 - 85	5		0	24.000	24.000	0.375	A53-B-42	1.000
6	85 - 80	5		0	24.000	24.000	0.375	A53-B-42	1.000
7	80 - 75	5		0	24.000	24.000	0.375	A53-B-42	1.000
8	75 - 70	5		0	24.000	24.000	0.375	A53-B-42	1.000
9	70 - 65	5		0	24.000	24.000	0.375	A53-B-42	1.000
10	65 - 60	5	0	0	24.000	24.000	0.375	A53-B-42	1.000
11	60 - 55	5		0	30.000	30.000	0.375	A53-B-42	1.000
12	55 - 50	5		0	30.000	30.000	0.375	A53-B-42	1.000
13	50 - 45	5		0	30.000	30.000	0.375	A53-B-42	1.000
14	45 - 40	5		0	30.000	30.000	0.375	A53-B-42	1.000
15	40 - 39.33	0.67		0	30.000	30.000	0.375	A53-B-42	1.000
16	39.33 - 39.08	0.25		0	30.000	30.000	0.4875	A53-B-42	0.966
17	39.08 - 34.08	5		0	30.000	30.000	0.4875	A53-B-42	0.966
18	34.08 - 30	4.08	0	0	30.000	30.000	0.4875	A53-B-42	0.966
19	30 - 29.75	0.25		0	30.000	30.000	0.5	A53-B-42	1.000
20	29.75 - 25	4.75		0	30.000	30.000	0.5	A53-B-42	1.000
21	25 - 24.75	0.25		0	30.000	30.000	0.55625	A53-B-42	1.250
22	24.75 - 19.75	5		0	30.000	30.000	0.55625	A53-B-42	1.250
23	19.75 - 18.58	1.17		0	30.000	30.000	0.55625	A53-B-42	1.250
24	18.58 - 18.33	0.25		0	30.000	30.000	0.6875	A53-B-42	1.284
25	18.33 - 13.33	5		0	30.000	30.000	0.6875	A53-B-42	1.284
26	13.33 - 8.42	4.91		0	30.000	30.000	0.6875	A53-B-42	1.284
27	8.42 - 8.07	0.35		0	30.000	30.000	1.3	A53-B-42	0.929
28	8.07 - 7.83	0.24		0	30.000	30.000	1.2	A53-B-42	1.003
29	7.83 - 6	1.83		0	30.000	30.000	1.2	A53-B-42	1.003
30	6 - 5.75	0.25		0	30.000	30.000	1.15	A53-B-42	0.872
31	5.75 - 2	3.75		0	30.000	30.000	1.15	A53-B-42	0.872
32	2 - 1.75	0.25		0	30.000	30.000	1.6	A53-B-42	0.821
33	1.75 - 0	1.75		0	30.000	30.000	0.875	A53-B-42	0.907

TNX Section Forces

Increment (ft):		TNX Output		
	5	P _u	M _{ux} (kip-ft)	V _u
	Section Height (ft)	(K)		(K)
1	110 - 105	3.79	10.37	4.03
2	105 - 100	5.26	36.68	5.41
3	100 - 95	5.67	64.47	5.71
4	95 - 90	6.08	93.71	5.99
5	90 - 85	11.06	151.90	11.64
6	85 - 80	11.72	210.92	11.96
7	80 - 75	16.22	274.81	15.59
8	75 - 70	16.97	353.52	15.88
9	70 - 65	17.75	433.59	16.14
10	65 - 60	21.72	525.64	19.10
11	60 - 55	22.67	621.84	19.39
12	55 - 50	26.74	729.64	22.24
13	50 - 45	27.74	841.33	22.46
14	45 - 40	28.77	954.03	22.65
15	40 - 39.33	28.91	969.20	22.67
16	39.33 - 39.08	28.98	974.86	22.68
17	39.08 - 34.08	30.16	1088.79	22.91
18	34.08 - 30	31.11	1184.75	23.78
19	30 - 29.75	36.05	1190.73	23.94
20	29.75 - 25	37.25	1304.65	24.07
21	25 - 24.75	37.35	1310.66	24.07
22	24.75 - 19.75	38.98	1432.04	24.52
23	19.75 - 18.58	39.36	1460.75	24.63
24	18.58 - 18.33	39.48	1466.90	24.63
25	18.33 - 13.33	41.45	1591.10	25.09
26	13.33 - 8.42	43.41	1715.20	25.52
27	8.42 - 8.07	43.60	1724.13	25.53
28	8.07 - 7.83	43.72	1730.26	25.56
29	7.83 - 6	44.63	1777.21	25.80
30	6 - 5.75	44.75	1783.65	25.79
31	5.75 - 2	46.36	1880.96	26.14
32	2 - 1.75	46.51	1887.49	26.14
33	1.75 - 0	47.12	1933.32	26.29

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
110 - 105	Pole	TP24x24x0.25	Pole	3.1%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	9.6%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	16.4%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	23.5%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	24.3%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	33.4%	Pass
80 - 75	Pole	TP24x24x0.375	Pole	43.7%	Pass
75 - 70	Pole	TP24x24x0.375	Pole	55.8%	Pass
70 - 65	Pole	TP24x24x0.375	Pole	68.1%	Pass
65 - 60	Pole	TP24x24x0.375	Pole	82.6%	Pass
60 - 55	Pole	TP30x30x0.375	Pole	64.4%	Pass
55 - 50	Pole	TP30x30x0.375	Pole	75.6%	Pass
50 - 45	Pole	TP30x30x0.375	Pole	86.9%	Pass
45 - 40	Pole	TP30x30x0.375	Pole	98.3%	Pass
40 - 39.33	Pole	TP30x30x0.375	Pole	99.8%	Pass
39.33 - 39.08	Pole + Reinf.	TP30x30x0.4875	Pole	78.3%	Pass
39.08 - 34.08	Pole + Reinf.	TP30x30x0.4875	Pole	87.3%	Pass
34.08 - 30	Pole + Reinf.	TP30x30x0.4875	Pole	94.9%	Pass
30 - 29.75	Pole	TP30x30x0.5	Pole	88.7%	Pass
29.75 - 25	Pole	TP30x30x0.5	Pole	97.0%	Pass
25 - 24.75	Pole + Reinf.	TP30x30x0.5563	Pole	87.6%	Pass
24.75 - 19.75	Pole + Reinf.	TP30x30x0.5563	Pole	95.6%	Pass
19.75 - 18.58	Pole + Reinf.	TP30x30x0.5563	Pole	97.5%	Pass
18.58 - 18.33	Pole + Reinf.	TP30x30x0.6875	Pole	84.7%	Pass
18.33 - 13.33	Pole + Reinf.	TP30x30x0.6875	Pole	91.8%	Pass
13.33 - 8.42	Pole + Reinf.	TP30x30x0.6875	Pole	98.9%	Pass
8.42 - 8.07	Pole + Reinf.	TP30x30x1.3	Reinf. 1 Bolt Shear	67.6%	Pass
8.07 - 7.83	Pole + Reinf.	TP30x30x1.2	Pole	56.6%	Pass
7.83 - 6	Pole + Reinf.	TP30x30x1.2	Pole	58.1%	Pass
6 - 5.75	Pole + Reinf.	TP30x30x1.15	Reinf. 1 Tension Rupture	66.7%	Pass
5.75 - 2	Pole + Reinf.	TP30x30x1.15	Reinf. 1 Tension Rupture	70.4%	Pass
2 - 1.75	Pole + Reinf.	TP30x30x1.6	Reinf. 4 Weldment	69.0%	Pass
1.75 - 0	Pole + Reinf.	TP30x30x0.875	Pole	88.8%	Pass
				Summary	
			Pole	99.8%	Pass
			Reinforcement	88.5%	Pass
			Overall	99.8%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity*					
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5
110 - 105	1315	n/a	1315	18.65	n/a	18.65	3.1%					
105 - 100	1315	n/a	1315	18.65	n/a	18.65	9.6%					
100 - 95	1315	n/a	1315	18.65	n/a	18.65	16.4%					
95 - 90	1315	n/a	1315	18.65	n/a	18.65	23.5%					
90 - 85	1942	n/a	1942	27.83	n/a	27.83	24.3%					
85 - 80	1942	n/a	1942	27.83	n/a	27.83	33.4%					
80 - 75	1942	n/a	1942	27.83	n/a	27.83	43.7%					
75 - 70	1942	n/a	1942	27.83	n/a	27.83	55.8%					
70 - 65	1942	n/a	1942	27.83	n/a	27.83	68.1%					
65 - 60	1942	n/a	1942	27.83	n/a	27.83	82.6%					
60 - 55	3829	n/a	3829	34.90	n/a	34.90	64.4%					
55 - 50	3829	n/a	3829	34.90	n/a	34.90	75.6%					
50 - 45	3829	n/a	3829	34.90	n/a	34.90	86.9%					
45 - 40	3829	n/a	3829	34.90	n/a	34.90	98.3%					
40 - 39.33	3829	n/a	3829	34.90	n/a	34.90	99.8%					
39.33 - 39.08	3829	1067	4897	34.90	8.76	43.66	78.3%		73.0%			
39.08 - 34.08	3829	1067	4897	34.90	8.76	43.66	87.3%		81.4%			
34.08 - 30	3829	1067	4897	34.90	8.76	43.66	94.9%		88.5%			
30 - 29.75	5042	n/a	5042	46.34	n/a	46.34	88.7%					
29.75 - 25	5042	n/a	5042	46.34	n/a	46.34	97.0%					
25 - 24.75	5042	533	5575	46.34	18.00	64.34	87.6%					68.7%
24.75 - 19.75	5042	533	5575	46.34	18.00	64.34	95.6%					75.0%
19.75 - 18.58	5042	533	5575	46.34	18.00	64.34	97.5%					76.5%
18.58 - 18.33	5098	1801	6899	46.34	34.95	81.29	84.7%			70.0%		63.3%
18.33 - 13.33	5098	1801	6899	46.34	34.95	81.29	91.8%			75.9%		68.6%
13.33 - 8.42	5098	1801	6899	46.34	34.95	81.29	98.9%			81.8%		73.9%
8.42 - 8.07	5042	7152	12194	46.34	62.56	108.90	52.6%	67.6%				51.0%
8.07 - 7.83	5042	6329	11372	46.34	62.56	108.90	56.6%	55.6%				51.2%
7.83 - 6	5042	6329	11372	46.34	62.56	108.90	58.1%	57.1%				52.6%
6 - 5.75	5042	5797	10839	46.34	44.56	90.90	61.3%	66.7%				
5.75 - 2	5042	5797	10839	46.34	44.56	90.90	64.6%	70.4%				
2 - 1.75	5049	9515	14564	46.34	70.81	117.15	49.7%	52.8%			69.0%	
1.75 - 0	5049	3377	8426	46.34	26.25	72.59	88.8%				79.4%	

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

Monopole Flange Plate Connection

Elevation = 90 ft.



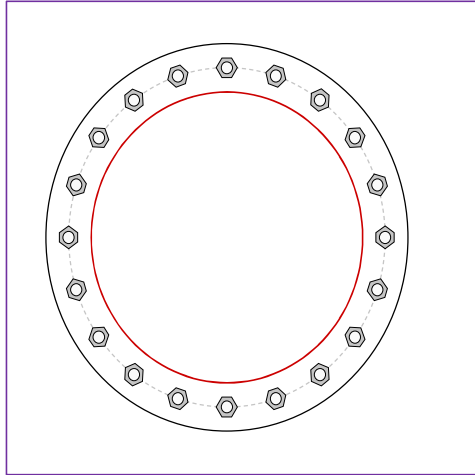
BU #	876325
Site Name	WESTON SQUARE
Order #	556614 Rev. 0

Applied Loads	
Moment (kip-ft)	93.71
Axial Force (kips)	6.08
Shear Force (kips)	5.99

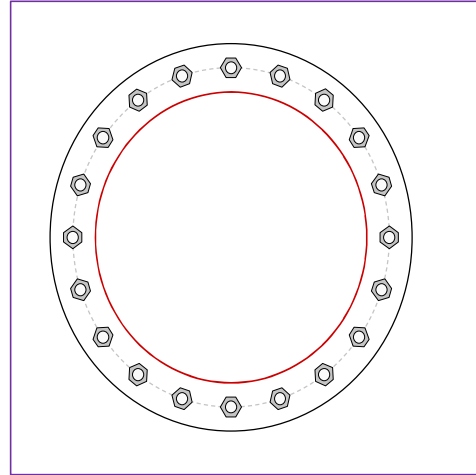
TIA-222 Revision	H
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*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(20) 1" \varnothing bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 28" BC

Top Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.25" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	7.72
Allowable (kips)	54.54
Stress Rating:	13.5% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Rohn OK
Tension Side Stress Rating:	Rohn OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Rohn OK
Tension Side Stress Rating:	Rohn OK

Monopole Flange Plate Connection

Elevation = 60 ft.



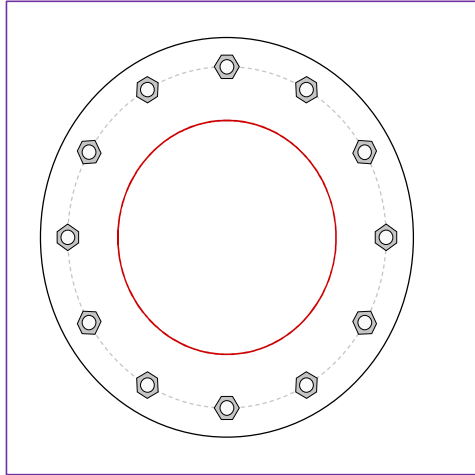
BU #	876325
Site Name	WESTON SQUARE
Order #	556614 Rev. 0

Applied Loads	
Moment (kip-ft)	525.64
Axial Force (kips)	21.72
Shear Force (kips)	19.10

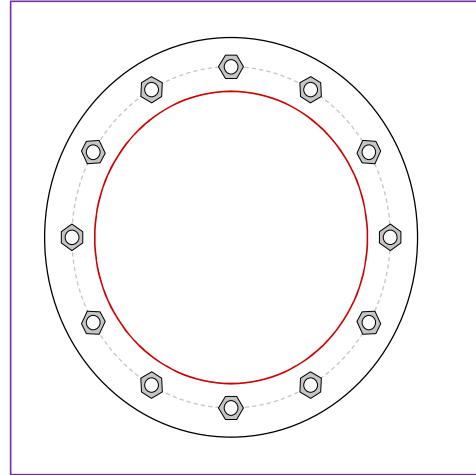
TIA-222 Revision	H
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*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1-1/2" ϕ bolts (A325 N; Fy=81 ksi, Fu=120 ksi) on 35" BC

Top Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	58.22
Allowable (kips)	126.87
Stress Rating:	43.7% Pass

Top Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Rohn OK
Tension Side Stress Rating:	Rohn OK

Bottom Plate Capacity

Max Stress (ksi):	-
Allowable Stress (ksi):	-
Stress Rating:	Rohn OK
Tension Side Stress Rating:	Rohn OK

Monopole Flange Plate Connection

Elevation = 30 ft.



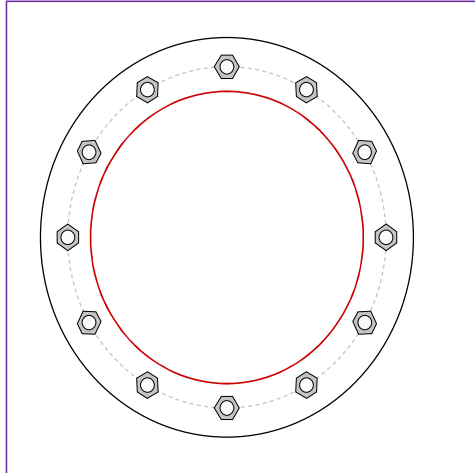
BU #	876325
Site Name	WESTON SQUARE
Order #	556614 Rev. 0

TIA-222 Revision	H
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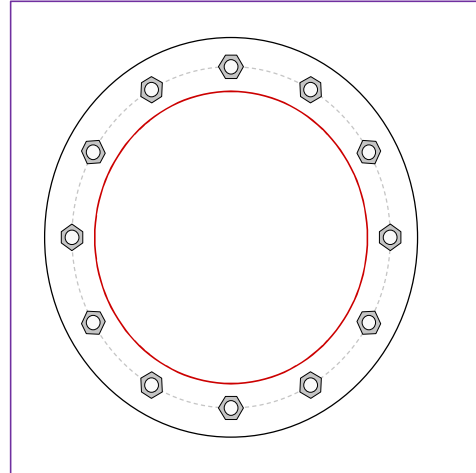
Applied Loads to Flange Connections		Applied Loads to Bridge Stiffeners	
Moment (kip-ft)	262.17	Moment (kip-ft)	922.57
Axial Force (kips)	31.11	Axial Force (kips)	0.00
Shear Force (kips)	23.78	Shear Force (kips)	0.00

*TIA-222-H Section 15.5 Applied

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(12) 1-1/2" ϕ bolts (A325 N; Fy=81 ksi, Fu=120 ksi) on 35" BC

Top Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Top Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bridge Stiffener Group 1 Data

(3) Welded, 5"x1.25", A572-65, Lu=4.125", Upper Plate Width=11", Lower Plate Width=11", Neglect Flange in MOI: No

Bottom Plate Data

41" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

30" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bridge Stiffener Group 2 Data

(3) Bolted, 6.25"x1", A572-65, Lu=20", Neglect Flange in MOI: No

Analysis Results

Bolt Capacity

Max Load (kips)	27.35
Allowable (kips)	126.86
Stress Rating:	20.5% Pass

Top Plate Capacity

Max Stress (ksi):	6.66	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	19.6%	Pass
Tension Side Stress Rating:	6.2%	Pass

Bridge Stiffener Group 1 Analysis Capacity

Max Compression (kip):	178.35	
Max Tension (kip):	178.35	
Comp. Capacity (kip):	361.11	
Tens. Capacity (kip):	365.63	(Yield)
Comp. Stress Rating:	47.0%	Pass
Tens. Stress Rating:	46.5%	Pass

Bottom Plate Capacity

Max Stress (ksi):	6.66	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	19.6%	Pass
Tension Side Stress Rating:	6.2%	Pass

Bridge Stiffener Group 2 Analysis Capacity

Max Compression (kip):	155.58	
Max Tension (kip):	155.58	
Comp. Capacity (kip):	231.68	
Tens. Capacity (kip):	300.00	(Rupture)
Comp. Stress Rating:	64.0%	Pass
Tens. Stress Rating:	49.4%	Pass

Welded Bridge Stiffener Design

Elevation = 30 ft.

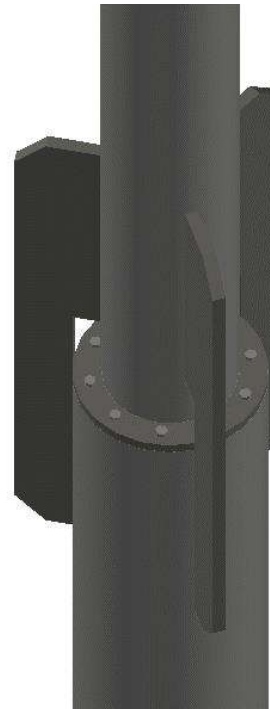
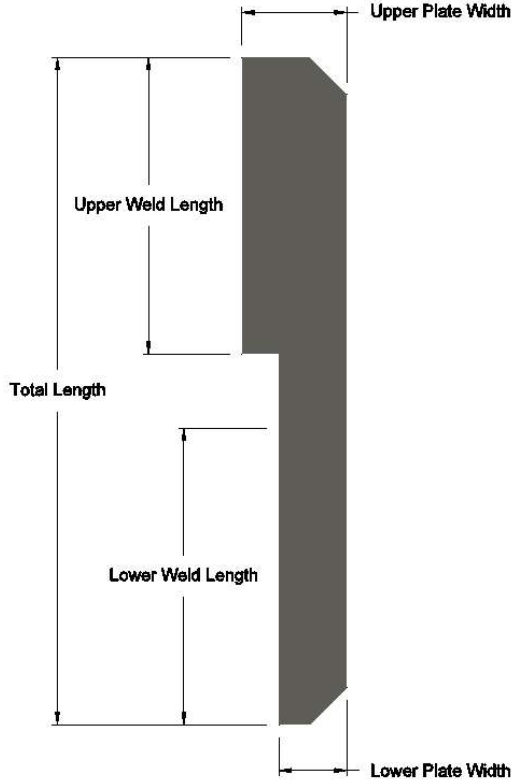


BU #	876325
Site Name	WESTON SQUARE
Order #	556614 Rev. 0

Applied Loads to Design Groups	
Moment (kip-ft)	523.90
Axial Force (kips)	0.00
Shear Force (kips)	0.00

TIA-222 Revision	H
------------------	---

*TIA-222-H Section 15.5 Applied



Design Properties

Bridge Stiffener Group 1 Data

(3) Welded, 5"x1.25", A572-65, Lu=4.125", Upper Plate Width=11", Lower Plate Width=11", Neglect Flange in MOI: No

Total Length:	72 in	Upper Weld Size:	Good
Weld Type:	Fillet (both sides)	Upper Weld Rating:	31.65%
Weld Size:	0.375 in	Lower Weld Size:	Good
Exx:	80 ksi	Lower Weld Rating:	33.72%
Upper Weld Length:	34.75 in	Top Plate Lateral-Torsional Buckling Rating:	7.16%
Upper Plate Width:	11 in	Top Plate Tension Yield Rating:	10.03%
Lower Weld Length:	33.125 in	Top Plate Tension Rupture Rating:	10.86%
Lower Plate Width:	11 in	Top Plate Interaction Rating:	8.40%
Stiffener Front EPA (No Ice):	6.74 ft ²	Bottom Plate Lateral-Torsional Buckling Rating:	7.84%
Stiffener Side EPA (No Ice):	1.25 ft ²	Bottom Plate Tension Yield Rating:	10.52%
Stiffener Front EPA (1/2" Ice):	7.13 ft ²	Bottom Plate Tension Rupture Rating:	11.39%
Stiffener Side EPA (1/2" Ice):	2.28 ft ²	Bottom Plate Interaction Rating:	9.21%
Stiffener Weight (No Ice):	0.249 kip	Top Pole Punching Shear Rating:	25.30%
Stiffener Weight (1/2" Ice):	0.275 kip	Bottom Pole Punching Shear Rating:	20.89%

Monopole Base Plate Connection

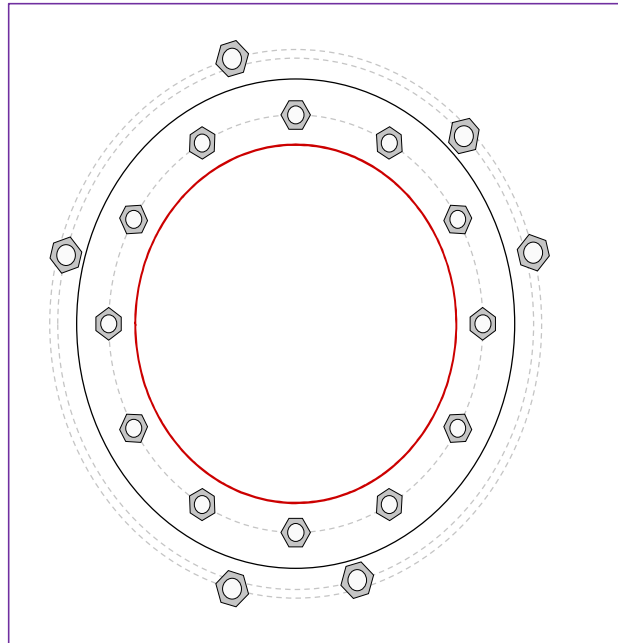


Site Info	
BU #	876325
Site Name	WESTON SQUARE
Order #	556614 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
l_{ar} (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	1933.32
Axial Force (kips)	47.12
Shear Force (kips)	26.29

*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data

GROUP 1: (12) 1-1/2" ϕ bolts (A354-BC N; $F_y=109$ ksi, $F_u=125$ ksi) on 35" BC
 GROUP 2: (3) 1-3/4" ϕ bolts (A722 N; $F_y=120$ ksi, $F_u=125$ ksi) on 44.5" BC
 GROUP 3: (3) 1-3/4" ϕ bolts (A193 Gr. B7 N; $F_y=105$ ksi, $F_u=125$ ksi) on 46" BC
pos. (deg): 15, 105, 255

Base Plate Data

41" OD x 2" Plate (A36; $F_y=36$ ksi, $F_u=58$ ksi)

Stiffener Data

N/A

Pole Data

30" x 0.5" round pole (A53-B-42; $F_y=42$ ksi, $F_u=63$ ksi)

Anchor Rod Summary			<i>(units of kips, kip-in)</i>
GROUP 1:			
$P_{u,t} = 102.41$	$\phi P_{n,t} = 132.19$	Stress Rating	
$V_u = 2.19$	$\phi V_n = 82.83$	73.8%	
$M_u = n/a$	$\phi M_n = n/a$	Pass	
GROUP 2:			
$P_{u,t} = 248.76$	$\phi P_{n,t} = 243.75$	Stress Rating	
$V_u = 0$	$\phi V_n = 121.88$	99.2%	
$M_u = 0$	$\phi M_n = 108.42$	Pass	
GROUP 3:			
$P_{u,t} = 171.92$	$\phi P_{n,t} = 178.13$	Stress Rating	
$V_u = 0$	$\phi V_n = 112.75$	91.9%	
$M_u = n/a$	$\phi M_n = n/a$	Pass	

Base Plate Summary		
Max Stress (ksi):	22.63	(Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	66.5%	Pass

CClplate

Elevation (ft) 0 (Base)

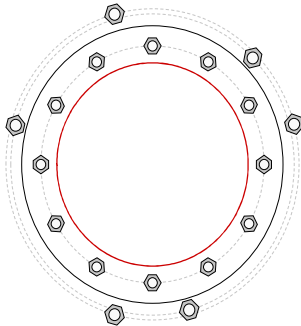
note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	No	No	No	No	No	
3	No	No	No	No	No	

Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, η :	I_{br} (in):	Thread Type	Area Override, in ²	Tension Only
1	1	0	1.5	A354-BC	35	0.5	0.75	N-Included		No
2	1	30	1.5	A354-BC	35	0.5	0.75	N-Included		No
3	1	60	1.5	A354-BC	35	0.5	0.75	N-Included		No
4	1	90	1.5	A354-BC	35	0.5	0.75	N-Included		No
5	1	120	1.5	A354-BC	35	0.5	0.75	N-Included		No
6	1	150	1.5	A354-BC	35	0.5	0.75	N-Included		No
7	1	180	1.5	A354-BC	35	0.5	0.75	N-Included		No
8	1	210	1.5	A354-BC	35	0.5	0.75	N-Included		No
9	1	240	1.5	A354-BC	35	0.5	0.75	N-Included		No
10	1	270	1.5	A354-BC	35	0.5	0.75	N-Included		No
11	1	300	1.5	A354-BC	35	0.5	0.75	N-Included		No
12	1	330	1.5	A354-BC	35	0.5	0.75	N-Included		No
13	2	45	1.75	A722	44.5	0.5	2	N-Included	2.6	No
14	2	165	1.75	A722	44.5	0.5	2	N-Included	2.6	No
15	2	285	1.75	A722	44.5	0.5	2	N-Included	2.6	No
16	3	15	1.75	A193 Gr. B7	46	0.5	1	N-Included		No
17	3	105	1.75	A193 Gr. B7	46	0.5	1	N-Included		No
18	3	255	1.75	A193 Gr. B7	46	0.5	1	N-Included		No

Plot Graphic



Drilled Pier Foundation

BU # :	876325
Site Name:	WESTON SQUARE
Order Number:	556614 Rev. 0
TIA-222 Revision:	H
Tower Type:	Monopole

Report File: C:\Users\uea06854\Documents\BVM\Work\CC11876325\876325_2018292 - TSA\Structural\87632



Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A:	<input type="checkbox"/>
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Shear Design Options	<input checked="" type="checkbox"/>
Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input checked="" type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

[Go to Soil Calculations](#)

Soil Lateral Check			Analysis Results		
	Compression	Uplift		Compression	Uplift
D _{ult} (ft from TOC)	8.94	-			
Soil Safety Factor	5.23	-			
Max Moment (kip-ft)	2125.54	-			
Rating*	24.2%	-			
Soil Vertical Check			Uplift		
Skin Friction (kips)	395.02	-			
End Bearing (kips)	135.00	-			
Weight of Concrete (kips)	100.17	-			
Total Capacity (kips)	530.01	-			
Axial (kips)	147.32	-			
Rating*	26.5%	-			
Reinforced Concrete Flexure			Uplift		
Critical Depth (ft from TOC)	8.64	-			
Critical Moment (kip-ft)	2125.29	-			
Critical Moment Capacity	2195.17	-			
Rating*	92.2%	-			
Reinforced Concrete Shear			Uplift		
Critical Depth (ft from TOC)	23.12	-			
Critical Shear (kip)	185.18	-			
Critical Shear Capacity	1008.00	-			
Rating*	17.5%	-			

Shear-Friction Methodology is Applied

Structural Foundation Rating*	92.2%
Soil Interaction Rating*	26.5%

*Rating per TIA-222-H Section 15.5

Material Properties	
Concrete Strength, f _c :	3 ksi
Rebar Strength, F _y :	60 ksi
Tie Yield Strength, F _y :	60 ksi

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

Pier Design Data	
Depth	37 ft
Ext. Above Grade	0.5 ft
Pier Section 1	
<i>From 0.5' above grade to 24.67' below grade</i>	
Pier Diameter	16
Rebar Quantity	9
Rebar Size	3 in
Clear Cover to Ties	4
Tie Spacing	12 in
Rebar Quantity	3
Rebar Size	10
Pier Section 2	
<i>From 24.67' below grade to 37' below grade</i>	
Pier Diameter	5 ft
Rebar Quantity	16
Rebar Size	9
Clear Cover to Ties	3 in
Tie Size	4
Tie Spacing	12 in

Soil Profile

of Layers 8

Groundwater Depth 15

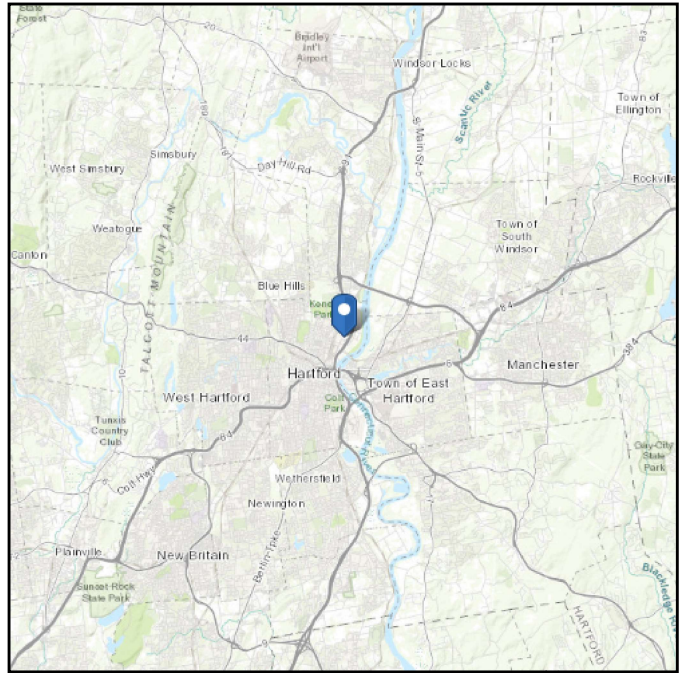
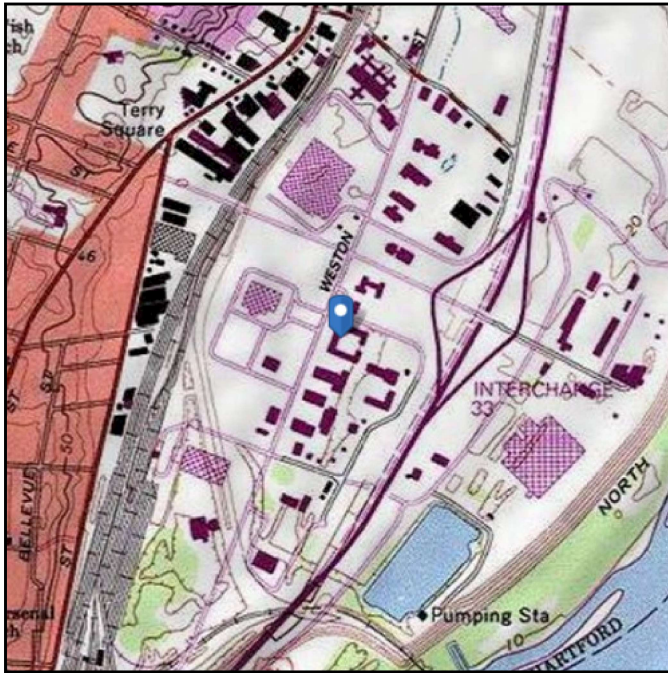
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	V _{soil} (pcf)	V _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	3.33	1.33	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.33	6	2.67	110	150	0	30	0.000	0.000	0.00	0.00			Cohesionless
4	6	13	7	110	150	0.75	0	0.413	0.413	0.40	0.40			Cohesive
5	13	15	2	105	150	0	30	0.000	0.000	1.70	1.70			Cohesionless
6	15	28	13	52.6	87.6	0	32	0.000	0.000	1.70	1.70			Cohesionless
7	28	33	5	37.6	87.6	0.75	0	0.41	0.41	0.39	0.39			Cohesive
8	33	37	4	57.6	87.6	1.5	0	0.83	0.83	0.79	0.79	9.167		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 10.46 ft (NAVD 88)
Latitude: 41.78675
Longitude: -72.662339



Wind

Results:

Wind Speed:	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue Oct 05 2021

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 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

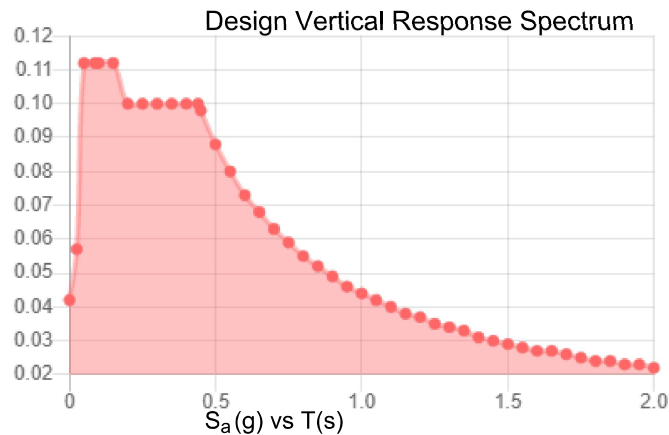
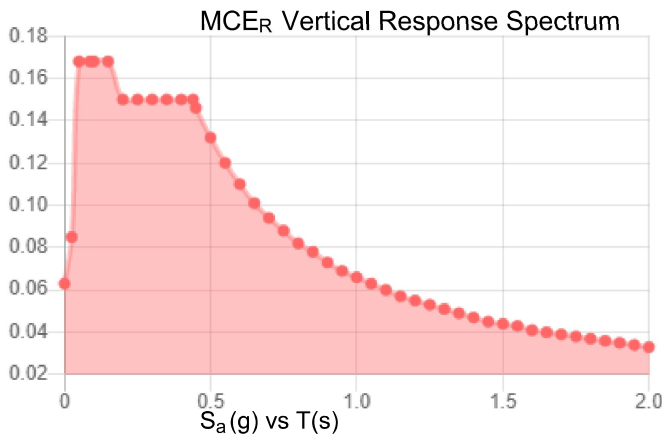
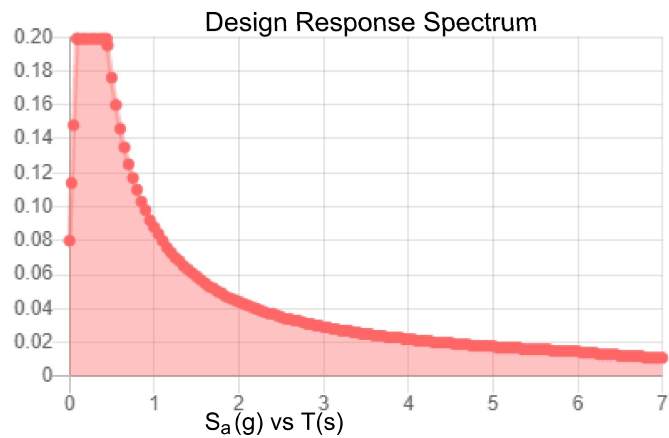
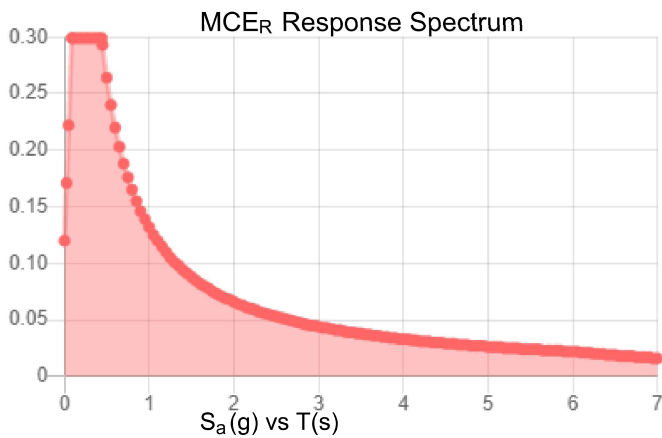
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.187	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.1
F_v :	2.4	PGA _M :	0.161
S_{MS} :	0.299	F_{PGA} :	1.599
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.199	C_v :	0.7

Seismic Design Category B



Data Accessed:

Tue Oct 05 2021

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.50 in.
Concurrent Temperature: 5 F
Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Tue Oct 05 2021

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 500-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.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Exhibit E

Mount Analysis

Date: **September 15, 2021**



Kimley-Horn and Associates, Inc.
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000
CrownMounts@kimley-horn.com

Subject: Mount Analysis - Conditional Passing Report

Carrier Designation: DISH Equipment Change-Out
Carrier Site Number: BOBDL00079A
Carrier Site Name: CT-CCI-T-876325

Crown Castle Designation: **BU Number:** 876325
Site Name: Weston Square
JDE Job Number: 659969
Order Number: 556614, Rev. 0

Engineering Firm Designation: Kimley-Horn Project Number: 019558056

Site Data: 92 Weston Street , Hartford, Hartford County, CT 06103
Latitude 41° 47' 12.30" Longitude -72° 39' 44.42"

Structure Information: **Tower Height & Type:** 110 ft Monopole
Mount Elevation: 54 ft
Mount Type: 8 ft Platform w/ Support Rails

Kimley-Horn is pleased to submit this “**Mount Analysis - Conditional Passing Report**” to determine the structural integrity of DISH’s antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

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:

Platform w/ Support Rails **Sufficient**
* See Section 4.1 for loading and structural modifications required for the mount to support the loading listed in Table 1.

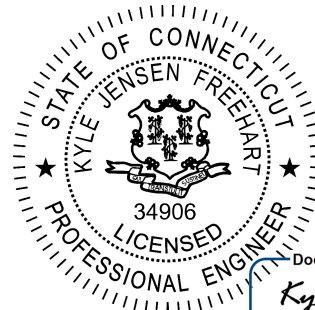
This analysis utilizes an ultimate 3-second gust wind speed of 122 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Jeffery Rahming

Respectfully Submitted by:

Kyle Freehart, P.E.

Lic. #PEN.0034906, Exp. 01/31/2022
Kimley-Horn and Associates, Inc. COA #PEC.0000738



DocuSigned by:
Kyle Freehart
D8BEE252A3804C1...

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Additional Calculations

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Supplemental Drawings

8 ft Platform w/ Support Rails Mount Analysis - Conditional Passing
Order 556614, Rev. 0**1) INTRODUCTION**

The mounting configuration consists of a proposed 8 ft Platform w/ Support Rails designed by CommScope.

2) ANALYSIS CRITERIA

Building Code:	2018 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	122 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	2 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

Elevation (ft)		Antennas			Mount / Modification Details
Mount	Centerline	#	Manufacturer	Model	
54	54	3	Fujitsu	TA08025-B604	Proposed 8 ft Platform w/ Support Rails designed by CommScope
		3	Fujitsu	TA08025-B605	
		3	Jma wireless	MX08FRO665-21	
		1	Raycap	RDIDC-9181-PF-48	

3) ANALYSIS PROCEDURE**Table 2 – Documents Provided**

Document	Remarks	Reference	Source
Structural Analysis	Black & Veatch	9804567	CCIsites

3.1) Analysis Method

RISA-3D (version 17.02.00), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A proprietary tool internally developed by Kimley-Horn was used to calculate wind loading on all appurtenances, dishes and mount members for various load cases. Selected output from the analysis is included in Appendix B.

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

3.2) Assumptions

- 1) The antenna mounting system (including any considered modifications) was properly fabricated, installed and maintained in good condition in accordance with its original design, TIA standards, and/or manufacturer specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the provided reference information.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) The 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 that could not be verified at this time.
- 5) Any referenced prior structural modifications to the tower mounting system are assumed to be installed as shown per available data unless noted otherwise.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (Gr. 36)
HSS (Rectangular)	ASTM A36 (Gr. 36)
Pipe	ASTM A53 (Gr. B-35)
Connection Bolts	ASTM A325
Threaded Rods	ASTM A36 (Gr. 36)

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

8 ft Platform w/ Support Rails Mount Analysis - Conditional Passing
Order 556614, Rev. 0**4) ANALYSIS RESULTS****Table 3 – Mount Component Stresses vs. Capacity**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Cross Horizontal	M62A	54	29%	Pass
1, 2	Stand Off Horizontals	M12		20%	Pass
1, 2	Mount Pipes	MP8		15%	Pass

Structure Rating (max from all components) =	29%
---	------------

Notes:

- 1) See additional documentation in Appendix C and Appendix D for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H, Section 15.5.

4.1) Recommendations

The mounting configuration will have sufficient capacity to carry the referenced loading once the following modifications are completed:

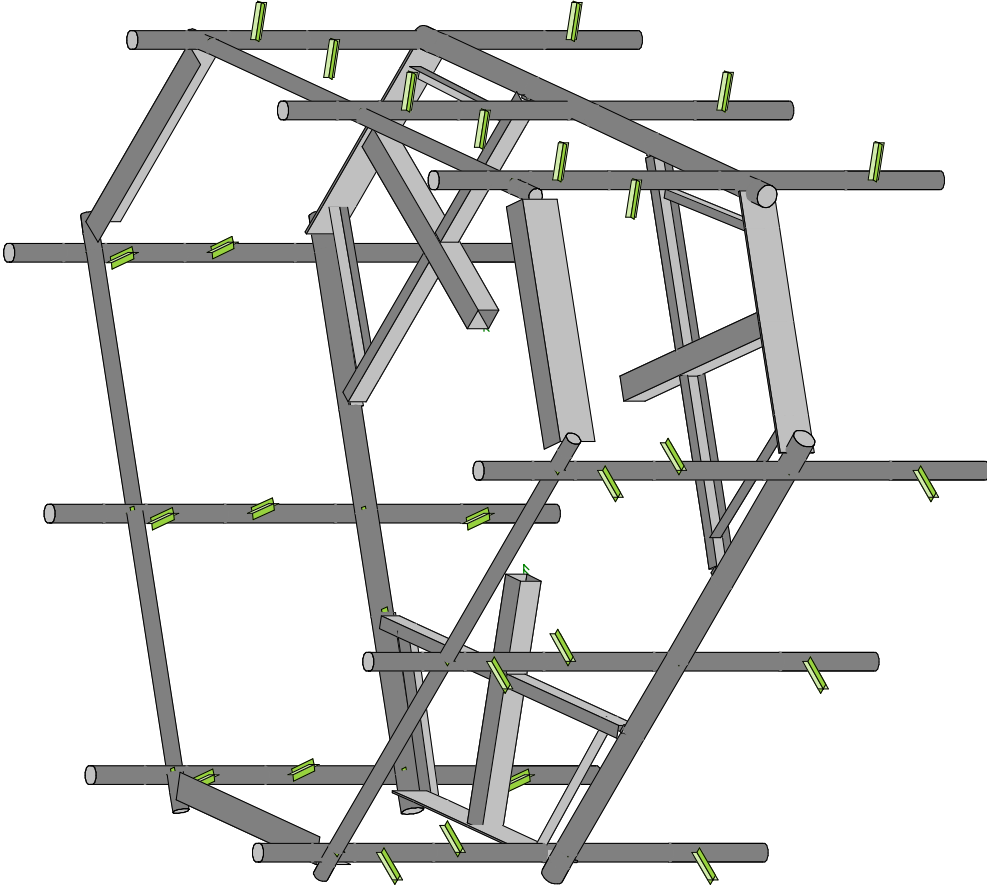
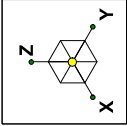
- **Install a new CommScope MC-PK8-DSH platform with support rails. Vertically center mount pipes and panel antennas on base of platform.**

No additional modifications are required at this time provided that the above-listed changes are completed.

*8 ft Platform w/ Support Rails Mount Analysis - Conditional Passing
Order 556614, Rev. 0*

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Kimley-Horn and Associates, Inc.

JJR

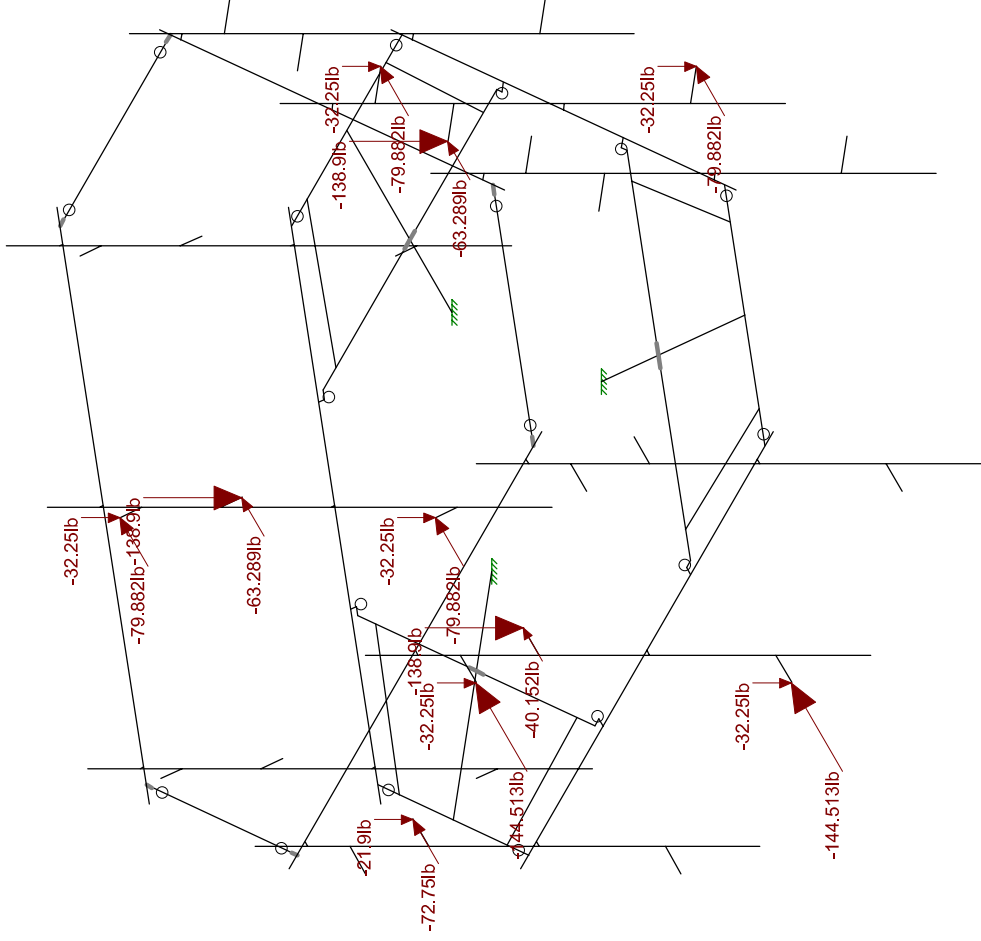
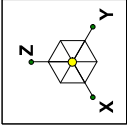
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SK - 1

Sept 15, 2021 at 1:33 PM

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Loads: LC 1, Summary: 1.0D + 1.0W
Envelope Only Solution

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SK - 2

Sept 15, 2021 at 1:33 PM

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*8 ft Low Profile Platform Mount Analysis - Conditional Passing
Order 556614, Rev. 0*

APPENDIX B
SOFTWARE INPUT CALCULATIONS



Date September 13, 2021

Client Crown Castle

Site # 876325

Site Name Weston Square

Project # 19558056

General Criteria	
TIA Standard	H
IBC Edition	2015
Structure Class	-
Risk Category	II

Wind Summary	
Basic Wind Speed w/o Ice, V (mph)	122.00
Velocity Pressure Coeff., K_z	1.11
Velocity Pressure, q_z (w/o Ice) (psf)	40.18

Site-Specific Criteria	
Exposure Category	C
Topographic Factor, K_{zt}	1.00
Structure Base Elev. (AMSL), z_g (ft)	41.79
Ground Effect Factor, K_e	1.00

Ice Load Summary	
Basic Wind Speed w/ Ice, V_i (mph)	50.00
Design Ice Thick. (ASCE 7-10), t_i (in)	1
Velocity Pressure, q_z (w/ Ice) (psf)	6.75
Escalated Ice Thick. @ Mount, t_z (in)	2.10

Mount & Structure Criteria	
Mount Elevation (AGL) (ft)	54.00
Structure Height (ft)	110.00
Structure Type	Monopole

Seismic Load Summary	
Spectral Response (Short Periods), S_s	-
Spectral Response (1-Sec. Period), S_1	-
Site Class	-
Seismic Design Category	-
Seismic Risk Category	-

Constants	
Wind Direction Probability Factor, K_d	0.95
Gust Effect Factor, G_h	1
Shielding Factor, K_a (antenna)	0.9
Shielding Factor, K_s (mount)	0.9

Snow Load Summary	
Ground Snow Load, p_g (psf)	-
Snow Load on Flat Roofs, p_f (psf)	-

225

11

Antenna Name	Qty	Shape	Dimensions (in)			Weight (lb)	Joint Labels								EPA (ft ²)		Wind Force, F_A (lb)			
			H	W	D		Alpha		Beta		Gamma		Delta		Front	Side	No Ice		With Ice	
							A2T	A2B	B2T	B2B	G2T	G2B					Front	Side	Front	Side
MX08FRO665-21	3	Flat	72	20	8	64.5	A2T	A2B	B2T	B2B	G2T	G2B			7.99	3.23	289.03	116.68	61.18	29.47
TA08025-B604	3	Flat	15.8	15	7.9	63.9	A2R		B2R			G2R			0.52	0.98	18.68	35.5	6.1	9.68
TA08025-B605	3	Flat	15.8	15	9.1	75	A2R		B2R			G2R			0.59	0.98	21.48	35.5	6.89	9.68
RDIDC-9181-PF-48	1	Flat	16.6	14.6	8.5	21.9	A3R								2.01	1.17	72.75	42.24	19.74	13.31

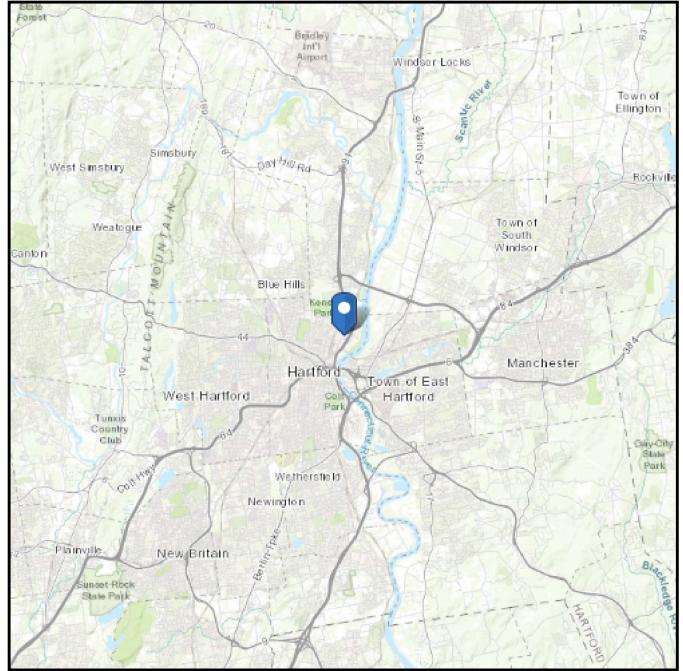
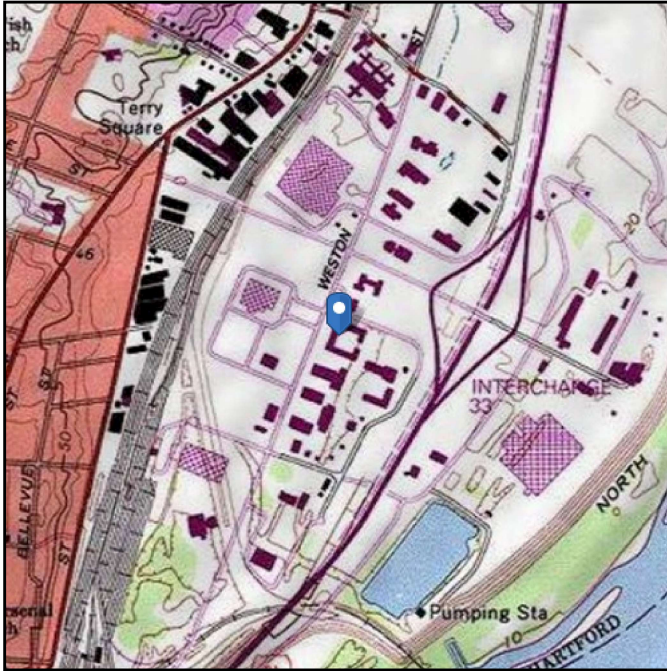


ASCE 7 Hazards Report

Address:
No Address at This
Location

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

Elevation: 10.46 ft (NAVD 88)
Latitude: 41.78675
Longitude: -72.662333



Wind

Results:

Wind Speed:	122 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 2010, Fig. 26.5-1A and Figs. CC-1--CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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.



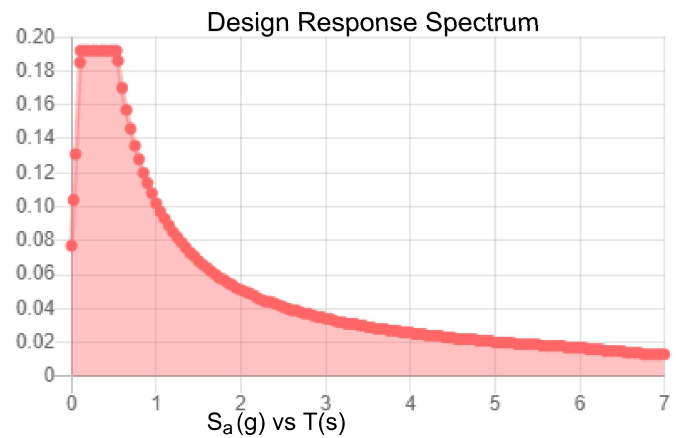
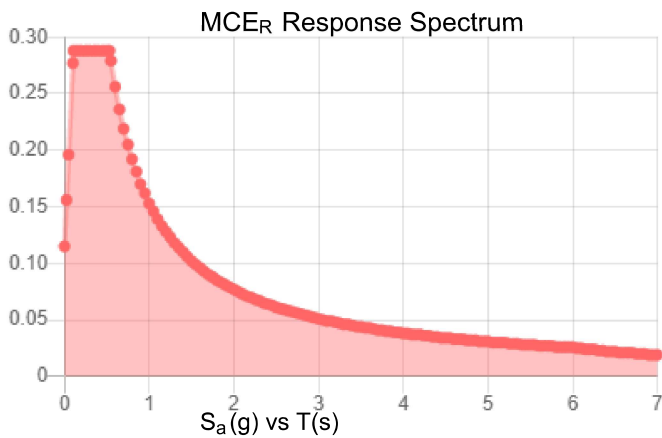
Seismic

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.18	S_{DS} :	0.192
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.288	PGA_M :	0.145
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B



Data Accessed:

Fri Sep 10 2021

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: 1.00 in.
Concurrent Temperature: 5 F
Gust Speed: 50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Fri Sep 10 2021

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.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

*8 ft Low Profile Platform Mount Analysis - Conditional Passing
Order 556614, Rev. 0*

APPENDIX C
SOFTWARE ANALYSIS OUTPUT



Company : Kimley-Horn and Associates, Inc.
 Designer : JJR
 Job Number : 019558056.1.100
 Model Name : 876325

Sept 15, 2021
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 Checked By: ZAM

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 Rnd	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	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
8	A913 Gr.65	29000	11154	.3	.65	.49	65	1.1	80	1.1
9	A500 Gr.C Rnd	29000	11154	.3	.65	.49	46	1.6	62	1.2
10	A500 Gr.C Rect	29000	11154	.3	.65	.49	50	1.5	62	1.2
11	A529 Gr. 50	29000	11154	.3	.65	.49	50	1.1	65	1.1
12	A1011-33 ksi	29000	11154	.3	.65	.49	33	1.5	58	1.2
13	A1011 36 ksi	29000	11154	.3	.65	.49	36	1.5	58	1.2
14	A1018 50 ksi	29000	11154	.3	.65	.49	50	1.5	65	1.2
15	Q235	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Corner Plate	PL6-1/2x3/8	Beam	None	A1011 36 ksi	Typical	2.438	.029	8.582	.11
2	Side Plate	PL2-3/8x1/2	Beam	None	A1011 36 ksi	Typical	1.188	.025	.558	.086
3	Grating Horiz	L2x2x4	Beam	None	A529 Gr. 50	Typical	.944	.346	.346	.021
4	Face Horiz	HSS3.500x...	Beam	None	A500 Gr.C ...	Typical	1.729	2.409	2.409	4.819
5	Mount Pipe	HSS2.875x...	Column	None	A500 Gr.C ...	Typical	1.039	.987	.987	1.975
6	Cross Horiz	C3.38x2.06...	Beam	None	A1011 36 ksi	Typical	1.75	.715	3.026	.034
7	Stand-Off Horiz	HSS4X4X6	Beam	None	A500 Gr.C ...	Typical	4.78	10.3	10.3	17.5
8	Support Rail	PIPE 2.0	Beam	None	A500 Gr.C ...	Typical	1.02	.627	.627	1.25
9	SR Corner Brace	L6.6x4.46x0...	Beam	None	A1011 36 ksi	Typical	2.703	4.759	12.473	.055

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbby[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M3	Grating Horiz	27.295					Lbby				Lateral
2	M8	Grating Horiz	27.295					Lbby				Lateral
3	M13	Grating Horiz	27.295					Lbby				Lateral
4	M28	SR Corner ...	42					Lbby				Lateral
5	M29	SR Corner ...	42					Lbby				Lateral
6	M30	SR Corner ...	42					Lbby				Lateral
7	M63A	Cross Horiz	33					Lbby				Lateral
8	M61B	Cross Horiz	33					Lbby				Lateral
9	M63B	Cross Horiz	33					Lbby				Lateral
10	M25	Support Rail	96					Lbby				Lateral
11	M51	Support Rail	96					Lbby				Lateral
12	M65A	Support Rail	96					Lbby				Lateral
13	M2	Stand-Off H..	40					Lbby				Lateral
14	M7	Stand-Off H..	40					Lbby				Lateral
15	M12	Stand-Off H..	40					Lbby				Lateral
16	MP9	Mount Pipe	96					Lbby				Lateral
17	MP7	Mount Pipe	96					Lbby				Lateral
18	MP8	Mount Pipe	96					Lbby				Lateral



Company : Kimley-Horn and Associates, Inc.
 Designer : JJR
 Job Number : 019558056.1.100
 Model Name : 876325

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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
19	MP3	Mount Pipe	96			Lbyy						Lateral
20	MP1	Mount Pipe	96			Lbyy						Lateral
21	MP6	Mount Pipe	96			Lbyy						Lateral
22	MP4	Mount Pipe	96			Lbyy						Lateral
23	MP2	Mount Pipe	96			Lbyy						Lateral
24	MP5	Mount Pipe	96			Lbyy						Lateral
25	M4	Grating Horiz	27.295			Lbyy						Lateral
26	M9	Grating Horiz	27.295			Lbyy						Lateral
27	M14	Grating Horiz	27.295			Lbyy						Lateral
28	M18	Face Horiz	96			Lbyy						Lateral
29	M48	Face Horiz	96			Lbyy						Lateral
30	M62	Face Horiz	96			Lbyy						Lateral
31	M61A	Cross Horiz	33			Lbyy						Lateral
32	M60A	Cross Horiz	33			Lbyy						Lateral
33	M62A	Cross Horiz	33			Lbyy						Lateral
34	M5	Corner Plate	42			Lbyy						Lateral
35	M10	Corner Plate	42			Lbyy						Lateral
36	M15	Corner Plate	42			Lbyy						Lateral
37	M88A	Side Plate	1.5			Lbyy						Lateral
38	M89A	Side Plate	1.5			Lbyy						Lateral
39	M90A	Side Plate	1.5			Lbyy						Lateral
40	M91A	Side Plate	1.5			Lbyy						Lateral
41	M92A	Side Plate	1.5			Lbyy						Lateral
42	M93A	Side Plate	1.5			Lbyy						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	Dead	DL			-1	13			
2	Dead of Ice	RL				13		42	
4	Structure Wind (0)	None						84	
5	Structure Wind (30)	None						84	
6	Structure Wind (45)	None						84	
7	Structure Wind (60)	None						84	
8	Structure Wind (90)	None						84	
9	Structure Wind (120)	None						84	
10	Structure Wind (135)	None						84	
11	Structure Wind (150)	None						84	
12	Structure Wind w/ Ice...	None						84	
13	Structure Wind w/ Ice...	None						84	
14	Structure Wind w/ Ice...	None						84	
15	Structure Wind w/ Ice...	None						84	
16	Structure Wind w/ Ice...	None						84	
17	Structure Wind w/ Ice...	None						84	
18	Structure Wind w/ Ice...	None						84	
19	Structure Wind w/ Ice...	None						84	
20	Antenna Wind (0)	None				26			
21	Antenna Wind (30)	None				26			
22	Antenna Wind (45)	None				26			
23	Antenna Wind (60)	None				26			
24	Antenna Wind (90)	None				26			



Company : Kimley-Horn and Associates, Inc.
 Designer : JJR
 Job Number : 019558056.1.100
 Model Name : 876325

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Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
25	Antenna Wind (120)	None				26			
26	Antenna Wind (135)	None				26			
27	Antenna Wind (150)	None				26			
28	Antenna Wind w/ Ice ...	None				26			
29	Antenna Wind w/ Ice ...	None				26			
30	Antenna Wind w/ Ice ...	None				26			
31	Antenna Wind w/ Ice ...	None				26			
32	Antenna Wind w/ Ice ...	None				26			
33	Antenna Wind w/ Ice ...	None				26			
34	Antenna Wind w/ Ice ...	None				26			
35	Antenna Wind w/ Ice ...	None				26			
36	Maintenance Live Lm ...	OL1				1			
37	Maintenance Live Lm ...	OL2				1			
38	Maintenance Live Lm ...	OL3				1			
41	Maintenance Live Lv (...)	OL6					1		
42	Maintenance Live Lv (...)	OL7					1		
43	Maintenance Live Lv (...)	OL8					1		

Load Combinations

	Description	Sol.	PD	SR	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...	BLC Fact...
1	Summary:...	Yes	Y		DL	1	20	1						
2	1.4D	Yes	Y		DL	1.4								
3	1.2D + 1.0...	Yes	Y		DL	1.2	4	1	20	1				
4	1.2D + 1.0...	Yes	Y		DL	1.2	5	1	21	1				
5	1.2D + 1.0...	Yes	Y		DL	1.2	6	1	22	1				
6	1.2D + 1.0...	Yes	Y		DL	1.2	7	1	23	1				
7	1.2D + 1.0...	Yes	Y		DL	1.2	8	1	24	1				
8	1.2D + 1.0...	Yes	Y		DL	1.2	9	1	25	1				
9	1.2D + 1.0...	Yes	Y		DL	1.2	10	1	26	1				
10	1.2D + 1.0...	Yes	Y		DL	1.2	11	1	27	1				
11	1.2D + 1.0...	Yes	Y		DL	1.2	4	-1	20	-1				
12	1.2D + 1.0...	Yes	Y		DL	1.2	5	-1	21	-1				
13	1.2D + 1.0...	Yes	Y		DL	1.2	6	-1	22	-1				
14	1.2D + 1.0...	Yes	Y		DL	1.2	7	-1	23	-1				
15	1.2D + 1.0...	Yes	Y		DL	1.2	8	-1	24	-1				
16	1.2D + 1.0...	Yes	Y		DL	1.2	9	-1	25	-1				
17	1.2D + 1.0...	Yes	Y		DL	1.2	10	-1	26	-1				
18	1.2D + 1.0...	Yes	Y		DL	1.2	11	-1	27	-1				
19	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	12	1	28	1		
20	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	13	1	29	1		
21	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	14	1	30	1		
22	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	15	1	31	1		
23	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	16	1	32	1		
24	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	17	1	33	1		
25	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	18	1	34	1		
26	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	19	1	35	1		
27	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	12	-1	28	-1		
28	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	13	-1	29	-1		
29	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	14	-1	30	-1		
30	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	15	-1	31	-1		



Company : Kimley-Horn and Associates, Inc.
 Designer : JJR
 Job Number : 019558056.1.100
 Model Name : 876325

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Load Combinations (Continued)

	Description	Sol.	PD.	SR.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.
31	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	16	-1	32	-1								
32	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	17	-1	33	-1								
33	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	18	-1	34	-1								
34	1.2D + 1.0...	Yes	Y		DL	1.2	RL	1	19	-1	35	-1								
35	1.2D + 1.5...	Yes	Y		DL	1.2		4	.06	20	.06	OL1	1.5							
36	1.2D + 1.5...	Yes	Y		DL	1.2		5	.06	21	.06	OL1	1.5							
37	1.2D + 1.5...	Yes	Y		DL	1.2		6	.06	22	.06	OL1	1.5							
38	1.2D + 1.5...	Yes	Y		DL	1.2		7	.06	23	.06	OL1	1.5							
39	1.2D + 1.5...	Yes	Y		DL	1.2		8	.06	24	.06	OL1	1.5							
40	1.2D + 1.5...	Yes	Y		DL	1.2		9	.06	25	.06	OL1	1.5							
41	1.2D + 1.5...	Yes	Y		DL	1.2		10	.06	26	.06	OL1	1.5							
42	1.2D + 1.5...	Yes	Y		DL	1.2		11	.06	27	.06	OL1	1.5							
43	1.2D + 1.5...	Yes	Y		DL	1.2		4	-.06	20	-.06	OL1	1.5							
44	1.2D + 1.5...	Yes	Y		DL	1.2		5	-.06	21	-.06	OL1	1.5							
45	1.2D + 1.5...	Yes	Y		DL	1.2		6	-.06	22	-.06	OL1	1.5							
46	1.2D + 1.5...	Yes	Y		DL	1.2		7	-.06	23	-.06	OL1	1.5							
47	1.2D + 1.5...	Yes	Y		DL	1.2		8	-.06	24	-.06	OL1	1.5							
48	1.2D + 1.5...	Yes	Y		DL	1.2		9	-.06	25	-.06	OL1	1.5							
49	1.2D + 1.5...	Yes	Y		DL	1.2		10	-.06	26	-.06	OL1	1.5							
50	1.2D + 1.5...	Yes	Y		DL	1.2		11	-.06	27	-.06	OL1	1.5							
51	1.2D + 1.5...	Yes	Y		DL	1.2		4	.06	20	.06	OL2	1.5							
52	1.2D + 1.5...	Yes	Y		DL	1.2		5	.06	21	.06	OL2	1.5							
53	1.2D + 1.5...	Yes	Y		DL	1.2		6	.06	22	.06	OL2	1.5							
54	1.2D + 1.5...	Yes	Y		DL	1.2		7	.06	23	.06	OL2	1.5							
55	1.2D + 1.5...	Yes	Y		DL	1.2		8	.06	24	.06	OL2	1.5							
56	1.2D + 1.5...	Yes	Y		DL	1.2		9	.06	25	.06	OL2	1.5							
57	1.2D + 1.5...	Yes	Y		DL	1.2		10	.06	26	.06	OL2	1.5							
58	1.2D + 1.5...	Yes	Y		DL	1.2		11	.06	27	.06	OL2	1.5							
59	1.2D + 1.5...	Yes	Y		DL	1.2		4	-.06	20	-.06	OL2	1.5							
60	1.2D + 1.5...	Yes	Y		DL	1.2		5	-.06	21	-.06	OL2	1.5							
61	1.2D + 1.5...	Yes	Y		DL	1.2		6	-.06	22	-.06	OL2	1.5							
62	1.2D + 1.5...	Yes	Y		DL	1.2		7	-.06	23	-.06	OL2	1.5							
63	1.2D + 1.5...	Yes	Y		DL	1.2		8	-.06	24	-.06	OL2	1.5							
64	1.2D + 1.5...	Yes	Y		DL	1.2		9	-.06	25	-.06	OL2	1.5							
65	1.2D + 1.5...	Yes	Y		DL	1.2		10	-.06	26	-.06	OL2	1.5							
66	1.2D + 1.5...	Yes	Y		DL	1.2		11	-.06	27	-.06	OL2	1.5							
67	1.2D + 1.5...	Yes	Y		DL	1.2		4	.06	20	.06	OL3	1.5							
68	1.2D + 1.5...	Yes	Y		DL	1.2		5	.06	21	.06	OL3	1.5							
69	1.2D + 1.5...	Yes	Y		DL	1.2		6	.06	22	.06	OL3	1.5							
70	1.2D + 1.5...	Yes	Y		DL	1.2		7	.06	23	.06	OL3	1.5							
71	1.2D + 1.5...	Yes	Y		DL	1.2		8	.06	24	.06	OL3	1.5							
72	1.2D + 1.5...	Yes	Y		DL	1.2		9	.06	25	.06	OL3	1.5							
73	1.2D + 1.5...	Yes	Y		DL	1.2		10	.06	26	.06	OL3	1.5							
74	1.2D + 1.5...	Yes	Y		DL	1.2		11	.06	27	.06	OL3	1.5							
75	1.2D + 1.5...	Yes	Y		DL	1.2		4	-.06	20	-.06	OL3	1.5							
76	1.2D + 1.5...	Yes	Y		DL	1.2		5	-.06	21	-.06	OL3	1.5							
77	1.2D + 1.5...	Yes	Y		DL	1.2		6	-.06	22	-.06	OL3	1.5							
78	1.2D + 1.5...	Yes	Y		DL	1.2		7	-.06	23	-.06	OL3	1.5							
79	1.2D + 1.5...	Yes	Y		DL	1.2		8	-.06	24	-.06	OL3	1.5							
80	1.2D + 1.5...	Yes	Y		DL	1.2		9	-.06	25	-.06	OL3	1.5							
81	1.2D + 1.5...	Yes	Y		DL	1.2		10	-.06	26	-.06	OL3	1.5							
82	1.2D + 1.5...	Yes	Y		DL	1.2		11	-.06	27	-.06	OL3	1.5							



Company : Kimley-Horn and Associates, Inc.
 Designer : JJR
 Job Number : 019558056.1.100
 Model Name : 876325

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Load Combinations (Continued)

	Description	Sol.	PD.	SR.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.	BLC Fact.
83	1.2D + 1.5...	Yes	Y		DL	1.2	4	.06	20	.06	OL6	1.5								
84	1.2D + 1.5...	Yes	Y		DL	1.2	5	.06	21	.06	OL6	1.5								
85	1.2D + 1.5...	Yes	Y		DL	1.2	6	.06	22	.06	OL6	1.5								
86	1.2D + 1.5...	Yes	Y		DL	1.2	7	.06	23	.06	OL6	1.5								
87	1.2D + 1.5...	Yes	Y		DL	1.2	8	.06	24	.06	OL6	1.5								
88	1.2D + 1.5...	Yes	Y		DL	1.2	9	.06	25	.06	OL6	1.5								
89	1.2D + 1.5...	Yes	Y		DL	1.2	10	.06	26	.06	OL6	1.5								
90	1.2D + 1.5...	Yes	Y		DL	1.2	11	.06	27	.06	OL6	1.5								
91	1.2D + 1.5...	Yes	Y		DL	1.2	4	-.06	20	-.06	OL6	1.5								
92	1.2D + 1.5...	Yes	Y		DL	1.2	5	-.06	21	-.06	OL6	1.5								
93	1.2D + 1.5...	Yes	Y		DL	1.2	6	-.06	22	-.06	OL6	1.5								
94	1.2D + 1.5...	Yes	Y		DL	1.2	7	-.06	23	-.06	OL6	1.5								
95	1.2D + 1.5...	Yes	Y		DL	1.2	8	-.06	24	-.06	OL6	1.5								
96	1.2D + 1.5...	Yes	Y		DL	1.2	9	-.06	25	-.06	OL6	1.5								
97	1.2D + 1.5...	Yes	Y		DL	1.2	10	-.06	26	-.06	OL6	1.5								
98	1.2D + 1.5...	Yes	Y		DL	1.2	11	-.06	27	-.06	OL6	1.5								
99	1.2D + 1.5...	Yes	Y		DL	1.2	4	.06	20	.06	OL7	1.5								
100	1.2D + 1.5...	Yes	Y		DL	1.2	5	.06	21	.06	OL7	1.5								
101	1.2D + 1.5...	Yes	Y		DL	1.2	6	.06	22	.06	OL7	1.5								
102	1.2D + 1.5...	Yes	Y		DL	1.2	7	.06	23	.06	OL7	1.5								
103	1.2D + 1.5...	Yes	Y		DL	1.2	8	.06	24	.06	OL7	1.5								
104	1.2D + 1.5...	Yes	Y		DL	1.2	9	.06	25	.06	OL7	1.5								
105	1.2D + 1.5...	Yes	Y		DL	1.2	10	.06	26	.06	OL7	1.5								
106	1.2D + 1.5...	Yes	Y		DL	1.2	11	.06	27	.06	OL7	1.5								
107	1.2D + 1.5...	Yes	Y		DL	1.2	4	-.06	20	-.06	OL7	1.5								
108	1.2D + 1.5...	Yes	Y		DL	1.2	5	-.06	21	-.06	OL7	1.5								
109	1.2D + 1.5...	Yes	Y		DL	1.2	6	-.06	22	-.06	OL7	1.5								
110	1.2D + 1.5...	Yes	Y		DL	1.2	7	-.06	23	-.06	OL7	1.5								
111	1.2D + 1.5...	Yes	Y		DL	1.2	8	-.06	24	-.06	OL7	1.5								
112	1.2D + 1.5...	Yes	Y		DL	1.2	9	-.06	25	-.06	OL7	1.5								
113	1.2D + 1.5...	Yes	Y		DL	1.2	10	-.06	26	-.06	OL7	1.5								
114	1.2D + 1.5...	Yes	Y		DL	1.2	11	-.06	27	-.06	OL7	1.5								
115	1.2D + 1.5...	Yes	Y		DL	1.2	4	.06	20	.06	OL8	1.5								
116	1.2D + 1.5...	Yes	Y		DL	1.2	5	.06	21	.06	OL8	1.5								
117	1.2D + 1.5...	Yes	Y		DL	1.2	6	.06	22	.06	OL8	1.5								
118	1.2D + 1.5...	Yes	Y		DL	1.2	7	.06	23	.06	OL8	1.5								
119	1.2D + 1.5...	Yes	Y		DL	1.2	8	.06	24	.06	OL8	1.5								
120	1.2D + 1.5...	Yes	Y		DL	1.2	9	.06	25	.06	OL8	1.5								
121	1.2D + 1.5...	Yes	Y		DL	1.2	10	.06	26	.06	OL8	1.5								
122	1.2D + 1.5...	Yes	Y		DL	1.2	11	.06	27	.06	OL8	1.5								
123	1.2D + 1.5...	Yes	Y		DL	1.2	4	-.06	20	-.06	OL8	1.5								
124	1.2D + 1.5...	Yes	Y		DL	1.2	5	-.06	21	-.06	OL8	1.5								
125	1.2D + 1.5...	Yes	Y		DL	1.2	6	-.06	22	-.06	OL8	1.5								
126	1.2D + 1.5...	Yes	Y		DL	1.2	7	-.06	23	-.06	OL8	1.5								
127	1.2D + 1.5...	Yes	Y		DL	1.2	8	-.06	24	-.06	OL8	1.5								
128	1.2D + 1.5...	Yes	Y		DL	1.2	9	-.06	25	-.06	OL8	1.5								
129	1.2D + 1.5...	Yes	Y		DL	1.2	10	-.06	26	-.06	OL8	1.5								
130	1.2D + 1.5...	Yes	Y		DL	1.2	11	-.06	27	-.06	OL8	1.5								



Company : Kimley-Horn and Associates, Inc.
 Designer : JJR
 Job Number : 019558056.1.100
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Envelope Joint Reactions

Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC		
1	P24	max	1124.743	18	757.971	16	2241.265	30	-.329	6	-.229	7	1.51	18
2		min	-1127.735	10	-759.493	8	356.199	6	-4.096	30	-2.854	63	-1.528	10
3	P13	max	518.673	3	1210.581	15	2067.182	19	.152	15	4.359	19	1.398	7
4		min	-521.642	11	-1215.689	7	312.266	11	-.13	7	.297	11	-1.371	15
5	P1	max	1052.817	4	745.285	14	2009.861	24	3.591	24	-.117	15	1.375	12
6		min	-1047.881	12	-738.667	6	303.367	16	.249	16	-2.728	71	-1.385	4
7	Totals:	max	2617.076	3	2586.497	15	6074.532	33						
8		min	-2617.072	11	-2586.5	7	1589.734	1						

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

Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn	
1	M62A	C3.38x2.06x1...	.306	0	29	.056	26.105	y	21	48281.427	56700	2.203	5.751	1...	H1-1b
2	M63B	C3.38x2.06x1...	.295	0	22	.057	26.105	y	23	48281.427	56700	2.203	5.751	1...	H1-1b
3	M61B	C3.38x2.06x1...	.293	0	19	.054	26.105	y	27	48281.427	56700	2.203	5.751	1...	H1-1b
4	M63A	C3.38x2.06x1...	.290	0	32	.056	26.105	y	33	48281.427	56700	2.203	5.751	1...	H1-1b
5	M61A	C3.38x2.06x1...	.286	0	24	.054	26.105	y	32	48281.427	56700	2.203	5.751	1...	H1-1b
6	M60A	C3.38x2.06x1...	.284	0	27	.053	26.105	y	27	48281.427	56700	2.203	5.751	1...	H1-1b
7	M12	HSS4X4X6	.215	40	27	.086	40	y	64	203733.28	215100	23.963	23.963	2...	H1-1b
8	M7	HSS4X4X6	.194	40	22	.040	40	y	32	203733.28	215100	23.963	23.963	2...	H1-1b
9	M2	HSS4X4X6	.184	40	22	.082	40	y	70	203733.28	215100	23.963	23.963	2...	H1-1b
10	M3	L2x2x4	.181	13.647	114	.024	27.295	z	109	29527.563	42480	.96	2.173	1...	H2-1
11	M89A	PL2-3/8x1/2	.159	1.5	16	.282	0	y	27	38256.871	38475	.401	1.904	2...	H1-1b
12	M88A	PL2-3/8x1/2	.158	1.5	14	.276	0	y	26	38256.871	38475	.401	1.904	1...	H1-1b
13	M93A	PL2-3/8x1/2	.154	1.5	11	.267	0	y	23	38256.871	38475	.401	1.904	2...	H1-1b
14	M92A	PL2-3/8x1/2	.154	1.5	16	.269	0	y	21	38256.871	38475	.401	1.904	2...	H1-1b
15	MP8	HSS2.875x0....	.154	42.442	4	.048	63.158		12	22397.228	43014.6	3.143	3.143	1...	H1-1b
16	M90A	PL2-3/8x1/2	.153	1.5	3	.285	0	y	31	38256.871	38475	.401	1.904	1...	H1-1b
17	M15	PL6-1/2x3/8	.151	21	62	.088	5.968	y	51	3658.14	78975	.617	8.676	1...	H1-1b
18	M91A	PL2-3/8x1/2	.149	1.5	14	.271	0	y	19	38256.871	38475	.401	1.904	1...	H1-1b
19	MP2	HSS2.875x0....	.149	42.442	7	.050	63.158		15	22397.228	43014.6	3.143	3.143	1...	H1-1b
20	M5	PL6-1/2x3/8	.145	21	72	.084	36.032	y	67	3658.14	78975	.617	8.655	1...	H1-1b
21	M10	PL6-1/2x3/8	.139	21	3	.070	36.032	y	30	3658.14	78975	.617	7.446	1...	H1-1b
22	MP5	HSS2.875x0....	.139	42.442	10	.052	42.442		18	22397.228	43014.6	3.143	3.143	2...	H1-1b
23	M14	L2x2x4	.120	0	13	.014	0	y	21	29527.563	42480	.96	2.19	2...	H2-1
24	M8	L2x2x4	.114	0	3	.015	0	z	27	29527.563	42480	.96	2.19	2...	H2-1
25	MP3	HSS2.875x0....	.111	42.442	7	.044	42.442		4	22397.228	43014.6	3.143	3.143	2...	H1-1b
26	MP7	HSS2.875x0....	.110	42.442	4	.044	42.442		7	22397.228	43014.6	3.143	3.143	2...	H1-1b
27	MP4	HSS2.875x0....	.110	42.442	10	.041	42.442		12	22397.228	43014.6	3.143	3.143	1...	H1-1b
28	M4	L2x2x4	.109	0	8	.015	0	y	31	29527.562	42480	.96	2.19	2...	H2-1
29	M48	HSS3.500x0....	.107	48	47	.037	3.537		63	45873.009	71580.6	6.338	6.338	1...	H1-1b
30	MP1	HSS2.875x0....	.106	42.442	15	.055	42.442		18	22397.228	43014.6	3.143	3.143	1...	H1-1b
31	MP6	HSS2.875x0....	.106	42.442	18	.041	42.442		15	22397.228	43014.6	3.143	3.143	1...	H1-1b
32	MP9	HSS2.875x0....	.102	42.442	12	.047	42.442		10	22397.228	43014.6	3.143	3.143	2...	H1-1b
33	M9	L2x2x4	.101	0	11	.015	0	z	26	29527.563	42480	.96	2.19	2...	H2-1
34	M13	L2x2x4	.101	0	6	.016	0	y	23	29527.562	42480	.96	2.19	2...	H2-1
35	M62	HSS3.500x0....	.098	48	34	.035	48		17	45873.009	71580.6	6.338	6.338	1...	H1-1b
36	M51	PIPE 2.0	.098	89.937	7	.034	90.442		14	15369.683	42228	2.46	2.46	1...	H1-1b
37	M18	HSS3.500x0....	.097	48	27	.038	64.168		30	45873.009	71580.6	6.338	6.338	1...	H1-1b
38	M25	PIPE 2.0	.094	6.063	4	.039	90.442		3	15369.683	42228	2.46	2.46	1...	H1-1b



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

Member	Shape	Code C...	Loc[in]	LC Shear ...	Loc[in]	Dir	LC phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn			
39	M65A	PIPE 2.0	.094	6.063	10	.038	5.558	3	15369.683	42228	2.46	2.46	1...	H1-1b	
40	M30	L6.6x4.46x0.25	.079	0	3	.010	5.953	z	10	51434.506	87561	2.465	7.125	1...	H2-1
41	M29	L6.6x4.46x0.25	.078	39	3	.009	39	z	3	51434.506	87561	2.465	7.125	1...	H2-1
42	M28	L6.6x4.46x0.25	.077	0	9	.010	0	z	16	51434.506	87561	2.465	7.125	1...	H2-1

*8 ft Low Profile Platform Mount Analysis - Conditional Passing
Order 556614, Rev. 0*

APPENDIX D
ADDITIONAL CALCULATIONS

Square/Rectangular Flange Connection

TIA-222-H

Kimley»Horn

Site Number	876325
Job number	19558056
Code	TIA-222-H

Member/Node Under Consideration	M2
Controlling Load Combination	30

 Normalize usages per TIA-222-H, Sec. 15.5

REACTIONS	
Moment, Mu (kip-ft)	3.782
Axial, Pu (kips) - <i>Negative for tension</i>	0.077
Shear, Vu (kips)	0.627

About X

BOLT CONFIGURATION	
Bolt Quantity, n _b	4
Bolt Diameter, d _b (in)	0.625
Bolt Grade	A325
Width between bolts, s (in)	7.00

BOLT USAGE	
Maximum Tension in Bolt, T _{ub} (kip)	4.565
Nominal Tensile Strength, φR _{nt} (kip)	20.340
Tensile Usage (Section 4.9.6.1)	22%

PLATE CONFIGURATION	
Plate Grade	A572-50
Thickness of plate, t (in)	0.750
Width of plate, w (in)	9.00

PLATE USAGE	
Ultimate flexural load in plate, Mu (kip-in)	7.239
Factored flexural capacity, φM _n (kip-in)	28.430
Flexural Usage	25%

SUPPORT ARM CONFIGURATION	
Member Shape	Square
Member Grade	A500-50
Thickness of Member, t (in)	0.375
Width of member, w (in)	4.000

SUPPORT ARM USAGE	
Ultimate flexural load in member, Mu (kip-ft)	3.782
Factored flexural capacity, φM _n (kip-ft)	27.817
Flexural Usage	14%

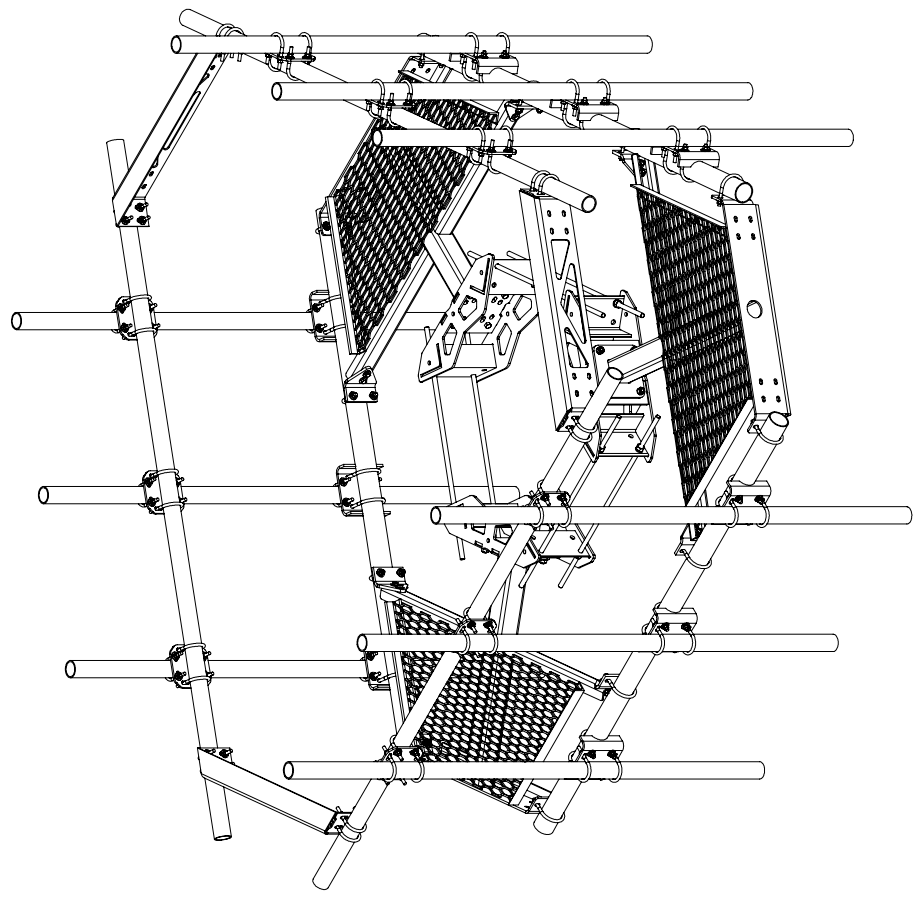
 Stiffeners present?

*8 ft Platform w/ Support Rails Mount Analysis - Conditional Passing
Order 556614, Rev. 0*

APPENDIX E
SUPPLEMENTAL DRAWINGS

NOTES:

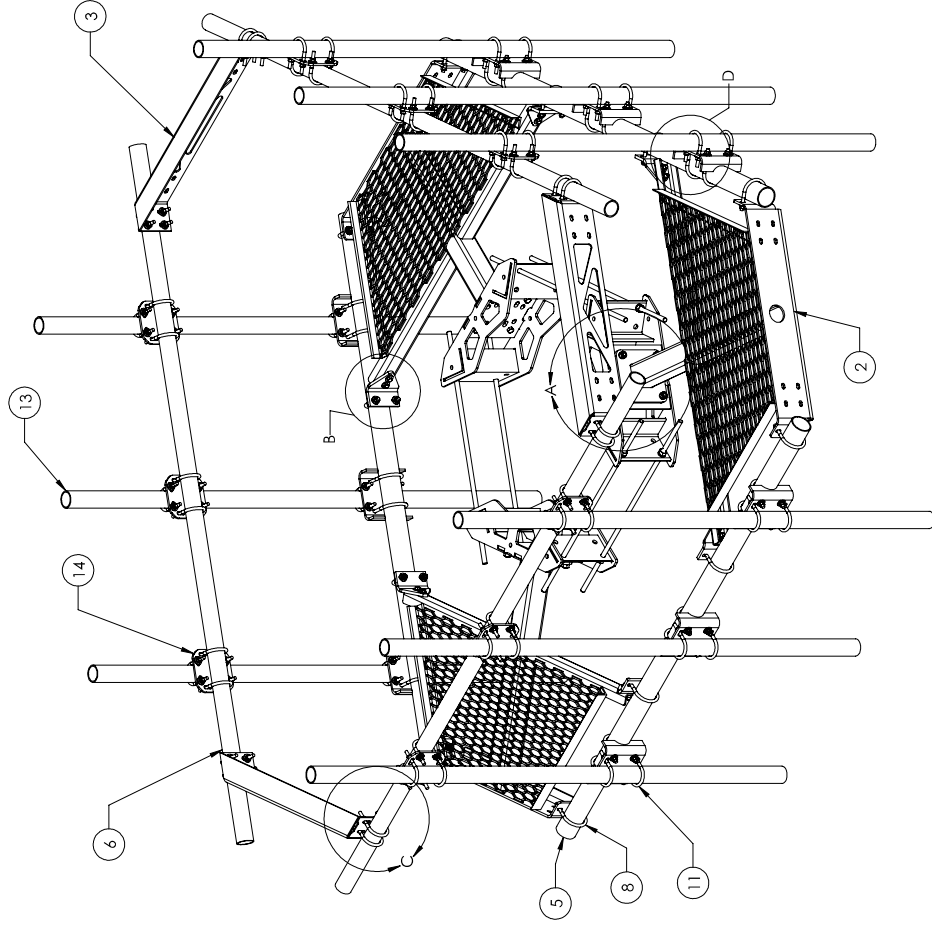
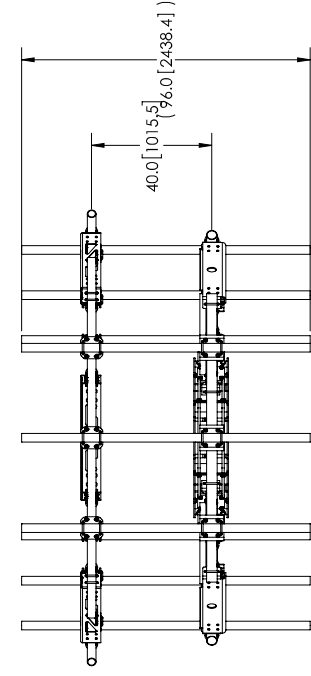
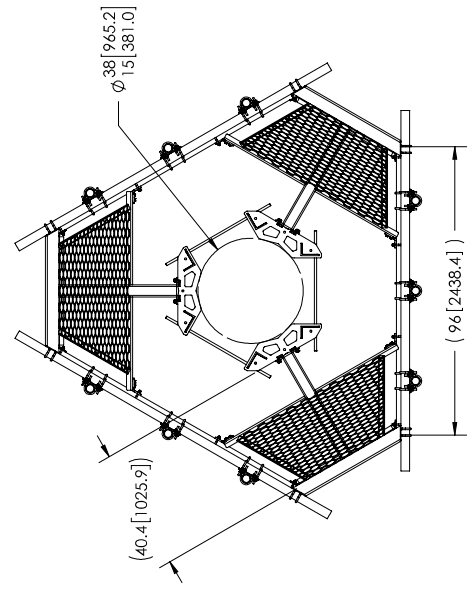
- 1.0 GENERAL
 - 1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS
 - 1.2 FOR PATENTS, SEE WWW.CS-PAT.COM
- 2.0 DESIGN NOTES
 - 2.1 TORQUE U-BOLTS TO 44 FT-LBS
- 3.0 MANUFACTURING/SPECIAL REQUIREMENTS
- 4.0 TEST
- 5.0 PACKAGING



REV.	ECN	DESCRIPTION	INITIAL RELEASE	BY	DATE
A	10272PC			HDAI	03/09/2021

COMMSCOPE, INC. OF NORTH CAROLINA		PATENT PENDING	
TOLERANCES		SAP MATERIAL MASTER	
1 PLACE .X ± .25	3 PLACE .XXX ± 0.06	MC-PK8-DSH	
2 PLACE .XX ± 0.12	ANGLES ± 2°		
FINISH		MATERIAL	
GALV A123		A500, A1011/A1018	
NAME		TITLE	
CE MRC	02/17/20		
EWI ROGHANSON	03/16/2021		
AD BUCROSS	03/17/2021		
RE FA1024	02/27/2020		
ECN 10272PC			
Autli Group		Autli Group	
INSL	INSL		
VERSION 01	VERSION 01		
STATUS AD	STATUS AD		
REVISION	REVISION		
VERSION 00	VERSION 00		
DRAWING	DRAWING		
STATUS AD	STATUS AD		
REVISION	REVISION		
VERSION 00	VERSION 00		
SCALE 1:32		DOCUMENT NO. MC-PK8-DSH	
SIZE C		SHEET 1 OF 3	
DENSITY	lbs/in ³		
MASS	lbs		
VOLUME	in ³		
SURFACE AREA	in ²		
HEIGHT	96"		
LENGTH	46"		
WIDTH	29"		

NOTES:



ITEM	PART NO.	DESCRIPTION	QTY.
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1
2	MITC300602	SECTOR WELDMENT FOR SNUB NOSE PLATFORM	3
3	MIT195801	Corner Weldment, Snub Nose Handrail	12
4	GB-0520A	5/8" X 2" GALV. BOLT KIT (A325)	12
5	MIT54796	3.50" OD X 96" GALV PIPE	3
6	MIT546120	2.875" O.D. X 120" PIPE	3
7	GW-04	1/2" GALV FLAT WASHER	12
8	GLB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12
9	MITC300618	MOUNTING PLATE FOR MIT-196	6
10	GB-04205	1/2" X 2" GALV BOLT KIT	12
11	MIT-219MH	3.5" OD X 2-7/8" OD Clamp Bracket Assembly	9
12	GLB-4352	1/2" X 3" X 5-1/4" GALV U-BOLT	12
13	MIT54496	Ø 2.875" O.D. X 96 PIPE	9
14	XP-2525	CROSSOVER PLATE KIT, 2-7/8 OD X 2-7/8 OD	9

COMMSCOPE, INC. OF NORTH CAROLINA

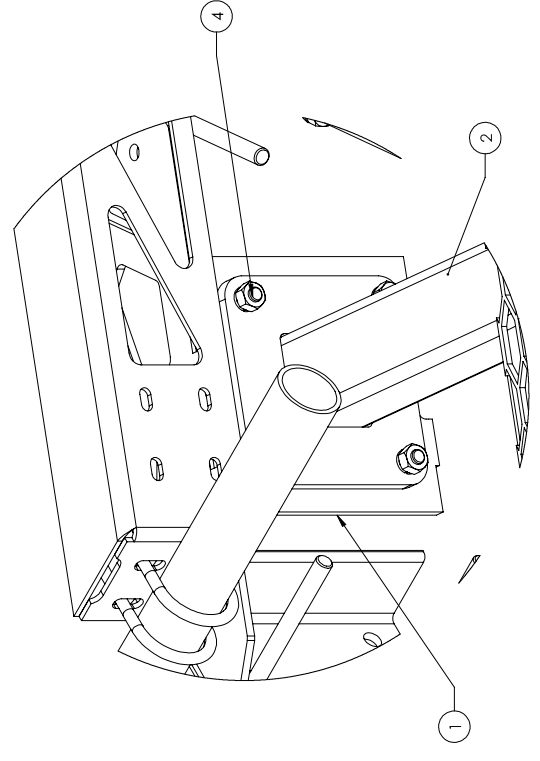
TITLE
LOW PROFILE PLATFORM FACE

SIZE C SCALE 1:32

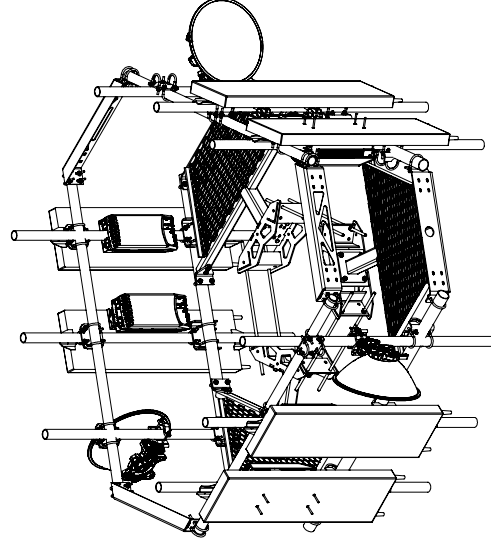
DOCUMENT NO. MC-PK8-DSH

VERSION	STATUS	REVISION	SHEET
00	AD	A	A

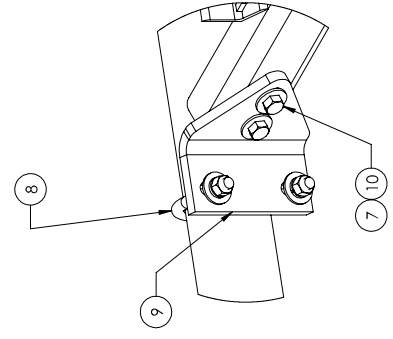
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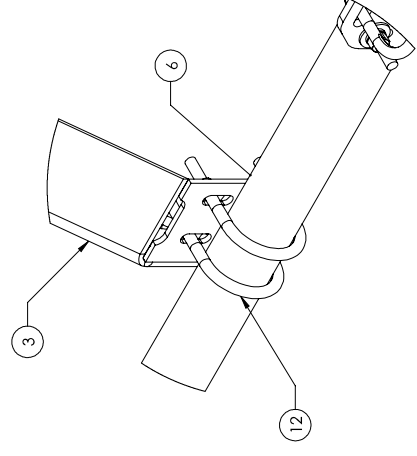
DETAIL A
SCALE 1 : 4



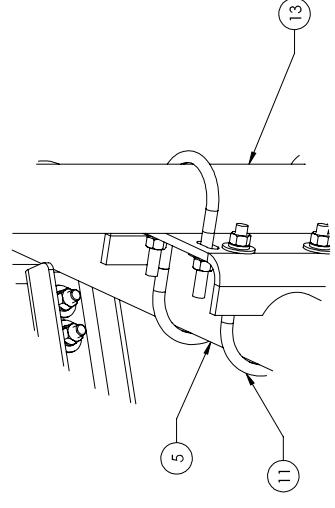
WITH ANTENNAS



DETAIL B
SCALE 1 : 4



DETAIL C
SCALE 1 : 4



DETAIL D
SCALE 1 : 4

TITLE		COMMSCOPE, INC. OF NORTH CAROLINA	
SIZE		LOW PROFILE PLATFORM FACE	
SCALE	1:24	DOCUMENT NO.	MC-PK8-DSH
		DRAWING	
VERSION	00	STATUS	AD
		REVISION	A
SHEET		3 OF 3	

Exhibit F

Power Density/RF Emissions Report

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

Dish Wireless Existing Facility

Site ID: BOBDL00079A

876325

92 Weston Street
Hartford, Connecticut 06103

November 18, 2021

EBI Project Number: 6221007185

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	69.97%

November 18, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00079A - 876325

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **92 Weston Street in Hartford, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 92 Weston Street in Hartford, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 4 n71 channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 4) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.



- 5) The antennas used in this modeling are the JMA MX08FRO665-2I for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-2I for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-2I for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 6) The antenna mounting height centerline of the proposed antennas is 54 feet above ground level (AGL).
- 7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 8) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz
Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd
Height (AGL):	54 feet	Height (AGL):	54 feet	Height (AGL):	54 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts
ERP (W):	3,065.51	ERP (W):	3,065.51	ERP (W):	3,065.51
Antenna AI MPE %:	6.88%	Antenna BI MPE %:	6.88%	Antenna CI MPE %:	6.88%

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	6.88%
Verizon	27.67%
T-Mobile	13.36%
Sprint	5.11%
AT&T	16.95%
Site Total MPE % :	69.97%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	6.88%
Dish Wireless Sector B Total:	6.88%
Dish Wireless Sector C Total:	6.88%
Site Total MPE % :	69.97%

Dish Wireless Maximum MPE Power Values (Sector A)							
Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	54.0	13.96	600 MHz n71	400	3.49%
Dish Wireless 1900 MHz n70	4	542.70	54.0	33.87	1900 MHz n70	1000	3.39%
						Total:	6.88%

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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 Dish Wireless 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:

Dish Wireless Sector	Power Density Value (%)
Sector A:	6.88%
Sector B:	6.88%
Sector C:	6.88%
Dish Wireless Maximum MPE % (Sector A):	6.88%
Site Total:	69.97%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **69.97%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit G

Letter of Authorization



4545 E River Rd, Suite 320
West Henrietta, NY 14586

Phone: (585) 445-5896
Fax: (724) 416-4461
www.crowncastle.com

Crown Castle Letter of Authorization

CT - CONNECTICUT SITING COUNCIL

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

Re: Tower Share Application
Crown Castle telecommunications site at:
92 WESTON STREET, HARTFORD, CT 06103-1217

GLOBAL SIGNAL ACQUISITIONS II LLC ("Crown Castle") hereby authorizes DISH Wireless, LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:


Crown Site ID/Name: 876325/WESTON SQUARE
Customer Site ID: BOBDL00079A/CT-CCI-T-876325
Site Address: 92 Weston Street, Hartford, CT 06103-1217

Crown Castle

By:  _____ Date: 1/20/2022
Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



**UNITED STATES
POSTAL SERVICE®**

Click-N-Ship®

P

usps.com 9405 5036 9930 0141 9426 64 0089 5000 0031 4586
US POSTAGE
 Flat Rate Envoy

U.S. POSTAGE PAID
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01/20/2022 Mailed from 01566

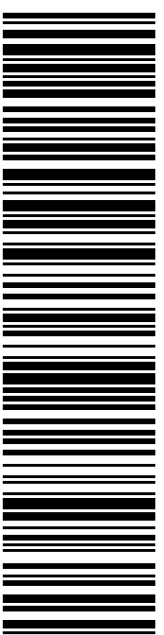
PRIORITY MAIL 2-DAY™

Expected Delivery Date: 01/24/22
 Re#: DS-876325
0006

R013

SHIP TO: RICH ZAJAC
 CROWN CASTLE
 4545 E RIVER RD
 STE 320
 W HENRIETTA NY 14586-9024

USPS TRACKING #



9405 5036 9930 0141 9426 64

Electronic Rate Approved #038555749



Cut on dotted line.

Instructions

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2. Place your label so it does not wrap around the edge of the package.
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4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0141 9426 64

Trans. #: 554545940	Priority Mail® Postage: \$8.95
Print Date: 01/20/2022	Total: \$8.95
Ship Date: 01/20/2022	
Expected Delivery Date: 01/24/2022	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359


Re#: DS-876325

To: RICH ZAJAC
 CROWN CASTLE
 4545 E RIVER RD
 STE 320
 W HENRIETTA NY 14586-9024

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.



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P

usps.com 9405 5036 9930 0141 9426 71 0089 5000 0010 6103
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 01/20/2022

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Click-N-Ship®

Mailed from 01566


PRIORITY MAIL 2-DAY™

Expected Delivery Date: 01/24/22
 Re#: DS-876325
0006

C006

SHIP TO: LUKE BRONIN
 MAYOR OF HARTFORD
 550 MAIN ST RM 200
 HARTFORD CT 06103-2913

USPS TRACKING #



9405 5036 9930 0141 9426 71

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Click-N-Ship® Label Record

USPS TRACKING # :
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Trans. #: 554545940	Priority Mail® Postage: \$8.95
Print Date: 01/20/2022	Total: \$8.95
Ship Date: 01/20/2022	
Expected Delivery Date: 01/24/2022	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359

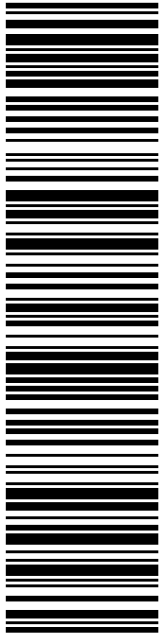
Re#: DS-876325

To: LUKE BRONIN
 MAYOR OF HARTFORD
 550 MAIN ST RM 200
 HARTFORD CT 06103-2913

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SHIP TO: AIMEE CHAMBERS-MCKAY
DIRECTOR OF PLANNING
250 CONSTITUTION PLZ
FL 4
HARTFORD CT 06103-1800

SHIP TO: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

P

usps.com 9405 5036 9930 0141 9426 88 0089 5000 0010 6103
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Expected Delivery Date: 01/24/22
 Re#: DS-876325
0006

C003



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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0141 9426 88

Trans. #: 554545940	Priority Mail® Postage: \$8.95
Print Date: 01/20/2022	Total: \$8.95
Ship Date: 01/20/2022	
Expected Delivery Date: 01/24/2022	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359


Re#: DS-876325

To: AIMEE CHAMBERS-MCKAY
 DIRECTOR OF PLANNING
 250 CONSTITUTION PLZ
 FL 4
 HARTFORD CT 06103-1800

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usps.com 9405 5036 9930 0141 9426 95 0089 5000 0010 2122
US POSTAGE
 Flat Rate Env
 01/20/2022

U.S. POSTAGE PAID
Click-N-Ship®

Mailed from 01566

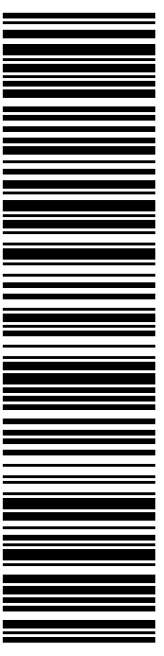
PRIORITY MAIL 1-DAY™

Expected Delivery Date: 01/21/22
 Re#: DS-876325
0006

C058

SHIP TO:
 FREEPORT REALTY V LLC
 337 FREEPORT ST
 BOSTON MA 02122-3545

USPS TRACKING #



9405 5036 9930 0141 9426 95

Electronic Rate Approved #038555749



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5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0141 9426 95

Trans. #: 554545940	Priority Mail® Postage: \$8.95
Print Date: 01/20/2022	Total: \$8.95
Ship Date: 01/20/2022	
Expected Delivery Date: 01/21/2022	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 420 MAIN ST
 STE 1
 STURBRIDGE MA 01566-1359

Re#: DS-876325

To: FREEPORT REALTY V LLC
 337 FREEPORT ST
 BOSTON MA 02122-3545

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876325



UNIONVILLE
24 MILL ST
UNIONVILLE, CT 06085-9998
(800)275-8777

01/26/2022

12:11 PM

Product	Qty	Unit Price	Price
Prepaid Mail West Henrietta, NY 14586 Weight: 0 lb 1.90 oz Acceptance Date: Wed 01/26/2022 Tracking #: 9405 5036 9930 0141 9426 64	1		\$0.00
Prepaid Mail Hartford, CT 06103 Weight: 0 lb 7.40 oz Acceptance Date: Wed 01/26/2022 Tracking #: 9405 5036 9930 0141 9426 88	1		\$0.00
Prepaid Mail Dorchester, MA 02122 Weight: 0 lb 7.40 oz Acceptance Date: Wed 01/26/2022 Tracking #: 9405 5036 9930 0141 9426 95	1		\$0.00
Prepaid Mail Hartford, CT 06103 Weight: 0 lb 7.40 oz Acceptance Date: Wed 01/26/2022 Tracking #: 9405 5036 9930 0141 9426 71	1		\$0.00