

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:

NEW CINGULAR WIRELESS PCS, LLC (AT&T) PETITION NO. 1409
PETITION FOR A DECLARATORY RULING,
PURSUANT TO CONNECTICUT GENERAL
STATUTES §4-176 AND §16-50K, FOR THE July 9, 2020
INSTALLATION OF A SMALL CELL
WIRELESS TELECOMMUNICATIONS
FACILITY ON PROPERTY LOCATED AT
880 WETHERSFIELD AVENUE, HARTFORD,
CONNECTICUT.

RESPONSES TO INTERROGATORIES SET ONE

- Q1. Were the existing utility wood light poles along Wethersfield Avenue located adjacent and across the street of the proposed pole location considered for antenna attachment? Explain and include the height of these existing poles.
- A1. *All of the wood utility poles along Wethersfield Avenue support streetlights where the power runs underground and then is provided to the light with a riser. CL&P will not allow small cell attachments on utility poles with risers. The utility poles on the side streets would all require mounting the antenna in the communications space of the pole, or a side-mount antenna (as opposed to an antenna mounted to the top of the utility pole). Suitable poles along the side streets that would allow for a side-mounted antenna are located a significant distance from Wethersfield Avenue. Thus, due to the reduced height of a side mounted antenna and the location from Wethersfield Avenue, a small cell attachment on these poles would not meet the RF objectives for this small cell facility.*
- Q2. Has AT&T considered alternative locations for the proposed facility within the subject parcel? (i.e., the billboard, existing wood poles on the subject property, or placing the proposed pole near or to the rear of the existing building on the subject property) Explain.
- A2. *The use of the billboard would require a separate agreement with the billboard owner and the current market rent for these types of agreements are beyond the budget for this type of facility. Two other locations that were evaluated included 839 Wethersfield Avenue and 864 Wethersfield Avenue. Both of these locations are private properties where a small cell facility would include a design similar to the proposed design. While these locations were deemed viable by AT&T RF engineers, neither provided the same level of service as the proposed location at 880 Wethersfield Avenue. The two other private properties located at 867 Wethersfield Avenue and 825-829 Wethersfield Avenue were evaluated and deemed not viable by AT&T's RF engineers. The utility poles on the*

property include risers and as noted in A1, the utility company does not allow attachments to utility poles with risers.

- Q3. Would the proposed light metal pole be the same color as the existing wood utility poles in the vicinity of the subject parcel? Could the proposed metal pole be changed to a wood pole consistent with wood poles in the area? Could it be painted?
- A3. *The property owner reviewed design options and preferred a metal light pole over the wood utility pole due to aesthetics and because they can benefit from an additional light in the parking lot. Yes, the metal light pole can be painted in the field, standard color options from the light pole manufacturer, CommScope, are included in Attachment 1.*
- Q4. The Construction Drawings (CD) provided with the filing dated September 5, 2019 and prepared by Hudson Design Group, LLC, is not stamped and signed by a Professional Engineer Licensed in the State of Connecticut. Please provide a CD that is stamped and signed by a Professional Engineer Licensed in the State of Connecticut
- A4. *Please see the Construction Drawings included in Attachment 2 which bear the signature and seal of a Professional Engineer Licensed in the State of Connecticut.*
- Q5. How deep in the ground would the base of the pole be buried? Sheet A-1 of the CD references ground rods, would the pole be attached to the ground rods?
- A5. *The ground rod is usually a 6'-8' copper rod that gets installed immediately near the base of the pole and is connected to the pole via a wire as shown in the drawings in Attachment 2.*
- Q6. How would the proposed light metal pole be attached to the equipment enclosure? Please provide a detailed construction drawing showing the poles attachment to the ground and the equipment enclosure.
- A6. *Please see details included in Attachment 3.*
- Q7. Sheet A-1 of the CD and page 4 of Attachment No. 4 refers to the proposed installation as "proposed metal light pole (by others)." However, the cover letter states that AT&T would own the pole and lease the ground space on which it is installed from the property owner. Please clarify.
- A7. *The "by others" note refers to the pole being supplied by the manufacturer, which is CommScope. This note is not a reference to ownership. As stated in the Petition, the pole will be owned by AT&T and AT&T leases the ground space for the facility from the property owner.*

Q8. Would the proposed facility have backup power, e.g. battery backup? If yes, for how long could it support the facility during a power outage?

A8. *The proposed small cell facility will not be equipped with battery backup.*

Q9. Provide the proposed construction hours and days of the week for the proposed project.

A9. *The construction of the proposed small cell facility is anticipated to take eight (8) days working eight (8) hours each day. Construction will be conducted within the City of Hartford regulations regarding construction hours (7 am to 6pm weekdays and Saturdays). Details for these construction days is included below:*

Civil / Electrical	Qty	MH ea	Hours
Excavate	2	4	8
set prefab concrete foundation	2	4	8
run conduit and set handholes	2	8	8
set pole and cabinet	2	8	8
power equip. cabinet and lights	2	8	8
Install and wire additional fixtures	2	8	8

Q10. Identify the zoning for the subject parcel.

A10. *The subject parcel is classified in the MS-3, Main Street, zoning district.*

Q11. What is the duration of construction to install the proposed facility?

A11. *Please see A9.*

CERTIFICATE OF SERVICE

I hereby certify that on this day the foregoing was sent electronically to the Connecticut Siting Council and one copy was sent via first class mail in accordance with Connecticut Siting Council directives.

July 9, 2020



Lucia Chiochio
Cuddy & Feder LLP
445 Hamilton Ave, 14th Floor
White Plains, NY 10601
(914)-761-1300
Attorneys for the Petitioner

ATTACHMENT 1

COLORS

Available in 9 Standard colors

- 1 Light Grey RAL 7035
 - 2 Green RAL 6005
 - 3 Black RAL 9005
 - 4 Brown RAL 8014
 - 5 Beige Grey RAL 7006
 - 9 Metallic Silver
 - W Pure White RAL 9010
 - C Faux Concrete
 - Z Antique Bronze SRSL 45893
-
- Additional Pole Cab Colors
 - 20 Umbra Grey RAL 7022



ATTACHMENT 2



AT&T SITE ID: CRAN_RCTB_A1CT_130
880 WETHERSFIELD AVE.
HARTFORD, CT 06114

FOR ZONING (NOT FOR CONSTRUCTION)



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

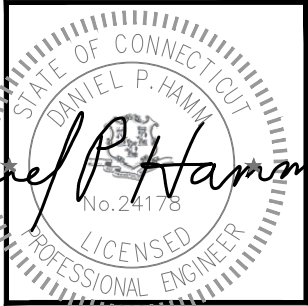


750 WEST CENTER STREET,
SUITE# 301
WEST BRIDGEWATER, MA 02379



HUDSON
Design Group LLC

45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



CHECKED BY: AT

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	06/30/20	ISSUED FOR ZONING	MR
A	09/05/19	ISSUED FOR REVIEW	MR

CLUSTER AND NODE NUMBER:
CRAN_RCTB_A1CT_130

SITE ID:
CRAN_RCTB_A1CT_130

SITE ADDRESS:
880 WETHERSFIELD AVE.
HARTFORD, CT 06114
NEW HAVEN COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

SHEET INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
C-1	SITE PLAN	1
A-1	KEY PLAN AND ELEVATION	1
A-2	EQUIPMENT DETAILS	1

PROJECT DESCRIPTION

1. INSTALLATION OF ANTENNA AND ASSOCIATED EQUIPMENT ON PROPOSED UTILITY POLE.
2. THIS IS AN UNMANNED AND RESTRICTED ACCESS EQUIPMENT SITE AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF IMPROVING CELLULAR AND WIRELESS INTERNET SERVICE.

PROJECT SUMMARY

SITE ADDRESS: 880 WETHERSFIELD AVE.
HARTFORD, CT 06114

COUNTY: NEW HAVEN

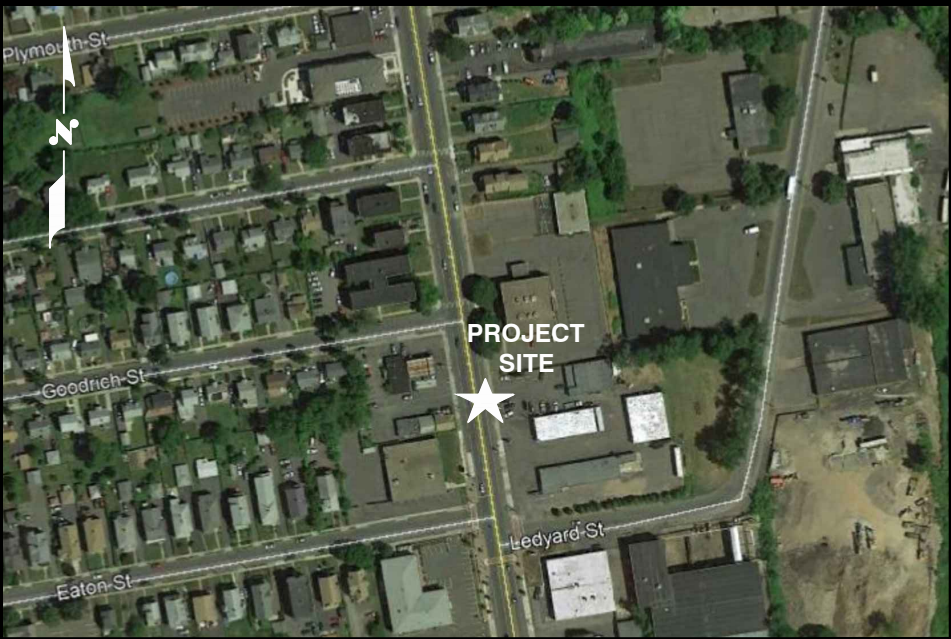
LATITUDE: 41.7321042° N

LONGITUDE: 72.6697584° W

STRUCTURE TYPE: UTILITY POLE

ARCHITECT/ENGINEER: HUDSON DESIGN GROUP LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845

VICINITY MAP (NOT TO SCALE)



DRIVING DIRECTIONS

FROM ROCKY HILL, CT:

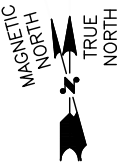
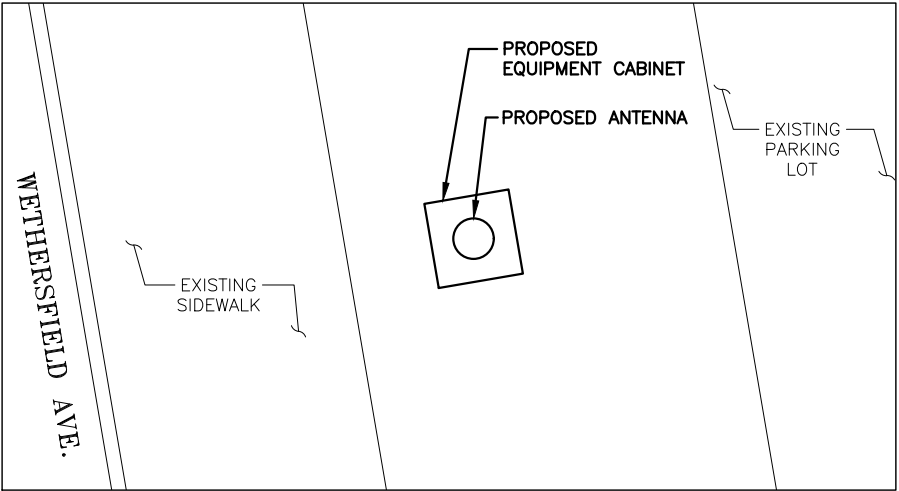
HEAD SOUTH TOWARD ENTERPRISE DR. TURN LEFT ONTO ENTERPRISE DR. TURN LEFT ONTO CAPITAL BLVD. TURN LEFT ONTO STATE HWY 411. TURN LEFT TO MERGE ONTO I-91 N. MERGE ONTO I-91 N. TAKE EXIT 27 FOR BRAINARD RD TOWARD AIRPORT RD/BRAINARD/AIRPORT. TURN LEFT ONTO BRAINARD RD. TURN LEFT ONTO AIRPORT RD. TURN RIGHT ONTO LEYARD ST. TURN LEFT ONTO MEADOW ST. TURN RIGHT ONTO WETHERSFIELD AVE.

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

IMMEDIATE ADJOINING PROPERTY OWNER INFORMATION			
PARCEL	OWNER	PHYSICAL ADDRESS	MAILING ADDRESS
277-815-224	MCGUIRE PROPERTIES PTNSHP	864 WETHERSFIELD AVE. LLC HARTFORD, CT 06114	880 WETHERSFIELD AVE. LLC HARTFORD, CT 06114
277-815-225	ERS 880 WETHERSFIELD AVE. LLC	880 WETHERSFIELD AVE. LLC HARTFORD, CT 06114	26 HOLBROOK RD WEST HARTFORD, CT 06107
278-815-115	CONSTELLATION REALTY LLC.	888 WETHERSFIELD AVE. LLC HARTFORD, CT 06114	888 WETHERSFIELD AVE. LLC HARTFORD, CT 06114
277-810-001	GETTY LEASING INC.	867 WETHERSFIELD AVE. LLC HARTFORD, CT 06114	TWO JERICHO PLAZA WING C- SUITE 110 JERICHO, NY 11753
278-810-100	SERVICE EMPLOYEES INTERNATIONAL UNION LOCAL 32BJ	885 WETHERSFIELD AVE. LLC HARTFORD, CT 06114	25 WEST 18TH ST. NEW YORK, NY 10011
278-810-101	873 WETHERSFIELD AVE. LLC	873 WETHERSFIELD AVE. LLC HARTFORD, CT 06114	149 CHAPMAN ST. NE BRITAIN, CT 06051

APPROXIMATE COORDINATES: LAT: 41.7321042° N LONG: 72.6697584° W



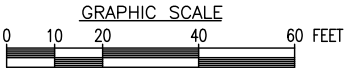
EQUIPMENT ORIENTATION PLAN 2 C-1
SCALE: N.T.S

INFORMATION SHOWN HEREON IS BASED ON EXISTING INFORMATION OBTAINED FROM TAX MAPS, MUNICIPAL GIS WEBSITE, & AERIAL IMAGERY. THE INFORMATION SHOWN IS NOT A RIGHT OF WAY OR BOUNDARY SURVEY AND DOES NOT SATISFY THE REQUIREMENTS FOR A BOUNDARY SURVEY. A SITE SURVEY WAS NOT PERFORMED BY HUDSON DESIGN GROUP, LLC

SITE PLAN

22x34 SCALE: 1"=20'
11x17 SCALE: 1"=40'

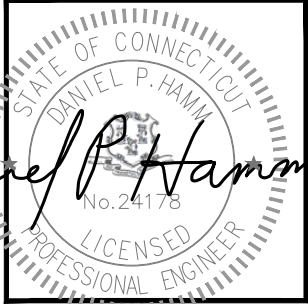
1 C-1



750 WEST CENTER STREET,
SUITE# 301
WEST BRIDGEWATER, MA 02379



45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



CHECKED BY: AT

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
1	06/30/20	ISSUED FOR ZONING	MR
A	09/05/19	ISSUED FOR REVIEW	MR

CLUSTER AND NODE NUMBER:
CRAN_RCTB_A1CT_130

SITE ID:
CRAN_RCTB_A1CT_130

SITE ADDRESS:
880 WETHERSFIELD AVE.
HARTFORD, CT 06114
NEW HAVEN COUNTY

SHEET TITLE

SITE PLAN

SHEET NUMBER

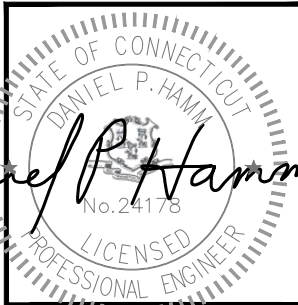
C-1

APPROXIMATE
COORDINATES: LAT: 41.7321042° N
LONG: 72.6697584° W


500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067


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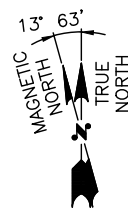
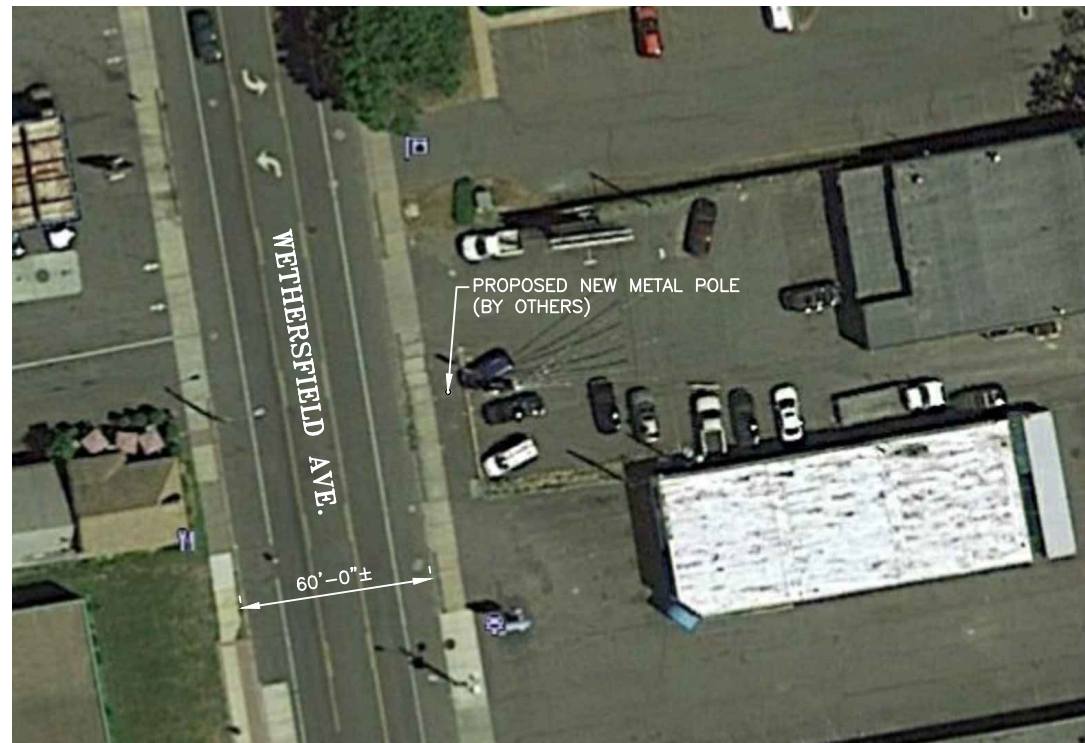
SITE ID:
CRAN_RCTB_A1CT_130

SITE ADDRESS:
880 WETHERSFIELD AVE.
HARTFORD, CT 06114
NEW HAVEN COUNTY

SHEET TITLE
KEY PLAN AND
ELEVATION

SHEET NUMBER

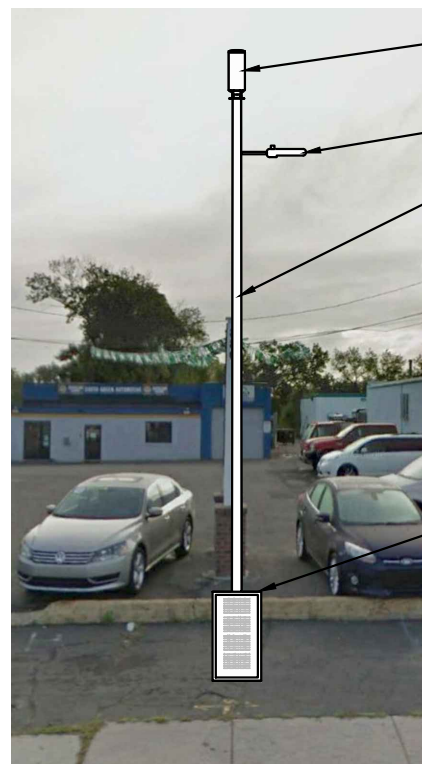
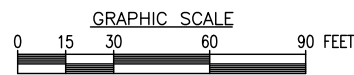
A-1



KEY PLAN

22x34 SCALE: 1"=30'
11x17 SCALE: 1"=60'

1
A-1



EXISTING CONDITIONS PHOTO DETAIL

SCALE: N.T.S

2
A-1

NOTE:

REFER TO STRUCTURAL ANALYSIS
BY: HUDSON DESIGN GROUP, LLC
DATED: DECEMBER 04, 2019,
FOR THE CAPACITY OF THE
STRUCTURE TO SUPPORT
THE PROPOSED EQUIPMENT.

NOTES:

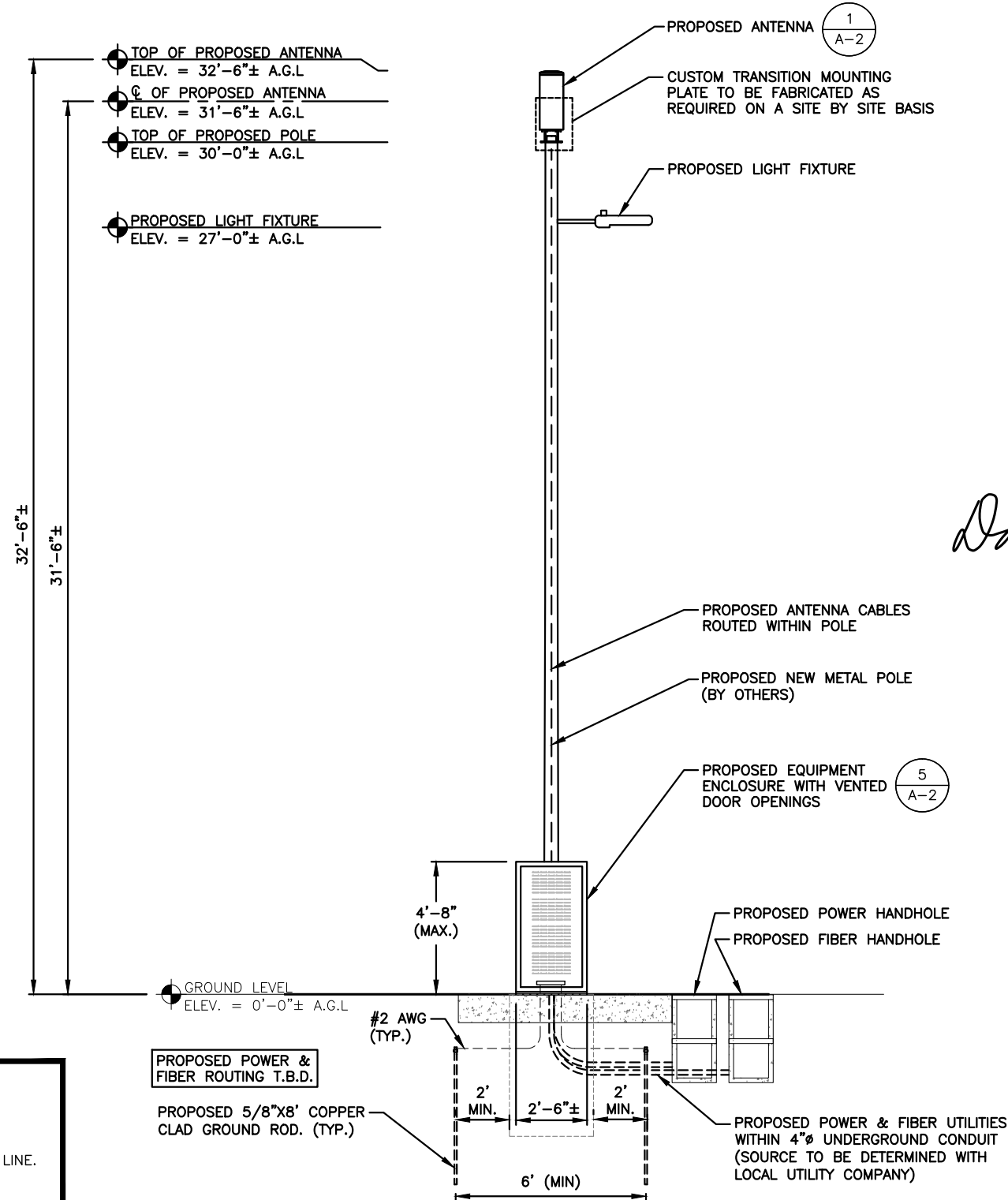
- PROPOSED POWER & FIBER ROUTING T.B.D.
- METER TO BE MOUNTED AT POWER SOURCE LOCATION

NOTES:

- GROUND ROD(S) SHALL BE INSTALLED IN UNDISTURBED SOIL, 2' MIN. FROM THE POLE. TOP OF GROUND ROD(S) SHALL BE 24" MIN. BELOW FINISHED GRADE OR 6" BELOW FROST LINE. THE POLE GROUND SHALL HAVE A MAXIMUM RESISTANCE OF 25 OHMS.

NOTE:

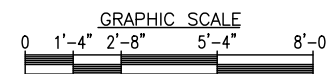
- THE WIRELESS COMMUNICATIONS OPERATOR IS RESPONSIBLE FOR PLACING A WARNING SIGN ON THE POWER SUPPLY COMMUNICATING THE RF EMISSIONS IN COMPLIANCE WITH THE CURRENT EDITION OF IEEE STANDARD C95.2. THIS SIGN MUST ALSO HAVE A 24-HOUR CONTACT PHONE NUMBER IN CASE OF EMERGENCY. THIS NUMBER MUST BE VISIBLE FROM THE GROUND.

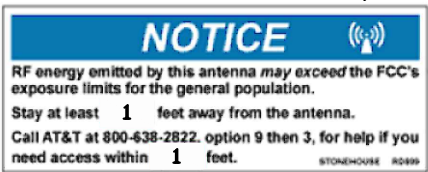
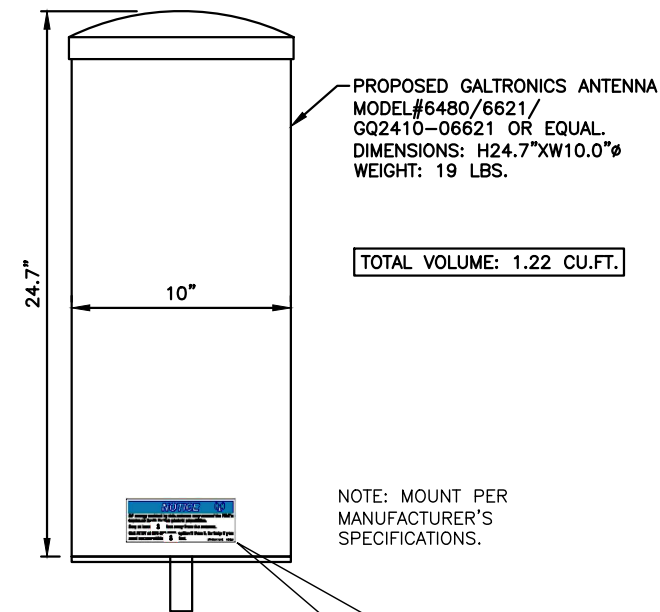


ELEVATION

22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

3
A-1

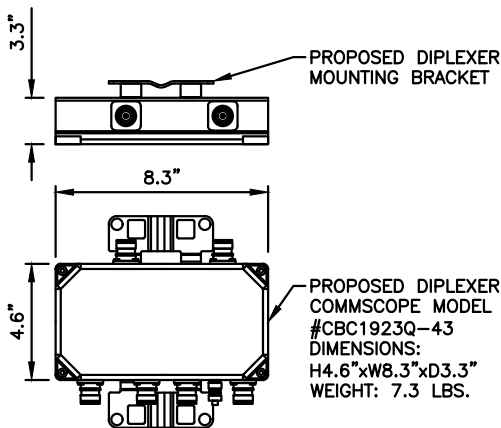




STONEHOUSE SIGNS INC. P/N RD899
SIGN DIMENSIONS 2.5"x6.5"
TWO NOTICE STICKERS MUST BE PLACED OPPOSITE EACH OTHER ON THE ANTENNA

ANTENNA DETAIL

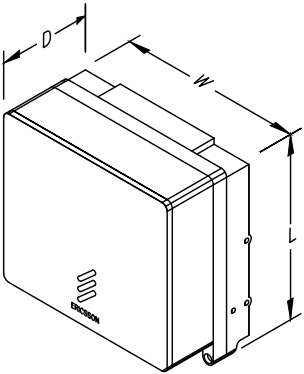
SCALE: N.T.S



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DIPLEXER DETAIL
(AS REQUIRED)

SCALE: N.T.S

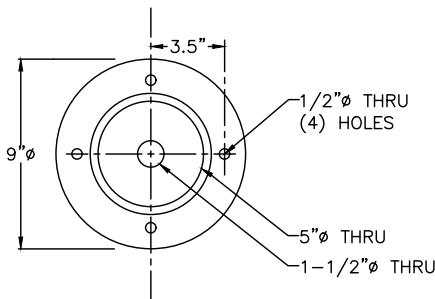
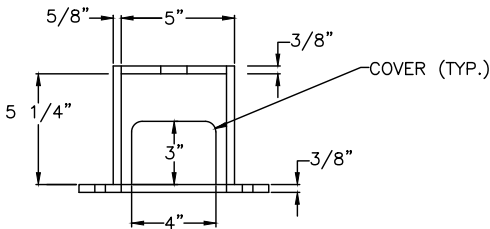


MODEL	QTY.	L	W	D	WGT.
4415	1	16.5"	13.5"	6.3"	47.4 LBS
4426	1	15.0"	13.5"	5.8"	48.5 LBS
2205	1	8.0"	8.0"	4.0"	11 LBS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

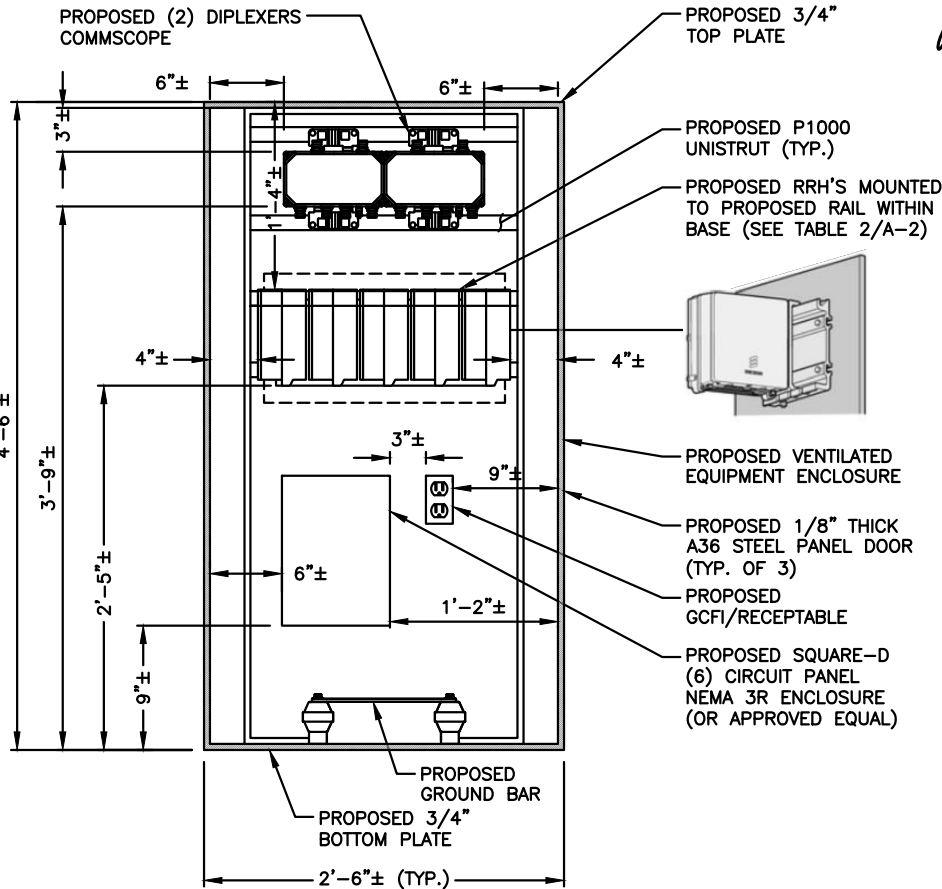
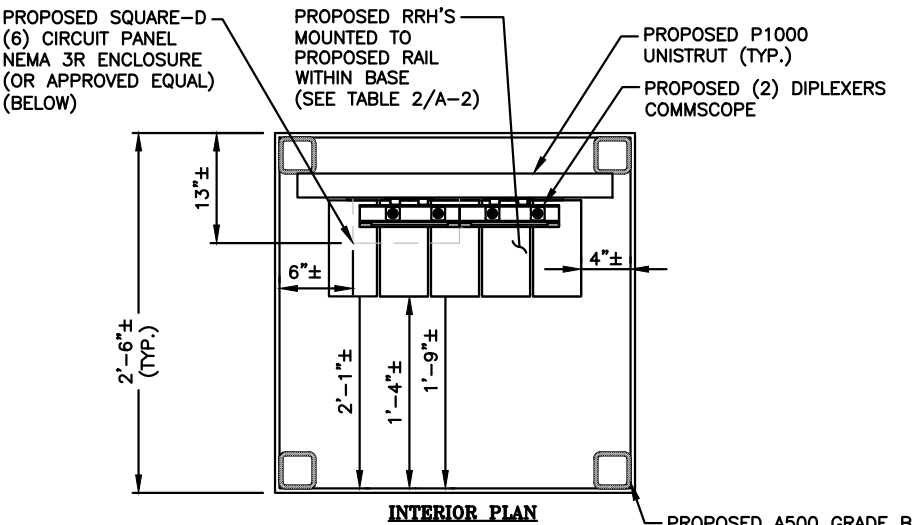
RRH DETAIL

SCALE: N.T.S



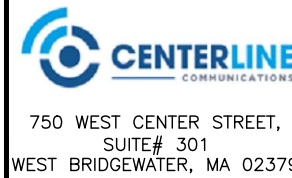
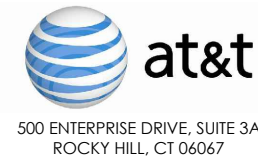
PROPOSED ANTENNA
MOUNTING BRACKET

SCALE: N.T.S



EQUIPMENT MOUNTING DETAIL

SCALE: N.T.S



CHECKED BY: AT

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	06/30/20	ISSUED FOR ZONING	MR
A	09/05/19	ISSUED FOR REVIEW	MR

CLUSTER AND NODE NUMBER:
CRAN_RCTB_A1CT_130

SITE ID:
CRAN_RCTB_A1CT_130

SITE ADDRESS:
880 WETHERSFIELD AVE.
HARTFORD, CT 06114
NEW HAVEN COUNTY

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-2

ATTACHMENT 3

COMMSCOPE®

VARIOUS SITES THROUGHOUT THE STATE OF CONNECTICUT

STRUCTURAL CALCULATIONS FOR
NEW MAXIMUM 30' INTEGRATED LIGHT POLE
FOUNDATION DESIGN FOR METROCELL

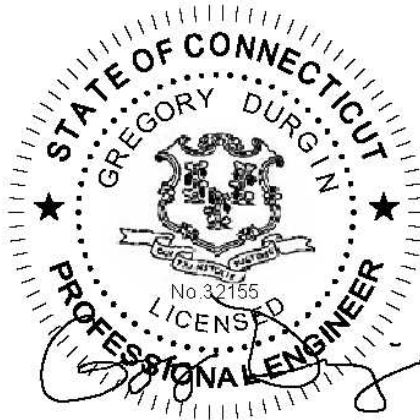
SSC-760239237xy306P

IBC 2018 / IBC 2015 / IBC 2012 / IBC 2009

ASCE 7-16 / ASCE 7-10 / ASCE 7-05

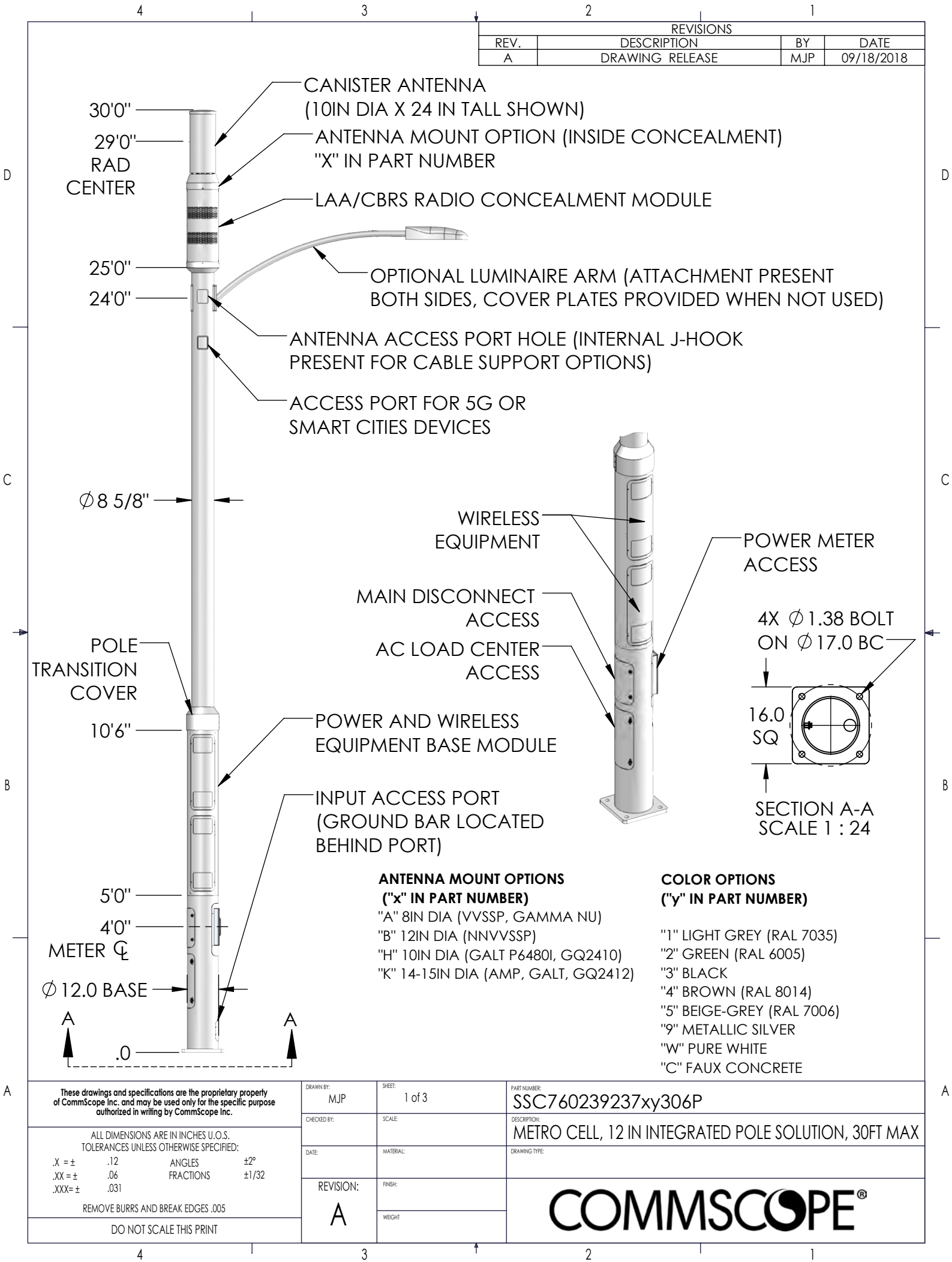
TIA-222-H / TIA-222-G

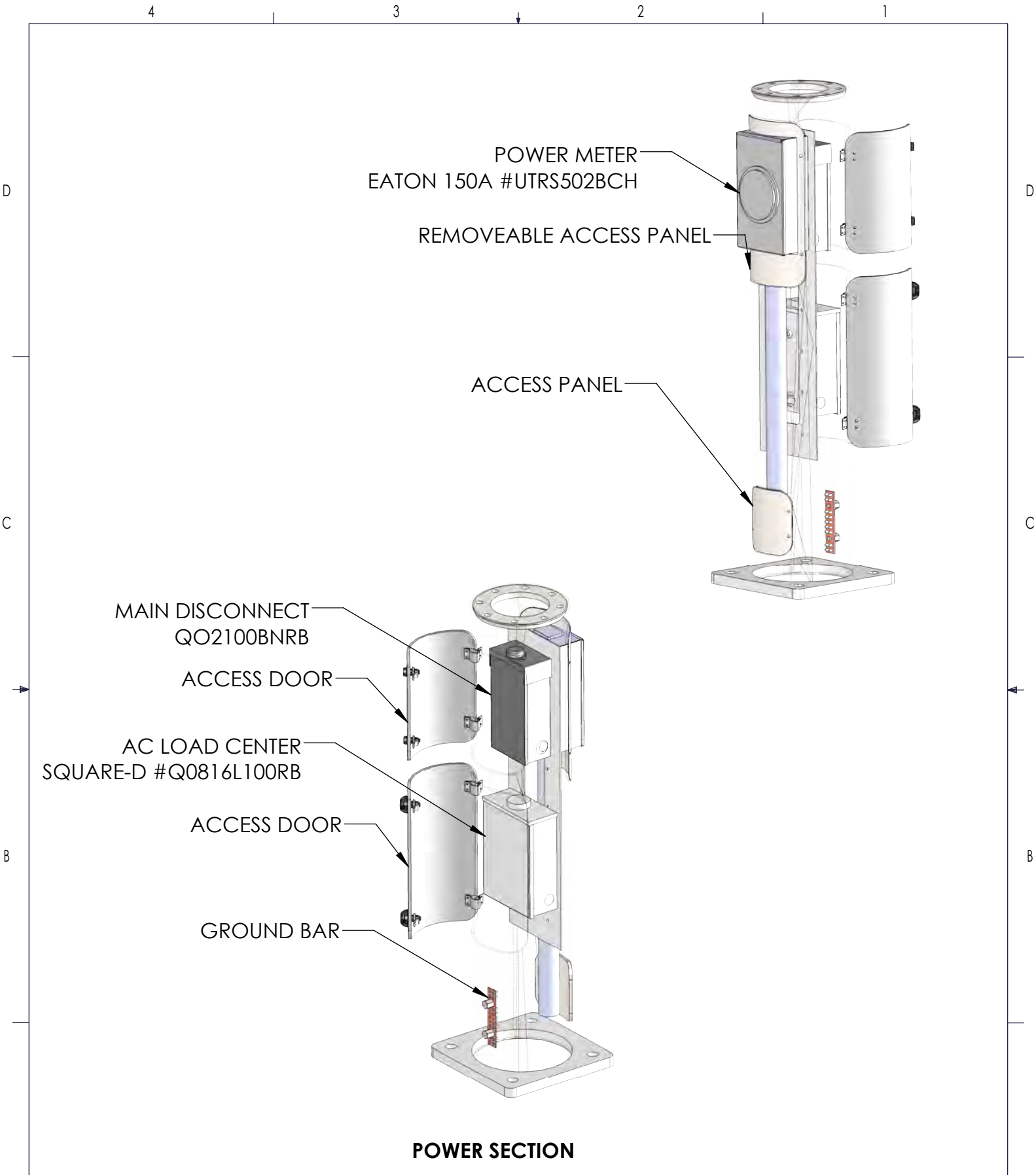
STRUCTURAL CALCULATIONS



February 12, 2020

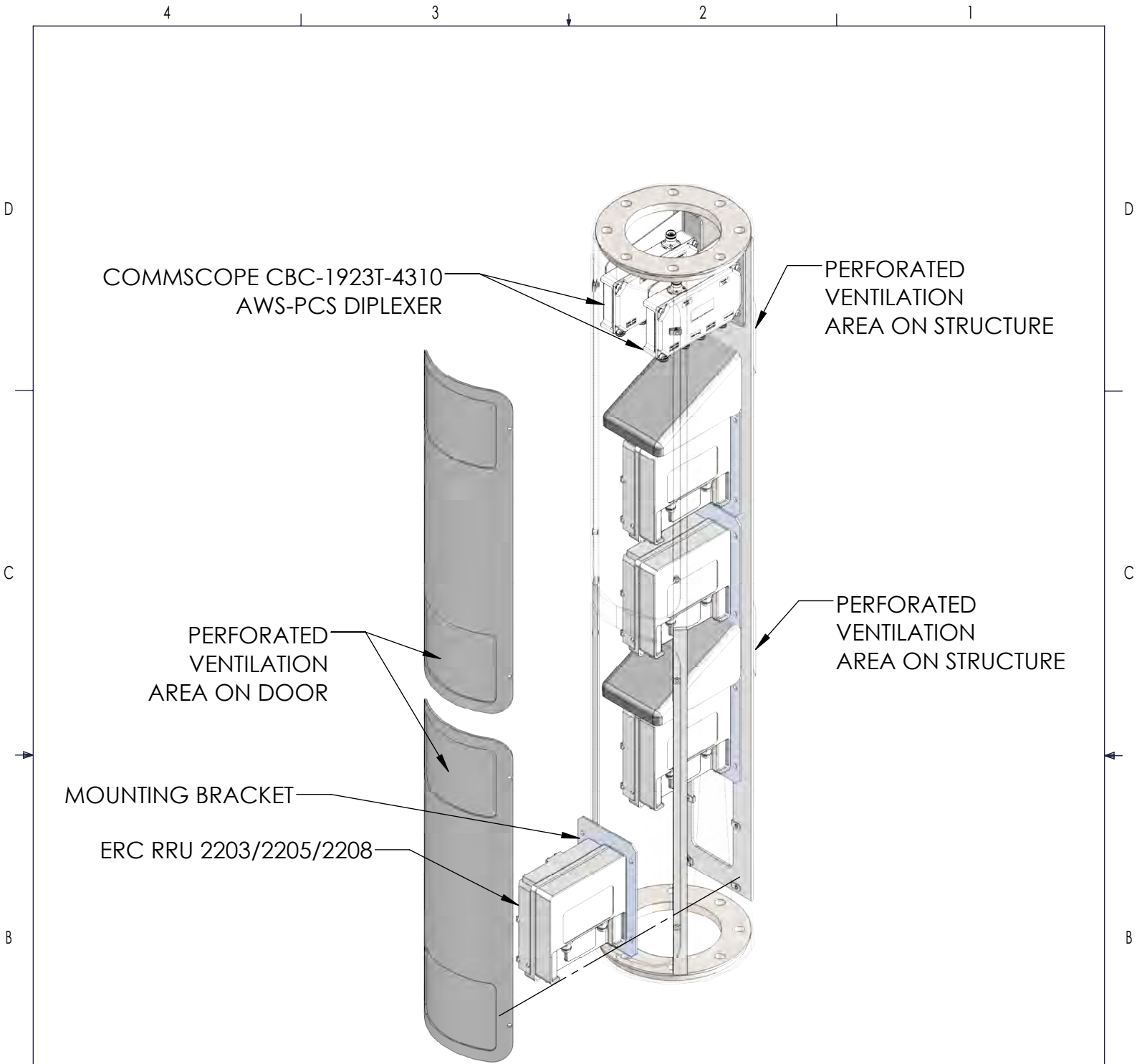
Revision #	Date Issued	Description
0	2/12/2020	Initial Calculations





POWER SECTION

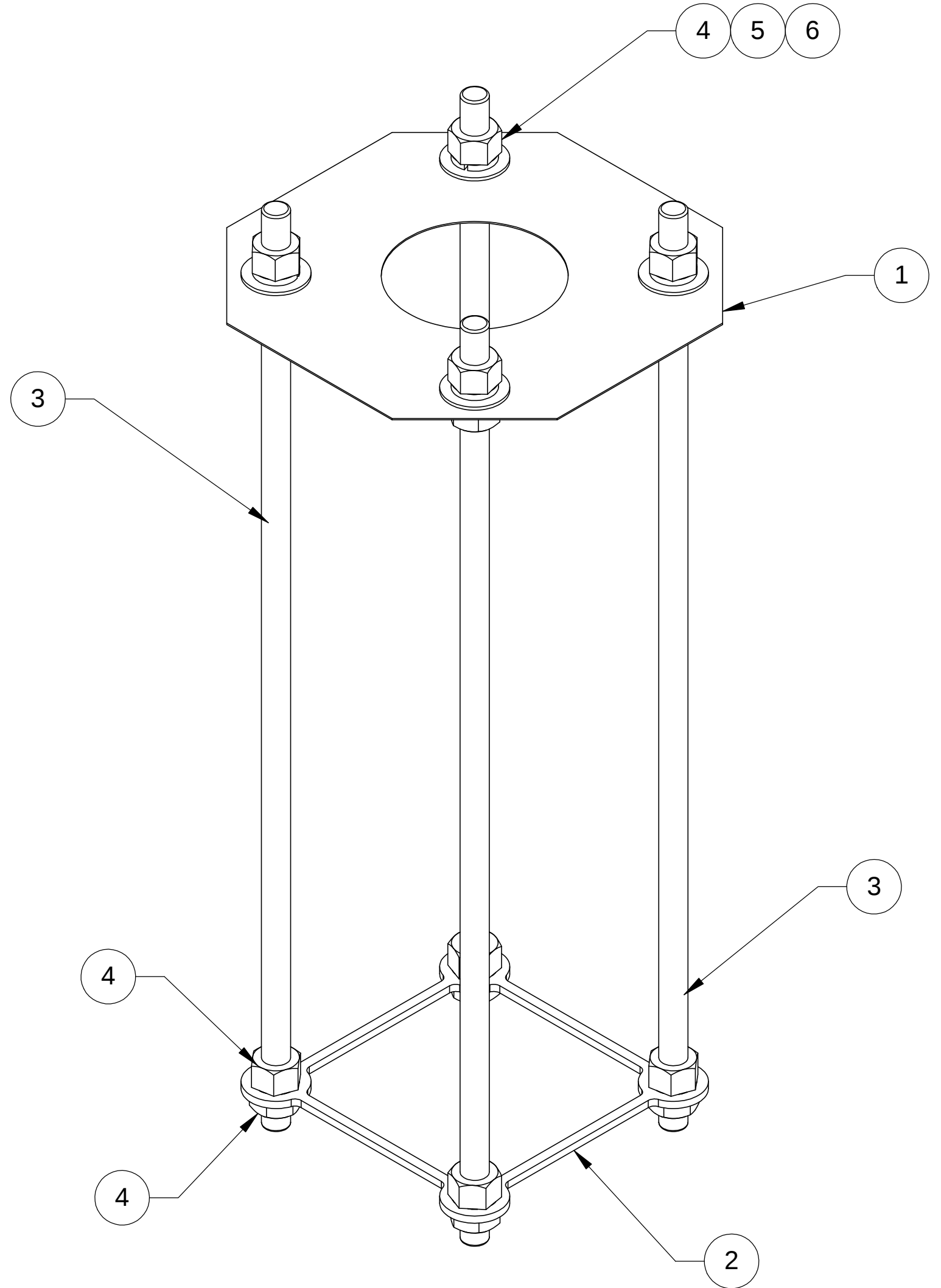
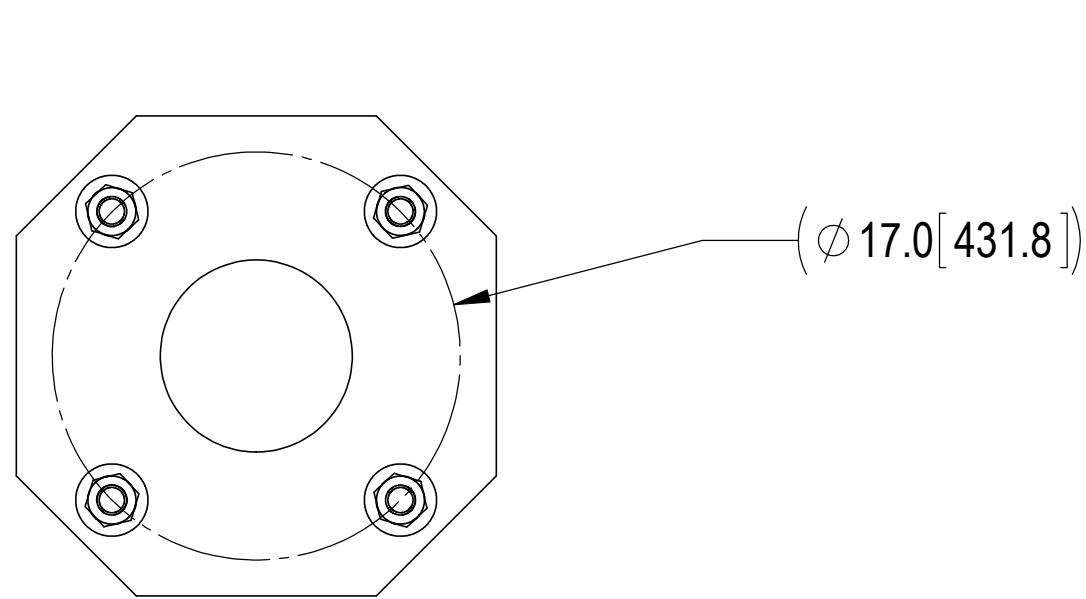
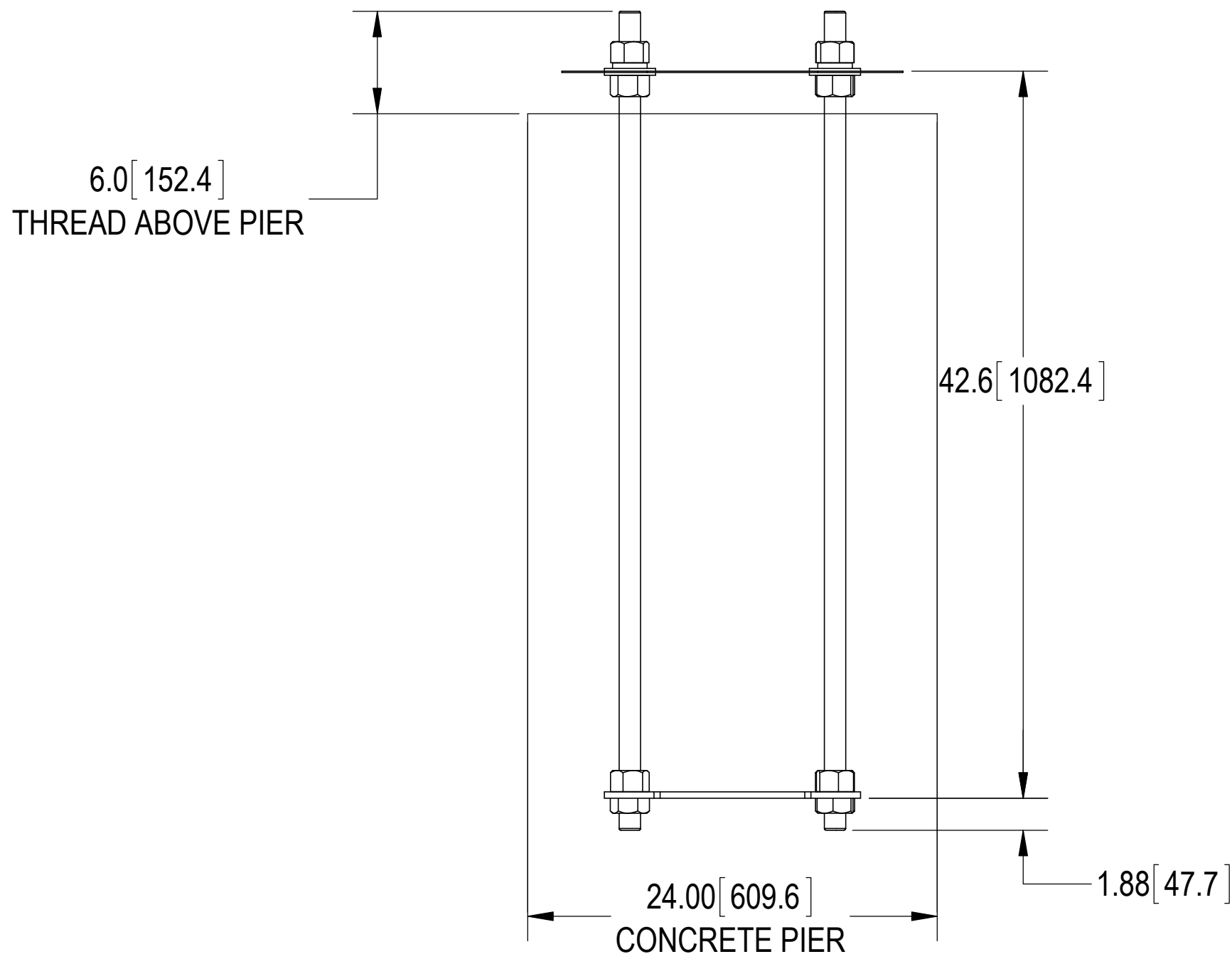
These drawings and specifications are the proprietary property of CommScope Inc. and may be used only for the specific purpose authorized in writing by CommScope Inc.	DRAWN BY: MJP	SHEET: 2 of 3	PART NUMBER: SSC760239237xy306P
	CHECKED BY:	SCALE:	DESCRIPTION: METRO CELL, 12 IN INTEGRATED POLE SOLUTION, 30FT MAX
ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED: .X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .031 REMOVE BURRS AND BREAK EDGES .005 DO NOT SCALE THIS PRINT	DATE:	MATERIAL:	DRAWING TYPE:
	REVISION: A	FINISH: WEIGHT	COMMScope®



ACTIVE RAN EQUIPMENT SECTION
ERC RRU 2203/2205/2208 OPTION

These drawings and specifications are the proprietary property of CommScope Inc. and may be used only for the specific purpose authorized in writing by CommScope Inc. ALL DIMENSIONS ARE IN INCHES U.O.S. TOLERANCES UNLESS OTHERWISE SPECIFIED: .X = ± .12 ANGLES ±2° .XX = ± .06 FRACTIONS ±1/32 .XXX = ± .031 REMOVE BURRS AND BREAK EDGES .005 DO NOT SCALE THIS PRINT	DRAWN BY: MJP	SHEET: 3 of 3	PART NUMBER: SSC760239237xy306P
	CHECKED BY:	SCALE:	DESCRIPTION: METRO CELL, 12 IN INTEGRATED POLE SOLUTION, 30FT MAX
	DATE:	MATERIAL:	DRAWING TYPE:
	REVISION: A	FINISH:	COMMScope®
		WEIGHT:	

NOTES: 1.0 ALL METRIC DIMENSIONS ARE IN BRACKETS.
2.0 SET THREADED ROD TO BE 6.0" ABOVE FOUNDATION.



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	MTC3985FK01	FOUNDATION TEMPLATE, 1.25 HOLES X 17" BC	1	6.14 LBS	
2	MTC3985FK02	FOUNDATION TEMPLATE BOTTOM, 1.25 HOLES X 17" BC	1	4.35 LBS	
3	MT39312548	THREADED ROD, 1.25-7 X 48,F1554 GR55, GALV	4	16.59 LBS	
4	GN-10A	HEX NUT GALV, 1.25-7, HEAVY	16	0.872 LBS	
5	GWL-10	GALV WASHER, LOCK, 1-1/4"	4	0.168 LBS	
6	GWLF-10A	GALV WASHER FLAT, 1.25" X 3"OD	8	0.260 LBS	

COMMScope, INC. OF NORTH CAROLINA					
TITLE					
FOUNDATION KIT, 1.25 HOLES X 48" RODS X 17" BC					
SIZE	SCALE	DOCUMENT NO.			
C	1:8	MTC3985FK			
 		DRAWING			SHEET 2 OF 2
		VERSION	STATUS	REVISION	
				B	

1.0 GENERAL

1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS

1.2 MARK PART WITH IDENTIFICATION NUMBER

2.0 DESIGN NOTES

2.1 THIS DRAWING IS FOR MULTIPLE PARTS. SEE TABLE FOR BOM

2.2 PART NUMBER DEFINITION: MTM1029-70XX-XX

2.2.1 THE FIRST "XX" IS SEQUENTIAL ALPHA NUMERIC REGARDING LENGTH & CUTOUT PLACEMENT

2.2.2 THE SECOND "XX" SIGNIFIES COLOR (SEE NOTE 3.1)

3.0 MANUFACTURING/SPECIAL REQUIREMENTS

3.1 FINISH: -XX SUFFIX ON PART NUMBER REPRESENTS SPECIFIC COLOR / FINISH

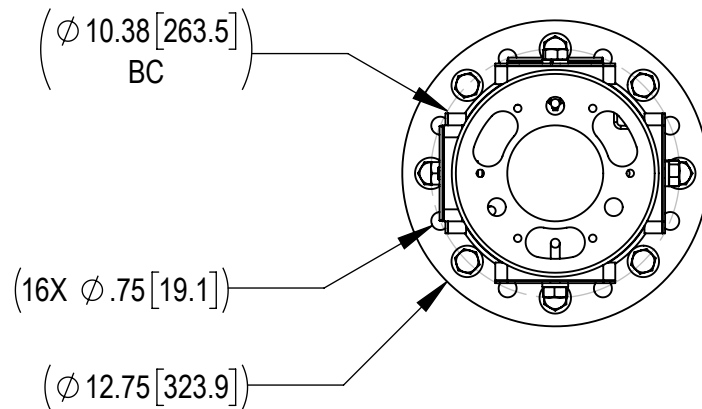
REFER TO METROCELL PRODUCT COLOR / FINISH SPECIFICATION MTM1004 FOR SPECIFIC REQUIREMENTS

3.2 HARDWARE KIT TO SHIP WITH ASSEMBLY IN A BAG

3.3 (SHOWN FOR REF.) INSTALLED BY CUSTOMER

4.0 TEST

5.0 PACKAGING



REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
D	8000033839	ADDED -7017	AK1101	2/22/2019
E	8000034351	ADDED -7018 AND -7019	MSM	3/11/2019
F	8000035886	ADDED -7020 CONFIG	JP1130	6/20/2019
G	8000036785	ADDED -7021 & -7022 CONFIG, ADD LUMINAIRE GROUP 2 TO -7000 & -7001, ADDED FLAT WASHER, REPLACED POLE MNT HDW W/KIT MTM00HK-0001	CB1074	08/23/2019
J	8000037366	9963-70 WAS GB-0514A SWL-05 WAS GWF05A	SF1043	10/11/2019

POLE ASSEMBLY TABLE

PART #	DESCRIPTION	POLE	ITEM 2 QTY	ITEM 3 QTY	ITEM 4 & 5 QTY	WEIGHT (LBS)
MTM1029-7000-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 9.5'	MTM1029-7400-XX	4	5	8	211
MTM1029-7001-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 10.0'	MTM1029-7401-XX	4	5	8	219
MTM1029-7002-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 11.5'	MTM1029-7402-XX	2	4	4	231
MTM1029-7003-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 14.5'	MTM1029-7403-XX	2	4	4	282
MTM1029-7004-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 15.0'	MTM1029-7404-XX	2	4	4	290
MTM1029-7005-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 16.5'	MTM1029-7405-XX	2	4	4	315
MTM1029-7006-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 18.0'	MTM1029-7406-XX	2	4	4	341
MTM1029-7007-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 19.5'	MTM1029-7407-XX	2	4	4	366
MTM1029-7008-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 20.0'	MTM1029-7408-XX	2	4	4	374
MTM1029-7009-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 21.5'	MTM1029-7409-XX	2	4	4	400
MTM1029-7010-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 21.5'	MTM1029-7410-XX	2	4	4	400
MTM1029-7011-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 22.0'	MTM1029-7411-XX	2	4	4	408
MTM1029-7012-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 25.0'	MTM1029-7412-XX	2	4	4	459
MTM1029-7013-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 27.0'	MTM1029-7413-XX	2	4	4	492
MTM1029-7014-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 16.5'	MTM1029-7414-XX	2	4	4	315
MTM1029-7015-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 20.0'	MTM1029-7415-XX	2	4	4	366
MTM1029-7016-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 23.0'	MTM1029-7416-XX	2	4	4	424
MTM1029-7017-XX	ASSEM, 8.625 OD .188 WALL LENGTH: 14.5'	MTM1029-7417-XX	2	4	4	282
MTM1029-7018-XX	ASSEM, 8.625 OD .188 WALL, LENGTH 17'	MTM1029-7418-XX	2	4	4	323
MTM1029-7019-XX	ASSEM, 8.625 OD .188 WALL, LENGTH 24'	MTM1029-7419-XX	2	4	4	442
MTM1029-7020-XX	ASSEM, 8.625 OD .188 WALL, LENGTH 11.5'	MTM1029-7420-XX	2	4	4	231
MTM1029-7021-XX	ASSEM, 8.625 OD .188 WALL, LENGTH 6.5'	MTM1029-7421-XX	2	4	4	147
MTM1029-7022-XX	ASSEM, 8.625 OD .188 WALL, LENGTH 19.5'	MTM1029-7422-XX	2	4	4	366

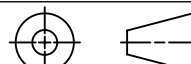
BOM TABLE

ITEM	PART NO.	DESCRIPTION	QTY.	NOTES
1	MTM1029-7400	WELDMNT, 8.625 OD .188 WALL LENGTH: 9.5'	1	
2	MTC399920-XX	PLATE. STREET LIGHT ARMS COVER	(SEE POLE ~ TABLE)	
3	MTC317060-XX	4 X 5 HANDHOLE COVER KIT FOR MTC3170 SERIES	(SEE POLE ~ TABLE)	
4	9963-70	SCR, HCS, 5/8-11, 1.00, SST, PASS	(SEE POLE ~ TABLE)	
5	SWL-05	5/8" SS LOCK WASHER	(SEE POLE ~ TABLE)	
6	MTM00HK-0001	KIT, HARDWARE 5/8" X 3" A325 & LOCKS (8/16)	1	3.2, 3.3
7	MTM00HK-0002	KIT GROUND BONDING, 6AWG, 18IN, 1/4 LUG	1	3.2

LUMINAIRE GROUP 2
ONLY USED ON
MTM1029-7000-XX
MTM1029-7001-XX

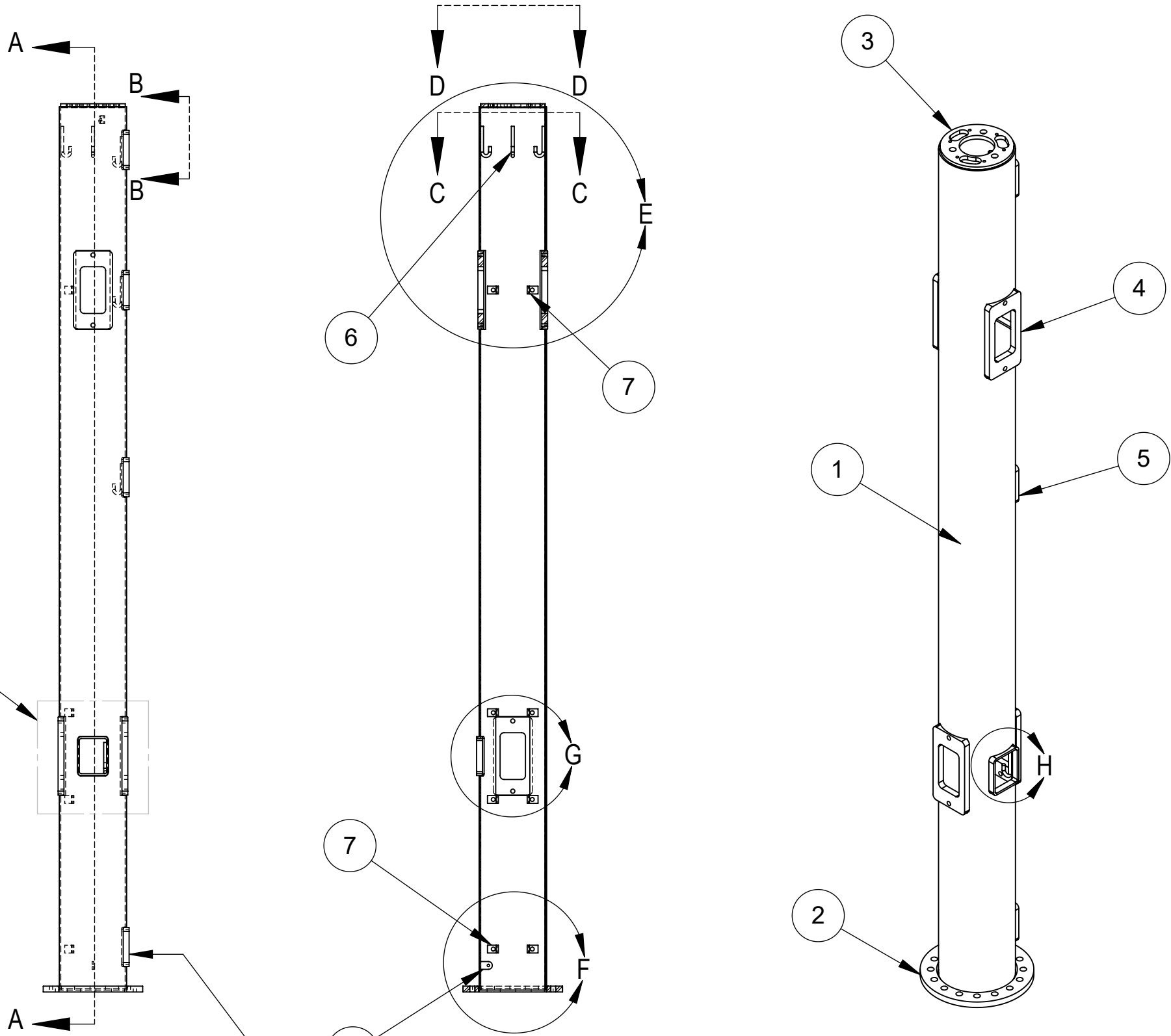
SEE NOTE 3.3

-7000 (SHOWN)

COMMSCOPE, INC. OF NORTH CAROLINA									
TOLERANCES						SAP MATERIAL MASTER			
1 PLACE .X ± 0.25		3 PLACE .XXX ± 0.06				MTM1029-70XX-XX			
2 PLACE .XX ± 0.12		ANGLES ± 2°							
FINISH SEE NOTES 3.1						MATERIAL SEE BOM			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET PER ANSI Y 14.5M-1994		NAME	DATE	ASSY 8.OD.188 WALL MULTI LONG					
	CE	RW1043	8/28/2018						
	RW	SF1043	11/04/2019						
	RV								
	AD	SF1043	11/04/2019						
	RE	SF1043	11/04/2019	SCALE	DOCUMENT NO.				
	ECN 008000037366			1:48	MTM1029-70XX SERIES				
	SIZE	WORK AREA 24		MODEL			DRAWING		
C			VERSION	STATUS	REVISION	VERSION	STATUS	REVISION	
			12	RE		16	RE	J	

- 1.0 GENERAL
- 1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS
- 1.2 FEATURES CRITICAL TO QUALITY ARE INDICATED IN ROUNDED BOX (X.X)
- 2.0 DESIGN NOTES
- 2.1 THIS DRAWING IS FOR MULTIPLE PARTS. SEE TABLE FOR BOM
- 3.0 MANUFACTURING/SPECIAL REQUIREMENTS
- 3.1A GALVANIZE PER ASTM A123. ENSURE NO BUMPS, RUNS OR DRIPS ON EXTERIOR SURFACES AND EDGES.
- 3.1B POWDER COAT EXTERIOR SURFACE PER METROCELL PRODUCT COLOR/FINISH SPECIFICATION MTM1004 AS PER SUFFIX -XX. DO NOT POWDER COAT END CAP SURFACES OR INTERIOR OF ASSEMBLY.
- OVERSPRAY PERMISSIBLE ON INTERIOR SURFACE
- 3.2 WELDING WORKMANSHIP PER AWS D1.1, TABLE 6.1
- 3.3 TERMINATE WELDS AT ENDS OF JOINT
- 3.4 CLEAN HOLES AND CHASE THREADS AFTER GALV
- 3.5 APPLY RUST PREVENTIVE COATING WHERE GALV IS REMOVED
- 3.6 PART NUMBER DEFINITION: MTM1029-74YY-XX. "YY" IS SEQUENTIAL ALPHA NUMERIC REGARDING LENGTH AND CUTOUT PLACEMENT. "-XX" (SEE NOTE 3.1)
- 3.7 MASK 1IN GROUND LUGS PRIOR TO PAINT, BOTH SIDES
- 3.8 ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY.
- WELDING ELECTRODES SHALL BE E70XX
- 4.0 TEST
- 5.0 PACKAGING

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
F	8000033839	ADDED CONFIGURATION -7417	AK1101	2/22/2019
G	8000034351	ADD CONFIGURATIONS - 7618 / 7619	MSM	3/11/2019
H	8000035886	ADDED CONFIGURATION -7620	JP1130	6/20/2019
J	8000035591	UPDATED STRUCT WELD CALLOUTS SH2	AG1119	8/6/2019
K	8000036785	ADDED NEW CONFIGS -7421 & -7422, ADDED 2ND LUMINAIRE GROUP ON -7400 & -7401, ADDED MORE J-HOOKS, CHG LUMINAIRE PLATES TO ONES W/HANDHOLES	CB1074	08/19/2019
L	8000037076	ADDED CONFIGURATION -7623 MOVE TOP GROUND LUG TO CLEAR HARDWARE	GR1010	08/28/2019



NO J-HOOK ON BOTTOM HANDHOLE

SECTION A-A
SCALE 1 : 16

LUMINAIRE GROUP 2
ONLY USED ON
MTM1029-7400-XX
MTM1029-7401-XX

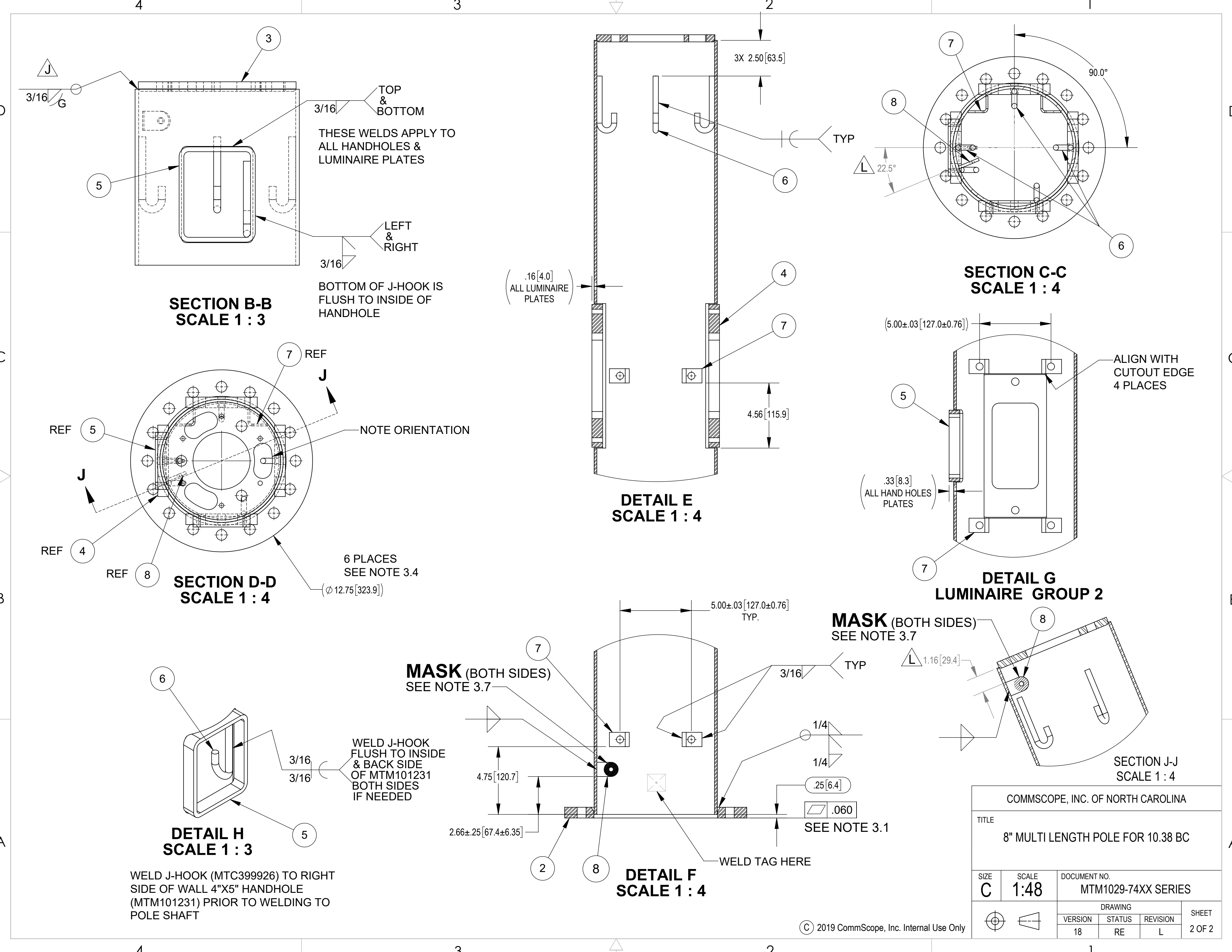
BOM TABLE				
ITEM	PART NO.	DESCRIPTION	QTY.	NOTES
1	MTM1029-7600	PIPE, 8.625 OD .188 WALL LENGTH: 9.5'	1	
2	MTM1029-710	FLANGE BASE MOUNT, 8.63" OD POLE, 10.38 BC	1	
3	MTC3999101	PLATE, POLE TOP	1	
4	MTM1071-5005	LUMINAIRE MOUNT PLATE	(SEE POLE ~ TABLE)	
5	MTM101231	4" X 5" HAND HOLE FOR MTC3170 POLE	(SEE POLE ~ TABLE)	
6	MTC399926	J-HOOK	(SEE POLE ~ TABLE)	
7	MTM1029-711	WELD PLATE FOR CLIP SCREW MOUNT	(SEE POLE ~ TABLE)	
8	MTM1010-562	GROUND LUG	2	

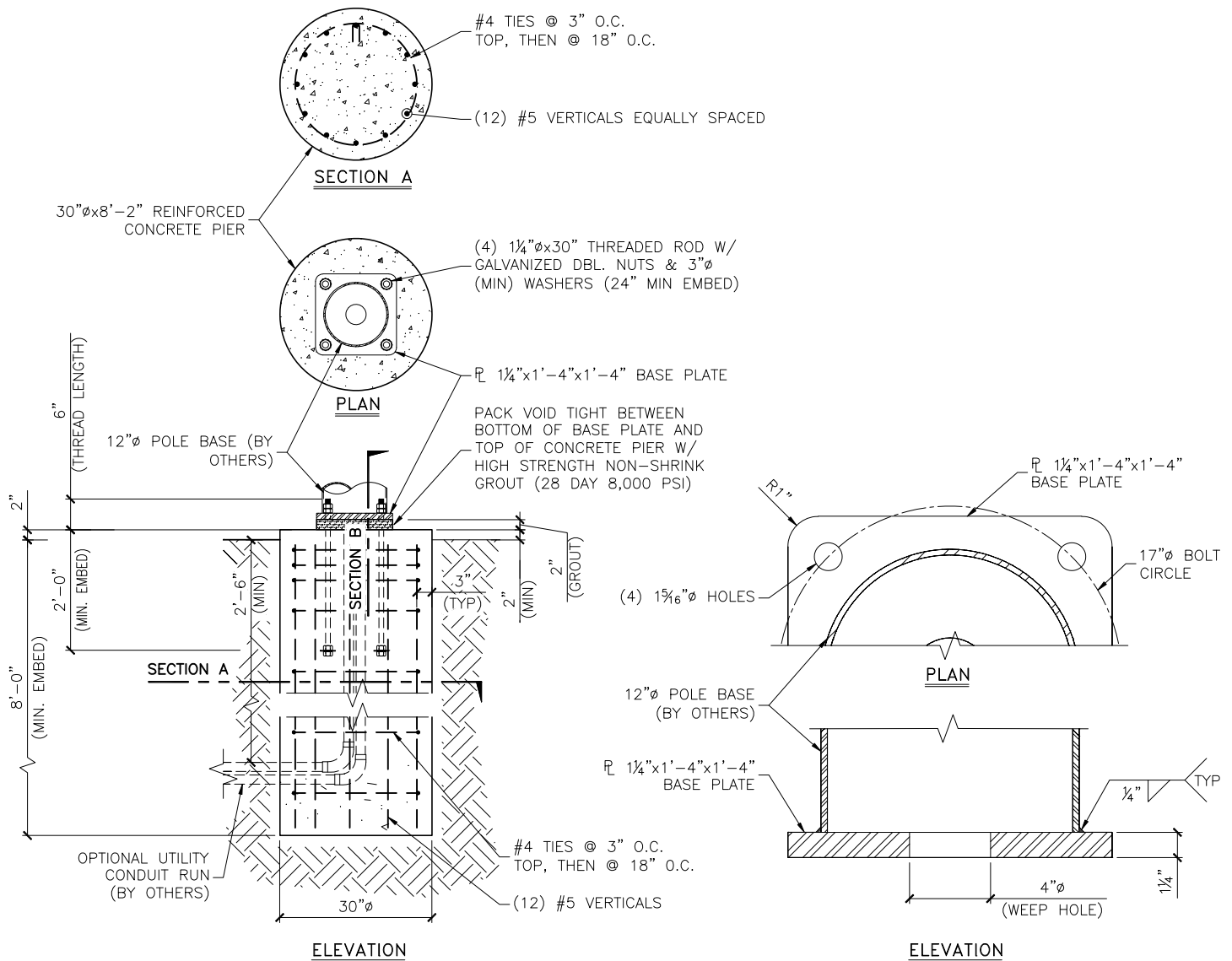
POLE WELDMENT TABLE								
PART #	RAW PIPE	DESCRIPTION.	WEIGHT (LBS)	TOTAL SURFACE AREA IN²	ITEM 4 QTY	ITEM 5 QTY	ITEM 6 QTY	ITEM 7 QTY
MTM1029-7400-XX	MTM1029-7600	POLE WELDMENT, 8.63OD, .188W, 9.5'	193	6,434	4	5	7	8
MTM1029-7401-XX	MTM1029-7601	POLE WELDMENT, 8.63OD, .188W,10.0'	202	6,752	4	5	7	8
MTM1029-7402-XX	MTM1029-7602	POLE WELDMENT, 8.63OD, .188W,11.5'	219	7,660	2	4	6	4
MTM1029-7403-XX	MTM1029-7603	POLE WELDMENT, 8.63OD, .188W,14.5'	269	9,568	2	4	6	4
MTM1029-7404-XX	MTM1029-7604	POLE WELDMENT, 8.63OD, .188W,15.0'	278	9,886	2	4	6	4
MTM1029-7405-XX	MTM1029-7605	POLE WELDMENT, 8.63OD, .188W,16.5'	303	10,841	2	4	6	4
MTM1029-7406-XX	MTM1029-7606	POLE WELDMENT, 8.63OD, .188W,18.0'	328	11,795	2	4	6	4
MTM1029-7407-XX	MTM1029-7607	POLE WELDMENT, 8.63OD, .188W,19.5'	354	12,749	2	4	6	4
MTM1029-7408-XX	MTM1029-7608	POLE WELDMENT, 8.63OD, .188W, 20.0'	362	13,067	2	4	6	4
MTM1029-7409-XX	MTM1029-7609	POLE WELDMENT, 8.63OD, .188W, 21.5'	387	14,021	2	4	6	4
MTM1029-7410-XX	MTM1029-7610	POLE WELDMENT, 8.63OD, .188W, 21.5'	387	14,021	2	4	6	4
MTM1029-7411-XX	MTM1029-7611	POLE WELDMENT, 8.63OD, .188W, 22.0'	396	14,339	2	4	6	4
MTM1029-7412-XX	MTM1029-7612	POLE WELDMENT, 8.63OD, .188W, 25.0'	446	16,248	2	4	6	4
MTM1029-7413-XX	MTM1029-7613	POLE WELDMENT, 8.63OD, .188W, 27.0'	480	17,520	2	4	6	4
MTM1029-7414-XX	MTM1029-7614	POLE WELDMENT, 8.63OD, .188W,16.5'	303	10,841	2	4	6	4
MTM1029-7415-XX	MTM1029-7615	POLE WELDMENT, 8.63OD, .188W, 20.0'	362	13,067	2	4	6	4
MTM1029-7416-XX	MTM1029-7616	POLE WELDMENT, 8.63OD, .188W, 23.0'	413	14,975	2	4	6	4
MTM1029-7417-XX	MTM1029-7617	POLE WELDMENT, 8.63OD, .188W, 14.5'	269	9,568	2	4	6	4
MTM1029-7418-XX	MTM1029-7618	POLE WELDMENT, 8.63OD, .188W, 17.0'	312	11,159	2	4	6	4
MTM1029-7419-XX	MTM1029-7619	POLE WELDMENT, 8.63OD, .188W, 24.0'	430	15,612	2	4	6	4
MTM1029-7420-XX	MTM1029-7620	POLE WELDMENT, 8.63OD, .188W, 11.5'	219	7,660	2	4	6	4
MTM1029-7421-XX	MTM1029-7621	POLE WELDMENT, 8.63OD, .188W, 6.5'	135	4,479	2	4	6	4
MTM1029-7422-XX	MTM1029-7622	POLE WELDMENT, 8.63OD, .188W, 19.5'	354	12,749	2	4	6	4
MTM1029-7423-XX	MTM1029-7623	POLE WELDMENT, 8.63OD, .188W, 9.5'	185	6,387	2	4	6	4

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DENSITY	0.28	lbs/in³
MASS	MULTI	lbs
VOLUME		in³
SURFACE AREA	MULTI	in²
HEIGHT	MULTI	
LENGTH	12.75	
WIDTH	12.75	

COMMSCOPE, INC. OF NORTH CAROLINA									
TOLERANCES						SAP MATERIAL MASTER			
1 PLACE .X ± 0.188						3 PLACE .XXX ± 0.063			
2 PLACE .XX ± 0.125						ANGLES ± .5°			
FINISH SEE NOTES						MATERIAL SEE BOM			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET PER ANSI Y 14.5M-1994		NAME	DATE	TITLE 8" MULTI LENGTH POLE FOR 10.38 BC					
	CE	RW1043	8/24/2018						
	RW	GR1010	10/14/2019						
	RV								
	AD	CC1022	10/15/2019	SCALE 1:20	DOCUMENT NO. MTM1029-74XX SERIES				
	RE	GR1010	10/16/2019						
	ECN 008000037076								
	SIZE	WORK AREA 24		MODEL			DRAWING		
C			VERSION	STATUS	REVISION	VERSION	STATUS	REVISION	
			11	RE	K	18	RE	L	





STEEL & CONCRETE NOTES:

- ALL STEEL SHALL BE GALVANIZED PER ASTM A123 & CONFORM TO THE FOLLOWING MINIMUM SPECS.:
PLATE ASTM A572 GR.65 (65 KSI), PIPE ASTM A500 GR.B (42 KSI), THREADED ROD ASTM F1554 GR.55
- ALL BOLTS SHALL BE GALVANIZED PER ASTM A153 AND CONFORM TO ASTM A325 U.N.O. ALL BOLTED CONNECTIONS SHALL BE EQUIPPED WITH AN APPROVED NUT-LOCKING DEVICE.
- ALL WELDING WORK SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY. WELDING ELECTRODES SHALL BE E70XX.
- ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO AISC SPECS AND CODES, LATEST EDITION.
- AT HIS OWN DISCRETION, THE CONTRACTOR MAY SUBMIT DETAILED, ENGINEERED, COORDINATED AND CHECKED SHOP DRAWINGS FOR ALL STRUCTURAL STEEL TO THE ENGINEER OF RECORD TO REVIEW FOR COMPLIANCE WITH DESIGN INTENT PRIOR TO THE START OF FABRICATION AND/OR ERECTION. TOWERCOM IS ABSOLVED OF ALL LIABILITY ASSOCIATED WITH THE MISINTERPRETATION OF THE CONSTRUCTION DOCUMENTS IF CONTRACTOR CHOOSES NOT TO SUBMIT SHOP DRAWINGS.
- TORCH-CUTTING OF ANY KIND SHALL NOT BE PERMITTED.
- ALL BOLTS SHALL BE TIGHTENED TO A "SNUG-TIGHT" CONDITION AS DEFINED IN AISC 13TH EDITION, PAGE 16.2-46, SECTION 8.1. THE SNUG-TIGHTENED CONDITION IS DEFINED AS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
- $f'_c=4000$ PSI, $F_y = 60$ (KSI) SPECIAL INSPECTION REQUIRED FOR CONCRETE STRENGTH OVER 2500 PSI.

NOTE:

ALL DIMENSIONS, SECTIONS AND DETAILS OF THE EXISTING STRUCTURE ARE INCLUDED FOR INFORMATION PURPOSED ONLY. THE CONTRACTOR SHALL VERIFY ALL RELEVANT INFORMATION PRIOR TO CONSTRUCTION OR FABRICATION. FABRICATION AND/OR FIT-UP ISSUES ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY PRIOR TO THE START OF CONSTRUCTION. SHOULD THERE BE ANY DISCREPANCIES, ERRORS, OR OMISSIONS ON THIS SKETCH, NOTIFY THE ENGINEER OF RECORD IMMEDIATELY FOR RESOLUTION. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS.

DESIGNED FOR:	DESIGNED BY:	PROJECT NAME:	SSC-760239237XY306P
		PROJECT ADDRESS:	OPTION A (CONNECTICUT)
		SHEET TITLE:	LIGHTPOLE PIER W/ ANCHOR BOLT DETAIL
		BY: RWB	DATE: 2/18/2020
		SHEET NUMBER:	S1

COMMScope

INFRASTRUCTURE
PARTNERS

PROJECT: Commscope 30' Light Pole Foundation

Project No. SSC-760239237xy306P

Height 30 ft

LOCATION: Connecticut Market

DESCRIPTION: Design a 30' pole and foundation for the Connecticut Market for the loading below for the maximum design criteria in the State of Connecticut.

LOADING: (1) 15"ø x 60" Tall Canister Antenna with
Equipment Concealment at the Top

Assume Equip. Weight 200 lbs

(2) Optional Luminares at ~25'

(2) Optional Luminaire Arms at 24'

Assume Equip. Weight 200 lbs

(1) 12" DIA x5'-6" Active Ran Equipment module at ~8'-0"

(1) 12" dia x5'-0" Power Base module at ~3'-0"

Assume Equip. Weight 300

POLE SIZE: HSS8x0.1875 at top

Base Diameter 12 inches

Steel Grade A500 Gr. B

Fy 42 ksi

BASEPLATE: 1-1/4"x16"x16"

Thickness 1.25 inches

Width 16 inches

Steel Grade A572 Gr. 65

Fy 65 ksi

FOUNDATION:

Option A Anchor Bolts Embedded in Concrete Pier

Pier Diameter 30 inches

DESIGN CODE: IBC 2018 / IBC 2015 / 2012 / 2009

ASCE 7-16 / 7-10 / 7-05

TIA-222-H / TIA-222-G

Exposure C

Structure Type II

Soil Site Class D

DESIGN LOADS: (Look up values form Tables in G-Code)

Max. Wind Speed 120 mph (3-sec Gust from G-Code)
 140 Vult (factored) Per IBC 2018
Location New London County in Connecticut
Max. Ice Wind Speed 50 mph (G-code)
Location Various Counties in Connecticut
Max. Ice 1.5 inch
Location Various Counties in Connecticut

Since this is a Lightpole, it will likely be used in City and Town areas, not in Mountains, so assume a Topography Category 1 and Exposure C for wind

Wind Presure 0.95 Kd
 0.85 Kz
 1 Kzt
 40.51712 psf

Max. Ss 0.41 g
Location Fairfield County (TIA-222-G-Code)

Seismic may be ignored per Section 2.7.3 of G-Code

Use Method 1, Equivalent Later Force Procedure, from TIA-222-G Code (Section 2.7.7)

Fa 1.45
Sms 0.5945
Sds 0.396333 g
R 1.5 for pole structures
I 1 for Structural Class II
Structure Weight: 1257.5 lbs (from TNX model and Commscope info)
Pole/Antenna/Light 1257.50 lbs
Vs 332 lbs
Wind Controls

TOWER BASE REACTIONS:

Take values from TNX model

	Factored		Unfactored (Use for Foundation Design)
Axial	1.509 k	"---->	1.26 k
Shear	1.215 k		0.76 k
Moment	22.071 k-ft		13.79 k-ft

Location for Wind Shear in Enercalc Foundation Model

18.17 ft

Location for Shear load in Enercalc

SEISMIC VERTICAL FORCE DISTRIBUTION:

TIA-222-G Section 2.7.7.2

frequency 1.120023 Hz
ke 1.549986

E 29000 ksi
Iavg 41.30 in⁴
Itop 41.30 in⁴
Ibtm 41.30 in⁴
Wu 0.4 k
Wt 1.2575 k
Wl 0.8575 k
L 360 in
g 387.36 in/s²

Level	wx (lbs)	hx (ft)	wx hx ^ k	Fsz (lbs)
Omni	200	27.5	34038.89	100.57
Light	100	26	15602.31	46.10
Arm	100	24	13781.87	40.72
Pole	868	13.5	49036.69	144.88
Total	1268		112459.8	332.26

SEISMIC BASE REACTIONS:

Axial 1.26 k
Shear 0.33 k
Moment 6.90 k-ft

20.75844
Doesn't apply if Wind Controls

SOIL PROPS:

Since we don't know location, assume minimul values from IBC

Lateral Bearing 100 psf/ft
Soil Bearing 1500 psf
Aggregate Lat. Bearing 150 psf/ft

Per IBC 1806.3.4, Design as Isolate pier, so double lateral bearing

Design Lateral Bearing 200 psf/ft (use this value in Enercalc)
Max. Lateral Bearing 3000 psf (use this value in Enercalc)
Aggregate Lat. Bearing 300 psf/ft (use this value in Enercalc)

CONCRETE PIER REBAR:

Area 706.85835 in²
As 3.5342917 in² (minimum of As = 0.005 * A)
Area #5 Bar 0.31 in²
Quantity Required 12 Use (12) #5 Vertical Rebar



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Commscope 16" Omni w/ Shroud Equipment	27.5	3" DIA x 6' Long Luminaire Arm (Street Light Mount)	25
3" DIA x 6' Long Luminaire Arm (Street Light Mount)	25	Street Lighting	25
Street Lighting	25	RAN Equipment Module	10.5 - 5
		Power and Wireless Equipment Module	5 - 0

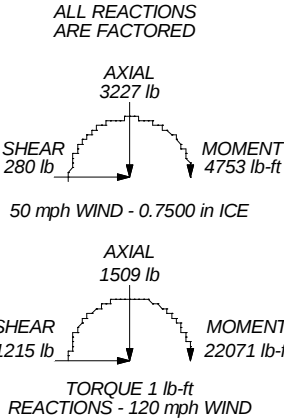
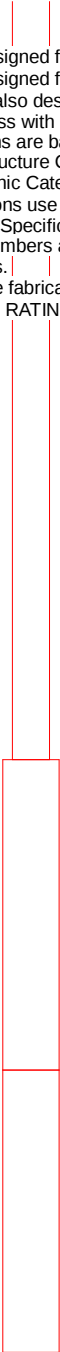
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
8. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
9. Welds are fabricated with ER-70S-6 electrodes.
10. TOWER RATING: 28.8%

1	HSS8.625x.188	14.50	A500-42	227.9	25.0 ft
2	CSI Integrated 12" Pole/Module	5.50		172.7	10.5 ft
3	CSI Integrated 12" Pole/Module	5.00		157.0	5.0 ft
Section	Size	Length (ft)	Grade	Weight (lb)	0.0 ft



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	Project: Structural Analysis - Rev-0		
	Client: Commscope SSC760239237xy306P	Drawn by: DanhHo	App'd:
	Code: TIA-222-G	Date: 02/11/20	Scale: NTS
	Path:	Dwg No. E-1	

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Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Basic wind speed of 120 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..

Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..

Welds are fabricated with ER-70S-6 electrodes..

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

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Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length in
L1	25.00-10.50	14.50	HSS8.625x.188	A500-42 (42 ksi)	
L2	10.50-5.00	5.50	CSI Intergrated 12" Pole/Module	A500-42 (42 ksi)	
L3	5.00-0.00	5.00	CSI Intergrated 12" Pole/Module	A500-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 25.00-10.50				1	1	1			
L2 10.50-5.00				1	1	1			
L3 5.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
* EXISTING *											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
* EXISTING *								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	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 lb
L1	25.00-10.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
L2	10.50-5.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
L3	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	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 lb
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2	Weight lb
L1	25.00-10.50	A	1.410	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		0.000	0.000	0.000	0.000	0.00
L2	10.50-5.00	A	1.298	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		0.000	0.000	0.000	0.000	0.00
L3	5.00-0.00	A	1.159	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
		D		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	25.00-10.50	0.0000	0.0000	0.0000	0.0000
L2	10.50-5.00	0.0000	0.0000	0.0000	0.0000
L3	5.00-0.00	0.0000	0.0000	0.0000	0.0000

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
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Discrete Tower Loads

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight lb
* EXISTING *									
Commscope 16" Omni w/ Shroud Equipment	D	None		0.0000	27.50	No Ice	3.52	3.52	200.00
						1/2" Ice	5.22	5.22	257.75
						1" Ice	5.59	5.59	320.34
3" DIA x 6' Long Luminaire Arm	A	From Leg	6.00	0.0000	25.00	No Ice	1.80	0.07	50.00
(Street Light Mount)			0.00			1/2" Ice	2.22	0.11	66.85
Street Lighting	A	From Leg	0.00	0.0000	25.00	1" Ice	2.65	0.16	88.95
			12.00			No Ice	1.20	1.20	50.00
			0.00			1/2" Ice	1.37	1.37	79.78
			0.00			1" Ice	1.55	1.55	113.26
3" DIA x 6' Long Luminaire Arm	C	From Leg	6.00	0.0000	25.00	No Ice	1.80	0.07	50.00
(Street Light Mount)			0.00			1/2" Ice	2.22	0.11	66.85
Street Lighting	C	From Leg	0.00	0.0000	25.00	1" Ice	2.65	0.16	88.95
			12.00			No Ice	1.20	1.20	50.00
			0.00			1/2" Ice	1.37	1.37	79.78
			0.00			1" Ice	1.55	1.55	113.26
RAN Equipment Module	D	None		0.0000	10.50 - 5.00	No Ice	0.00	0.00	150.00
						1/2" Ice	0.00	0.00	446.30
						1" Ice	0.00	0.00	497.33
Power and Wireless Equipment Module	C	None		0.0000	5.00 - 0.00	No Ice	0.00	0.00	150.00
						1/2" Ice	0.00	0.00	442.48
						1" Ice	0.00	0.00	489.39

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
* EXISTING *										

Tower Pressures - No Ice

$$G_H = 1.100$$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 25.00-10.50	17.75	0.88	31	10.422	A	0.000	10.422	10.422	100.00	0.000	0.000
					B	0.000	10.422		100.00	0.000	0.000
					C	0.000	10.422		100.00	0.000	0.000
					D	0.000	10.422		100.00	0.000	0.000
L2 10.50-5.00	7.75	0.85	30	5.500	A	0.000	5.500	5.500	100.00	0.000	0.000
					B	0.000	5.500		100.00	0.000	0.000
					C	0.000	5.500		100.00	0.000	0.000

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Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			ft ²
L3 5.00-0.00	2.50	0.85	30	5.000	D	0.000	5.500		100.00	0.000	0.000
					A	0.000	5.000	5.000	100.00	0.000	0.000
					B	0.000	5.000		100.00	0.000	0.000
					C	0.000	5.000		100.00	0.000	0.000
					D	0.000	5.000		100.00	0.000	0.000

Tower Pressure - With Ice

$$G_H = 1.100$$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 25.00-10.50	17.75	0.88	5	1.4098	13.829	A	0.000	13.829	13.829	100.00	0.000	0.000
						B	0.000	13.829		100.00	0.000	0.000
						C	0.000	13.829		100.00	0.000	0.000
						D	0.000	13.829		100.00	0.000	0.000
L2 10.50-5.00	7.75	0.85	5	1.2977	6.690	A	0.000	6.690	6.690	100.00	0.000	0.000
						B	0.000	6.690		100.00	0.000	0.000
						C	0.000	6.690		100.00	0.000	0.000
						D	0.000	6.690		100.00	0.000	0.000
L3 5.00-0.00	2.50	0.85	5	1.1589	5.966	A	0.000	5.966	5.966	100.00	0.000	0.000
						B	0.000	5.966		100.00	0.000	0.000
						C	0.000	5.966		100.00	0.000	0.000
						D	0.000	5.966		100.00	0.000	0.000

Tower Pressure - Service

$$G_H = 1.100$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			ft ²
L1 25.00-10.50	17.75	0.88	7	10.422	A	0.000	10.422	10.422	100.00	0.000	0.000
					B	0.000	10.422		100.00	0.000	0.000
					C	0.000	10.422		100.00	0.000	0.000
					D	0.000	10.422		100.00	0.000	0.000
L2 10.50-5.00	7.75	0.85	7	5.500	A	0.000	5.500	5.500	100.00	0.000	0.000
					B	0.000	5.500		100.00	0.000	0.000
					C	0.000	5.500		100.00	0.000	0.000
					D	0.000	5.500		100.00	0.000	0.000
L3 5.00-0.00	2.50	0.85	7	5.000	A	0.000	5.000	5.000	100.00	0.000	0.000
					B	0.000	5.000		100.00	0.000	0.000
					C	0.000	5.000		100.00	0.000	0.000
					D	0.000	5.000		100.00	0.000	0.000

Discrete Appurtenance Pressures - No Ice

$$G_H = 1.100$$

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Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
Commscope 16" Omni w/ Shroud Equipment	0.0000	200.00	0.00	0.00	27.50	0.964	34	3.52	3.52
3" DIA x 6' Long Luminaire Arm	315.0000	50.00	-4.50	-4.50	25.00	0.945	33	1.80	0.07
Street Lighting	315.0000	50.00	-8.74	-8.74	25.00	0.945	33	1.20	1.20
3" DIA x 6' Long Luminaire Arm	135.0000	50.00	4.50	4.50	25.00	0.945	33	1.80	0.07
Street Lighting	135.0000	50.00	8.74	8.74	25.00	0.945	33	1.20	1.20
RAN Equipment Module	0.0000	150.00	0.00	0.00	7.75	0.850	30	0.00	0.00
Power and Wireless Equipment Module	0.0000	150.00	0.00	0.00	2.50	0.850	30	0.00	0.00
Sum Weight:		700.00							

Discrete Appurtenance Pressures - With Ice $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²	t _z in
Commscope 16" Omni w/ Shroud Equipment	0.0000	386.69	0.00	0.00	27.50	0.964	6	5.95	5.95	1.4729
3" DIA x 6' Long Luminaire Arm	315.0000	116.83	-4.50	-4.50	25.00	0.945	6	3.05	0.21	1.4589
Street Lighting	315.0000	149.43	-8.74	-8.74	25.00	0.945	6	1.72	1.72	1.4589
3" DIA x 6' Long Luminaire Arm	135.0000	116.83	4.50	4.50	25.00	0.945	6	3.05	0.21	1.4589
Street Lighting	135.0000	149.43	8.74	8.74	25.00	0.945	6	1.72	1.72	1.4589
RAN Equipment Module	0.0000	532.12	0.00	0.00	7.75	0.850	5	0.00	0.00	1.2977
Power and Wireless Equipment Module	0.0000	506.50	0.00	0.00	2.50	0.850	5	0.00	0.00	1.1589
Sum Weight:		1957.82								

Discrete Appurtenance Pressures - Service $G_H = 1.100$

Description	Aiming Azimuth °	Weight lb	Offset _x ft	Offset _z ft	z ft	K _z	q _z psf	C _{AAc} Front ft ²	C _{AAc} Side ft ²
Commscope 16" Omni w/ Shroud Equipment	0.0000	200.00	0.00	0.00	27.50	0.964	8	3.52	3.52
3" DIA x 6' Long Luminaire Arm	315.0000	50.00	-4.50	-4.50	25.00	0.945	7	1.80	0.07
Street Lighting	315.0000	50.00	-8.74	-8.74	25.00	0.945	7	1.20	1.20
3" DIA x 6' Long Luminaire Arm	135.0000	50.00	4.50	4.50	25.00	0.945	7	1.80	0.07
Street Lighting	135.0000	50.00	8.74	8.74	25.00	0.945	7	1.20	1.20
RAN Equipment Module	0.0000	150.00	0.00	0.00	7.75	0.850	7	0.00	0.00
Power and Wireless Equipment Module	0.0000	150.00	0.00	0.00	2.50	0.850	7	0.00	0.00
Sum Weight:		700.00							

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Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	557.66					
Bracing Weight	0.00					
Total Member Self-Weight	557.66			0.00	0.00	
Total Weight	1257.66			0.00	0.00	
Wind 0 deg - No Ice		-62.81	-704.55	-12330.21	1570.37	0.00
Wind 30 deg - No Ice		297.87	-578.75	-9893.09	-4805.13	0.00
Wind 60 deg - No Ice		578.75	-297.87	-4805.13	-9893.09	0.00
Wind 90 deg - No Ice		704.55	62.81	1570.37	-12330.21	0.00
Wind 120 deg - No Ice		641.56	406.67	7525.08	-11463.46	0.00
Wind 150 deg - No Ice		406.67	641.56	11463.46	-7525.08	0.00
Wind 180 deg - No Ice		62.81	704.55	12330.21	-1570.37	0.00
Wind 210 deg - No Ice		-297.87	578.75	9893.09	4805.13	0.00
Wind 240 deg - No Ice		-578.75	297.87	4805.13	9893.09	0.00
Wind 270 deg - No Ice		-704.55	-62.81	-1570.37	12330.21	0.00
Wind 300 deg - No Ice		-641.56	-406.67	-7525.08	11463.46	0.00
Wind 330 deg - No Ice		-406.67	-641.56	-11463.46	7525.08	0.00
Member Ice	459.72					
Total Weight Ice	2975.21			0.00	0.00	
Wind 0 deg - Ice		-17.98	-264.71	-4303.14	449.41	0.00
Wind 30 deg - Ice		116.79	-220.26	-3501.92	-1762.37	0.00
Wind 60 deg - Ice		220.26	-116.79	-1762.37	-3501.92	0.00
Wind 90 deg - Ice		264.71	17.98	449.41	-4303.14	0.00
Wind 120 deg - Ice		238.23	147.92	2540.77	-3951.33	0.00
Wind 150 deg - Ice		147.92	238.23	3951.33	-2540.77	0.00
Wind 180 deg - Ice		17.98	264.71	4303.14	-449.41	0.00
Wind 210 deg - Ice		-116.79	220.26	3501.92	1762.37	0.00
Wind 240 deg - Ice		-220.26	116.79	1762.37	3501.92	0.00
Wind 270 deg - Ice		-264.71	-17.98	-449.41	4303.14	0.00
Wind 300 deg - Ice		-238.23	-147.92	-2540.77	3951.33	0.00
Wind 330 deg - Ice		-147.92	-238.23	-3951.33	2540.77	0.00
Total Weight	1257.66			0.00	0.00	
Wind 0 deg - Service		-14.05	-192.44	-3286.05	351.27	0.00
Wind 30 deg - Service		84.05	-159.63	-2670.17	-1338.82	0.00
Wind 60 deg - Service		159.63	-84.05	-1338.82	-2670.17	0.00
Wind 90 deg - Service		192.44	14.05	351.27	-3286.05	0.00
Wind 120 deg - Service		173.68	108.39	1947.23	-3021.43	0.00
Wind 150 deg - Service		108.39	173.68	3021.43	-1947.23	0.00
Wind 180 deg - Service		14.05	192.44	3286.05	-351.27	0.00
Wind 210 deg - Service		-84.05	159.63	2670.17	1338.82	0.00
Wind 240 deg - Service		-159.63	84.05	1338.82	2670.17	0.00
Wind 270 deg - Service		-192.44	-14.05	-351.27	3286.05	0.00
Wind 300 deg - Service		-173.68	-108.39	-1947.23	3021.43	0.00
Wind 330 deg - Service		-108.39	-173.68	-3021.43	1947.23	0.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice

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

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	26	3226.74	0.00	0.00
	Max. H _x	21	1131.89	1127.27	100.50
	Max. H _z	2	1509.19	100.50	1127.27
	Max. M _x	2	19844.52	100.50	1127.27
	Max. M _z	8	19844.52	-1127.27	-100.50
	Max. Torsion	20	1.01	1127.27	100.50
	Min. Vert	17	1131.89	476.60	-926.00
	Min. H _x	8	1509.19	-1127.27	-100.50

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H _z	14	1509.19	-100.50	-1127.27
	Min. M _x	14	-19844.52	-100.50	-1127.27
	Min. M _z	20	-19844.52	1127.27	100.50
	Min. Torsion	14	-1.01	-100.50	-1127.27

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	1257.66	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	1509.19	-100.50	-1127.27	-19844.52	2529.37	1.01
0.9 Dead+1.6 Wind 0 deg - No Ice	1131.89	-100.50	-1127.27	-19815.16	2525.13	1.01
1.2 Dead+1.6 Wind 30 deg - No Ice	1509.19	476.60	-926.00	-15921.27	-7731.81	0.50
0.9 Dead+1.6 Wind 30 deg - No Ice	1131.89	476.60	-926.00	-15897.97	-7720.80	0.50
1.2 Dead+1.6 Wind 60 deg - No Ice	1509.19	926.00	-476.60	-7731.81	-15921.27	-0.50
0.9 Dead+1.6 Wind 60 deg - No Ice	1131.89	926.00	-476.60	-7720.80	-15897.97	-0.50
1.2 Dead+1.6 Wind 90 deg - No Ice	1509.19	1127.27	100.50	2529.37	-19844.52	-1.01
0.9 Dead+1.6 Wind 90 deg - No Ice	1131.89	1127.27	100.50	2525.13	-19815.16	-1.01
1.2 Dead+1.6 Wind 120 deg - No Ice	1509.19	1026.50	650.68	12112.67	-18450.42	-0.50
0.9 Dead+1.6 Wind 120 deg - No Ice	1131.89	1026.50	650.68	12094.32	-18422.87	-0.50
1.2 Dead+1.6 Wind 150 deg - No Ice	1509.19	650.68	1026.50	18450.42	-12112.67	0.50
0.9 Dead+1.6 Wind 150 deg - No Ice	1131.89	650.68	1026.50	18422.87	-12094.32	0.50
1.2 Dead+1.6 Wind 180 deg - No Ice	1509.19	100.50	1127.27	19844.52	-2529.37	1.01
0.9 Dead+1.6 Wind 180 deg - No Ice	1131.89	100.50	1127.27	19815.16	-2525.13	1.01
1.2 Dead+1.6 Wind 210 deg - No Ice	1509.19	-476.60	926.00	15921.27	7731.81	0.50
0.9 Dead+1.6 Wind 210 deg - No Ice	1131.89	-476.60	926.00	15897.97	7720.80	0.50
1.2 Dead+1.6 Wind 240 deg - No Ice	1509.19	-926.00	476.60	7731.81	15921.27	-0.50
0.9 Dead+1.6 Wind 240 deg - No Ice	1131.89	-926.00	476.60	7720.80	15897.97	-0.50
1.2 Dead+1.6 Wind 270 deg - No Ice	1509.19	-1127.27	-100.50	-2529.37	19844.52	-1.01
0.9 Dead+1.6 Wind 270 deg - No Ice	1131.89	-1127.27	-100.50	-2525.13	19815.16	-1.01
1.2 Dead+1.6 Wind 300 deg - No Ice	1509.19	-1026.50	-650.68	-12112.67	18450.42	-0.50
0.9 Dead+1.6 Wind 300 deg - No Ice	1131.89	-1026.50	-650.68	-12094.32	18422.87	-0.50
1.2 Dead+1.6 Wind 330 deg - No Ice	1509.19	-650.68	-1026.50	-18450.42	12112.67	0.50

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Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
0.9 Dead+1.6 Wind 330 deg - No Ice	1131.89	-650.68	-1026.50	-18422.87	12094.32	0.50
1.2 Dead+1.0 Ice+1.0 Temp	3226.74	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	3226.74	-17.98	-264.71	-4353.34	455.65	0.03
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	3226.74	116.79	-220.26	-3542.28	-1782.06	0.02
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	3226.74	220.26	-116.79	-1782.06	-3542.28	-0.02
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	3226.74	264.71	17.98	455.65	-4353.34	-0.03
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	3226.74	238.23	147.92	2571.28	-3997.93	-0.02
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	3226.74	147.92	238.23	3997.93	-2571.28	0.02
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	3226.74	17.98	264.71	4353.34	-455.65	0.03
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	3226.74	-116.79	220.26	3542.28	1782.06	0.02
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	3226.74	-220.26	116.79	1782.06	3542.28	-0.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	3226.74	-264.71	-17.98	-455.65	4353.34	-0.03
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	3226.74	-238.23	-147.92	-2571.28	3997.93	-0.02
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	3226.74	-147.92	-238.23	-3997.93	2571.28	0.02
Dead+Wind 0 deg - Service	1257.66	-14.05	-192.44	-3301.67	353.22	0.02
Dead+Wind 30 deg - Service	1257.66	84.05	-159.63	-2682.72	-1344.94	0.01
Dead+Wind 60 deg - Service	1257.66	159.63	-84.05	-1344.94	-2682.72	-0.01
Dead+Wind 90 deg - Service	1257.66	192.44	14.05	353.22	-3301.67	-0.02
Dead+Wind 120 deg - Service	1257.66	173.68	108.39	1956.73	-3035.94	-0.01
Dead+Wind 150 deg - Service	1257.66	108.39	173.68	3035.94	-1956.73	0.01
Dead+Wind 180 deg - Service	1257.66	14.05	192.44	3301.67	-353.22	0.02
Dead+Wind 210 deg - Service	1257.66	-84.05	159.63	2682.72	1344.94	0.01
Dead+Wind 240 deg - Service	1257.66	-159.63	84.05	1344.94	2682.72	-0.01
Dead+Wind 270 deg - Service	1257.66	-192.44	-14.05	-353.22	3301.67	-0.02
Dead+Wind 300 deg - Service	1257.66	-173.68	-108.39	-1956.73	3035.94	-0.01
Dead+Wind 330 deg - Service	1257.66	-108.39	-173.68	-3035.94	1956.73	0.01

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-1257.66	0.00	0.00	1257.66	0.00	0.000%
2	-100.50	-1509.19	-1127.27	100.50	1509.19	1127.27	0.000%
3	-100.50	-1131.89	-1127.27	100.50	1131.89	1127.27	0.000%
4	476.60	-1509.19	-926.00	-476.60	1509.19	926.00	0.000%
5	476.60	-1131.89	-926.00	-476.60	1131.89	926.00	0.000%
6	926.00	-1509.19	-476.60	-926.00	1509.19	476.60	0.000%
7	926.00	-1131.89	-476.60	-926.00	1131.89	476.60	0.000%
8	1127.27	-1509.19	100.50	-1127.27	1509.19	-100.50	0.000%
9	1127.27	-1131.89	100.50	-1127.27	1131.89	-100.50	0.000%
10	1026.50	-1509.19	650.68	-1026.50	1509.19	-650.68	0.000%
11	1026.50	-1131.89	650.68	-1026.50	1131.89	-650.68	0.000%
12	650.68	-1509.19	1026.50	-650.68	1509.19	-1026.50	0.000%
13	650.68	-1131.89	1026.50	-650.68	1131.89	-1026.50	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
14	100.50	-1509.19	1127.27	-100.50	1509.19	-1127.27	0.000%
15	100.50	-1131.89	1127.27	-100.50	1131.89	-1127.27	0.000%
16	-476.60	-1509.19	926.00	476.60	1509.19	-926.00	0.000%
17	-476.60	-1131.89	926.00	476.60	1131.89	-926.00	0.000%
18	-926.00	-1509.19	476.60	926.00	1509.19	-476.60	0.000%
19	-926.00	-1131.89	476.60	926.00	1131.89	-476.60	0.000%
20	-1127.27	-1509.19	-100.50	1127.27	1509.19	100.50	0.000%
21	-1127.27	-1131.89	-100.50	1127.27	1131.89	100.50	0.000%
22	-1026.50	-1509.19	-650.68	1026.50	1509.19	650.68	0.000%
23	-1026.50	-1131.89	-650.68	1026.50	1131.89	650.68	0.000%
24	-650.68	-1509.19	-1026.50	650.68	1509.19	1026.50	0.000%
25	-650.68	-1131.89	-1026.50	650.68	1131.89	1026.50	0.000%
26	0.00	-3226.74	0.00	0.00	3226.74	0.00	0.000%
27	-17.98	-3226.74	-264.71	17.98	3226.74	264.71	0.000%
28	116.79	-3226.74	-220.26	-116.79	3226.74	220.26	0.000%
29	220.26	-3226.74	-116.79	-220.26	3226.74	116.79	0.000%
30	264.71	-3226.74	17.98	-264.71	3226.74	-17.98	0.000%
31	238.23	-3226.74	147.92	-238.23	3226.74	-147.92	0.000%
32	147.92	-3226.74	238.23	-147.92	3226.74	-238.23	0.000%
33	17.98	-3226.74	264.71	-17.98	3226.74	-264.71	0.000%
34	-116.79	-3226.74	220.26	116.79	3226.74	-220.26	0.000%
35	-220.26	-3226.74	116.79	220.26	3226.74	-116.79	0.000%
36	-264.71	-3226.74	-17.98	264.71	3226.74	17.98	0.000%
37	-238.23	-3226.74	-147.92	238.23	3226.74	147.92	0.000%
38	-147.92	-3226.74	-238.23	147.92	3226.74	238.23	0.000%
39	-14.05	-1257.66	-192.44	14.05	1257.66	192.44	0.000%
40	84.05	-1257.66	-159.63	-84.05	1257.66	159.63	0.000%
41	159.63	-1257.66	-84.05	-159.63	1257.66	84.05	0.000%
42	192.44	-1257.66	14.05	-192.44	1257.66	-14.05	0.000%
43	173.68	-1257.66	108.39	-173.68	1257.66	-108.39	0.000%
44	108.39	-1257.66	173.68	-108.39	1257.66	-173.68	0.000%
45	14.05	-1257.66	192.44	-14.05	1257.66	-192.44	0.000%
46	-84.05	-1257.66	159.63	84.05	1257.66	-159.63	0.000%
47	-159.63	-1257.66	84.05	159.63	1257.66	-84.05	0.000%
48	-192.44	-1257.66	-14.05	192.44	1257.66	14.05	0.000%
49	-173.68	-1257.66	-108.39	173.68	1257.66	108.39	0.000%
50	-108.39	-1257.66	-173.68	108.39	1257.66	173.68	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001

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15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	25 - 10.5	0.376	50	0.1308	0.0000
L2	10.5 - 5	0.061	50	0.0493	0.0000
L3	5 - 0	0.015	43	0.0279	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
27.50	Commscope 16" Omni w/ Shroud Equipment	50	0.376	0.1308	0.0000	18362
25.00	3" DIA x 6' Long Luminaire Arm	50	0.376	0.1308	0.0000	18362
10.50	RAN Equipment Module	50	0.061	0.0493	0.0000	7283
7.75	RAN Equipment Module	50	0.033	0.0390	0.0000	8493

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
5.00	RAN Equipment Module	43	0.015	0.0279	0.0000	12559
2.50	Power and Wireless Equipment Module	43	0.006	0.0148	0.0000	12559
0.00	Power and Wireless Equipment Module	0	0.000	0.0000	0.0000	12559

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	25 - 10.5	2.378	12	0.8408	0.0002
L2	10.5 - 5	0.373	12	0.3048	0.0000
L3	5 - 0	0.094	12	0.1711	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
27.50	Commscope 16" Omni w/ Shroud Equipment	12	2.378	0.8408	0.0002	2826
25.00	3" DIA x 6' Long Luminaire Arm	12	2.378	0.8408	0.0002	2826
10.50	RAN Equipment Module	12	0.373	0.3048	0.0000	1128
7.75	RAN Equipment Module	12	0.199	0.2400	0.0000	1340
5.00	RAN Equipment Module	12	0.094	0.1711	0.0000	2037
2.50	Power and Wireless Equipment Module	12	0.038	0.0909	0.0000	2037
0.00	Power and Wireless Equipment Module	0	0.000	0.0000	0.0000	2037

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	25 - 23.9643	HSS8.625x.188	14.50	0.00	0.0	4.6196	-491.12	174622.00	0.003
	23.9643 - 22.9286					4.6196	-510.39	174622.00	0.003
	22.9286 - 21.8929					4.6196	-529.71	174622.00	0.003
	21.8929 - 20.8571					4.6196	-549.09	174622.00	0.003
	20.8571 -					4.6196	-568.54	174622.00	0.003

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
	19.8214								
	19.8214 - 18.7857					4.6196	-588.07	174622.00	0.003
	18.7857 - 17.75					4.6196	-607.69	174622.00	0.003
	17.75 - 16.7143					4.6196	-627.40	174622.00	0.004
	16.7143 - 15.6786					4.6196	-647.22	174622.00	0.004
	15.6786 - 14.6429					4.6196	-667.15	174622.00	0.004
	14.6429 - 13.6071					4.6196	-687.21	174622.00	0.004
	13.6071 - 12.5714					4.6196	-707.39	174622.00	0.004
	12.5714 - 11.5357					4.6196	-727.72	174622.00	0.004
L2	11.5357 - 10.5	CSI Intergrated 12" Pole/Module	5.50	0.00	0.0	4.6196	-748.21	174622.00	0.004
	10.5 - 9.4					9.2284	-826.25	348835.00	0.002
	9.4 - 8.3					9.2284	-903.91	348835.00	0.003
	8.3 - 7.2					9.2284	-981.65	348835.00	0.003
	7.2 - 6.1	CSI Intergrated 12" Pole/Module	5.00	0.00	0.0	9.2284	-1059.45	348835.00	0.003
L3	6.1 - 5					9.2284	-1137.32	348835.00	0.003
	5 - 4					9.2284	-1211.49	348835.00	0.003
	4 - 3					9.2284	-1285.70	348835.00	0.004
	3 - 2					9.2284	-1359.98	348835.00	0.004
	2 - 1					9.2284	-1434.34	348835.00	0.004
	1 - 0					9.2284	-1508.78	348835.00	0.004

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} lb-ft	φM _{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} lb-ft	φM _{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	25 - 23.9643	HSS8.625x.188	1108.75	38826.67	0.029	0.00	38826.67	0.000
	23.9643 - 22.9286		1720.63	38826.67	0.044	0.00	38826.67	0.000
	22.9286 - 21.8929		2357.87	38826.67	0.061	0.00	38826.67	0.000
	21.8929 - 20.8571		3020.29	38826.67	0.078	0.00	38826.67	0.000
	20.8571 - 19.8214		3707.80	38826.67	0.095	0.00	38826.67	0.000
	19.8214 - 18.7857		4420.32	38826.67	0.114	0.00	38826.67	0.000
	18.7857 - 17.75		5157.79	38826.67	0.133	0.00	38826.67	0.000
	17.75 - 16.7143		5920.11	38826.67	0.152	0.00	38826.67	0.000
	16.7143 - 15.6786		6707.19	38826.67	0.173	0.00	38826.67	0.000
	15.6786 - 14.6429		7518.95	38826.67	0.194	0.00	38826.67	0.000
	14.6429 -		8355.25	38826.67	0.215	0.00	38826.67	0.000

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Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	13.6071							
	13.6071 - 12.5714		9216.08	38826.67	0.237	0.00	38826.67	0.000
	12.5714 - 11.5357		10101.17	38826.67	0.260	0.00	38826.67	0.000
L2	11.5357 - 10.5		11010.50	38826.67	0.284	0.00	38826.67	0.000
	10.5 - 9.4	CSI Intergrated 12" Pole/Module	12008.17	108740.83	0.110	0.00	108740.83	0.000
	9.4 - 8.3		13043.83	108740.83	0.120	0.00	108740.83	0.000
	8.3 - 7.2		14117.33	108740.83	0.130	0.00	108740.83	0.000
	7.2 - 6.1		15228.67	108740.83	0.140	0.00	108740.83	0.000
L3	6.1 - 5		16377.67	108740.83	0.151	0.00	108740.83	0.000
	5 - 4	CSI Intergrated 12" Pole/Module	17454.83	108740.83	0.161	0.00	108740.83	0.000
	4 - 3		18562.83	108740.83	0.171	0.00	108740.83	0.000
	3 - 2		19701.67	108740.83	0.181	0.00	108740.83	0.000
	2 - 1		20871.17	108740.83	0.192	0.00	108740.83	0.000
	1 - 0		22071.17	108740.83	0.203	0.00	108740.83	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	25 - 23.9643	HSS8.625x.188	578.94	87311.00	0.007	0.51	60273.83	0.000
	23.9643 - 22.9286		603.27	87311.00	0.007	0.51	60273.83	0.000
	22.9286 - 21.8929		627.57	87311.00	0.007	0.51	60273.83	0.000
	21.8929 - 20.8571		651.82	87311.00	0.007	0.51	60273.83	0.000
	20.8571 - 19.8214		676.02	87311.00	0.008	0.51	60273.83	0.000
	19.8214 - 18.7857		700.16	87311.00	0.008	0.51	60273.83	0.000
	18.7857 - 17.75		724.23	87311.00	0.008	0.51	60273.83	0.000
	17.75 - 16.7143		748.23	87311.00	0.009	0.51	60273.83	0.000
	16.7143 - 15.6786		772.14	87311.00	0.009	0.51	60273.83	0.000
	15.6786 - 14.6429		795.96	87311.00	0.009	0.51	60273.83	0.000
	14.6429 - 13.6071		819.68	87311.00	0.009	0.51	60273.83	0.000
	13.6071 - 12.5714		843.30	87311.00	0.010	0.51	60273.83	0.000
	12.5714 - 11.5357		866.80	87311.00	0.010	0.51	60273.83	0.000
L2	11.5357 - 10.5		890.17	87311.00	0.010	0.51	60273.83	0.000
	10.5 - 9.4	CSI Intergrated 12" Pole/Module	924.45	174417.00	0.005	0.51	167301.67	0.000
	9.4 - 8.3		959.00	174417.00	0.005	0.51	167301.67	0.000
	8.3 - 7.2		993.46	174417.00	0.006	0.51	167301.67	0.000
	7.2 - 6.1		1027.81	174417.00	0.006	0.51	167301.67	0.000
	6.1 - 5		1062.04	174417.00	0.006	0.51	167301.67	0.000

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Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L3	5 - 4	CSI Intergrated 12" Pole/Module	1093.04	174417.00	0.006	0.51	167301.67	0.000
	4 - 3		1123.94	174417.00	0.006	0.51	167301.67	0.000
	3 - 2		1154.72	174417.00	0.007	0.51	167301.67	0.000
	2 - 1		1185.36	174417.00	0.007	0.51	167301.67	0.000
	1 - 0		1215.86	174417.00	0.007	0.51	167301.67	0.000

Pole Interaction Design Data

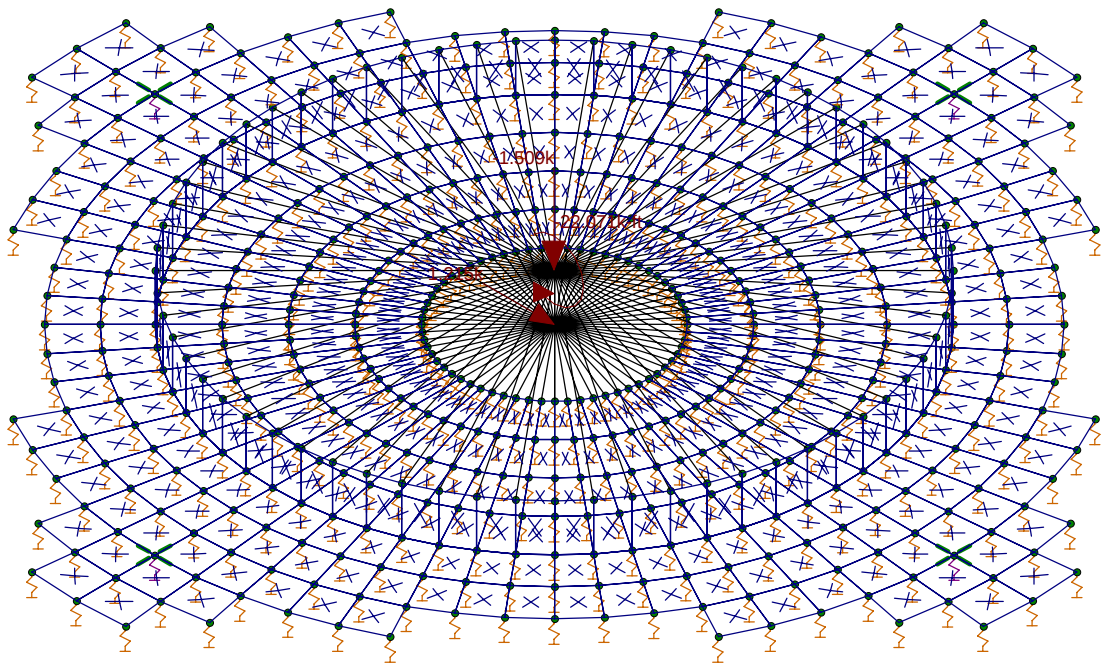
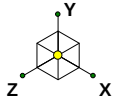
Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	25 - 23.9643	0.003	0.029	0.000	0.007	0.000	0.031	1.000	4.8.2 ✓
	23.9643 - 22.9286	0.003	0.044	0.000	0.007	0.000	0.047	1.000	4.8.2 ✓
	22.9286 - 21.8929	0.003	0.061	0.000	0.007	0.000	0.064	1.000	4.8.2 ✓
	21.8929 - 20.8571	0.003	0.078	0.000	0.007	0.000	0.081	1.000	4.8.2 ✓
	20.8571 - 19.8214	0.003	0.095	0.000	0.008	0.000	0.099	1.000	4.8.2 ✓
	19.8214 - 18.7857	0.003	0.114	0.000	0.008	0.000	0.117	1.000	4.8.2 ✓
	18.7857 - 17.75	0.003	0.133	0.000	0.008	0.000	0.136	1.000	4.8.2 ✓
	17.75 - 16.7143	0.004	0.152	0.000	0.009	0.000	0.156	1.000	4.8.2 ✓
	16.7143 - 15.6786	0.004	0.173	0.000	0.009	0.000	0.177	1.000	4.8.2 ✓
	15.6786 - 14.6429	0.004	0.194	0.000	0.009	0.000	0.198	1.000	4.8.2 ✓
	14.6429 - 13.6071	0.004	0.215	0.000	0.009	0.000	0.219	1.000	4.8.2 ✓
	13.6071 - 12.5714	0.004	0.237	0.000	0.010	0.000	0.242	1.000	4.8.2 ✓
	12.5714 - 11.5357	0.004	0.260	0.000	0.010	0.000	0.264	1.000	4.8.2 ✓
	11.5357 - 10.5	0.004	0.284	0.000	0.010	0.000	0.288	1.000	4.8.2 ✓
L2	10.5 - 9.4	0.002	0.110	0.000	0.005	0.000	0.113	1.000	4.8.2 ✓
	9.4 - 8.3	0.003	0.120	0.000	0.005	0.000	0.123	1.000	4.8.2 ✓
	8.3 - 7.2	0.003	0.130	0.000	0.006	0.000	0.133	1.000	4.8.2 ✓
	7.2 - 6.1	0.003	0.140	0.000	0.006	0.000	0.143	1.000	4.8.2 ✓
	6.1 - 5	0.003	0.151	0.000	0.006	0.000	0.154	1.000	4.8.2 ✓

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Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	5 - 4	0.003	0.161	0.000	0.006	0.000	0.164	1.000	4.8.2 ✓
	4 - 3	0.004	0.171	0.000	0.006	0.000	0.174	1.000	4.8.2 ✓
	3 - 2	0.004	0.181	0.000	0.007	0.000	0.185	1.000	4.8.2 ✓
	2 - 1	0.004	0.192	0.000	0.007	0.000	0.196	1.000	4.8.2 ✓
	1 - 0	0.004	0.203	0.000	0.007	0.000	0.207	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	25 - 10.5	Pole	HSS8.625x.188	1	-748.21	174622.00	28.8	Pass
L2	10.5 - 5	Pole	CSI Intergrated 12" Pole/Module	2	-1137.32	348835.00	15.4	Pass
L3	5 - 0	Pole	CSI Intergrated 12" Pole/Module	3	-1508.78	348835.00	20.7	Pass
							Summary	
							Pole (L1)	28.8
							RATING =	28.8
								Pass



Loads: BLC 1, Proposed Lightpole Reactions

Commscope

Danh Ho, E.I.T.

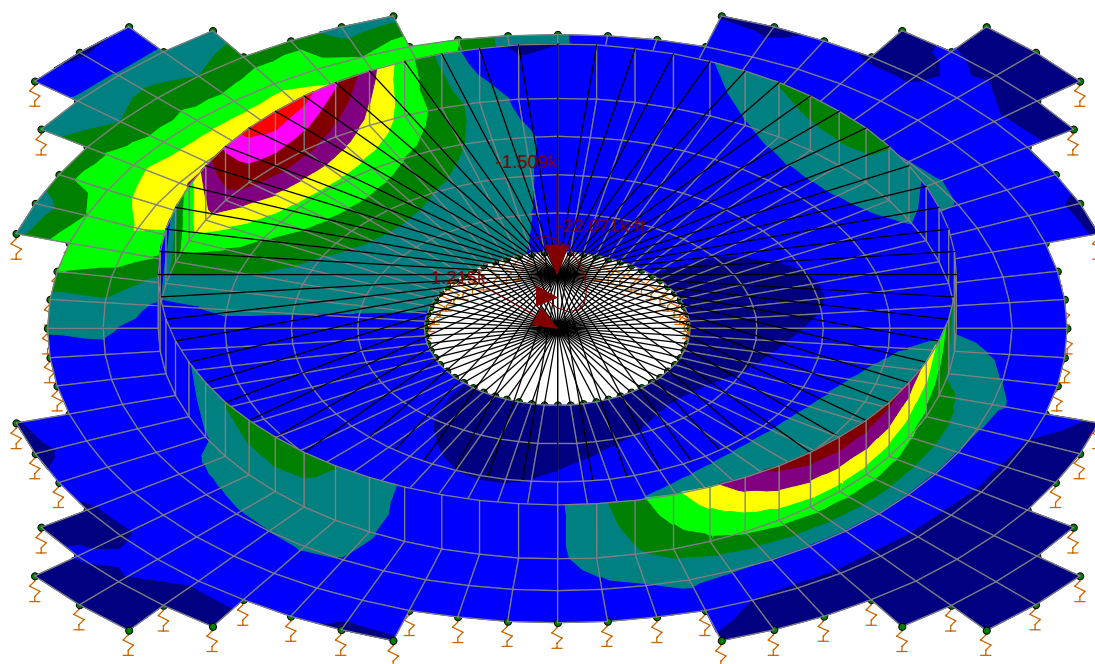
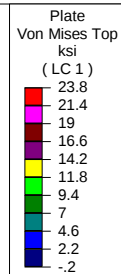
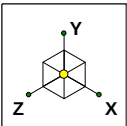
SSC760239237xy306P

30' Pole with 12" Baseplate

SK - 1

Feb 11, 2020 at 9:25 AM

Commscope 30-ft Pole with 12in Ba...



Loads: BLC 1, Proposed Lightpole Reactions
Results for LC 1, Proposed Lightpole Base Reactions

Commscope	30' Pole with 12" Baseplate	SK - 2
Danh Ho, E.I.T.		Feb 11, 2020 at 9:26 AM
SSC760239237xy306P		Commscope 30-ft Pole with 12in Ba...

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N646	Reaction	S2965	Reaction			
2	N694	Reaction	S2965	Reaction			
3	N678	Reaction	S2965	Reaction			
4	N662	Reaction	S2965	Reaction			
5	N3		CS1000				
6	N4		CS1000				
7	N5		CS1000				
8	N6		CS1000				
9	N7		CS1000				
10	N8		CS1000				
11	N9		CS1000				
12	N10		CS1000				
13	N11		CS1000				
14	N12		CS1000				
15	N13		CS1000				
16	N14		CS1000				
17	N15		CS1000				
18	N16		CS1000				
19	N17		CS1000				
20	N18		CS1000				
21	N19		CS1000				
22	N20		CS1000				
23	N21		CS1000				
24	N22		CS1000				
25	N23		CS1000				
26	N24		CS1000				
27	N25		CS1000				
28	N26		CS1000				
29	N27		CS1000				
30	N28		CS1000				
31	N29		CS1000				
32	N30		CS1000				
33	N31		CS1000				
34	N32		CS1000				
35	N33		CS1000				
36	N34		CS1000				
37	N35		CS1000				
38	N36		CS1000				
39	N37		CS1000				
40	N38		CS1000				
41	N39		CS1000				
42	N40		CS1000				
43	N41		CS1000				
44	N42		CS1000				
45	N43		CS1000				
46	N44		CS1000				
47	N45		CS1000				
48	N46		CS1000				
49	N47		CS1000				
50	N48		CS1000				
51	N49		CS1000				

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
520	N870		CS1000				
521	N884		CS1000				
522	N885		CS1000				
523	N886		CS1000				
524	N900		CS1000				

Plate Primary Data

	Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
1	P1	N3	N4	N69	N68	gen Steel	1.25
2	P2	N4	N5	N70	N69	gen Steel	1.25
3	P3	N5	N6	N71	N70	gen Steel	1.25
4	P4	N6	N7	N72	N71	gen Steel	1.25
5	P5	N7	N8	N73	N72	gen Steel	1.25
6	P6	N8	N9	N74	N73	gen Steel	1.25
7	P7	N9	N10	N75	N74	gen Steel	1.25
8	P8	N10	N11	N76	N75	gen Steel	1.25
9	P9	N11	N12	N77	N76	gen Steel	1.25
10	P10	N12	N13	N78	N77	gen Steel	1.25
11	P11	N13	N14	N79	N78	gen Steel	1.25
12	P12	N14	N15	N80	N79	gen Steel	1.25
13	P13	N15	N16	N81	N80	gen Steel	1.25
14	P14	N16	N17	N82	N81	gen Steel	1.25
15	P15	N17	N18	N83	N82	gen Steel	1.25
16	P16	N18	N19	N84	N83	gen Steel	1.25
17	P17	N19	N20	N85	N84	gen Steel	1.25
18	P18	N20	N21	N86	N85	gen Steel	1.25
19	P19	N21	N22	N87	N86	gen Steel	1.25
20	P20	N22	N23	N88	N87	gen Steel	1.25
21	P21	N23	N24	N89	N88	gen Steel	1.25
22	P22	N24	N25	N90	N89	gen Steel	1.25
23	P23	N25	N26	N91	N90	gen Steel	1.25
24	P24	N26	N27	N92	N91	gen Steel	1.25
25	P25	N27	N28	N93	N92	gen Steel	1.25
26	P26	N28	N29	N94	N93	gen Steel	1.25
27	P27	N29	N30	N95	N94	gen Steel	1.25
28	P28	N30	N31	N96	N95	gen Steel	1.25
29	P29	N31	N32	N97	N96	gen Steel	1.25
30	P30	N32	N33	N98	N97	gen Steel	1.25
31	P31	N33	N34	N99	N98	gen Steel	1.25
32	P32	N34	N35	N100	N99	gen Steel	1.25
33	P33	N35	N36	N101	N100	gen Steel	1.25
34	P34	N36	N37	N102	N101	gen Steel	1.25
35	P35	N37	N38	N103	N102	gen Steel	1.25
36	P36	N38	N39	N104	N103	gen Steel	1.25
37	P37	N39	N40	N105	N104	gen Steel	1.25
38	P38	N40	N41	N106	N105	gen Steel	1.25
39	P39	N41	N42	N107	N106	gen Steel	1.25
40	P40	N42	N43	N108	N107	gen Steel	1.25
41	P41	N43	N44	N109	N108	gen Steel	1.25
42	P42	N44	N45	N110	N109	gen Steel	1.25

Plate Primary Data (Continued)

	Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
251	P251	N256	N257	N322	N321	gen Steel	1.25
252	P252	N257	N258	N323	N322	gen Steel	1.25
253	P253	N258	N259	N324	N323	gen Steel	1.25
254	P254	N259	N260	N325	N324	gen Steel	1.25
255	P255	N260	N261	N326	N325	gen Steel	1.25
256	P256	N261	N198	N263	N326	gen Steel	1.25
257	P257	N388	N389	N264	N263	gen Steel	.25
258	P258	N389	N390	N265	N264	gen Steel	.25
259	P259	N390	N391	N266	N265	gen Steel	.25
260	P260	N391	N392	N267	N266	gen Steel	.25
261	P261	N392	N393	N268	N267	gen Steel	.25
262	P262	N393	N394	N269	N268	gen Steel	.25
263	P263	N394	N395	N270	N269	gen Steel	.25
264	P264	N395	N396	N271	N270	gen Steel	.25
265	P265	N396	N397	N272	N271	gen Steel	.25
266	P266	N397	N398	N273	N272	gen Steel	.25
267	P267	N398	N399	N274	N273	gen Steel	.25
268	P268	N399	N400	N275	N274	gen Steel	.25
269	P269	N400	N401	N276	N275	gen Steel	.25
270	P270	N401	N402	N277	N276	gen Steel	.25
271	P271	N402	N403	N278	N277	gen Steel	.25
272	P272	N403	N404	N279	N278	gen Steel	.25
273	P273	N404	N405	N280	N279	gen Steel	.25
274	P274	N405	N406	N281	N280	gen Steel	.25
275	P275	N406	N407	N282	N281	gen Steel	.25
276	P276	N407	N408	N283	N282	gen Steel	.25
277	P277	N408	N409	N284	N283	gen Steel	.25
278	P278	N409	N410	N285	N284	gen Steel	.25
279	P279	N410	N411	N286	N285	gen Steel	.25
280	P280	N411	N412	N287	N286	gen Steel	.25
281	P281	N412	N413	N288	N287	gen Steel	.25
282	P282	N413	N414	N289	N288	gen Steel	.25
283	P283	N414	N415	N290	N289	gen Steel	.25
284	P284	N415	N416	N291	N290	gen Steel	.25
285	P285	N416	N417	N292	N291	gen Steel	.25
286	P286	N417	N418	N293	N292	gen Steel	.25
287	P287	N418	N419	N294	N293	gen Steel	.25
288	P288	N419	N420	N295	N294	gen Steel	.25
289	P289	N420	N421	N296	N295	gen Steel	.25
290	P290	N421	N422	N297	N296	gen Steel	.25
291	P291	N422	N423	N298	N297	gen Steel	.25
292	P292	N423	N424	N299	N298	gen Steel	.25
293	P293	N424	N425	N300	N299	gen Steel	.25
294	P294	N425	N426	N301	N300	gen Steel	.25
295	P295	N426	N427	N302	N301	gen Steel	.25
296	P296	N427	N428	N303	N302	gen Steel	.25
297	P297	N428	N429	N304	N303	gen Steel	.25
298	P298	N429	N430	N305	N304	gen Steel	.25
299	P299	N430	N431	N306	N305	gen Steel	.25
300	P300	N431	N432	N307	N306	gen Steel	.25
301	P301	N432	N433	N308	N307	gen Steel	.25
302	P302	N433	N434	N309	N308	gen Steel	.25

Plate Primary Data (Continued)

	Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
303	P303	N434	N435	N310	N309	gen Steel	.25
304	P304	N435	N436	N311	N310	gen Steel	.25
305	P305	N436	N437	N312	N311	gen Steel	.25
306	P306	N437	N438	N313	N312	gen Steel	.25
307	P307	N438	N439	N314	N313	gen Steel	.25
308	P308	N439	N440	N315	N314	gen Steel	.25
309	P309	N440	N441	N316	N315	gen Steel	.25
310	P310	N441	N442	N317	N316	gen Steel	.25
311	P311	N442	N443	N318	N317	gen Steel	.25
312	P312	N443	N444	N319	N318	gen Steel	.25
313	P313	N444	N445	N320	N319	gen Steel	.25
314	P314	N445	N446	N321	N320	gen Steel	.25
315	P315	N446	N447	N322	N321	gen Steel	.25
316	P316	N447	N448	N323	N322	gen Steel	.25
317	P317	N448	N449	N324	N323	gen Steel	.25
318	P318	N449	N450	N325	N324	gen Steel	.25
319	P319	N450	N451	N326	N325	gen Steel	.25
320	P320	N451	N388	N263	N326	gen Steel	.25
321	P321	N263	N264	N517	N516	gen Steel	1.25
322	P322	N264	N265	N518	N517	gen Steel	1.25
323	P323	N265	N266	N519	N518	gen Steel	1.25
324	P324	N266	N267	N520	N519	gen Steel	1.25
325	P325	N267	N268	N521	N520	gen Steel	1.25
326	P326	N268	N269	N522	N521	gen Steel	1.25
327	P327	N269	N270	N523	N522	gen Steel	1.25
328	P328	N270	N271	N524	N523	gen Steel	1.25
329	P329	N271	N272	N525	N524	gen Steel	1.25
330	P330	N272	N273	N526	N525	gen Steel	1.25
331	P331	N273	N274	N527	N526	gen Steel	1.25
332	P332	N274	N275	N528	N527	gen Steel	1.25
333	P333	N275	N276	N529	N528	gen Steel	1.25
334	P334	N276	N277	N530	N529	gen Steel	1.25
335	P335	N277	N278	N531	N530	gen Steel	1.25
336	P336	N278	N279	N532	N531	gen Steel	1.25
337	P337	N279	N280	N533	N532	gen Steel	1.25
338	P338	N280	N281	N534	N533	gen Steel	1.25
339	P339	N281	N282	N535	N534	gen Steel	1.25
340	P340	N282	N283	N536	N535	gen Steel	1.25
341	P341	N283	N284	N537	N536	gen Steel	1.25
342	P342	N284	N285	N538	N537	gen Steel	1.25
343	P343	N285	N286	N539	N538	gen Steel	1.25
344	P344	N286	N287	N540	N539	gen Steel	1.25
345	P345	N287	N288	N541	N540	gen Steel	1.25
346	P346	N288	N289	N542	N541	gen Steel	1.25
347	P347	N289	N290	N543	N542	gen Steel	1.25
348	P348	N290	N291	N544	N543	gen Steel	1.25
349	P349	N291	N292	N545	N544	gen Steel	1.25
350	P350	N292	N293	N546	N545	gen Steel	1.25
351	P351	N293	N294	N547	N546	gen Steel	1.25
352	P352	N294	N295	N548	N547	gen Steel	1.25
353	P353	N295	N296	N549	N548	gen Steel	1.25
354	P354	N296	N297	N550	N549	gen Steel	1.25

Plate Primary Data (Continued)

	Label	A Joint	B Joint	C Joint	D Joint	Material	Thickness[in]
511	P625	N820	N821	N886	N885	gen Steel	1.25
512	P640	N835	N772	N837	N900	gen Steel	1.25

Joint Loads and Enforced Displacements (BLC 1 : Proposed Lightpole Reactions)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/i...
1	N441A	L	Y	-1.509
2	N361A	L	X	1.215
3	N441A	L	Mz	-22.071

Basic Load Cases

	BLC Description	Category	X Grav...	Y Grav...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Proposed Lightpole Re...	None				3				

Load Combinations

	Description	S...	PD...	SR...	B...	Fac...	BLC	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...
1	Proposed Lightpole Bas...	Yes	Y		1	1														

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N694	-1.961	-12.986	0	0	0	0
2	1	N646	.832	-4.993	.85	0	0	0
3	1	N678	.832	-4.993	-.85	0	0	0
4	1	N3	0	0	0	0	0	0
5	1	N4	0	0	0	0	0	0
6	1	N5	0	0	0	0	0	0
7	1	N6	0	0	0	0	0	0
8	1	N7	0	0	0	0	0	0
9	1	N8	0	0	0	0	0	0
10	1	N9	0	0	0	0	0	0
11	1	N10	0	0	0	0	0	0
12	1	N11	0	0	0	0	0	0
13	1	N12	0	0	0	0	0	0
14	1	N13	0	0	0	0	0	0
15	1	N14	0	0	0	0	0	0
16	1	N15	0	0	0	0	0	0
17	1	N16	0	0	0	0	0	0
18	1	N17	0	0	0	0	0	0
19	1	N18	0	0	0	0	0	0
20	1	N19	0	0	0	0	0	0
21	1	N20	0	0	0	0	0	0
22	1	N21	0	0	0	0	0	0
23	1	N22	0	0	0	0	0	0
24	1	N23	0	0	0	0	0	0
25	1	N24	0	0	0	0	0	0
26	1	N25	0	0	0	0	0	0
27	1	N26	0	0	0	0	0	0

Joint Reactions (By Combination) (Continued)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
496	1	N600	0	.397	0	0	0	0
497	1	N591	0	.398	0	0	0	0
498	1	N603	0	.398	0	0	0	0
499	1	N597	0	.406	0	0	0	0
500	1	N596	0	.406	0	0	0	0
501	1	N598	0	.406	0	0	0	0
502	1	N595	0	.406	0	0	0	0
503	1	N599	0	.406	0	0	0	0
504	1	N275	0	.439	0	0	0	0
505	1	N283	0	.439	0	0	0	0
506	1	N528	0	.455	0	0	0	0
507	1	N536	0	.455	0	0	0	0
508	1	N868	0	.456	0	0	0	0
509	1	N838	0	.456	0	0	0	0
510	1	N529	0	.52	0	0	0	0
511	1	N535	0	.52	0	0	0	0
512	1	N276	0	.564	0	0	0	0
513	1	N282	0	.564	0	0	0	0
514	1	N530	0	.566	0	0	0	0
515	1	N534	0	.566	0	0	0	0
516	1	N662	-.917	.591	0	0	0	0
517	1	N531	0	.594	0	0	0	0
518	1	N533	0	.594	0	0	0	0
519	1	N532	0	.602	0	0	0	0
520	1	N277	0	.652	0	0	0	0
521	1	N281	0	.652	0	0	0	0
522	1	N278	0	.704	0	0	0	0
523	1	N280	0	.704	0	0	0	0
524	1	N279	0	.721	0	0	0	0
525	1	Totals:	-1.215	1.509	0			
526	1	COG (in):	X: 0	Y: 1	Z: 0			

Plate Principal Stresses (By Combination)

	LC	Plate Label	Loc	Sigma1[ksi]	Sigma2[ksi]	Tau Max[ksi]	Angle[rad]	Von Mises[ksi]
1	1	P368	T	18.004	3.986	7.009	1.671	16.379
2			B	-4.783	-16.665	5.941	.113	14.862
3	1	P369	T	18.004	3.986	7.009	1.471	16.379
4			B	-4.783	-16.665	5.941	-.113	14.862
5	1	P367	T	17.316	3.823	6.746	1.866	15.756
6			B	-4.439	-16.319	5.94	.33	14.614
7	1	P370	T	17.316	3.823	6.746	1.276	15.756
8			B	-4.439	-16.319	5.94	-.33	14.614
9	1	P366	T	15.975	3.467	6.254	2.029	14.555
10			B	-3.846	-15.478	5.816	.504	13.959
11	1	P371	T	15.975	3.467	6.254	1.113	14.555
12			B	-3.846	-15.478	5.816	-.504	13.959
13	1	P240	T	15.483	5.297	5.093	1.644	13.63
14			B	-6.561	-16.253	4.846	.075	14.162
15	1	P241	T	15.483	5.297	5.093	1.497	13.63
16			B	-6.561	-16.253	4.846	-.075	14.162

Base Reactions w/ Overstrength Consideration:

Axial: 1.509 k
 Shear: 1.215 k
 Moment: 22.071 k-ft

Base Plate Check

BASEPLATE DESIGN	
THICKNESS (in)	1.25
STEEL GRADE (KSI)	65.00
fmax (KSI)	16.38
ADJUSTMENT PLASTIC SECTION(KSI)	10.92
fall (0.9Fy)(KSI)	58.50
PLATE STRESS	19%

Refer to Risa3D For Base Plate Max. Stress

Anchor Bolts Check

ANCHOR BOLT DESIGN	
QUANTITY	4
DIAMETER (in)	1.25
ULTIMATE STRENGTH (ksi)	75
MAX TENSION (K)	12.192
EFFECTIVE AREA (in^2)	0.981748
ALLOWABLE TENSION (K)	50.109
$\eta = 0.55$ (GROUTED); 0.50 (ELEVATED)	0.55
MAX SHEAR (K)	0.304
INTERACTION CHECK	25%

Refer Hilti for Anchor Bolt Max Reaction

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Address:	767 North Star Road, Star, ID	Specifier:	Eric Rawlins
Phone Fax:		E-Mail:	
Design:	Commscope SSC760239237xy306P Anchor Bolts &	Date:	2/11/2020
Fastening point:			

Specifier's comments:

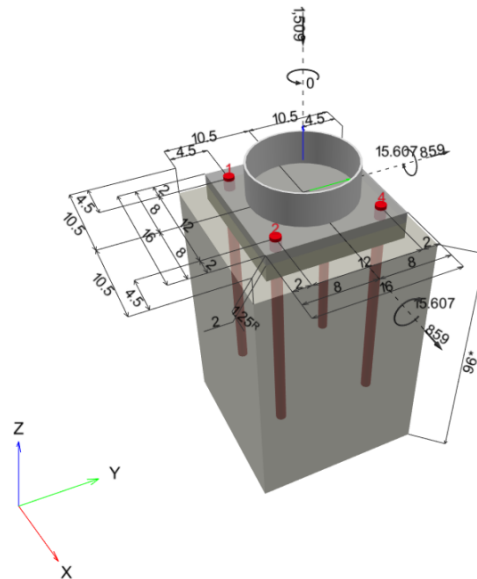
1 Input data

Anchor type and diameter:	Heavy Hex Head ASTM F 1554 GR. 55 1 1/4
Return period (service life in years):	50
Item number:	not available
Effective embedment depth:	$h_{ef} = 24.000$ in.
Material:	ASTM F 1554
Proof:	Design Method ACI 318-11 / CIP
Stand-off installation:	without clamping (anchor); restraint level (anchor plate): 2.00; $e_b = 2.000$ in.; $t = 1.250$ in. Hilti Grout: CB-G EG, epoxy, $f_{c,Grout} = 14,939$ psi
Anchor plate ^R :	$l_x \times l_y \times t = 16.000$ in. x 16.000 in. x 1.250 in.; (Recommended plate thickness: not calculated)
Profile:	Round HSS (AISC), HSS11-1/4X.250; (L x W x T) = 12.250 in. x 12.250 in. x 0.250 in.
Base material:	cracked concrete, 4000, $f'_c = 4,000$ psi; $h = 96.000$ in.
Reinforcement:	tension: condition A, shear: condition B; anchor reinforcement: tension edge reinforcement: > No. 4 bar with stirrups Corner reinforcement acc. to ACI 318-11 Part D.6.2.3 (c) present



^R - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, ft.kip]



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Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [ft.kip]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = -1,509; V _x = 859; V _y = 859; M _x = -15.60700; M _y = 15.60700; M _z = 0.00000;	no	25

2 Load case/Resulting anchor forces

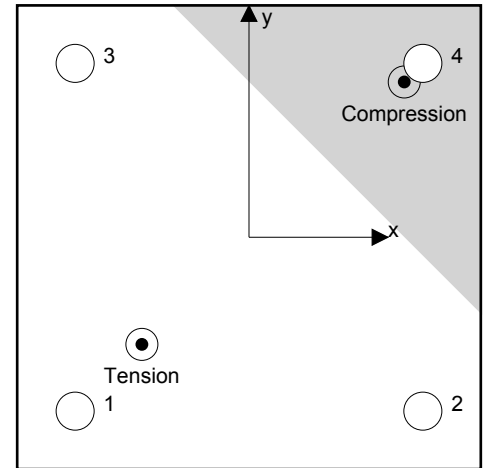
Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	12,192	304	215	215
2	3,799	304	215	215
3	3,799	304	215	215
4	0	304	215	215

max. concrete compressive strain: 0.26 [%]
max. concrete compressive stress: 1,144 [psi]
resulting tension force in (x/y)=(-3.696/-3.696): 19,791 [lb]
resulting compression force in (x/y)=(5.358/5.358): 21,300 [lb]



Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N _{ua} [lb]	Capacity ϕN_n [lb]	Utilization $\beta_N = N_{ua} / \phi N_n$	Status
Steel Strength*	12,192	54,506	23	OK
Pullout Strength*	12,192	50,109	25	OK
Concrete Breakout Failure** ¹	N/A	N/A	N/A	N/A
Concrete Side-Face Blowout, direction x-**	15,992	73,783	22	OK

* highest loaded anchor **anchor group (anchors in tension)

¹ Tension Anchor Reinforcement has been selected!

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Fastening point:			

3.1 Steel Strength

$$N_{sa} = A_{se,N} f_{uta} \quad \text{ACI 318-11 Eq. (D-2)}$$

$$\phi N_{sa} \geq N_{ua} \quad \text{ACI 318-11 Table D.4.1.1}$$

Variables

$A_{se,N} [\text{in.}^2]$	$f_{uta} [\text{psi}]$
0.97	75,000

Calculations

$N_{sa} [\text{lb}]$
72,675

Results

$N_{sa} [\text{lb}]$	ϕ_{steel}	$\phi N_{sa} [\text{lb}]$	$N_{ua} [\text{lb}]$
72,675	0.750	54,506	12,192

3.2 Pullout Strength

$$N_{pN} = \psi_{c,p} N_p \quad \text{ACI 318-11 Eq. (D-13)}$$

$$N_p = 8 A_{brg} f'_c \quad \text{ACI 318-11 Eq. (D-14)}$$

$$\phi N_{pN} \geq N_{ua} \quad \text{ACI 318-11 Table D.4.1.1}$$

Variables

$\psi_{c,p}$	$A_{brg} [\text{in.}^2]$	λ_a	$f'_c [\text{psi}]$
1.000	2.24	1.000	4,000

Calculations

$N_p [\text{lb}]$
71,584

Results

$N_{pn} [\text{lb}]$	ϕ_{concrete}	$\phi N_{pn} [\text{lb}]$	$N_{ua} [\text{lb}]$
71,584	0.700	50,109	12,192

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Fastening point:			

3.3 Concrete Side-Face Blowout, direction x-

$$N_{sb} = 160 c_{a1} \sqrt{A_{brg}} \lambda_a \sqrt{f'_c} \quad \text{ACI 318-11 Eq. (D-16)}$$

$$N_{sbg} = \alpha_{group} N_{sb} \quad \text{ACI 318-11 Eq. (D-17)}$$

$$\phi N_{sbg} \geq N_{ua} \quad \text{ACI 318-11 Table (D.4.1.1)}$$

$$\alpha_{group} = \left(1 + \frac{s}{6 c_{a1}} \right) \quad \text{see ACI 318-11, Part D.5.4.2 Eq. (D-17)}$$

Variables

c_{a1} [in.]	c_{a2} [in.]	A_{brg} [in. ²]	λ_a	f'_c [psi]	s [in.]
4.500	4.500	0.00	1.000	4,000	12.000

Calculations

α_{group}	N_{sb} [lb]
1.444	68,108

Results

N_{sbg} [lb]	$\phi_{concrete}$	ϕN_{sbg} [lb]	$N_{ua,edge}$ [lb]
98,378	0.750	73,783	15,992

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Fastening point:			

4 Shear load

	Load V_{ua} [lb]	Capacity ϕV_n [lb]	Utilization $\beta_v = V_{ua}/\phi V_n$	Status
Steel Strength*	304	22,675	2	OK
Steel failure (with lever arm)*	304	3,606	9	OK
Pryout Strength**	1,215	48,159	3	OK
Concrete edge failure in direction x+**	1,215	7,455	17	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

$$V_{sa} = 0.6 A_{se,V} f_{uta} \quad \text{ACI 318-11 Eq. (D-29)}$$

$$\phi V_{steel} \geq V_{ua} \quad \text{ACI 318-11 Table D.4.1.1}$$

Variables

$A_{se,V}$ [in. ²]	f_{uta} [psi]
0.97	75,000

Calculations

V_{sa} [lb]
43,605

Results

V_{sa} [lb]	ϕ_{steel}	ϕ_{eb}	ϕV_{sa} [lb]	V_{ua} [lb]
43,605	0.650	0.800	22,675	304

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Fastening point:			

4.2 Steel failure (with lever arm)

V_s^M	$= \frac{\alpha_M \cdot M_s}{L_b}$	bending equation for stand-off
M_s	$= M_s^0 \left(1 - \frac{N_{ua}}{\phi N_{sa}} \right)$	resultant flexural resistance of anchor
M_s^0	$= (1.2) (S) (f_{u,min})$	characteristic flexural resistance of anchor
$\left(1 - \frac{N_{ua}}{\phi N_{sa}} \right)$		reduction for tensile force acting simultaneously with a shear force on the anchor
S	$= \frac{\pi(d)^3}{32}$	elastic section modulus of anchor bolt at concrete surface
L_b	$= z + (n)(d_0)$	internal lever arm adjusted for spalling of the surface concrete
ϕV_s^M	$\geq V_{ua}$	ACI 318-11 Table D.4.1.1

Variables

α_M	$f_{u,min}$ [psi]	N_{ua} [lb]	ϕN_{sa} [lb]	z [in.]	n	d_0 [in.]
2.00	75,000	12,192	54,506	2.625	0.500	1.250

Calculations

M_s^0 [ft.kip]	$\left(1 - \frac{N_{ua}}{\phi N_{sa}} \right)$	M_s [ft.kip]	L_b [in.]
0.96779	0.776	0.75131	3.250

Results

V_s^M [lb]	ϕ_{steel}	ϕV_s^M [lb]	V_{ua} [lb]
5,548	0.650	3,606	304

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Fastening point:			

4.3 Pryout Strength

$$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right] \quad \text{ACI 318-11 Eq. (D-41)}$$

$$\phi V_{cp} \geq V_{ua} \quad \text{ACI 318-11 Table D.4.1.1}$$

$$A_{Nc} \text{ see ACI 318-11, Part D.5.2.1, Fig. RD.5.2.1(b)}$$

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-11 Eq. (D-5)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-8)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-10)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-12)}$$

$$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5} \quad \text{ACI 318-11 Eq. (D-6)}$$

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	4.000	0.000	0.000	4.500
$\psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f'_c [psi]
1.000	-	24	1.000	4,000

Calculations

A_{Nc} [in. ²]	A_{Nc0} [in. ²]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
441.00	144.00	1.000	1.000	0.925	1.000	12,143

Results

V_{cp} [lb]	$\phi_{concrete}$	ϕV_{cp} [lb]	V_{ua} [lb]
68,798	0.700	48,159	1,215

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Fastening point:			

4.4 Concrete edge failure in direction x+

$$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}} \right) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} \Psi_{parallel,V} V_b \quad \text{ACI 318-11 Eq. (D-31)}$$

$$\phi V_{cbg} \geq V_{ua} \quad \text{ACI 318-11 Table D.4.1.1}$$

$$A_{Vc} \text{ see ACI 318-11, Part D.6.2.1, Fig. RD.6.2.1(b)}$$

$$A_{Vc0} = 4.5 c_{a1}^2 \quad \text{ACI 318-11 Eq. (D-32)}$$

$$\Psi_{ec,V} = \left(\frac{1}{1 + \frac{2e_v}{3c_{a1}}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-36)}$$

$$\Psi_{ed,V} = 0.7 + 0.3 \left(\frac{c_{a2}}{1.5c_{a1}} \right) \leq 1.0 \quad \text{ACI 318-11 Eq. (D-38)}$$

$$\Psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0 \quad \text{ACI 318-11 Eq. (D-39)}$$

$$V_b = 9 \lambda_a \sqrt{f_c} c_{a1}^{1.5} \quad \text{ACI 318-11 Eq. (D-34)}$$

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\Psi_{c,V}$	h_a [in.]
4.500	4.500	0.000	1.400	96.000
l_e [in.]	λ_a	d_a [in.]	f_c [psi]	$\Psi_{parallel,V}$
10.000	1.000	1.250	4,000	1.000

Calculations

A_{Vc} [in. ²]	A_{Vc0} [in. ²]	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{h,V}$	V_b [lb]
141.75	91.13	1.000	0.900	1.000	5,434

Results

V_{cbg} [lb]	$\phi_{concrete}$	ϕV_{cbg} [lb]	V_{ua} [lb]
10,650	0.700	7,455	1,215

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.243	0.163	5/3	15	OK

$$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} \leq 1$$



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Fastening point:			

6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- ACI 318 does not specifically address anchor bending when a stand-off condition exists. PROFIS Engineering calculates a shear load corresponding to anchor bending when stand-off exists and includes the results as a shear Design Strength!
- For additional information about ACI 318 strength design provisions, please go to <https://submittals.us.hilti.com/PROFISAnchorDesignGuide/>
- The design of Anchor Reinforcement is beyond the scope of PROFIS Engineering. Refer to ACI 318-11, Part D.5.2.9 for information about Anchor Reinforcement.
- Anchor Reinforcement has been selected as a design option, calculations should be compared with PROFIS Engineering calculations.
- The characteristic bond resistances depend on the return period (service life in years): 50
- Please be aware that with $TE\ 70\ h_{min} \geq 0.000\ in.$ as per the ESR.

Fastening meets the design criteria!

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Fastening point:			

7 Installation data

Profile: Round HSS (AISC), HSS11-1/4X.250; (L x W x T) = 12.250 in. x 12.250 in. x 0.250 in.

Hole diameter in the fixture: $d_f = 1.313$ in.

Plate thickness (input): 1.250 in.

Recommended plate thickness: not calculated

Anchor type and diameter: Heavy Hex Head ASTM F 1554
GR. 55 1 1/4

Item number: not available

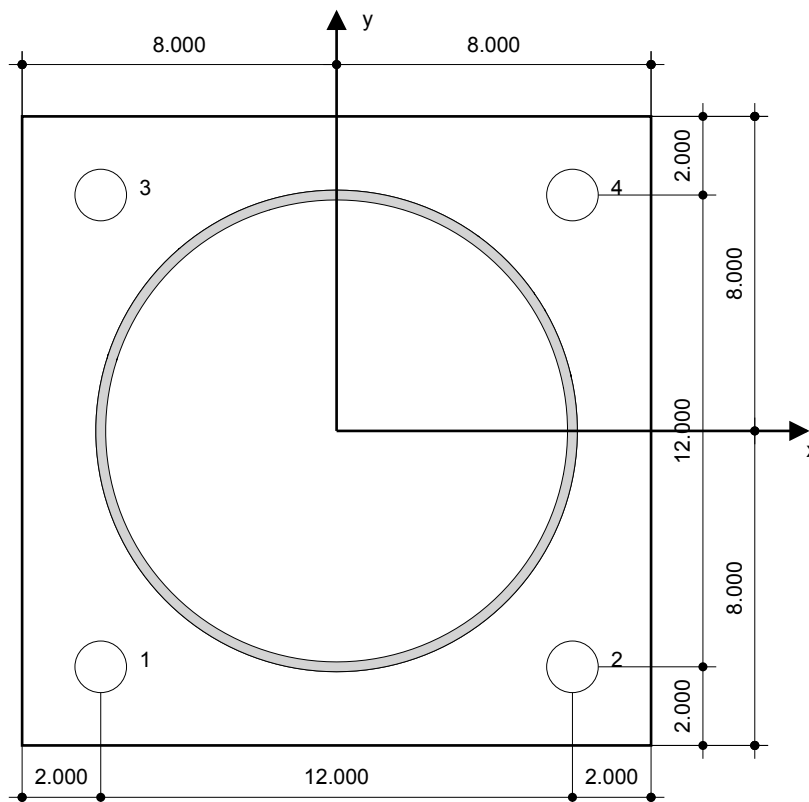
Installation torque: -

Hole diameter in the base material: - in.

Hole depth in the base material: 24.000 in.

Minimum thickness of the base material: 25.344 in.

Hilti Heavy Hex Head headed stud anchor with 24 in embedment, 1 1/4, Steel galvanized, installation per instruction for use



Coordinates Anchor in.

Anchor	x	y	c _{-x}	c _{+x}	c _{-y}	c _{+y}
1	-6.000	-6.000	4.500	16.500	4.500	16.500
2	6.000	-6.000	16.500	4.500	4.500	16.500
3	-6.000	6.000	4.500	16.500	16.500	4.500
4	6.000	6.000	16.500	4.500	16.500	4.500



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8 Remarks; Your Cooperation Duties

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TowerCom Technologies

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 * CAISSON - Pier Foundations Analysis and Design - Copyright Power Line Systems, Inc.
 1993-2011 *
 *
 *

Project Title: Commscope 30' Pole with 12" base
 Project Notes: 120 mph maximum wind for Connecticut

Calculation Method: Full 8CD

***** I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
2.50	0.17	4.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft ³)	CU (psf)	KP	PHI (deg)
1	Clay	20.00	0.00	110.0	130.0		

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
22.1	1.5	1.22	1.00

***** R E S U L T S

(kips)	(ft-k)			
	0.00		1.4	25.2
1.4		25.2		
	0.70		0.0	25.8
0.0		25.8		
	1.40		-1.8	25.2
1.8		25.2		-
	2.10		-3.6	23.3
3.6		23.3		-
	2.80		-5.5	20.1
5.5		20.1		-
	3.50		-7.3	15.6
7.3		15.6		-
	4.20		-7.3	10.2
7.3		10.2		-
	4.90		-5.5	5.7
5.5		5.7		-
	5.60		-3.6	2.5
3.6		2.5		-
	6.30		-1.8	0.6
1.8		0.6		-
	7.00		0.0	0.0
0.0		0.0		

Reinforcement and Capacity

Total Reinforcement Percent	Reinforcement Area (in^2)	Usable Axial Capacity (kips)	Usable Moment Capacity (ft-k)
0.36	2.54	1.5	139.4

US Standard Re-Bars (Select one of the following)

Quantity	Name	Area (in^2)	Diameter (in)	Spacing (in)
13	#4	0.20	0.500	4.83
9	#5	0.31	0.625	6.98
6	#6	0.44	0.750	10.47
5	#7	0.60	0.875	12.57
4	#8	0.79	1.000	15.71
3	#9	1.00	1.128	20.94
3	#10	1.27	1.270	20.94
2	#11	1.56	1.410	31.42
2	#14	2.25	1.693	31.42

Title Block Line 1
 You can change this area
 using the "Settings" menu item
 and then using the "Printing &
 Title Block" selection.
 Title Block Line 6

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Printed: 11 FEB 2020, 9:57AM

Pole Footing Embedded in Soil

top\COMMISC-1\CONNEC-1\SSC760-1\Commscope 30-ft Pole with 12in base Foundation Embed Design.ec6 .

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Lic. # : KW-06007480

J5 INFRASTRUCTURE PARTNERS

DESCRIPTION: 30' Pole Foundation with 12" base, maximum 120 mph Wind for Connecticut

Code References

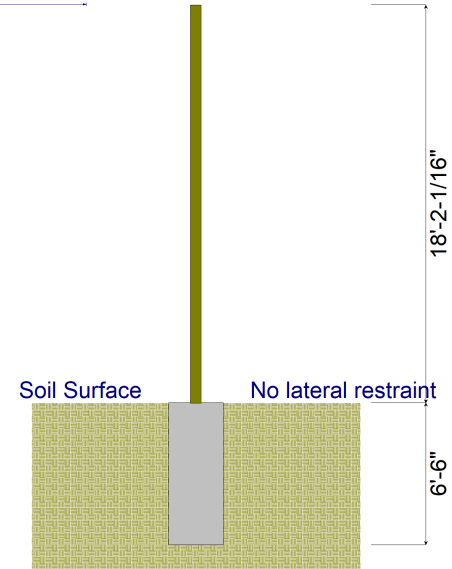
Calculations per IBC 2012 1807.3, CBC 2013, ASCE 7-10

Load Combinations Used : ASCE 7-10

General Information

Pole Footing Shape Circular
 Pole Footing Diameter 30.0 in
 Calculate Min. Depth for Allowable Pressures
 No Lateral Restraint at Ground Surface
 Allow Passive 200.0 pcf
 Max Passive 3,000.0 pcf

Point Load



Controlling Values

Governing Load Combination : +D+0.60W
 Lateral Load 0.7290 k
 Moment 13.246 k-ft

NO Ground Surface Restraint

Pressures at 1/3 Depth
 Actual 429.807 psf
 Allowable 430.467 psf

Minimum Required Depth 6.50 ft

Footing Base Area 4.909 ft²
 Maximum Soil Pressure 0.3074 ksf

Applied Loads

Lateral Concentrated Load (k)		Lateral Distributed Loads (klf)		Vertical Load (k)
D : Dead Load	k		k/ft	1.509 k
Lr : Roof Live	k		k/ft	k
L : Live	k		k/ft	k
S : Snow	k		k/ft	k
W : Wind	1.215 k		k/ft	k
E : Earthquake	0.0 k		k/ft	k
H : Lateral Earth	k		k/ft	k
Load distance above ground surface	18.170 ft	TOP of Load above ground surface	ft	
		BOTTOM of Load above ground surface	ft	

Load Combination Results

Load Combination	Forces @ Ground Surface		Required Depth - (ft)	Pressure at 1/3 Depth		Soil Increase Factor
	Loads - (k)	Moments - (ft-k)		Actual - (psf)	Allow - (psf)	
D Only	0.000	0.000	0.13	0.0	0.0	1.000
+D+0.60W	0.729	13.246	6.50	429.8	430.5	1.000
+D+0.450W	0.547	9.934	5.88	386.7	388.3	1.000
+0.60D+0.60W	0.729	13.246	6.50	429.8	430.5	1.000
+0.60D	0.000	0.000	0.13	0.0	0.0	1.000