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

January 23, 2019

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

RE: **Notice of Exempt Modification for T-Mobile / Crown Site BU: 823531**
T-Mobile Site ID: CT11896A
41 Padanaram Road, Danbury CT 06811
Latitude: 41.41890000 / Longitude: -73.46180000

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 80-foot wood pole located at 41 Padanaram Road, Danbury CT 06811. T-Mobile currently maintains six (6) antennas at the 79-foot level of the existing 80-foot tower. The tower is owned by Crown Castle. The property is owned by Robert J Kaufman. T-Mobile now intends to replace three (3) existing antenna with three (3) new antennas as well as add (3) RRUs, remove (6) lines of coax and replace with (1) Hybird fiber line. The new antennas would be installed at the 79- foot and level of the tower, the RRUs will be installed on an H-Frame mount on the ground.

This facility was approved by the CT Siting Council. Per the attached Petition No. 712 – Dated April 27, 2005. Approval for an 80-foot Centerline on the existing 80-foot pole. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mark D. Boughton, Mayor, as Elected Official for the City of Danbury and Sharon Calitro, Director of Zoning as well as the property owner and the tower owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

William Stone
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
518-373-3543
William.stone@crowncastle.com

Attachments:

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

cc: Mayor Mark D. Boughton
City of Danbury
155 Deer Hill Avenue
Danbury, CT 06810
203-797-4500

Sharon Calitro- Director of Zoning
City of Danbury
155 Deer Hill Avenue
Danbury, CT 06810
203-797-4500

Robert J. Kaufman
41 PADANARAM RD
DANBURY,CT 06811
(203) 744-2001

ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 23JAN19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO MAYOR BOUGHTON
CITY OF DANBURY
155 DEER HILL AVE

DANBURY CT 06810
(203) 797-4500 REF: 1734.7680
INV:
PO: DEPT:

565J2/D74C/23AD

FedEx Express

THU - 24 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7742 9343 3783

DSR

E9 DXRA 06810
CT-US SWF

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ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 23JAN19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO SHARON CALITRO- CITY PLANNER
CITY OF DANBURY
155 DEER HILL AVE

DANBURY CT 06810
(203) 797-4500 REF: 1734.7680
INV:
PO: DEPT:

565J2/D74C/23AD

FedEx Express

THU - 24 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7742 9344 9337

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06810

E9 DXRA

CT-US SWF

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ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 23JAN19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO ROBERT KAUFMAN
41 PADANARAM RD

DANBURY CT 06811
(203) 744-2001 REF: 1734.7680
INV:
PO: DEPT:

565J2/D74C/23AD

FedEx Express

E

J181019010701uv

THU - 24 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7742 9347 2596

DSR
06811
SWF
CT-US

E9 DXRA

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ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 23JAN19
ACTWGT: 4.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO **MELANIE BACHMAN**
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051
(860) 827-2951 REF: 1765.6680
INV:
PO: DEPT:

565J2/D74C/23AD

FedEx Express

J181019010781uv

THU - 24 JAN 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7742 9348 2303**

DSR
06051
CT-US **BDL**

EB BDLA

After printing this label:
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Petition No. 712
Omnipoint (T-Mobile)
Danbury, Connecticut
Staff Report
April 27, 2005

T-Mobile seeks to replace an existing 60-foot tall wooden utility pole, on which whip antennas were formerly attached to dispatch concrete trucks, with an 80-foot tall wood laminate pole to which a platform with twelve antennas would be mounted. The antennas would be mounted with a center line of 80 feet; the tops of the antennas would reach 83 feet. The new pole would be designed to accommodate one additional carrier. At the time of its petition submittal, T-Mobile also notified all abutting property owners of its plans.

On April 26, 2005, Council member Ed Wilensky and staff analyst David Martin visited the site of the petition at 41 Pandanaram Road (Route 37) in Danbury. Stephen Humes, Jackie Slaga, Dan O'Connor, and Jeffrey York were present at the field review representing T-Mobile.

The existing pole is located near the top of a small ridge line that parallels Pandanaram Road. The lower portions of the ridge between the pole site and Pandanaram Road are occupied by a concrete plant (at street level) and several graded off levels that are used for the storage of various concrete products. A graveled access road switches back and forth up the side of the ridge to eventually reach the pole, which is in a small cleared area surrounded by mature deciduous trees that appear to be 65 to 70 feet high.

T-Mobile would install a 15-foot by 15-foot fence compound next to the proposed replacement pole to house its ground equipment which would consist of equipment cabinets on two concrete Pands. In its petition, T-Mobile states the compound would be enclosed by a six-foot high chain link fence topped with three strands of barbed wire. During the field review, T-Mobile representatives stated they would be amenable to installing an eight-foot fence without the barbed wire. Utilities would be brought underground to the compound from a utility pole to be placed somewhere lower on the ridge. Underground utilities would be preferable to overhead lines because of the truck traffic and the use of booms to pick up and move the concrete products.

From the pole site, the ridge continues to rise to the north and east. Although there is a residential area just over the crest of the ridge, no houses are visible from the base of the existing pole. Mr. Wilensky and David Martin drove the residential road nearest the ridge line and could not see the existing tower from this location.

To the south of the existing pole, the ridge falls steeply away to a condominium development. The condominium units nearest to the pole site face the side of the ridge and would not be able to see the replacement pole. Units closer to Pandanaram Road may have some views of the higher proposed tower. Mr. Wilensky and David Martin drove through the condominium development but could not see the existing tower.

To the west of the site, Danbury High School is visible on the side of an opposite ridge. There are a few residences also visible on the opposite ridge. However, existing vegetation and distance should make any visual presence of the proposed, higher tower minimal.

View of Existing Pole

View From Pole, Looking Toward Roof Of Nearest Condominiums

Closer View of Condominium Roof from Edge of Ridge

Looking West From Pole Site

Looking Northeast From Site, Existing Pole In Foreground

PADANARAM RD

Location	PADANARAM RD	**Mblu**	H10/ / 140/ /
Acct#		**Owner**	KAUFMAN ROBERT J
Assessment	$1,725,900	**Appraisal**	$2,465,500
PID	10751	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$661,000	$1,804,500	$2,465,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$462,700	$1,263,200	$1,725,900

Owner of Record

Owner	KAUFMAN ROBERT J	**Sale Price**	$0
Co-Owner		**Book & Page**	0470/0094
Address	41 PADANARAM RD DANBURY, CT 06811	**Sale Date**	02/07/1969

Ownership History

Ownership History			
Owner	**Sale Price**	**Book & Page**	**Sale Date**
KAUFMAN ROBERT J	$0	0470/0094	02/07/1969

Building Information

Building 1 : Section 1

Year Built:	2006
Living Area:	23,280
Replacement Cost:	$957,958
Building Percent Good:	69
Replacement Cost Less Depreciation:	$661,000

Building Attributes

Field	Description
STYLE	Pre-Eng Mfg
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Metal/Tin
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Hot Air-no Duc
AC Type	None
Bldg Use	Commercial MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	200I
Heat/AC	NONE
Frame Type	FIREPRF STEEL
Baths/Plumbing	AVERAGE
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	25
% Comn Wall	0

Building Photo

(http://images.vgsi.com/photos/DanburyCTPhotos//\00\02\39/88.jpg)

Building Layout

Building Sub-Areas (sq ft) **Legend**

Code	Description	Gross Area	Living Area
BAS	First Floor	23,280	23,280
UEP	Unfi. Enclosed Porch	492	0
UST	Unf. Storage	4,080	0
		27,852	23,280

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	200I
Description	Commercial MDL-96
Zone	CN20
Neighborhood	6500
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	9.68
Frontage	0
Depth	0
Assessed Value	$1,263,200
Appraised Value	$1,804,500

Outbuildings

Outbuildings — Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CEL	Cell Tower			1 UNITS	$0	1

Valuation History

Appraisal

Valuation Year	Improvements	Land	Total
2015	$661,000	$1,804,500	$2,465,500
2014	$661,000	$1,804,500	$2,465,500
2013	$661,000	$1,804,500	$2,465,500

Assessment

Valuation Year	Improvements	Land	Total
2015	$462,700	$1,263,200	$1,725,900
2014	$462,700	$1,263,200	$1,725,900
2013	$462,700	$1,263,200	$1,725,900

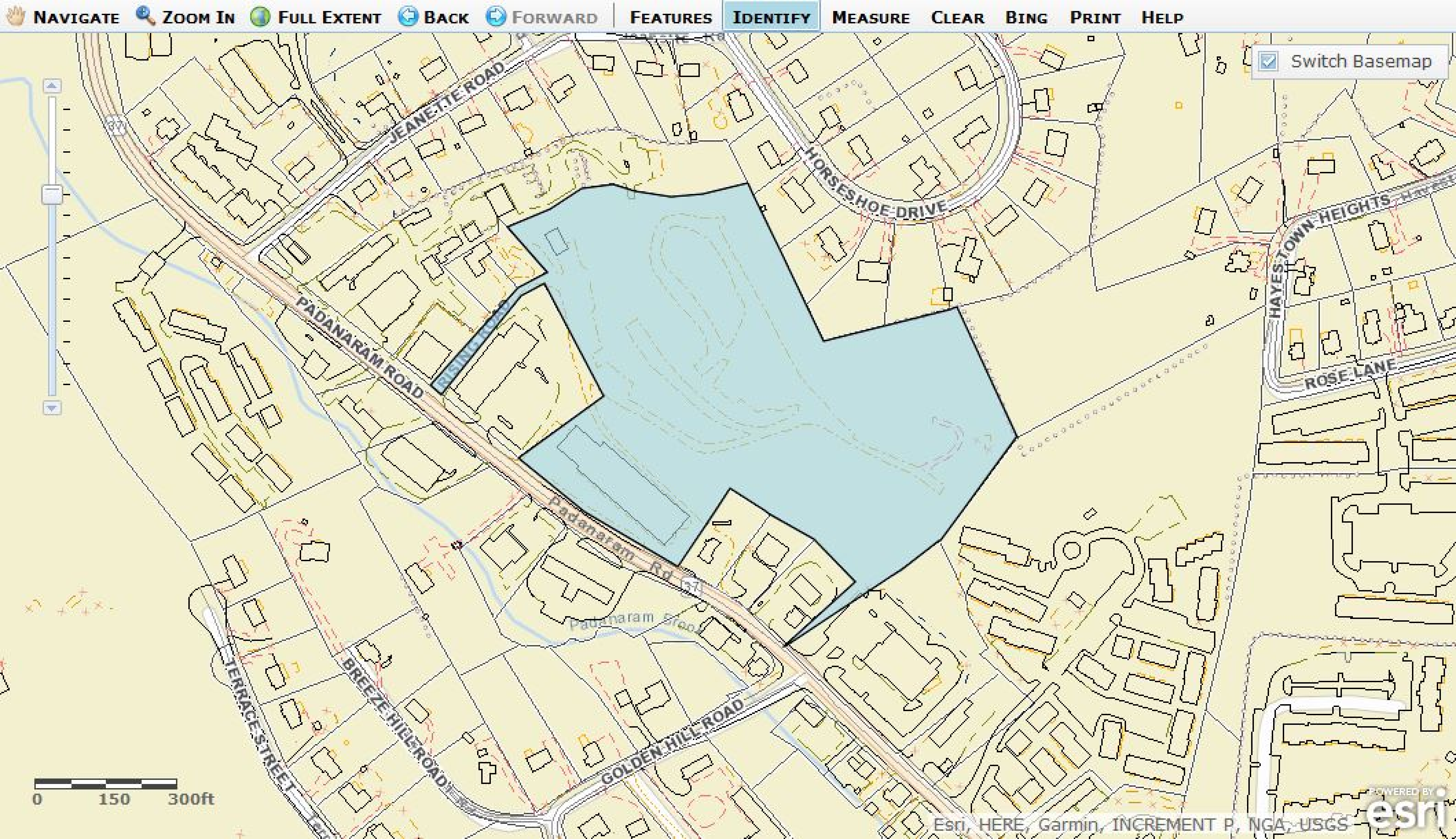

NAVIGATE
ZOOM IN
FULL EXTENT
BACK
FORWARD
FEATURES
IDENTIFY
MEASURE
CLEAR
BING
PRINT
HELP
Switch Basemap
JEANETTE ROAD
HORSESHOE DRIVE
HAYESTOWN HEIGHTS
ROSE LANE
PADANARAM ROAD
Padanaram Rd
Padanaram
GOLDEN HILL ROAD
BREEZE HILL ROAD
TERRACE STREET
0 150 300ft
Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Exhibit A

CROWN CASTLE

T-Mobile NORTHEAST, LLC.

CROWN SITE NAME:

CT896/M&M CONCRETE POLE

SITE ID#: 823531
APP ID #: 446044

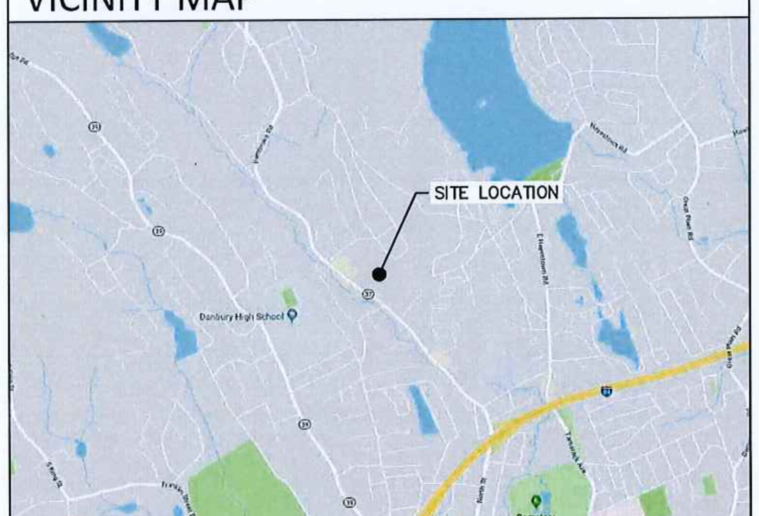
L600 UPGRADE

T–MOBILE SITE I.D. NUMBER:
CT11896A

T–MOBILE SITE NAME:
CT896/M&M CONCRETE POLE

CONFIGURATION:
67D92DBL

VICINITY MAP



PROJECT SUMMARY

T–MOBILE SITE NUMBER:	CT11896A
SITE ADDRESS:	41 PADANARAM RD DANBURY, CT 06811
COUNTY:	FAIRFIELD
APPLICANT:	T–MOBILE NORTHEAST LLC. 4 SYLVAN WAY PARSIPPANY, NJ 07054
STRUCTURE TYPE:	WOODEN MONOPOLE
STRUCTURE HEIGHT:	80'±
ANTENNA RAD CENTER:	80'±
LATITUDE: (NAD 83)	41° 25' 08.10" N
LONGITUDE: (NAD 83)	73° 27' 43.00" W
GRADE ELEVATION:	572'± AMSL

CONSTRUCTION MANAGER:	CROWN CASTLE 3 CORPORATE PARK DR. SUITE 101 CLIFTON PARK, NY 12065
CONTACT: PHONE:	JASON D'AMIRO (860) 209–0104
PROJECT MANAGER:	CROWN CASTLE 3 CORPORATE PARK DR. SUITE 101 CLIFTON PARK, NY 12065
CONTACT: PHONE:	WILL STONE (518) 373–3543
ENGINEER:	TECTONIC ENGINEERING CONSULTANTS 1279 ROUTE 300 NEWBURGH, NY 12550
CONTACT: PHONE:	EDWARD IAMICELI (845) 567–6656

SHEET INDEX

SHEET NO	DESCRIPTION	REV NO	REVISION DATE
T–1	TITLE SHEET	2	1/22/19
A–1	OVERALL SITE PLAN	2	1/22/19
A–2	ELEVATION & ANTENNA PLANS	2	1/22/19
A–3	ANTENNA, MOUNTING DETAIL & RF DIAGRAM	2	1/22/19
A–4	ANTENNA MOUNTING & SITE DETAILS	2	1/22/19
A–5	NOTES	2	1/22/19
E–1	ONE–LINE POWER DIAGRAM & NOTES	2	1/22/19
G–1	GROUNDING DETAILS & NOTES	2	1/22/19

THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL ITEMS HAVE BEEN ADDRESSED AND EACH OF THE DRAWINGS HAS BEEN REVISED AND ISSUED "FOR CONSTRUCTION".

SITE DIRECTIONS

DIRECTIONS: (FROM WOBURN, MA):

TAKE I–84S. TAKE EXIT 6 FOR CT–37. TURN RIGHT ONTO CT–37 N. SITE WILL BE ON THE RIGHT.

APPLICABLE CODES

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

1. 2016 CT STATE BUILDING CODE (IBC 2012)
2. ACCESSIBILITY CODE ADA 2015. BASED ON ICC/ANSI A117.1–LATEST EDITION
3. 2014 NATIONAL ELECTRIC CODE
4. FIRE/LIFE SAFETY CODE – IFC 2015
5. ENERGY CODE IECC 2012

811 Know what's below. Call 811 before you dig.

PROJECT SCOPE OF WORK

THE PROPOSED WORK CONSISTS OF:
- REMOVE (3) EXISTING T–MOBILE PANEL ANTENNAS
- REMOVE (1) EXISTING T–MOBILE DUW30 UNIT
- REMOVE (6) EXISTING T–MOBILE COAX CABLES
- INSTALL (3) PROPOSED T–MOBILE ANTENNAS
- INSTALL (3) PROPOSED T–MOBILE RRUS11 (B12)
- INSTALL (1) PROPOSED T–MOBILE H–FRAME
- INSTALL (1) PROPOSED T–MOBILE 6X12 HYBRID CABLE
- INSTALL (1) PROPOSED T–MOBILE DUS41 UNIT
- INSTALL (1) PROPOSED T–MOBILE XMU UNIT
- INSTALL (3) STANDOFF REINFORCEMENT KITS

CONFIGURATION
792DBE
REFER TO LATEST T–MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM

CROWN CASTLE
3 CORPORATE PARK DR. STE 101
CLIFTON PARK, NY 12065

T-Mobile NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
36 British American Blvd.
Suite 101
Latham, NY 12110
Phone: (518) 783-1630
(800) 829-6531
www.tectonicengineering.com

WORK ORDER NUMBER	DRAWN BY
9166.25	TRR

NO.	DATE	ISSUE
0	10/22/18	FOR PERMIT
1	1/14/19	PER REVISED RFDS
2	1/22/19	FOR CONSTRUCTION

RELEASED BY	DATE

STATE OF CONNECTICUT
EDWARD N. IAMICELI
28473
LICENSED
PROFESSIONAL ENGINEER

UNAUTHORIZED ALTERATION OR ADDITIONS TO A PLAN BEARING THE SEAL OF A LICENSED ENGINEER OR LAND SURVEYOR IS A VIOLATION IN THE STATE OF CONNECTICUT.

COPIES OF THIS DOCUMENT WITHOUT A FACSIMILE OF THE SIGNATURE AND AN ORIGINAL EMBOSSED SEAL OR ORIGINAL STAMP IN BLUE OR RED INK OF THE PROFESSIONAL ENGINEER OR LAND SURVEYOR SHALL NOT BE CONSIDERED VALID COPIES.

0 1 2 3
ORIGINAL SIZE IN INCHES

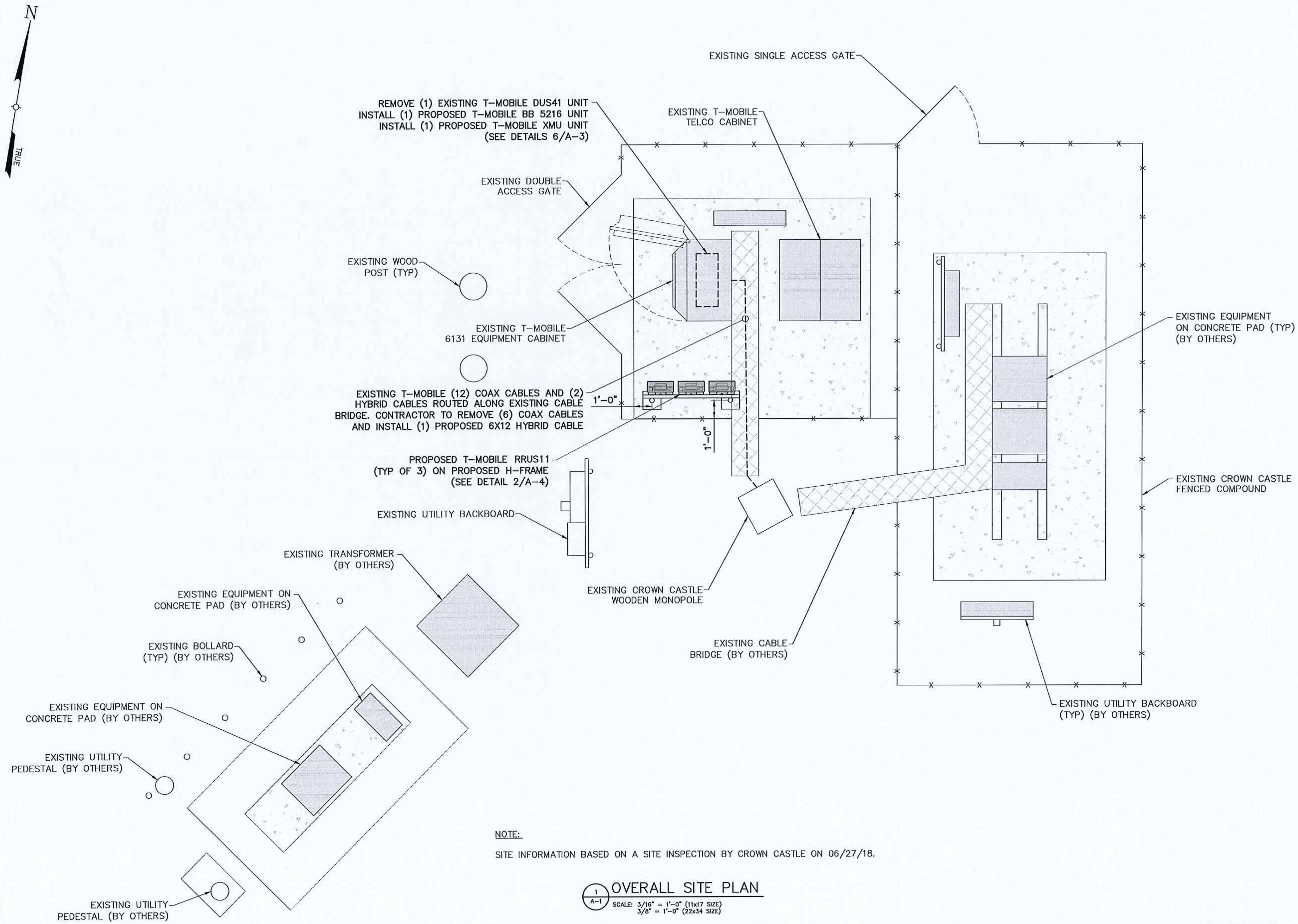
CROWN SITE INFORMATION
SITE ID #: 823531
APP ID #: 446044
CT896/M&M CONCRETE POLE

T–MOBILE SITE INFORMATION
SITE ID #: CT11896A
CT896/M&M CONCRETE POLE

SITE ADDRESS
41 PADANARAM RD
CITY OF DANBURY
FAIRFIELD COUNTY
CT 06811

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T–1



NOTE:

SITE INFORMATION BASED ON A SITE INSPECTION BY CROWN CASTLE ON 06/27/18.

1 / A-1 OVERALL SITE PLAN

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

CONFIGURATION

792DBE

REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM

CROWN CASTLE
3 CORPORATE PARK DR. STE 101
CLIFTON PARK, NY 12065

T-Mobile
NORTHEAST LLC
4 SYLVAN WAY
PARSIPPANY, NJ 07054

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
36 British American Blvd.
Suite 101
Latham, NY 12110
Phone: (518) 783-1630
(800) 829-6531
www.tectonicengineering.com

WORK ORDER NUMBER	DRAWN BY
9166.25	TRR

NO.	DATE	ISSUE
0	10/22/18	FOR PERMIT
1	1/14/19	PER REVISED RFDS
2	1/22/19	FOR CONSTRUCTION

RELEASED BY	DATE

STATE OF CONNECTICUT
EDWARD N. IAMICELI
28478
LICENSED
PROFESSIONAL ENGINEER

0 1 2 3
ORIGINAL SIZE IN INCHES

CROWN SITE INFORMATION

SITE ID #: 823531
APP ID #: 446044
CT896/M&M CONCRETE POLE

T-MOBILE SITE INFORMATION

SITE ID #: CT11896A
CT896/M&M CONCRETE POLE

SITE ADDRESS

41 PADANARAM RD
CITY OF DANBURY
FAIRFIELD COUNTY
CT 06811

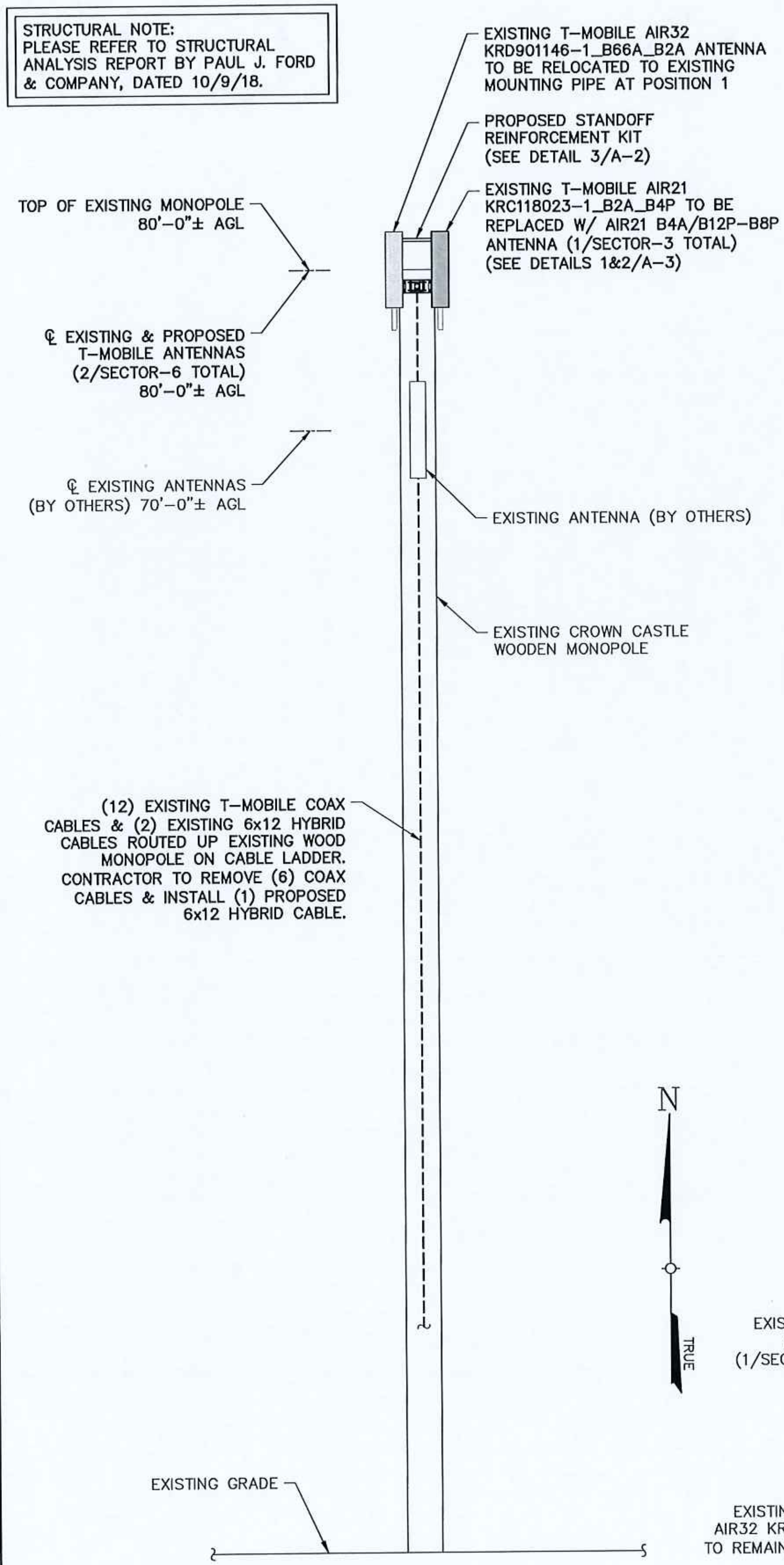
SHEET TITLE

OVERALL SITE PLAN

SHEET NUMBER

A-1

STRUCTURAL NOTE:
PLEASE REFER TO STRUCTURAL ANALYSIS REPORT BY PAUL J. FORD & COMPANY, DATED 10/9/18.



1/A-2 PROPSOSED ELEVATION
SCALE: 3/32" = 1'-0" (11x17 SIZE)
3/16" = 1'-0" (22x34 SIZE)

ANTENNA AND CABLE SCHEDULE

SECTOR MARK	SECTOR	STATUS	ANTENNA DATA	MECHANICAL DOWN TILT	ELECTRICAL DOWN TILT	AZIMUTH (TRUE NORTH)	ANTENNA ℄ HEIGHT (AGL)	TMA/RRU	CABLE	JUMPER TYPE	CABLE LENGTH
A-1 L600 L700 U2100	LEFT ALPHA	REPLACEMENT	ERICSSON AIR21 B4A/B12P-B8P 56.2" x 12.1" x 7.9", 91.5 LBS	0°	–	60°	80'	1/1	EXISTING (2) 1 5/8" COAX & EXISTING SHARED HYBRID FIBER TRUNK	DC FIBER 7/8" COAX	95'-0" 95'-0"
A-2 L2100 L1900 G1900	RIGHT ALPHA	EXISTING	ERICSSON AIR32 KRD901146-1B66A_B2A 56.6" x 12.9" x 8.7", 132.2 LBS	0°	–	60°	80'	0/0	PROPOSED HYBRID TRUNK	DC FIBER	8'-0"
B-1 L600 L700 U2100	LEFT BETA	REPLACEMENT	ERICSSON AIR21 B4A/B12P-B8P 56.2" x 12.1" x 7.9", 91.5 LBS	0°	–	60°	80'	1/1	EXISTING (2) 1 5/8" COAX & EXISTING SHARED HYBRID FIBER TRUNK	DC FIBER 7/8" COAX	95'-0" 95'-0"
B-2 L2100 L1900 G1900	RIGHT BETA	EXISTING	ERICSSON AIR32 KRD901146-1B66A_B2A 56.6" x 12.9" x 8.7", 132.2 LBS	0°	–	60°	80'	0/0	SHARED HYBRID TRUNK	DC FIBER	8'-0"
G-1 L600 L700 U2100	LEFT GAMMA	REPLACEMENT	ERICSSON AIR21 B4A/B12P-B8P 56.2" x 12.1" x 7.9", 91.5 LBS	0°	–	60°	80'	1/1	EXISTING (2) 1 5/8" COAX & EXISTING SHARED HYBRID FIBER TRUNK	DC FIBER 7/8" COAX	95'-0" 95'-0"
G-2 L2100 L1900 G1900	RIGHT GAMMA	EXISTING	ERICSSON AIR32 KRD901146-1B66A_B2A 56.6" x 12.9" x 8.7", 132.2 LBS	0°	–	60°	80'	0/0	SHARED HYBRID TRUNK	DC FIBER	8'-0"

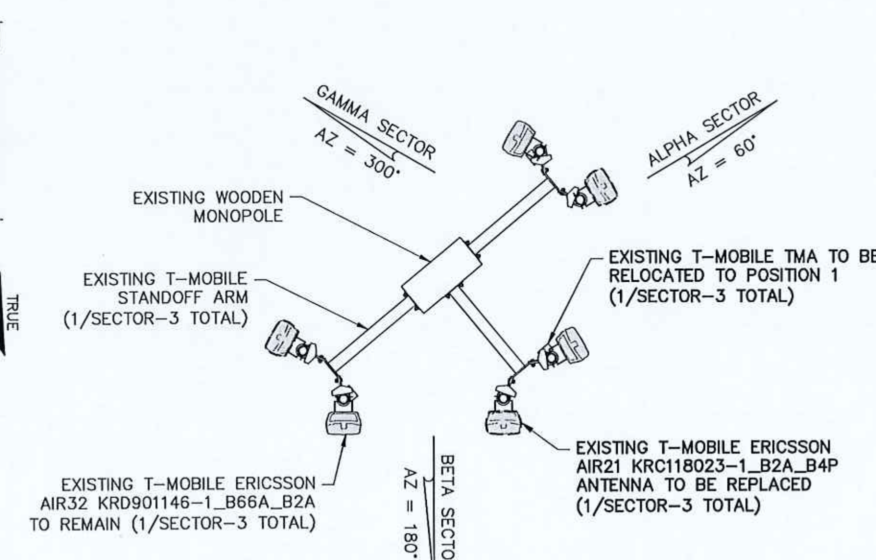
NOTE:
- INFORMATION BASED ON CROWN CASTLE APPLICATION #446044 REVISION 0, DATED 6/5/18.
- INFORMATION BASED ON RFDS VERSION 4.1, DATED 5/11/18.

RRH AND HYBRID SCHEDULE

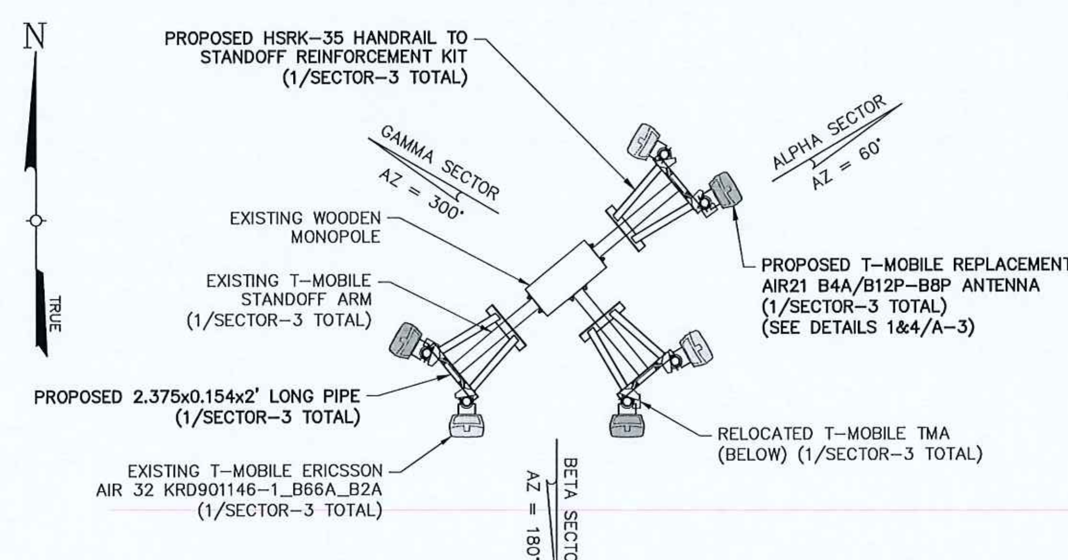
SECTOR	STATUS	UNITS	UNIT DATA	# OF UNITS	CABLE TYPE	# OF CABLES	CABLE LENGTH
GROUND	PROPOSED	RRUS11	17.8" x 17.3" x 7.2", 50 LBS	1	PROPOSED HYBRID TRUNK	1	95'-0"
GROUND	PROPOSED	RRUS11	17.8" x 17.3" x 7.2", 50 LBS	1	PROPOSED SHARED HYBRID TRUNK	1	–
GROUND	PROPOSED	RRUS11	17.8" x 17.3" x 7.2", 50 LBS	1	PROPOSED SHARED HYBRID TRUNK	1	–

NORTH NOTE: NORTH SHOWN HAS BEEN ESTABLISHED USING THE USGS QUADRANGLE 7.5 MINUTE MAPS AND IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO INSTALLATION OF ANTENNAS.

STRUCTURAL NOTE:
PLEASE REFER TO MOUNT STRUCTURAL ANALYSIS REPORT PREPARED BY PAUL J FORD & COMPANY DATED 12/14/2018.



2/A-2 ANTENNA PLAN (EXISTING)
SCALE: 3/16" = 1'-0" (22x34 SIZE)
3/8" = 1'-0" (11x17 SIZE)



3/A-2 ANTENNA PLAN (PROPOSED)
SCALE: 3/16" = 1'-0" (22x34 SIZE)
3/8" = 1'-0" (11x17 SIZE)

CONFIGURATION
792DBE
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM

CROWN CASTLE
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CLIFTON PARK, NY 12065

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RELEASED BY | DATE

STATE OF CONNECTICUT
EDWARD N. IAMICELI
28473
LICENSED PROFESSIONAL ENGINEER

0 1 2 3
ORIGINAL SIZE IN INCHES

CROWN SITE INFORMATION
SITE ID #: 823531
APP ID #: 446044
CT896/M&M CONCRETE POLE

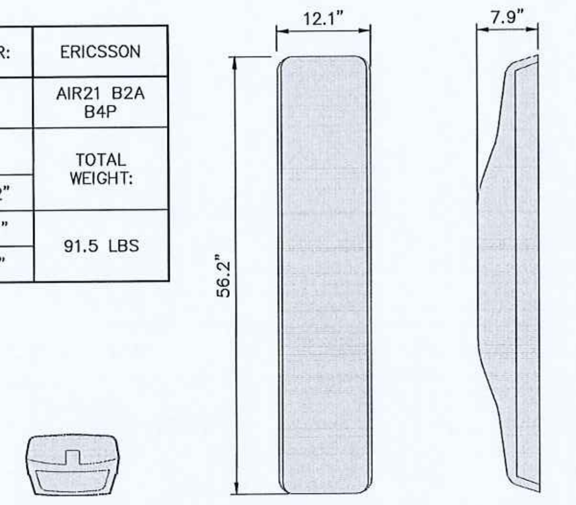
T-MOBILE SITE INFORMATION
SITE ID #: CT11896A
CT896/M&M CONCRETE POLE

SITE ADDRESS
41 PADANARAM RD
CITY OF DANBURY
FAIRFIELD COUNTY
CT 06811

SHEET TITLE
ELEVATION & ANTENNA PLANS

SHEET NUMBER
A-2

MANUFACTURER:	ERICSSON	
MODEL NO.:	AIR21 B2A B4P	
DIMENSIONS		TOTAL WEIGHT:
A	56.2"	
B	12.1"	91.5 LBS
C	7.9"	



TOP VIEW

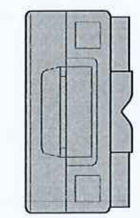
FRONT VIEW

SIDE VIEW

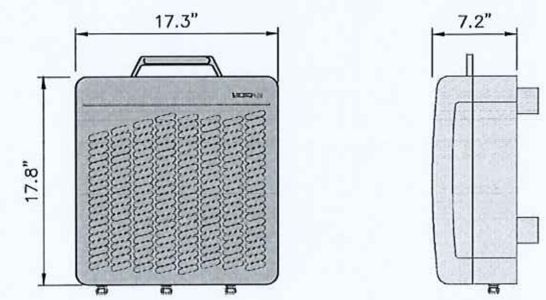
1 A-3 AIR21 ANTENNA DETAIL

SCALE: 1" = 1'-0" (22x34 SIZE)
2" = 1'-0" (11x17 SIZE)

MANUFACTURER:	ERICSSON	
MODEL NO.:	RRUS 11	
DIMENSIONS		TOTAL WEIGHT:
A	17.8"	
B	17.3"	±50 LBS
C	7.2"	



TOP VIEW

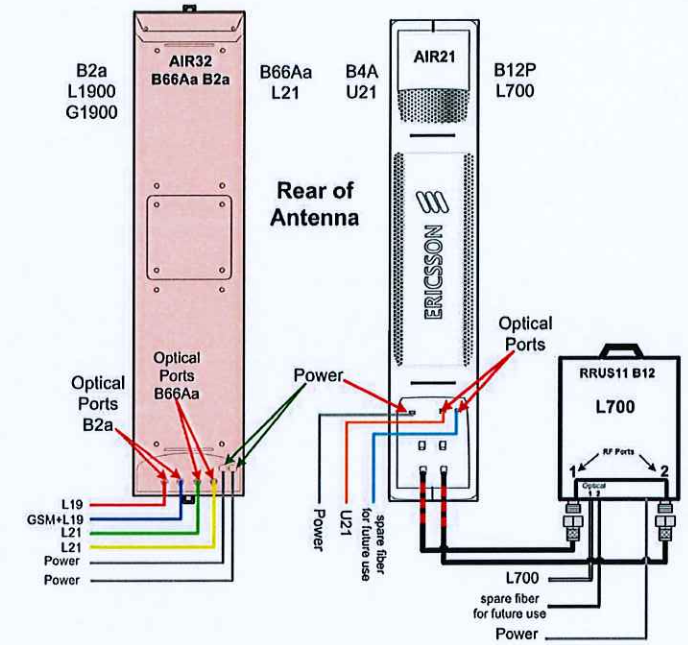


FRONT VIEW

SIDE VIEW

2 A-3 RRUS–11 DETAIL

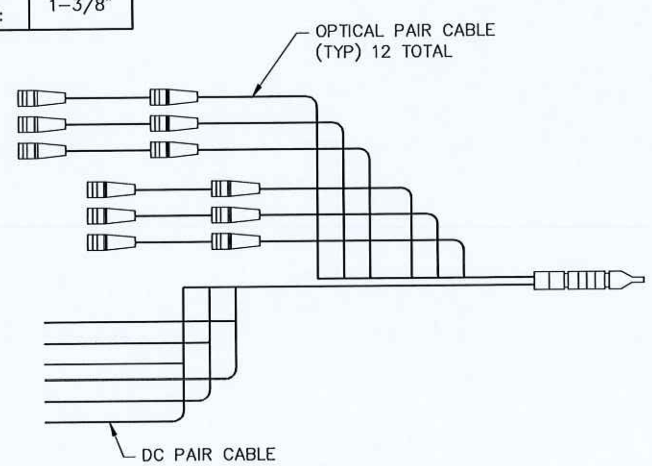
SCALE: 1-1/2" = 1'-0" (22x34 SIZE)
3" = 1'-0" (11x17 SIZE)



3 A-3 RF DIAGRAM

SCALE: NTS

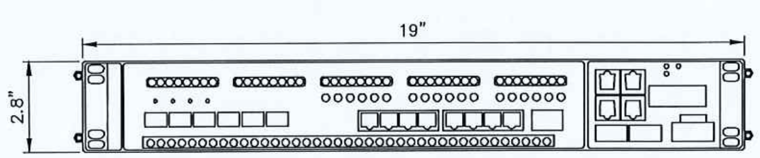
MANUFACTURER:	ERICSSON
MODEL NO.:	HCS 6X12
WEIGHT:	1.7 LBS/FT
DIAMETER:	1.38" (±.1")
COAX EQUIVALENT:	1-3/8"



4 A-3 6x12 HYBRID CABLE DETAIL

SCALE: NTS (22x34 SIZE)
NTS (11x17 SIZE)

MANUFACTURER:	ERICSSON	
MODEL NO.:	DUS 41	
DIMENSIONS		TOTAL WEIGHT:
A	2.8"	
B	19"	23 LBS
C	13.78"	



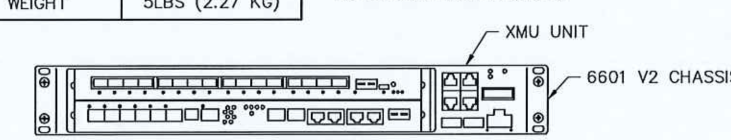
FRONT VIEW

5 A-3 DUS 41 DETAIL

SCALE: NTS (22x34 SIZE)
NTS (11x17 SIZE)

MANUFACTURER:	ERICSSON
MODEL NO.:	BASEBAND R503 XMU
DIMENSIONS (HxWxD):	1.22"x13.8"x11"
WEIGHT	5LBS (2.27 KG)

*INSTALLATION INTO EXISTING CABINET OR RACK REQUIRES NO SPECIAL INSTRUCTIONS



FRONT VIEW

*INSTALLED INSIDE EXISTING CABINET

6 A-3 XMU UNIT DETAIL

SCALE: NTS (22x34 SIZE)
NTS (11x17 SIZE)

CONFIGURATION
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SITE ADDRESS

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CITY OF DANBURY
FAIRFIELD COUNTY
CT 06811

SHEET TITLE

ANTENNA, MOUNTING DETAIL & RF DIAGRAM

SHEET NUMBER

A-3

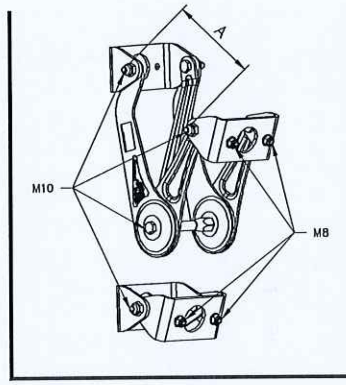
MANUFACTURER:	KATHREIN
MODEL NO.:	85010084
TOTAL WEIGHT:	±28.7 LBS

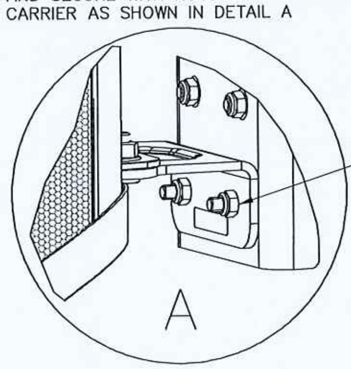
MAXIMUM TORQUE	
M10	50Nm (36.88 FT.LBS)

HANG ANTENNA ON BRACKET STUDS AND SECURE WITH NUTS. ADJUST LOWER CARRIER AS SHOWN IN DETAIL A

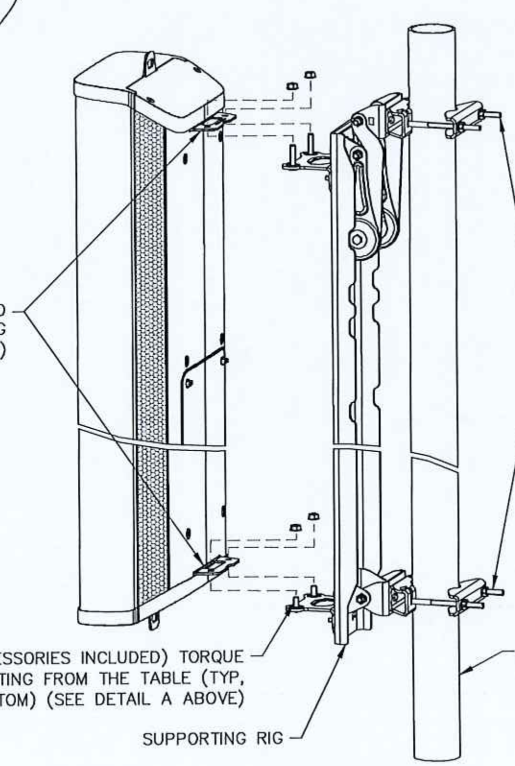
SCREW SIZE	TORQUE
M8	20Nm
M10	50Nm

∢	A mm
1°	69
2°	79
3°	93
4°	110
5°	129
6°	149
7°	169
8°	190
9°	211
10°	232
11°	253
12°	275
13°	296
14°	318
15°	340
16°	362
17°	383



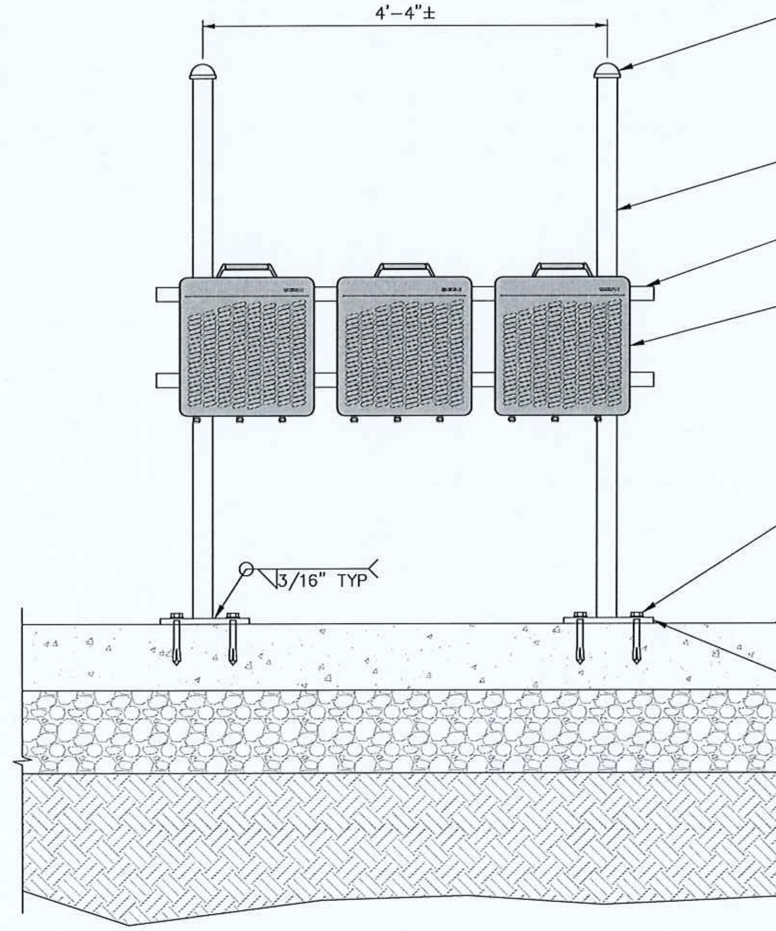


ATTENTION: LOOSEN BOTH SCREWS TO ADJUST THE LOWER CARRIER AND RESECURE THEM AFTERWARDS



1 A-4 AIR21 ANTENNA MOUNTING DETAIL

SCALE: NTS (22x34 SIZE)
NTS (11x17 SIZE)



2 A-4 BACKBOARD ELEVATION

SCALE: NTS

CONFIGURATION
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FAIRFIELD COUNTY
CT 06811

SHEET TITLE
ANTENNA MOUNTING & SITE DETAILS

SHEET NUMBER
A-4

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STATE BUILDING CODE, LATEST VERSION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
3. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
4. DIMENSIONS SHOWN ARE TO FINISH SURFACES, UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE AUTHORIZED REPRESENTATIVE OR THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
5. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
6. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
7. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE "NOTICE TO PROCEED," CONTRACTOR WILL CONTACT THE CONSTRUCTION MANAGER OF RECORD A MINIMUM OF 48 HOURS PRIOR TO WORK START.
8. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
9. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
10. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS, AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
12. CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
14. CONTRACTOR SHALL MAINTAIN LIABILITY INSURANCE TO PROTECT THE OWNER.
15. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
16. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, AND PIPING. REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
17. REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
18. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
19. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
20. PROVIDE 48 HOURS WRITTEN NOTICE TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
21. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS AND OTHER DOCUMENTATION SHALL BE TURNED OVER TO AT COMPLETION OF CONSTRUCTION.
22. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF ACCEPTANCE BY. ANY WORK, MATERIALS OR EQUIPMENT FOUND TO BE DEFECTIVE DURING THAT PERIOD SHALL BE CORRECTED IMMEDIATELY UPON WRITTEN NOTIFICATION AT NO ADDITIONAL COST TO T-MOBILE.

STRUCTURAL NOTES

1. **REFER TO MOUNT MODIFICATION REPORT PREPARED BY PAUL J FORD & COMPANY, DATED DECEMBER 14, 2018.**
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", LATEST EDITION.
4. STRUCTURAL STEEL BEAMS SHALL CONFORM TO ASTM A992 (FY=50KSI). STRUCTURAL STEEL PLATES AND ANGLES SHALL CONFORM TO ASTM A36.
5. ROUND AND SQUARE HOLLOW STRUCTURAL SECTIONS (HSS) CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B.
6. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 "PIPE, STEEL, BLACK AND HOT-DIPPED, ZINC-COATED WELDED AND SEAMLESS", TYPE E OR S, GRADE B.
7. CONNECTIONS: WELD OR BOLT CONNECTIONS, AS INDICATED:
   - A. CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF THE CITED AISC SPECIFICATION.
   - B. STRUCTURAL BOLTS SHALL CONFORM TO THE LATEST ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS".
   - C. WHERE THE REACTION VALUES OF BEAMS, BRACING, STRUTS, ETC., ARE NOT SHOWN ON THE DRAWINGS THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE END REACTION DERIVED FROM THE TABLES AND FORMULA OF UNIFORM LOAD CONSTANTS IN PART 2, NINTH EDITION, OF THE AISC MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN MEMBER SIZE, SPAN AND YIELD STRENGTH.
   - D. MINIMUM 3/16" FILLET E70-XX WELD SHALL APPLY UNLESS NOTED.
   - E. MINIMUM 1/2" DIA. A325 BOLTS SHALL APPLY UNLESS NOTED.
   - F. MINIMUM SIZE OF CLIP ANGLES SHALL BE L3X3X3/8" UNLESS NOTED.
   - G. ALL GUSSET PLATES SHALL BE 3/8" THICK UNLESS NOTED.
   - H. ALL HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
7. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS", LATEST EDITION. BOLTS SHALL BE 3/4 INCH DIA. UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
9. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
12. ALL STEEL SUPPORTS SHALL BE INSTALLED WITH DOUBLE NUTS AND SHALL BE INSTALLED SNUG TIGHT.
13. SLEEVE ANCHORS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 3, CLASS 3, AS MANUFACTURED BY HILTI FASTENING SYSTEMS OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE (3) INCHES.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS 1, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE FOUR (4) INCHES.
15. EPOXY ANCHORING SYSTEM SHALL BE THE HILTI HY-70 FOR MASONRY CONSTRUCTION WITH HOLLOW BRICK OR BLOCK & THE HILTI HIT HY200 INJECTION ADHESIVE ANCHOR FOR GROUT FILLED CONCRETE MASONRY UNITS AND CONCRETE. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2"ø STAINLESS STEEL ANCHOR ROD W/NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE FOR THE HY-70 ONLY & AN EPOXY ADHESIVE (6" MIN EMBEDMENT). THE INSTALLATION PROCEDURE SHALL BE AS FOLLOWS:

STRUCTURAL NOTES CONT'D

   - A. DRILL THE HOLE USING MANUFACTURER RECOMMENDED DRILL BIT UP TO SPECIFIED DEPTH. HAMMERING IS NOT PERMITTED.
   - B. CLEAN THE HOLE USING NYLON BRUSH AND/OR COMPRESSED AIR. THE HOLE SHOULD BE CLEAR OF ANY LOOSE MATERIAL. IF WET, THE MASONRY SHOULD BE ALLOWED TO DRY FULLY BEFORE ANCHOR INSTALLATION.
   - C. INSERT SPECIFIED SCREEN TUBE INTO THE HOLE.
   - D. FILL THE SCREEN TUBE COMPLETELY WITH ADHESIVE, BEGINNING AT THE BOTTOM END.
   - E. INSERT ANCHOR ROD OR INTERNALLY THREADED INSERT INTO THE ADHESIVE-FILLED SCREEN TUBE, TWISTING SLIGHTLY.
   - F. LOAD FASTENER ONLY AFTER MANUFACTURER SPECIFIED CURE TIME HAS ELAPSED.
16. GRATING SHALL BE GALVANIZED WELDED STEEL BAR GRATING TYPE W/BA WITH 1-1/4" BEARING BARS AT 1-3/16" OC. FASTEN TO SUPPORTING MEMBERS WITH SADDLE-TYPE CLIPS AT 2'-0" O.C. AND BAND ALL EXPOSED EDGES.
17. HAMMER DRILLS ARE NOT TO BE USED WHEN DRILLING HOLES FOR SLEEVE OR EXPANSION BOLTS INSTALLED IN MASONRY BLOCKS/BRICKS.
18. ALL HOLES TO BE ADDED IN THE FIELD SHALL BE PUNCHED OR DRILLED. NO HOLE BURNING SHALL BE ALLOWED.
19. SUBMIT DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
20. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
21. ALL WORK SHALL BE INSPECTED BY THE ENGINEER DURING AND AT THE COMPLETION OF CONSTRUCTION.
22. CONTRACTOR TO REMOVE MASTIC ON THE EXISTING WALL/PARAPET AT EVERY STEEL SUPPORT ATTACHMENT AND REPOINT MASONRY AS REQUIRED. A BED OF SILICONE SHALL BE APPLIED BEHIND AND ALL AROUND THE STEEL SUPPORT ATTACHMENT TO MAKE IT WEATHERPROOF.

SITE NOTES

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING.
2. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
3. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. CARE SHALL BE TAKEN TO RETAIN NATURAL GROWTH AND PREVENT DAMAGE TO TREES WITHIN AND OUTSIDE THE LIMITS OF CONSTRUCTION AND SPECIFIED WORK AREAS CAUSED BY EQUIPMENT AND MATERIALS. ANY DAMAGE TO THIS NATURAL GROWTH SHALL BE RESTORED AT THE EXPENSE OF THE CONTRACTOR.
6. ALL AREAS DISTURBED BY THE CONTRACTOR WITHOUT AUTHORIZATION SHALL BE RESTORED BY THE CONTRACTOR.
7. IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, HE SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE HIS WORK OPERATION UNTIL SERVICE IS RESTORED.

CONFIGURATION

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SITE ADDRESS
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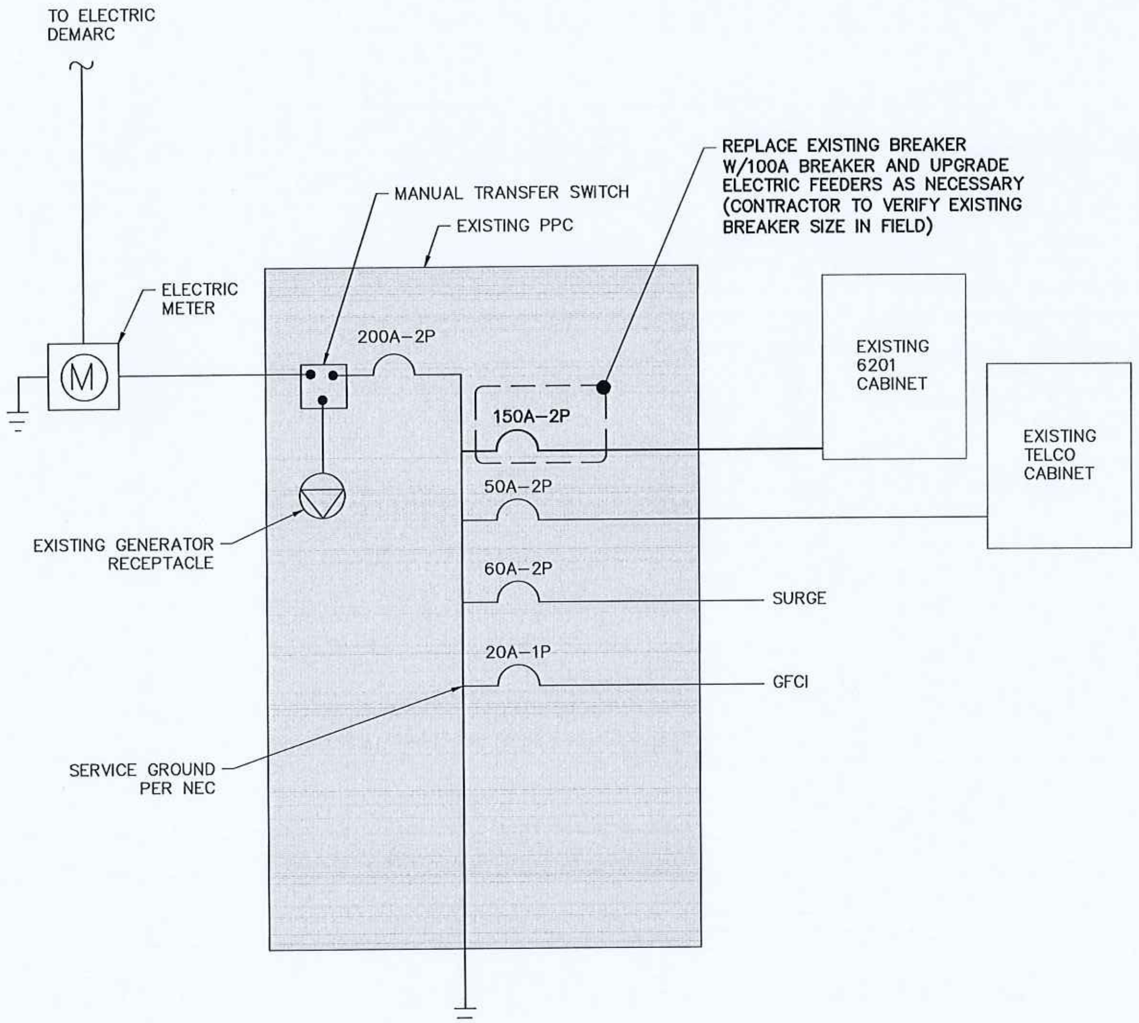
CITY OF DANBURY
FAIRFIELD COUNTY
CT 06811

SHEET TITLE
NOTES

SHEET NUMBER
A-5



NOTE:
THE ABOVE DIAGRAM IS GENERIC AND ANY ELECTRICAL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NEC STANDARDS.

1/E-1 ONE–LINE POWER DIAGRAM
SCALE: NTS

SITE NOTES

1. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ENGINEER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
2. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORIES (U.L.) AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. AND SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
4. CONTRACTOR TO COORDINATE WITH SITE OWNER FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
5. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
6. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
7. METER SOCKETS AMPERES, VOLTAGE AND NUMBER OF PHASES SHALL BE NOTED AND SHALL BE MANUFACTURED BY SQUARE "D" COMPANY, SANGAMO OR APPROVED EQUAL. METER SOCKET SHALL BE APPROVED BY UTILITY COMPANY PRIOR TO INSTALLATION.
8. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM WITH TYPE THHN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL CONDUCTORS SHALL BE COPPER.
10. USE T–TAP CONNECTIONS ON ALL MULTI–CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.
11. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J–BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
12. CONDUIT:
    - A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR.
    - B. INTERMEDIATE METAL CONDUIT SHALL BE U.L. LABEL, FITTINGS SHALL BE THREADED ALUMINUM OR STEEL AND SHALL BE USED FOR ALL EXTERIOR RUNS. THREADLESS COUPLINGS AND CONNECTORS SHALL NOT BE USED.
    - C. ELECTRICAL METALLIC TUBING (EMT) SHALL HAVE U.L. LABEL, FITTINGS SHALL BE NO SET SCREW OR CRIMP TYPE FITTINGS SHALL BE USED. GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
    - D. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
    - E. CONDUIT SHALL BE SIZED PER THE NEC AND AS SHOWN.
    - F. CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH OWNER PRIOR TO INSTALLING.
    - G. ALL CONDUIT ONLY (C.O.) RUNS SHALL HAVE A PULL WIRE OR ROPE.
13. COVERPLATES SHALL BE BRUSHED STAINLESS STEEL FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, AND SHALL HAVE ENGRAVED LETTERING WHERE INDICATED WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD–8 LIFT COVERPLATES.
14. REFER TO MANUFACTURERS MANUAL FOR RECOMMENDED FUSE AND WIRE SIZES.
15. ALL FINAL CONNECTIONS TO THE EQUIPMENT ARE TO BE OF FLEXIBLE WEATHERPROOF CONDUIT TO MEET APPLICABLE CODES.
16. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
17. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2, UNLESS OTHERWISE NOTED.
18. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE CONSTRUCTION MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
19. PROVIDE CONSTRUCTION MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH GAINING APPROVALS AND PAYING ALL FEES ASSESSED BY UTILITY COMPANY FOR ELECTRICAL SERVICE.

CONFIGURATION
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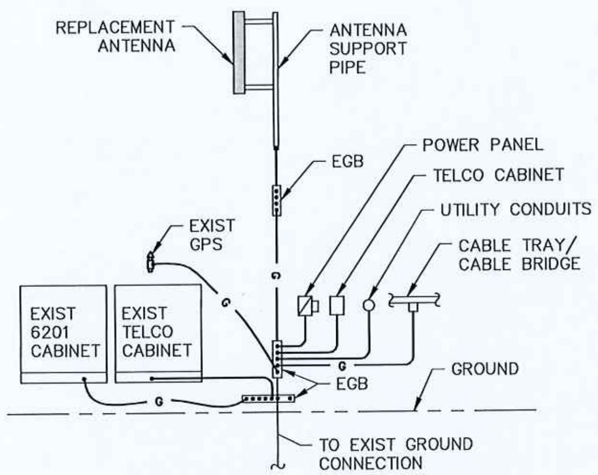
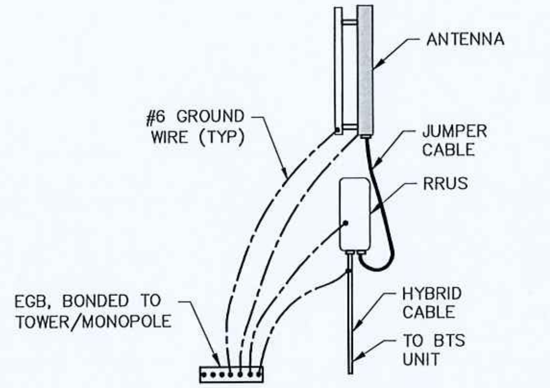
FAIRFIELD COUNTY
CT 06811

SHEET TITLE
ONE–LINE POWER DIAGRAM & NOTES

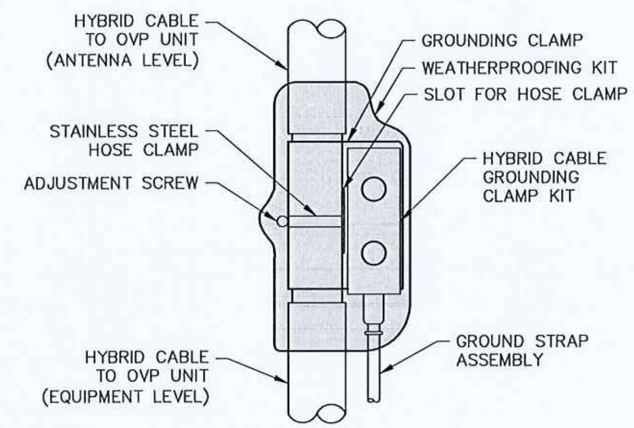
SHEET NUMBER
E–1



1 G-1 GROUNDING RISER DIAGRAM
SCALE: NTS



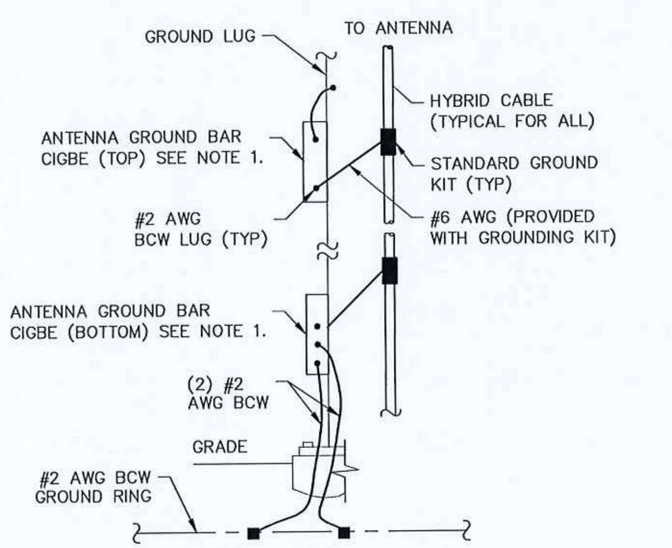
2 G-1 HYBRID CABLE CONNECTION DETAIL
SCALE: NTS



3 G-1 HYBRID CABLE GROUNDING DETAIL
SCALE: NTS

GROUNDING NOTES

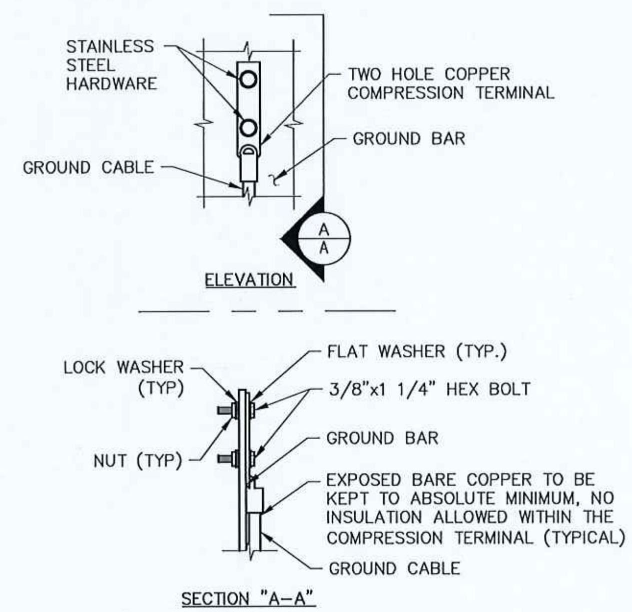
1. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
2. ALL GROUNDING WORK SHALL BE IN ACCORDANCE WITH T-MOBILE STANDARD PRACTICE.
3. ALL BUS CONNECTORS SHALL BE TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS, T&B OR EQUAL, UNLESS OTHERWISE NOTED ON DRAWINGS. ALL LUGS SHALL BE ATTACHED TO BUSSES USING BOLTS, NUTS, AND LOCK WASHERS. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON-OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. ALL COPPER BUSSES SHALL BE CLEANED, POLISHED, AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURN SHORTER THAN AN 8-INCH NOMINAL RADIUS.
8. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2. ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS, OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
9. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
10. ALL ROOF TOP ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TO THE NEAREST GROUND BUS. ALL CONNECTIONS ARE TO BE CAD-WELDED IF POSSIBLE.
11. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE PROJECT MANAGER.
12. GROUNDING CONNECTION TO TRAVEL IN A DOWNWARD DIRECTION.
13. ALL EXPOSED #2 WIRE MUST BE TINN NOT BTW.
14. TECTONIC TAKES NO RESPONSIBILITY OR LIABILITY FOR THE GROUNDING SYSTEM AS SHOWN ON THIS SITE. THIS IS A STANDARD GROUNDING SYSTEM.



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS UNIT IF REQUIRED.

4 G-1 ANTENNA CABLE GROUNDING
SCALE: NTS



NOTES:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

5 G-1 GROUNDING BAR CONN. DETAIL
SCALE: NTS

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28473
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CITY OF DANBURY
FAIRFIELD COUNTY
CT 06811

SHEET TITLE
GROUNDING DETAILS & NOTES

SHEET NUMBER
G-1

Exhibit B

PAUL J. FORD
& COMPANY

Date: **October 09, 2018**

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

Paul J. Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
(614) 221-6679

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11896A
	Carrier Site Name:	CT896/M&M Concrete Pole
Crown Castle Designation:	**Crown Castle BU Number:**	823531
	Crown Castle Site Name:	CT896/M&M Concrete Pole
	Crown Castle JDE Job Number:	512464
	Crown Castle Work Order Number:	1634580
	Crown Castle Order Number:	446044 Rev. 2
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37518-2331.010.7805
Site Data:	**41 Padanaram Rd, Danbury, Fairfield County, CT** **Latitude *41° 25′ 8.1″*, Longitude *-73° 27′ 43″*** **80 Foot - Monopole Tower**	

Dear Denice Nicholson,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

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

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis has been performed in accordance with the 2016 Connecticut State Building Code, the ANSI/TIA-222-G-2-2009 Standard, the ASCE/SEI 7-10, and the 2012 National Design Specification for Wood Construction based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind of 93 without ice. Applicable Standards referenced and design criteria are listed in Section 2 – Analysis Criteria.

Respectfully submitted by:

Robert C. Kozak Jr., ~~E.I.~~ C.J.P.
Structural Designer
rkozak@pauljford.com

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

10.9.18

PAUL J. FORD
& COMPANY

Date: **October 09, 2018**

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Crown Castle
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Clifton Park, NY 12065

Paul J. Ford and Company
250 East Broad St., Suite 600
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Respectfully submitted by:

Robert C. Kozak Jr., E.I.
Structural Designer
rkozak@pauljford.com

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 80 ft Monopole tower designed by LAMINATED WOOD SYSTEMS, INC.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
78.0	80.0	3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	7 2	1-5/8 1-1/2
		3	ericsson	ERICSSON AIR 21 B4A B12P-B8P 4FT w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
	78.0	1	tower mounts	Mount Modification		
		1	tower mounts	Side Arm Mount [SO 702-3]		

Table 2 – Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
70.0	70.0	3	alcatel lucent	1900MHZ RRH	1 3	1-5/8 1-1/4
		3	alcatel lucent	800MHZ RRH		
		3	alcatel lucent	RRH2X50-800		
		3	commscope	NNVV-65B-R4 w/ Mount Pipe		
		3	nokia	AAHC w/ Mount Pipe		
		1	tower mounts	Sector Mount [SM 502-3]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 15BKTB1600, 6/9/2015	3529191	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Laminated Wood Systems, TMOB-0018.06A1, 9/20/2005	3914350	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Laminated Wood Systems, TMOB-0018.06A1, 9/20/2005	3529192	CCISITES

3.1) Analysis Method

The wooden monopole was analyzed in Microsoft Excel based on the codes and standards referenced on the cover page of this report.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) The proposed feed line configuration is assumed to match the configuration shown in Appendix B.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Description	% Capacity	Pass / Fail
L1	80 - 0	Wooden Laminated Pole	83.2	Pass
			Summary	
		Pole (L1)	83.2	Pass
		Rating =	83.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Foundation	0	87.8	Pass
1	Base Foundation Soil Interaction	0	82.2	Pass

Structure Rating (max from all components) =	87.8%

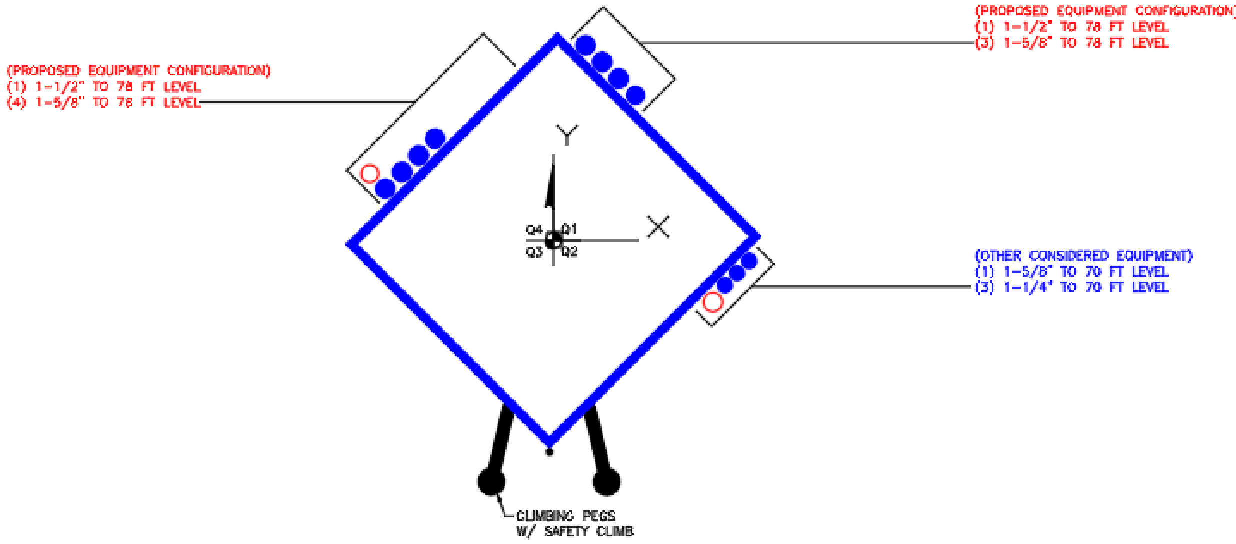
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A

BASE LEVEL DRAWING


(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 78 FT LEVEL
(4) 1-5/8" TO 78 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 78 FT LEVEL
(3) 1-5/8" TO 78 FT LEVEL
Y
X
Q4
Q1
Q3
Q2
(OTHER CONSIDERED EQUIPMENT)
(1) 1-5/8" TO 70 FT LEVEL
(3) 1-1/4" TO 70 FT LEVEL
CLIMBING PEGS
W/ SAFETY CLIMB

APPENDIX B

ADDITIONAL CALCULATIONS

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Job #:	37518-2331.010.7805
Client #:	BU 823531
Engineer:	RCK
Date:	10/9/2018

Version v0.8 Effective 1/18/2017

CODE: 2012 NDS (LRFD)

SQUARE WOOD POLE ANALYSIS

ASCE 7-10 --- 2012 NDS (LRFD)

SITE INPUTS

Basic Wind Speed	93	mph
Exposure Category	B	
Importance Category	II	
Importance Factor	1	
Kzt =	1	
Kd =	0.9	
G =	1.1	

MAXIMUM CAPACITIES

Pole Shaft	105%
Foundation	105%

INSTALLED SHAFT REINFORCING

Plate Thickness		in
Plate Width		in
Btm Effective El.		ft
Top Effective El.		ft
Bolt Spacing		in
Grade		ksi
Modulus of Elasticity		psi
Design Stress		ksi
Edge Distance		in

POLE GEOMETRY/PROPERTIES (Longitudinal Section)

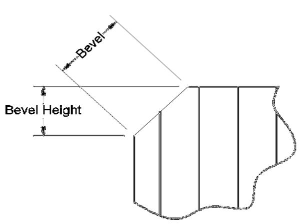
Total Pole Length	93.5	ft
Embedment Depth	13.5	ft
Top Width	12	in
Btm Width	27.5	in (Embedded End)
Top Depth	26.25	in
Btm Depth	26.25	in (Embedded End)
Raceway Width	0	in
Raceway Depth	0	in

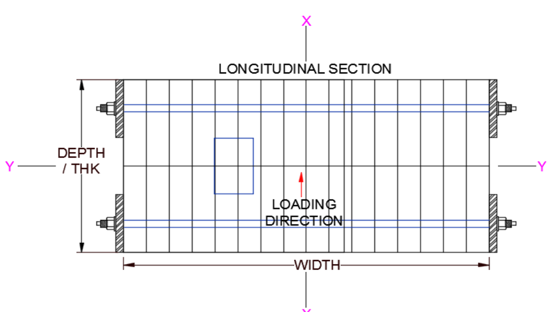
*Raceway is assumed to be centered based on the Top Dimensions

Straight Thru FDN?	Yes	
Beveled Edge Dim.	0	in
Beveled Height Dim.	0.000	in

POLE INFORMATION

Species	Southern Pine		
F_{bx}	2400		psi
F_{by}	1750	1750	psi
F_c	1600		psi
F_v	260		psi
E	1600000		psi
E_{min_Trans}	900000		psi
E_{min_Long}	850000		psi
Density	34.32		pcf





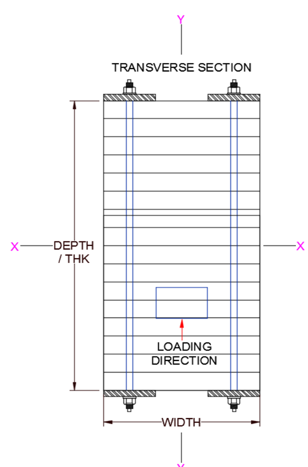


TABLE 1 - DISCRETE LOADS

	Database	Description	Classification	Qty.	Height	CaAa (F) No Ice (ft^2)	CaAa (S) No Ice (ft^2)	Weight No Ice (k)
1	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	Proposed	1	80.0	6.75	6.07	0.15
2	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	Proposed	1	80.0	6.75	6.07	0.15
3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	Proposed	1	80.0	6.75	6.07	0.15
4	ericsson	KRY 112 144/1	Proposed	1	80.0	0.35	0.18	0.01
5	ericsson	KRY 112 144/1	Proposed	1	80.0	0.35	0.18	0.01
6	ericsson	KRY 112 144/1	Proposed	1	80.0	0.35	0.18	0.01
7	ericsson	ERICSSON AIR 21 B4A B12P-B8P 4FT w/ Mount Pipe	Proposed	1	80.0	7.86	6.88	0.16
8	ericsson	ERICSSON AIR 21 B4A B12P-B8P 4FT w/ Mount Pipe	Proposed	1	80.0	7.86	6.88	0.16
9	ericsson	ERICSSON AIR 21 B4A B12P-B8P 4FT w/ Mount Pipe	Proposed	1	80.0	7.86	6.88	0.16
10	tower mounts (cci)	Side Arm Mount [SO 702-3]	Proposed	1	78.0	3.22	3.22	0.08
11		Mount Modification	Proposed	1	78.0	11.84	11.84	0.28
12		***						
13	alcatel lucent	1900MHZ RRH	Existing-C	2	70.0	2.49	3.26	0.04
14	alcatel lucent	1900MHZ RRH	Existing-C	1	70.0	2.49	3.26	0.04
15	alcatel lucent	800MHZ RRH	Existing-C	2	70.0	2.13	1.77	0.05
16	alcatel lucent	800MHZ RRH	Existing-C	1	70.0	2.13	1.77	0.05
17	commscope	NNVV-65B-R4 w/ Mount Pipe	Existing-C	1	70.0	12.51	7.41	0.10
18	commscope	NNVV-65B-R4 w/ Mount Pipe	Existing-C	1	70.0	12.51	7.41	0.10
19	commscope	NNVV-65B-R4 w/ Mount Pipe	Existing-C	1	70.0	12.51	7.41	0.10
20	nokia	AAHC w/ Mount Pipe	Existing-C	1	70.0	4.41	2.69	0.12
21	nokia	AAHC w/ Mount Pipe	Existing-C	1	70.0	4.41	2.69	0.12
22	nokia	AAHC w/ Mount Pipe	Existing-C	1	70.0	4.41	2.69	0.12
23	alcatel lucent	RRH2X50-800	Existing-C	1	70.0	1.70	1.28	0.05
24	alcatel lucent	RRH2X50-800	Existing-C	2	70.0	1.70	1.28	0.05
25	tower mounts (cci)	Sector Mount [SM 502-3]	Existing-C	1	70.0	33.02	33.02	1.67
26	tower mounts (cci)	5' x 2' Pipe Mount	<unassigned>	2	70.0	1.00	1.00	0.03
27	tower mounts (cci)	5' x 2' Pipe Mount	<unassigned>	2	70.0	1.00	1.00	0.03
28	tower mounts (cci)	5' x 2' Pipe Mount	<unassigned>	2	70.0	1.00	1.00	0.03

TABLE 2 - FEED LINES

	Database	Description	Classification	Qty.	Starting Height	Ending Height	CaAa No Ice (ft^2)	Weight No Ice (plf)
1	andrew	LDF7-50A(1-5/8)	Existing-C	4	0.0	78.00	0.20	0.82
2	huber and suhner	MLC HYBRID 6POWER/12FIBER(1-1/2)	Proposed	1	0.0	78.00	0.15	0.98
3	andrew	LDF7-50A(1-5/8)	Existing-C	2	0.0	78.00	0.20	0.82
4	huber and suhner	MLC HYBRID 6POWER/12FIBER(1-1/2)	Existing-C	1	0.0	78.00	0.15	0.98
5	huber and suhner	MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	Existing-C	1	0.0	78.00	0.16	1.07
6	rfs celwave	HB114-1-08U4-M6J(1-1/4)	Existing-C	3	0.0	70.00	0.15	1.30
7	rfs celwave	HB158-21U6M48-30F(1-5/8)	Reserved	1	0.0	70.00	0.17	2.39

TABLE 3 - DISHES

Database	Description	Classification	Qty.	Height	Dish Diameter	CaAa No Ice (ft^2)	Weight No Ice (k)

TABLE 4 - MONOPOLE

Direction	Pole Length (ft)	Embed Depth (ft)	Cf Factor	Centroid Height (ft)	CfAe (sqft)	GL Width	GL Depth	GL S (in^3)
Transverse	93.5	13.5	2.00	40.00	350.00	26.25	27.50	3308.59
Longitudinal	93.5	13.5	2.00	34.77	263.33	27.50	26.25	3158.20

TABLE 5 - LOADING SUMMARY (1.2D + 1.6W)

	Pole	Discrete Loads	Feedlines	Dishes	PΔ	Total
Trans. Moment (k-ft)	233.42	213.64	9.97	0.00	5%	767.81
Trans. Shear (kip)	5.84	2.90	0.26	0.00		14.38
Long. Moment (k-ft)	146.65	213.64	24.05	0.00	5%	645.70
Long. Shear (kip)	4.22	2.90	0.64	0.00		12.41
Axial (kip)	11.55	4.25	1.06	0.00		20.24

*PΔ only applies to the Moment (default value = 5%)

ADJUSTED DESIGN STRESSES

Flexure

	Trans.	Long.
C_d	1	1
C_m	0.800	0.800
C_t	1	1
min(C_v, C_L)	0.821	1
C_{fu}	1	1
C_c	1	1
C_i	1	1
K_f	2.540	2.540
Φ_b	0.850	0.850
λ	1	1

Shear

C_d	1
C_m	0.875
C_t	1
C_{vr}	0.720
K_f	2.540
Φ_v	0.750
λ	1

Compression

C_d	1
C_m	0.730
C_t	1
C_p	0.051
K_f	2.540
Φ_c	0.900
λ	1

Adjusted Design Stresses

$F'_{b\_trans.}$ =	3401.3	psi
$F'_{b\_long.}$ =	3022.6	psi
F'v =	312.0	psi
F'c =	136.7	psi

RESULTS SUMMARY

		Applied Stress (ksi)	Design Stress (ksi)	Capacity	
Longitudinal Direction	Bending	2.64	3.02	87.2%	Wood (-4.3 ft)
	Shear	0.02	0.31	6.4%	
Transverse Direction	Bending	2.99	3.40	87.8%	Wood (-4.28 ft)
	Shear	0.02	0.31	5.5%	
Compression		0.03	0.14	20.5%	

Overall Monopole Capacity =	87.8%	Passing

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Client #:	BU 823531
Engineer:	RCK
Date:	10/9/2018

LONGITUDINAL DIRECTION CHECKS

Increments 0.500 ft Width Slope 0.194 in/ft
E_{steel} / E_{wood} 0.000 Depth Slope 0.000 in/ft

Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

	%		fa (ksi)	Fa (ksi)
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.2%	-4.3 ft	2.64	3.02

Applied Transverse Moment = 645.70 kip*ft
Moment per 0.5 ft = 4.04 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.02 ksi

Elevation	S.R. Plate Sizes Width (in)	Thk (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
80.00				0.00	0.00	3.02			0.0%	
79.50				48.43	0.03	3.02			1.2%	
79.00				96.86	0.07	3.02			2.3%	
78.50				145.28	0.10	3.02			3.4%	
78.00				193.71	0.14	3.02			4.5%	
77.50				242.14	0.17	3.02			5.6%	
77.00				290.57	0.20	3.02			6.7%	
76.50				338.99	0.23	3.02			7.7%	
76.00				387.42	0.26	3.02			8.7%	
75.50				435.85	0.29	3.02			9.8%	
75.00				484.28	0.33	3.02			10.8%	
74.50				532.70	0.36	3.02			11.7%	
74.00				581.13	0.38	3.02			12.7%	
73.50				629.56	0.41	3.02			13.7%	
73.00				677.99	0.44	3.02			14.6%	
72.50				726.41	0.47	3.02			15.6%	
72.00				774.84	0.50	3.02			16.5%	
71.50				823.27	0.53	3.02			17.4%	
71.00				871.70	0.55	3.02			18.3%	
70.50				920.12	0.58	3.02			19.2%	
70.00				968.55	0.61	3.02			20.0%	
69.50				1016.98	0.63	3.02			20.9%	
69.00				1065.41	0.66	3.02			21.7%	
68.50				1113.83	0.68	3.02			22.6%	
68.00				1162.26	0.71	3.02			23.4%	
67.50				1210.69	0.73	3.02			24.2%	
67.00				1259.12	0.76	3.02			25.0%	
66.50				1307.54	0.78	3.02			25.8%	
66.00				1355.97	0.80	3.02			26.6%	
65.50				1404.40	0.83	3.02			27.3%	
65.00				1452.83	0.85	3.02			28.1%	
64.50				1501.25	0.87	3.02			28.8%	
64.00				1549.68	0.89	3.02			29.6%	
63.50				1598.11	0.92	3.02			30.3%	
63.00				1646.54	0.94	3.02			31.0%	

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Engineer:	RCK
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LONGITUDINAL DIRECTION CHECKS

Increments	0.500 ft	Width Slope	0.194 in/ft	Shaft Reinforcing Plates:	0	x	0
E_{steel} / E_{wood}	0.000	Depth Slope	0.000 in/ft	Effective Elevations:	0	to	0

Applied Transverse Moment =	645.70 kip*ft
Moment per 0.5 ft =	4.04 kip*ft
Design Steel Stress =	0.00 ksi
Design Wood Stress =	3.02 ksi

	%		fa (ksi)	Fa (ksi)
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.2%	-4.3 ft	2.64	3.02

Elevation	S.R. Plate Sizes Width (in)	Thk (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
62.50				1694.96	0.96	3.02			31.7%	
62.00				1743.39	0.98	3.02			32.4%	
61.50				1791.82	1.00	3.02			33.1%	
61.00				1840.25	1.02	3.02			33.8%	
60.50				1888.67	1.04	3.02			34.5%	
60.00				1937.10	1.06	3.02			35.2%	
59.50				1985.53	1.08	3.02			35.8%	
59.00				2033.96	1.10	3.02			36.5%	
58.50				2082.38	1.12	3.02			37.1%	
58.00				2130.81	1.14	3.02			37.7%	
57.50				2179.24	1.16	3.02			38.4%	
57.00				2227.67	1.18	3.02			39.0%	
56.50				2276.09	1.20	3.02			39.6%	
56.00				2324.52	1.22	3.02			40.2%	
55.50				2372.95	1.23	3.02			40.8%	
55.00				2421.38	1.25	3.02			41.4%	
54.50				2469.80	1.27	3.02			42.0%	
54.00				2518.23	1.29	3.02			42.6%	
53.50				2566.66	1.30	3.02			43.2%	
53.00				2615.09	1.32	3.02			43.7%	
52.50				2663.51	1.34	3.02			44.3%	
52.00				2711.94	1.36	3.02			44.8%	
51.50				2760.37	1.37	3.02			45.4%	
51.00				2808.80	1.39	3.02			45.9%	
50.50				2857.22	1.40	3.02			46.5%	
50.00				2905.65	1.42	3.02			47.0%	
49.50				2954.08	1.44	3.02			47.5%	
49.00				3002.51	1.45	3.02			48.0%	
48.50				3050.93	1.47	3.02			48.6%	
48.00				3099.36	1.48	3.02			49.1%	
47.50				3147.79	1.50	3.02			49.6%	
47.00				3196.22	1.51	3.02			50.1%	
46.50				3244.64	1.53	3.02			50.6%	
46.00				3293.07	1.54	3.02			51.0%	
45.50				3341.50	1.56	3.02			51.5%	

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LONGITUDINAL DIRECTION CHECKS

Increments 0.500 ft Width Slope 0.194 in/ft
E_{steel} / E_{wood} 0.000 Depth Slope 0.000 in/ft

Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

Applied Transverse Moment = 645.70 kip*ft
Moment per 0.5 ft = 4.04 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.02 ksi

	%		fa (ksi)	Fa (ksi)
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.2%	-4.3 ft	2.64	3.02

Elevation	S.R. Plate Sizes Width (in)	Thk (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
45.00				3389.93	1.57	3.02			52.0%	
44.50				3438.35	1.59	3.02			52.5%	
44.00				3486.78	1.60	3.02			52.9%	
43.50				3535.21	1.61	3.02			53.4%	
43.00				3583.64	1.63	3.02			53.9%	
42.50				3632.07	1.64	3.02			54.3%	
42.00				3680.49	1.66	3.02			54.8%	
41.50				3728.92	1.67	3.02			55.2%	
41.00				3777.35	1.68	3.02			55.6%	
40.50				3825.78	1.70	3.02			56.1%	
40.00				3874.20	1.71	3.02			56.5%	
39.50				3922.63	1.72	3.02			56.9%	
39.00				3971.06	1.73	3.02			57.4%	
38.50				4019.49	1.75	3.02			57.8%	
38.00				4067.91	1.76	3.02			58.2%	
37.50				4116.34	1.77	3.02			58.6%	
37.00				4164.77	1.78	3.02			59.0%	
36.50				4213.20	1.80	3.02			59.4%	
36.00				4261.62	1.81	3.02			59.8%	
35.50				4310.05	1.82	3.02			60.2%	
35.00				4358.48	1.83	3.02			60.6%	
34.50				4406.91	1.84	3.02			61.0%	
34.00				4455.33	1.86	3.02			61.4%	
33.50				4503.76	1.87	3.02			61.8%	
33.00				4552.19	1.88	3.02			62.1%	
32.50				4600.62	1.89	3.02			62.5%	
32.00				4649.04	1.90	3.02			62.9%	
31.50				4697.47	1.91	3.02			63.2%	
31.00				4745.90	1.92	3.02			63.6%	
30.50				4794.33	1.93	3.02			64.0%	
30.00				4842.75	1.94	3.02			64.3%	
29.50				4891.18	1.96	3.02			64.7%	
29.00				4939.61	1.97	3.02			65.0%	
28.50				4988.04	1.98	3.02			65.4%	
28.00				5036.46	1.99	3.02			65.7%	

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Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

Applied Transverse Moment = 645.70 kip*ft
Moment per 0.5 ft = 4.04 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.02 ksi

	%		fa (ksi)	Fa (ksi)
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.2%	-4.3 ft	2.64	3.02

Elevation	S.R. Plate Sizes Width (in)	Thk (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
27.50				5084.89	2.00	3.02			66.1%	
27.00				5133.32	2.01	3.02			66.4%	
26.50				5181.75	2.02	3.02			66.7%	
26.00				5230.17	2.03	3.02			67.1%	
25.50				5278.60	2.04	3.02			67.4%	
25.00				5327.03	2.05	3.02			67.7%	
24.50				5375.46	2.06	3.02			68.1%	
24.00				5423.88	2.07	3.02			68.4%	
23.50				5472.31	2.08	3.02			68.7%	
23.00				5520.74	2.09	3.02			69.0%	
22.50				5569.17	2.10	3.02			69.3%	
22.00				5617.59	2.11	3.02			69.6%	
21.50				5666.02	2.11	3.02			70.0%	
21.00				5714.45	2.12	3.02			70.3%	
20.50				5762.88	2.13	3.02			70.6%	
20.00				5811.30	2.14	3.02			70.9%	
19.50				5859.73	2.15	3.02			71.2%	
19.00				5908.16	2.16	3.02			71.5%	
18.50				5956.59	2.17	3.02			71.8%	
18.00				6005.01	2.18	3.02			72.0%	
17.50				6053.44	2.19	3.02			72.3%	
17.00				6101.87	2.19	3.02			72.6%	
16.50				6150.30	2.20	3.02			72.9%	
16.00				6198.72	2.21	3.02			73.2%	
15.50				6247.15	2.22	3.02			73.5%	
15.00				6295.58	2.23	3.02			73.7%	
14.50				6344.01	2.24	3.02			74.0%	
14.00				6392.43	2.25	3.02			74.3%	
13.50				6440.86	2.25	3.02			74.6%	
13.00				6489.29	2.26	3.02			74.8%	
12.50				6537.72	2.27	3.02			75.1%	
12.00				6586.14	2.28	3.02			75.4%	
11.50				6634.57	2.29	3.02			75.6%	
11.00				6683.00	2.29	3.02			75.9%	
10.50				6731.43	2.30	3.02			76.1%	

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Version v0.8 Effective 1/18/2017

Job #:	37518-2331.010.7805
Client #:	BU 823531
Engineer:	RCK
Date:	10/9/2018

LONGITUDINAL DIRECTION CHECKS

Increments 0.500 ft Width Slope 0.194 in/ft
E_{steel} / E_{wood} 0.000 Depth Slope 0.000 in/ft

Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

Applied Transverse Moment = 645.70 kip*ft
Moment per 0.5 ft = 4.04 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.02 ksi

	%		fa (ksi)	Fa (ksi)
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.2%	-4.3 ft	2.64	3.02

Elevation	S.R. Plate Sizes Width (in)	Thk (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
10.00				6779.85	2.31	3.02			76.4%	
9.50				6828.28	2.32	3.02			76.7%	
9.00				6876.71	2.32	3.02			76.9%	
8.50				6925.14	2.33	3.02			77.2%	
8.00				6973.57	2.34	3.02			77.4%	
7.50				7021.99	2.35	3.02			77.7%	
7.00				7070.42	2.35	3.02			77.9%	
6.50				7118.85	2.36	3.02			78.2%	
6.00				7167.28	2.37	3.02			78.4%	
5.50				7215.70	2.38	3.02			78.6%	
5.00				7264.13	2.38	3.02			78.9%	
4.50				7312.56	2.39	3.02			79.1%	
4.00				7360.99	2.40	3.02			79.3%	
3.50				7409.41	2.41	3.02			79.6%	
3.00				7457.84	2.41	3.02			79.8%	
2.50				7506.27	2.42	3.02			80.0%	
2.00				7554.70	2.43	3.02			80.3%	
1.50				7603.12	2.43	3.02			80.5%	
1.00				7651.55	2.44	3.02			80.7%	
0.50				7699.98	2.45	3.02			80.9%	
0.00				7748.41	2.45	3.02			81.2%	
-0.50				0.00	0.00	3.02				
-1.00				0.00	0.00	3.02				
-1.50				0.00	0.00	3.02				
-2.00				0.00	0.00	3.02				
-2.50				0.00	0.00	3.02				
-3.00				0.00	0.00	3.02				
-3.50				0.00	0.00	3.02				
-4.00				0.00	0.00	3.02				
-4.30				8322.00	2.64	3.02			87.2%	

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Job Number:	37518-2331.010.7805_Long	**Page:**	1
Site Number:	823531	**By:**	RCK
Site Name:	CT896/M&M Concrete Pole	**Date:**	10/9/2018

DIRECT EMBED SOIL AND STEEL ANALYSIS - TIA-222-G

Factored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, Mu =	645.7		k-ft
Shear, Vu =	12.4		kips
Axial Load, Pu =	20.2		kips (from 1.2D + 1.6W)*
OTMu =	645.7	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DE
ACI Code =	ACI 318-08
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

Direct Embed Concrete / Gravel Parameters

Diameter =	4.5	ft
Height Above Grade =	0	ft, Assumed 0 ft
Depth Below Grade =	13.5	ft
fc' =	2	ksi
εc =	0.003	in/in
L / D Ratio =	3.00	

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA-222-G

1. (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
2. (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

Soil Parameters

Water Table Depth =	13.50	ft
Depth to Ignore Soil =	3.33	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?*	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

*Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

Backfill Condition = Conc. Exterior (Use Conc. Dia.)

Define Soil Layers

Note: Cohesion = Undrained Shear Strengh = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	1.8	100		27	Sand				1.8
2	2.2	125		37	Sand				4
3	9.5	130		40	Sand	42200			13.5
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	10.08	ft, from Grade
Bending Moment, Mu =	770.75	k-ft, from COR
Resisting Moment, ΦMn =	1110.34	k-ft, from COR
Shear, Vu =	12.41	kips
Resisting Shear, ΦVn =	17.88	kips

MOMENT RATIO = 69.4% OK

SHEAR RATIO = 69.4% OK

Soil Results: Uplift

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	28.99	kips

UPLIFT RATIO = 0.0% OK

*Soil Results: Compression**

Compression, Cu =	20.24	kips
Comp. Capacity, ΦCn =	496.98	kips

COMPRESSION RATIO = 4.1% OK

***Compression Ratio based on diameter used for overturning calculation.**

Pole Capacity Results:

Axial Load, Pu =	32.55	kips @ 4.30 ft Below Grade
Shear, Vu =	0.00	kips @ 4.30 ft Below Grade
Moment, Mu =	693.50	k-ft @ 4.30 ft Below Grade

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Job #:	37518-2331.010.7805
Client #:	BU 823531
Engineer:	RCK
Date:	10/9/2018

TRANSVERSE DIRECTION CHECKS

Increments 0.500 ft Width Slope 0.000 in/ft

E_{steel} / E_{wood} 0.000 Depth Slope 0.194 in/ft

Shaft Reinforcing Plates: 0 x 0

Effective Elevations: 0 to 0

	%		fa	Fa
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.8%	-4.28 ft	2.99	3.4

Applied Transverse Moment = 767.81 kip*ft

Moment per 0.5 ft = 4.80 kip*ft

Design Steel Stress = 0.00 ksi

Design Wood Stress = 3.40 ksi

Elevation	S.R. Plate Sizes Thk (in)	Width (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
80.00				0.00	0.00	3.40			0.0%	
79.50				57.59	0.09	3.40			2.6%	
79.00				115.17	0.18	3.40			5.2%	
78.50				172.76	0.26	3.40			7.7%	
78.00				230.34	0.34	3.40			10.1%	
77.50				287.93	0.42	3.40			12.4%	
77.00				345.51	0.50	3.40			14.7%	
76.50				403.10	0.57	3.40			16.9%	
76.00				460.68	0.65	3.40			19.0%	
75.50				518.27	0.71	3.40			21.0%	
75.00				575.86	0.78	3.40			23.0%	
74.50				633.44	0.85	3.40			24.9%	
74.00				691.03	0.91	3.40			26.8%	
73.50				748.61	0.97	3.40			28.6%	
73.00				806.20	1.03	3.40			30.4%	
72.50				863.78	1.09	3.40			32.1%	
72.00				921.37	1.15	3.40			33.7%	
71.50				978.95	1.20	3.40			35.3%	
71.00				1036.54	1.25	3.40			36.9%	
70.50				1094.13	1.31	3.40			38.4%	
70.00				1151.71	1.36	3.40			39.8%	
69.50				1209.30	1.40	3.40			41.3%	
69.00				1266.88	1.45	3.40			42.6%	
68.50				1324.47	1.50	3.40			44.0%	
68.00				1382.05	1.54	3.40			45.3%	
67.50				1439.64	1.58	3.40			46.5%	
67.00				1497.22	1.62	3.40			47.7%	
66.50				1554.81	1.66	3.40			48.9%	
66.00				1612.40	1.70	3.40			50.1%	
65.50				1669.98	1.74	3.40			51.2%	
65.00				1727.57	1.78	3.40			52.2%	
64.50				1785.15	1.81	3.40			53.3%	
64.00				1842.74	1.85	3.40			54.3%	
63.50				1900.32	1.88	3.40			55.3%	
63.00				1957.91	1.91	3.40			56.3%	

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Job #:	37518-2331.010.7805
Client #:	BU 823531
Engineer:	RCK
Date:	10/9/2018

TRANSVERSE DIRECTION CHECKS

Increments 0.500 ft
E_{steel} / E_{wood} 0.000
Width Slope 0.000 in/ft
Depth Slope 0.194 in/ft

Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

	%		fa	Fa
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.8%	-4.28 ft	2.99	3.4

Applied Transverse Moment = 767.81 kip*ft
Moment per 0.5 ft = 4.80 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.40 ksi

	S.R. Plate Sizes									
Elevation	Thk (in)	Width (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
62.50				2015.49	1.94	3.40			57.2%	
62.00				2073.08	1.98	3.40			58.1%	
61.50				2130.67	2.01	3.40			59.0%	
61.00				2188.25	2.03	3.40			59.8%	
60.50				2245.84	2.06	3.40			60.6%	
60.00				2303.42	2.09	3.40			61.4%	
59.50				2361.01	2.12	3.40			62.2%	
59.00				2418.59	2.14	3.40			62.9%	
58.50				2476.18	2.17	3.40			63.7%	
58.00				2533.76	2.19	3.40			64.4%	
57.50				2591.35	2.21	3.40			65.1%	
57.00				2648.94	2.24	3.40			65.7%	
56.50				2706.52	2.26	3.40			66.4%	
56.00				2764.11	2.28	3.40			67.0%	
55.50				2821.69	2.30	3.40			67.6%	
55.00				2879.28	2.32	3.40			68.2%	
54.50				2936.86	2.34	3.40			68.8%	
54.00				2994.45	2.36	3.40			69.3%	
53.50				3052.03	2.38	3.40			69.9%	
53.00				3109.62	2.39	3.40			70.4%	
52.50				3167.21	2.41	3.40			70.9%	
52.00				3224.79	2.43	3.40			71.4%	
51.50				3282.38	2.44	3.40			71.8%	
51.00				3339.96	2.46	3.40			72.3%	
50.50				3397.55	2.47	3.40			72.7%	
50.00				3455.13	2.49	3.40			73.2%	
49.50				3512.72	2.50	3.40			73.6%	
49.00				3570.30	2.52	3.40			74.0%	
48.50				3627.89	2.53	3.40			74.4%	
48.00				3685.47	2.54	3.40			74.8%	
47.50				3743.06	2.56	3.40			75.1%	
47.00				3800.65	2.57	3.40			75.5%	
46.50				3858.23	2.58	3.40			75.8%	
46.00				3915.82	2.59	3.40			76.2%	
45.50				3973.40	2.60	3.40			76.5%	

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Client #:	BU 823531
Engineer:	RCK
Date:	10/9/2018

TRANSVERSE DIRECTION CHECKS

Increments	0.500 ft	Width Slope	0.000 in/ft
E_{steel} / E_{wood}	0.000	Depth Slope	0.194 in/ft

Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

	%		fa	Fa
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.8%	-4.28 ft	2.99	3.4

Applied Transverse Moment = 767.81 kip*ft
Moment per 0.5 ft = 4.80 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.40 ksi

Elevation	S.R. Plate Sizes Thk (in)	Width (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
45.00				4030.99	2.61	3.40			76.8%	
44.50				4088.57	2.62	3.40			77.1%	
44.00				4146.16	2.63	3.40			77.4%	
43.50				4203.74	2.64	3.40			77.7%	
43.00				4261.33	2.65	3.40			77.9%	
42.50				4318.92	2.66	3.40			78.2%	
42.00				4376.50	2.67	3.40			78.4%	
41.50				4434.09	2.68	3.40			78.7%	
41.00				4491.67	2.68	3.40			78.9%	
40.50				4549.26	2.69	3.40			79.2%	
40.00				4606.84	2.70	3.40			79.4%	
39.50				4664.43	2.71	3.40			79.6%	
39.00				4722.01	2.71	3.40			79.8%	
38.50				4779.60	2.72	3.40			80.0%	
38.00				4837.19	2.73	3.40			80.2%	
37.50				4894.77	2.73	3.40			80.3%	
37.00				4952.36	2.74	3.40			80.5%	
36.50				5009.94	2.74	3.40			80.7%	
36.00				5067.53	2.75	3.40			80.8%	
35.50				5125.11	2.75	3.40			81.0%	
35.00				5182.70	2.76	3.40			81.1%	
34.50				5240.28	2.76	3.40			81.3%	
34.00				5297.87	2.77	3.40			81.4%	
33.50				5355.46	2.77	3.40			81.5%	
33.00				5413.04	2.78	3.40			81.7%	
32.50				5470.63	2.78	3.40			81.8%	
32.00				5528.21	2.79	3.40			81.9%	
31.50				5585.80	2.79	3.40			82.0%	
31.00				5643.38	2.79	3.40			82.1%	
30.50				5700.97	2.80	3.40			82.2%	
30.00				5758.55	2.80	3.40			82.3%	
29.50				5816.14	2.80	3.40			82.4%	
29.00				5873.73	2.80	3.40			82.4%	
28.50				5931.31	2.81	3.40			82.5%	
28.00				5988.90	2.81	3.40			82.6%	

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Job #:	37518-2331.010.7805
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Engineer:	RCK
Date:	10/9/2018

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TRANSVERSE DIRECTION CHECKS

Increments	0.500 ft	Width Slope	0.000 in/ft	
E_{steel} / E_{wood}	0.000	Depth Slope	0.194 in/ft	

Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

Applied Transverse Moment = 767.81 kip*ft
Moment per 0.5 ft = 4.80 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.40 ksi

	%		fa	Fa
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.8%	-4.28 ft	2.99	3.4

Elevation	S.R. Plate Sizes Thk (in)	Width (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
27.50				6046.48	2.81	3.40			82.7%	
27.00				6104.07	2.81	3.40			82.7%	
26.50				6161.65	2.82	3.40			82.8%	
26.00				6219.24	2.82	3.40			82.8%	
25.50				6276.82	2.82	3.40			82.9%	
25.00				6334.41	2.82	3.40			82.9%	
24.50				6392.00	2.82	3.40			83.0%	
24.00				6449.58	2.82	3.40			83.0%	
23.50				6507.17	2.82	3.40			83.0%	
23.00				6564.75	2.83	3.40			83.1%	
22.50				6622.34	2.83	3.40			83.1%	
22.00				6679.92	2.83	3.40			83.1%	
21.50				6737.51	2.83	3.40			83.2%	
21.00				6795.09	2.83	3.40			83.2%	
20.50				6852.68	2.83	3.40			83.2%	
20.00				6910.27	2.83	3.40			83.2%	
19.50				6967.85	2.83	3.40			83.2%	
19.00				7025.44	2.83	3.40			83.2%	
18.50				7083.02	2.83	3.40			83.2%	
18.00				7140.61	2.83	3.40			83.2%	
17.50				7198.19	2.83	3.40			83.2%	
17.00				7255.78	2.83	3.40			83.2%	
16.50				7313.36	2.83	3.40			83.2%	
16.00				7370.95	2.83	3.40			83.2%	
15.50				7428.54	2.83	3.40			83.2%	
15.00				7486.12	2.83	3.40			83.2%	
14.50				7543.71	2.83	3.40			83.2%	
14.00				7601.29	2.83	3.40			83.1%	
13.50				7658.88	2.83	3.40			83.1%	
13.00				7716.46	2.83	3.40			83.1%	
12.50				7774.05	2.83	3.40			83.1%	
12.00				7831.63	2.82	3.40			83.0%	
11.50				7889.22	2.82	3.40			83.0%	
11.00				7946.81	2.82	3.40			83.0%	
10.50				8004.39	2.82	3.40			82.9%	

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Phone 614.221.6679 www.pauljford.com

Version v0.8 Effective 1/18/2017

Job #:	37518-2331.010.7805
Client #:	BU 823531
Engineer:	RCK
Date:	10/9/2018

TRANSVERSE DIRECTION CHECKS

Increments	0.500 ft	Width Slope	0.000 in/ft
E_{steel} / E_{wood}	0.000	Depth Slope	0.194 in/ft

Shaft Reinforcing Plates: 0 x 0
Effective Elevations: 0 to 0

Applied Transverse Moment = 767.81 kip*ft
Moment per 0.5 ft = 4.80 kip*ft
Design Steel Stress = 0.00 ksi
Design Wood Stress = 3.40 ksi

	%		fa	Fa
Steel	0.0%	#N/A	#N/A	#N/A
Wood	87.8%	-4.28 ft	2.99	3.4

Elevation	S.R. Plate Sizes Thk (in)	Width (in)	Area (in^2)	Applied Moment (k-in)	Applied Wood Stress f_b (ksi)	Allowable Wood Stress F'_b (ksi)	Applied Steel Stress f_b (ksi)	Allowable Steel Stress F_b (ksi)	Wood Capacity	Steel Capacity
10.00				8061.98	2.82	3.40			82.9%	
9.50				8119.56	2.82	3.40			82.9%	
9.00				8177.15	2.82	3.40			82.8%	
8.50				8234.73	2.82	3.40			82.8%	
8.00				8292.32	2.81	3.40			82.8%	
7.50				8349.90	2.81	3.40			82.7%	
7.00				8407.49	2.81	3.40			82.7%	
6.50				8465.08	2.81	3.40			82.6%	
6.00				8522.66	2.81	3.40			82.6%	
5.50				8580.25	2.81	3.40			82.5%	
5.00				8637.83	2.80	3.40			82.5%	
4.50				8695.42	2.80	3.40			82.4%	
4.00				8753.00	2.80	3.40			82.4%	
3.50				8810.59	2.80	3.40			82.3%	
3.00				8868.17	2.80	3.40			82.2%	
2.50				8925.76	2.80	3.40			82.2%	
2.00				8983.35	2.79	3.40			82.1%	
1.50				9040.93	2.79	3.40			82.1%	
1.00				9098.52	2.79	3.40			82.0%	
0.50				9156.10	2.79	3.40			81.9%	
0.00				9213.69	2.78	3.40			81.9%	
-0.50				0.00	0.00	3.40				
-1.00				0.00	0.00	3.40				
-1.50				0.00	0.00	3.40				
-2.00				0.00	0.00	3.40				
-2.50				0.00	0.00	3.40				
-3.00				0.00	0.00	3.40				
-3.50				0.00	0.00	3.40				
-4.00				0.00	0.00	3.40				
-4.28				9876.72	2.99	3.40			87.8%	

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Job Number:	37518-2331.010.7805_Trans	Page:	1
Site Number:	823531	By:	RCK
Site Name:	CT896/M&M Concrete Pole	Date:	10/9/2018

DIRECT EMBED SOIL AND STEEL ANALYSIS - TIA-222-G

Factored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, Mu =	767.8		k-ft
Shear, Vu =	14.4		kips
Axial Load, Pu =	20.2		kips (from 1.2D + 1.6W)*
OTMu =	767.8	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DE
ACI Code =	ACI 318-08
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Direct Embed Concrete / Gravel Parameters

Diameter =	4.5	ft
Height Above Grade =	0	ft, Assumed 0 ft
Depth Below Grade =	13.5	ft
fc' =	2	ksi
εc =	0.003	in/in
L / D Ratio =	3.00	

Load Combinations Checked per TIA-222-G

1. (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
2. (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

Soil Parameters

Water Table Depth =	13.50	ft
Depth to Ignore Soil =	3.33	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?*	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

*Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

Backfill Condition = Conc. Exterior (Use Conc. Dia.)

Define Soil Layers

Note: Cohesion = Undrained Shear Strengh = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	1.8	100		27	Sand				1.8
2	2.2	125		37	Sand				4
3	9.5	130		40	Sand	42200			13.5
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	10.07	ft, from Grade
Bending Moment, Mu =	912.67	k-ft, from COR
Resisting Moment, ΦMn =	1110.28	k-ft, from COR

MOMENT RATIO = 82.2% OK

Shear, Vu =	14.38	kips
Resisting Shear, ΦVn =	17.49	kips

SHEAR RATIO = 82.2% OK

Soil Results: Uplift

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	28.99	kips

UPLIFT RATIO = 0.0% OK

*Soil Results: Compression**

Compression, Cu =	20.24	kips
Comp. Capacity, ΦCn =	496.98	kips

COMPRESSION RATIO = 4.1% OK

***Compression Ratio based on diameter used for overturning calculation.**

Pole Capacity Results:

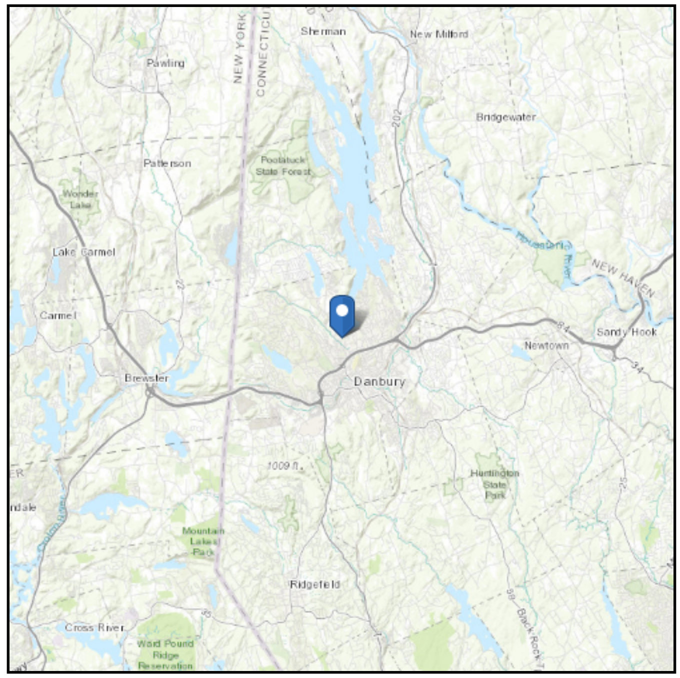
Axial Load, Pu =	32.50	kips @ 4.28 ft Below Grade
Shear, Vu =	0.00	kips @ 4.28 ft Below Grade
Moment, Mu =	823.06	k-ft @ 4.28 ft Below Grade

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 571.29 ft (NAVD 88)
Latitude: 41.418917
Longitude: -73.461944



Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph

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

Date Accessed: Tue Oct 09 2018

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

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

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

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PAUL J. FORD
& COMPANY

Date: December 14, 2018

Charles Mcguirt
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

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

Subject:	**Mount Modification Report**	
Carrier Designation:	***T-Mobile* Equipment Change-out**	
	Carrier Site Number:	CT11896A
	Carrier Site Name:	CT896/M&M Concrete Pole
Crown Castle Designation:	**Crown Castle BU Number:**	823531
	Crown Castle Site Name:	CT896/M&M Concrete Pole
	Crown Castle JDE Job Number:	512464
	Crown Castle Purchase Order Number:	1300131
	Crown Castle Order Number:	446044 Rev. 2
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	A37518-2331.011.7191
Site Data:	**41 Padanaram Rd, Danbury, Fairfield County, CT**	
	Latitude 41.418917°, Longitude -73.461944°	
Structure Information:	**Tower Height & Type:**	**80 Foot Monopole**
	Mount Elevation:	**78 Foot**
	Mount Type:	**(3) 1.25 Foot T-Arm**

Dear Charles Mcguirt,

Paul J Ford and Company is pleased to submit this “Mount Modification Report” to determine the structural integrity of the T-Mobile antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point is not part of this document.

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

1.25’ T-Arm (typical)	**68.1%**	**SUFFICIENT***

*** Sufficient upon completion of the changes listed in the ‘Recommendations’ section of this report.**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural Modification prepared by: Brady Hildebrand. E.I.

Respectfully submitted by:

Deepesh Salva, P.E.
Project Engineer
dsalva@pauljford.com

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

12-17-18

TABLE OF CONTENTS

1) INTRODUCTION

The existing mounts under consideration are (3) 1.25’ T-Arm mounts installed at the 78’ elevation on a 80’ Monopole tower. The existing mounts considered in this analysis are identified as a Laminated Wood Systems, Inc. based on photos.

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor:	2.0
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph

Table 1 - Proposed Equipment Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
78	80	3	Ericsson	AIR 32 B2A/B66AA	(3) 1.25’ T-Arm
		3	Ericsson	KRY 112 144/1	
		3	Ericsson	AIR 21 B4A/B12P-B8P 4FT	

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Mount Manufacturer Drawings	E-Lam, AMB-TBS-AD Dated: 05/27/1998	3529192	CCISites
Photos	Dated: 24/08/2017	-	CCISites
Order	ID: 446044 Rev. 2 Dated: 06/05/2018	-	CCISites

3.1) Analysis Method

RISA-3D (version 15.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix C.

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

3.2) Assumptions

1) The analysis of the existing tower or the effect of the mount attachment to the tower is not within the current scope of work.
2) The antenna mounting system was properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications and all bolts are tightened as specified by the manufacturer and AISC requirements.
3) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2.
4) All member connections have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report. All U-Bolt connections have been properly tightened. This analysis will be required to be revised if the existing conditions in the field differ from those shown in the above referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
5) Steel grades are as follows, unless noted otherwise:

a) Channel, Solid Round, Angle, Plate, Unistrut	*ASTM A36 (GR 36)*
b) Pipe	*ASTM A53 (GR 35)*
c) HSS (Rectangular)	*ASTM 500 (GR B-46)*
d) HSS (Round)	*ASTM 500 (GR B-42)*
e) Threaded Rods	*ASTM F1554 (GR 36)*
f) Connection Bolts	*ASTM A325*

6) Proposed equipment is to be installed in the locations specified in Appendix A. Any changes to the proposed equipment locations will render this report invalid.
7) SitePro1 HSRK-35 Kits are installed properly as shown in manufacturer drawings attached at the end of this report. Field cut angles to appropriate length and field drill holes at shortened end of angles.

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Face Horizontals	78	56.8	Pass
1	Standoff Members		61.1	Pass
1	Mount Pipes		23.8	Pass
1	Kick-Brace		9.50	Pass
1	Mount to Tower Connection		68.1	Pass

Mount Rating (max from all components) =	68.1%

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

4.1) Recommendations

- Install (3) 2.5-ft long 2STD (2.375” OD x 0.154”) pipes with crossover plates as shown in SK-8. Contractor to field verify required length and cut pipe to fit behind antennas, if necessary.
- Install (3) SitePro1 HSRK-35 Kit or EOR approved equivalent as shown in SK-8 and in conformance with the attached manufacturer drawings. Field cut and field drill the bracing angles to fit the mount as shown in SK-8.

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

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

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

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

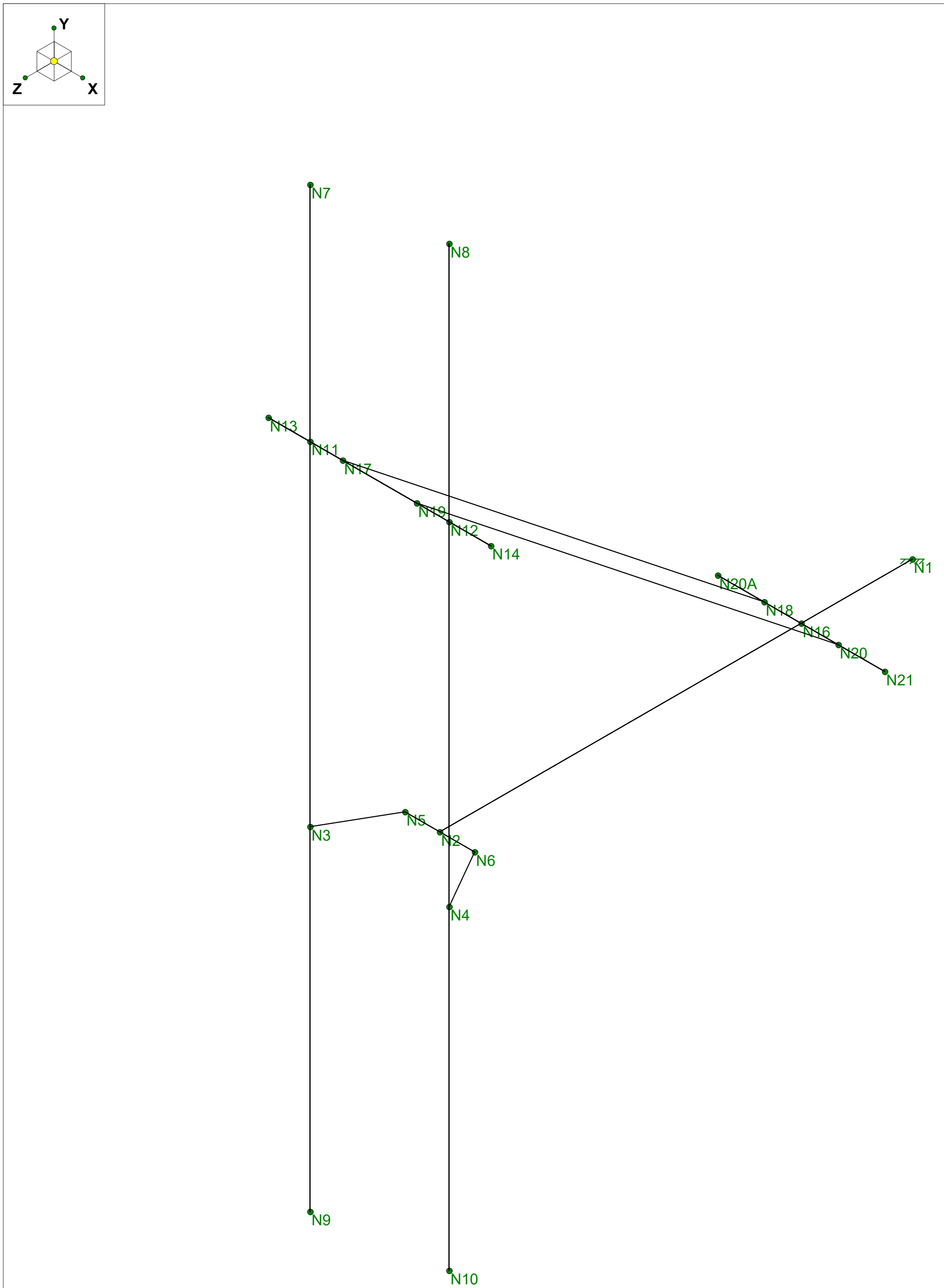
4) The standard of care for all Professional Engineering Services performed or furnished by Paul J. Ford and Company under this project will be the skill and care used by members of the Consultant's profession practicing under similar circumstances at the same time and in the same locality.

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

****

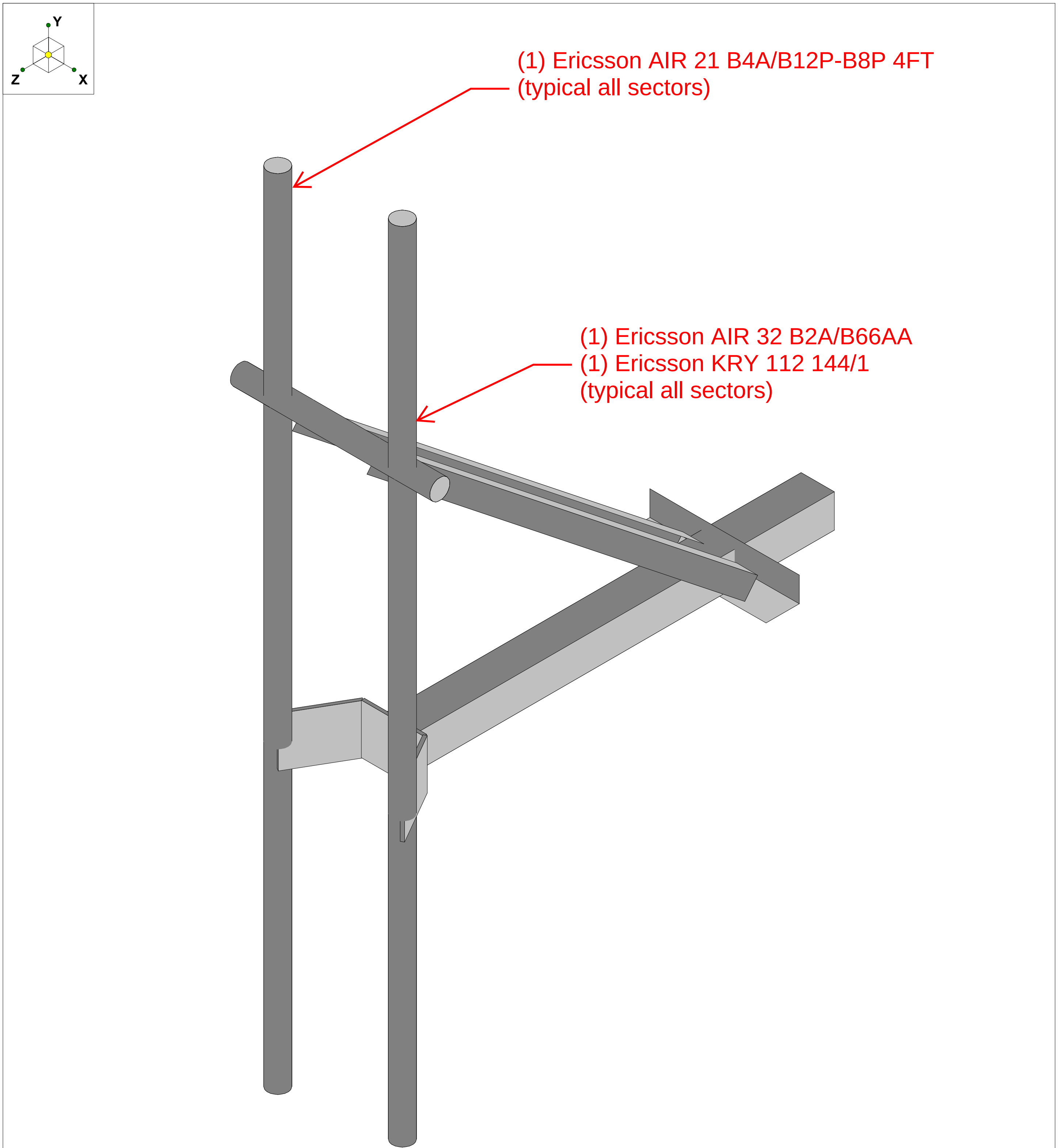
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 1
BMH		Dec 13, 2018 at 12:01 PM
37518-2331.011.7191		375-2331.011.7191 - MOD_Wind L...



Envelope Only Solution

Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 2
BMH		Dec 13, 2018 at 12:01 PM
37518-2331.011.7191		375-2331.011.7191 - MOD_Wind L...

APPENDIX B

SOFTWARE INPUT CALCULATION

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

Project # A37518-2331.011.7191
By BMH

Analysis 30 degrees

Date: 12/14/18

v1.0, Effective 04/03/2018

Mount Loading per TIA-222-H

Structure Information

Mount Type =	1 Sector	
Mount Elev, z =	78	ft
Ground Elev, z_s =	441	ft
Wind Speed =	125	mph
Ice Wind Speed =	50	mph
Ice Thickness =	2	in
Exposure Cat =	B	
Structure Class =	II	
Topographic Cat =	1	
Crest Height =	0	ft

Velocity Pressure Coefficients

z_g =	1200	ft	
a =	7.00		
K_{zmin} =	0.70		
K_z =	0.92		Calculated Value
Ke =	0.98		Ground Elevation Factor
K_z =	0.92		Velocity Press Coef (Section 2.6.5.2)
K_{zt} =	1.00		Topographic Factor (Section 2.6.6.4)
Gh =	1.00		Gust Effect Factor (Section 2.6.7)
K_d =	0.95		Wind Dir Probability Factor (Table 2-2)
K_a =	0.90		Shielding factor (Section 16.6)
q_z=	30.98	psf	Velocity Pressure (Section 2.6.9.6)

Ice Loading

Ii =	1.00		Ice Importance Factor (Table 2-3)
Iwi =	1.00		Wind Ice Importance Factor (Table 2-3)
q_z=	5.60	psf	Ice Velocity Pressure (Section 2.6.9.6)
K_{iz} =	1.09		Ice Escalation Factor (Section 2.6.8)
T_{iz} =	2.18	in	Factored Ice Thickness (Section 2.6.8)
h =		in	Bar Grating Height
W_i =	10.17	psf	Grating Ice Weight

Wind Pressures

Pressure =	30.983	psf
Ice Pressure =	5.597	psf

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

Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)	Length, in	Face	Label	Top Elev (in)	Bot Elev (in)
A					B					C	C1	80.3	35.7	96.0	D			
A					B					C (2)	C1	61.5	54.5	96.0	D			
A					B					C					D			
A					B					C					D			
A					B					C	C2	83.4	36.6	96.0	D			
A					B					C					D			
A					B					C					D			
A					B					C					D			
A					B					C					D			
A					B					C					D			

Antennas

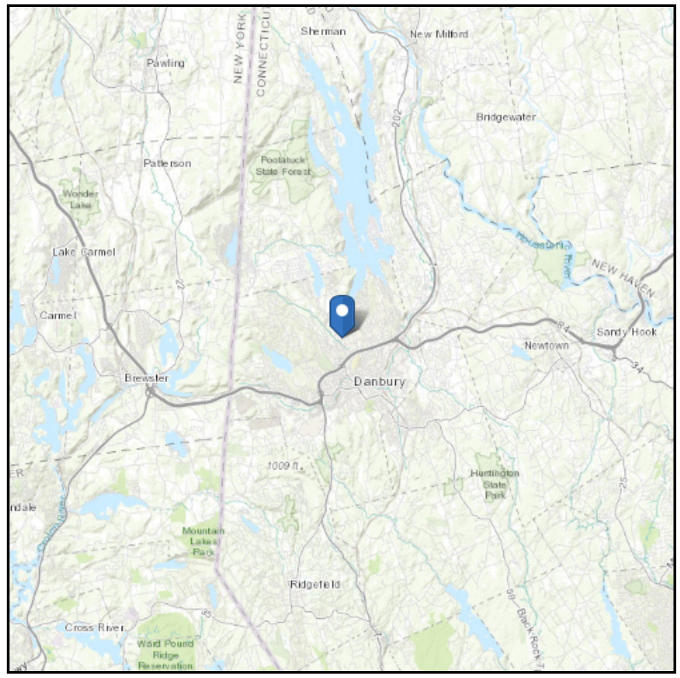
Item	Manufacturer	Antenna	Height (in)	Width (in)	Depth (in)	Flat or Round	Weight (lbs)	Antenna Attachment Locations					
								Label	Label	Label	Label	Label	Label
1	ERICSSON	AIR 32 B2A/B66AA	56.6	12.9	8.7	Flat	132.2	C1					
2	ERICSSON	KRY 112 144/1	7	6	3	Flat	11	C1(2)					
3	ERICSSON	AIR 21 B4A/B12P-B8P 4FT	58.8	14.8	9.5	Flat	124	C2					
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 571.29 ft (NAVD 88)
Latitude: 41.418917
Longitude: -73.461944



Wind

Results:	**75 Vmph**
Wind Speed:	115 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	96 Vmph
Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Thu Dec 13 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

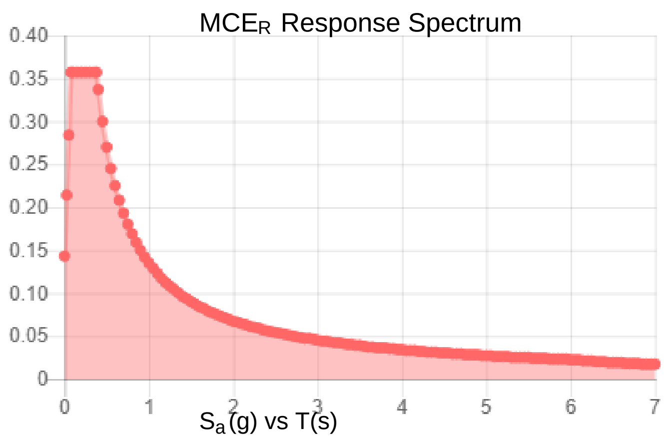
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

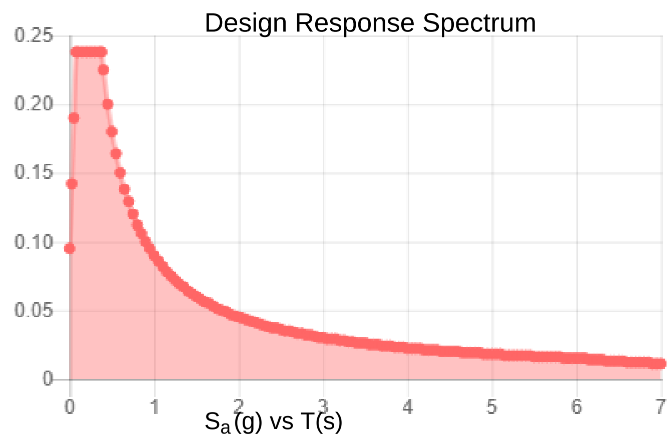
Seismic

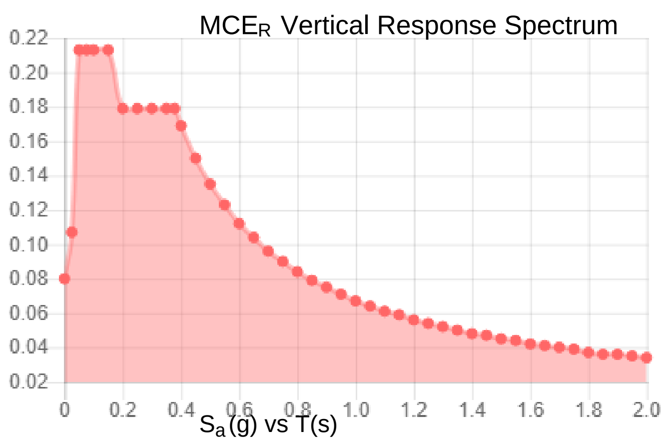
Site Soil Class:	D - Stiff Soil
Results:	

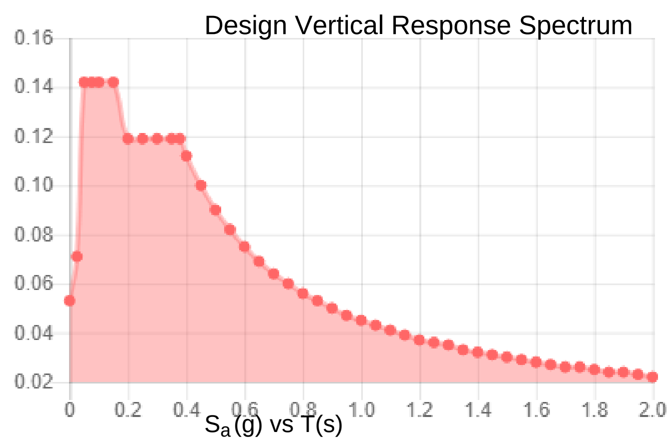
S_S :	0.223	S_{D1} :	0.09
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.128
F_v :	2.4	PGA_M :	0.198
S_{MS} :	0.357	F_{PGA} :	1.543
S_{M1} :	0.135	I_e :	1
S_{DS} :	0.238	C_v :	0.746

Seismic Design Category B









Data Accessed:	Thu Dec 13 2018
Date Source:	USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

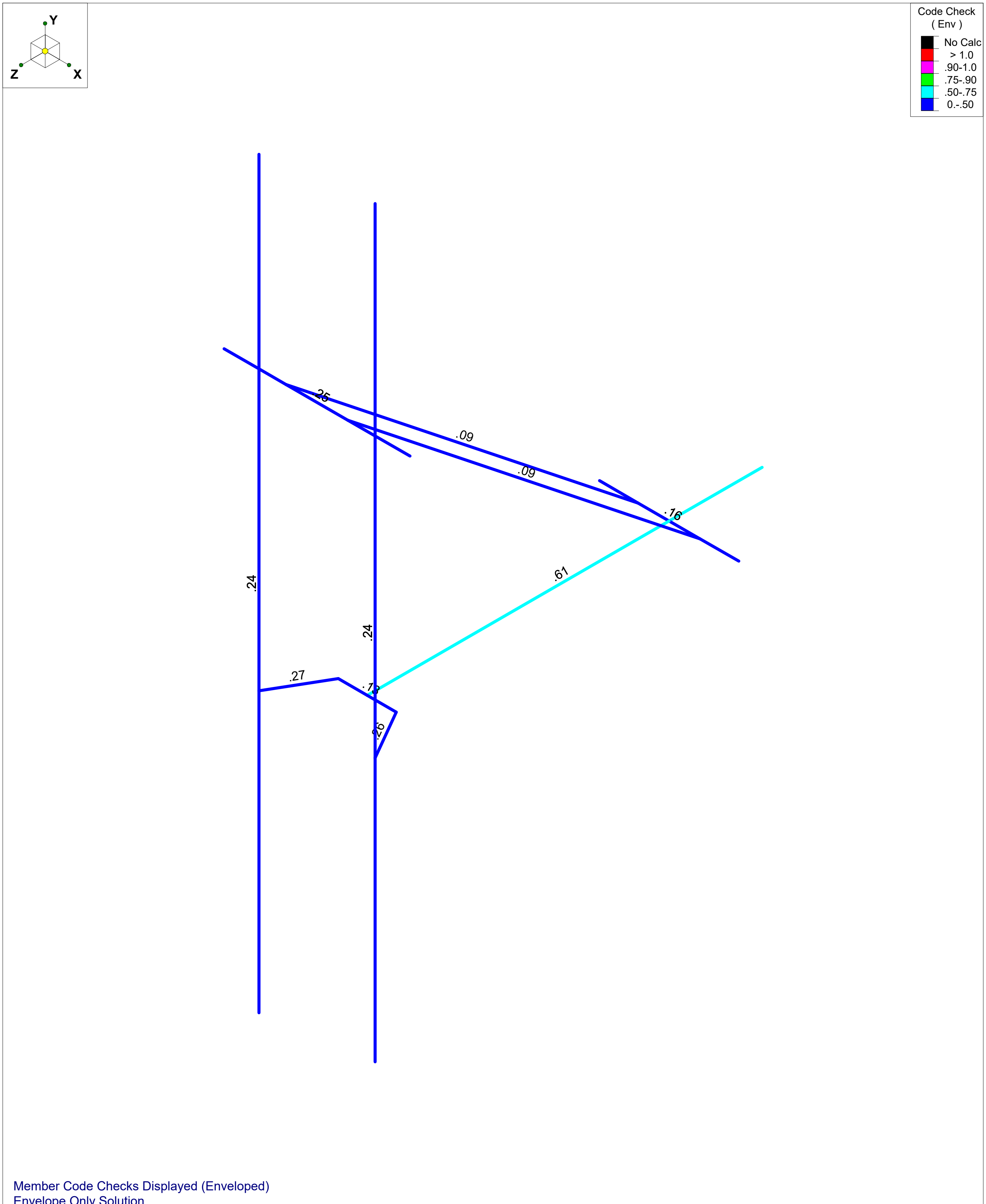
Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Thu Dec 13 2018

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

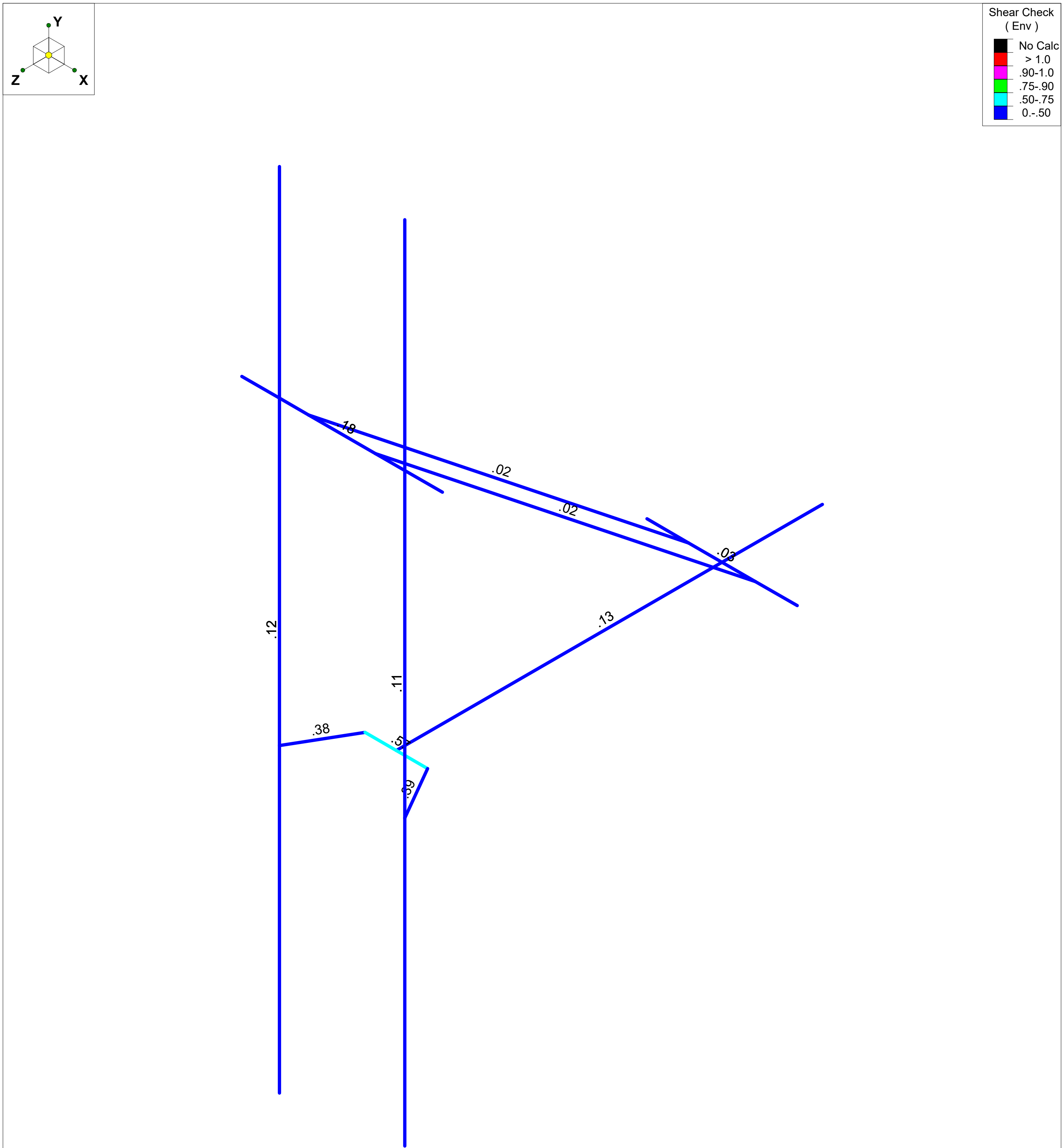
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

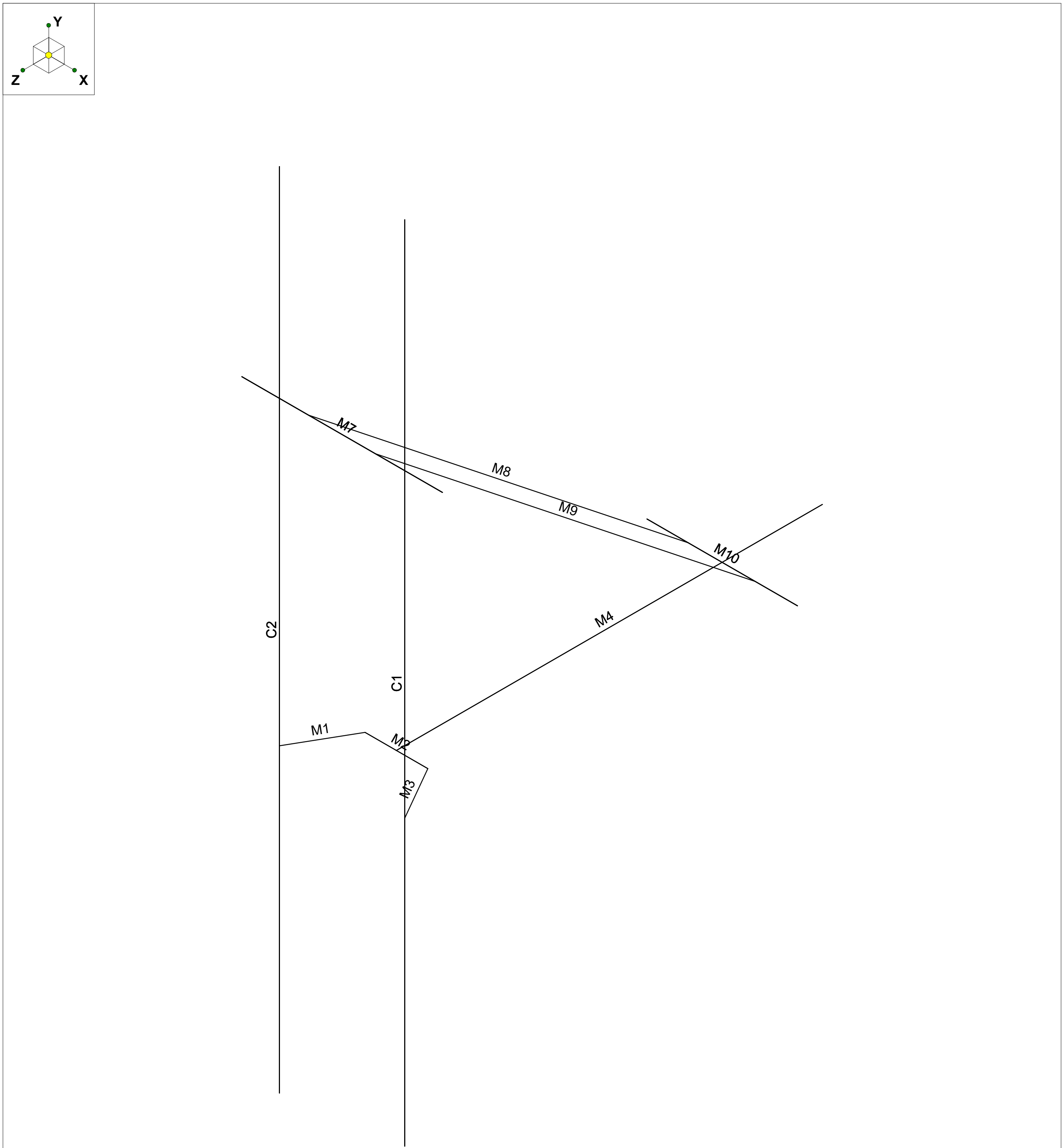


Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 3
BMH		Dec 14, 2018 at 8:04 AM
37518-2331.011.7191		375-2331.011.7191 - MOD_Wind L...



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 4
BMH		Dec 14, 2018 at 8:04 AM
37518-2331.011.7191		375-2331.011.7191 - MOD_Wind L...



Envelope Only Solution

Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 5
BMH		Dec 13, 2018 at 12:02 PM
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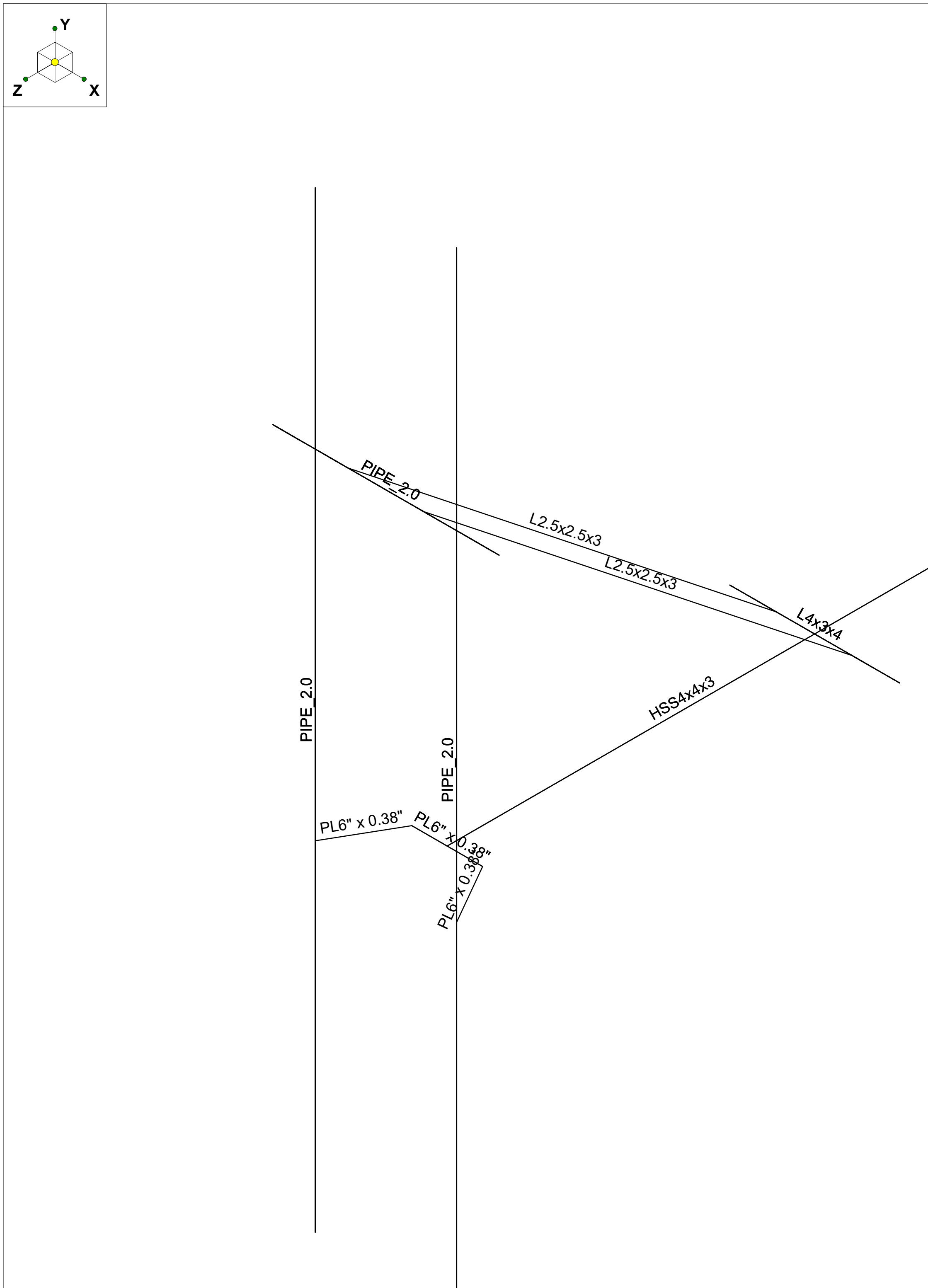

Envelope Only Solution

Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 6
BMH		Dec 13, 2018 at 12:02 PM
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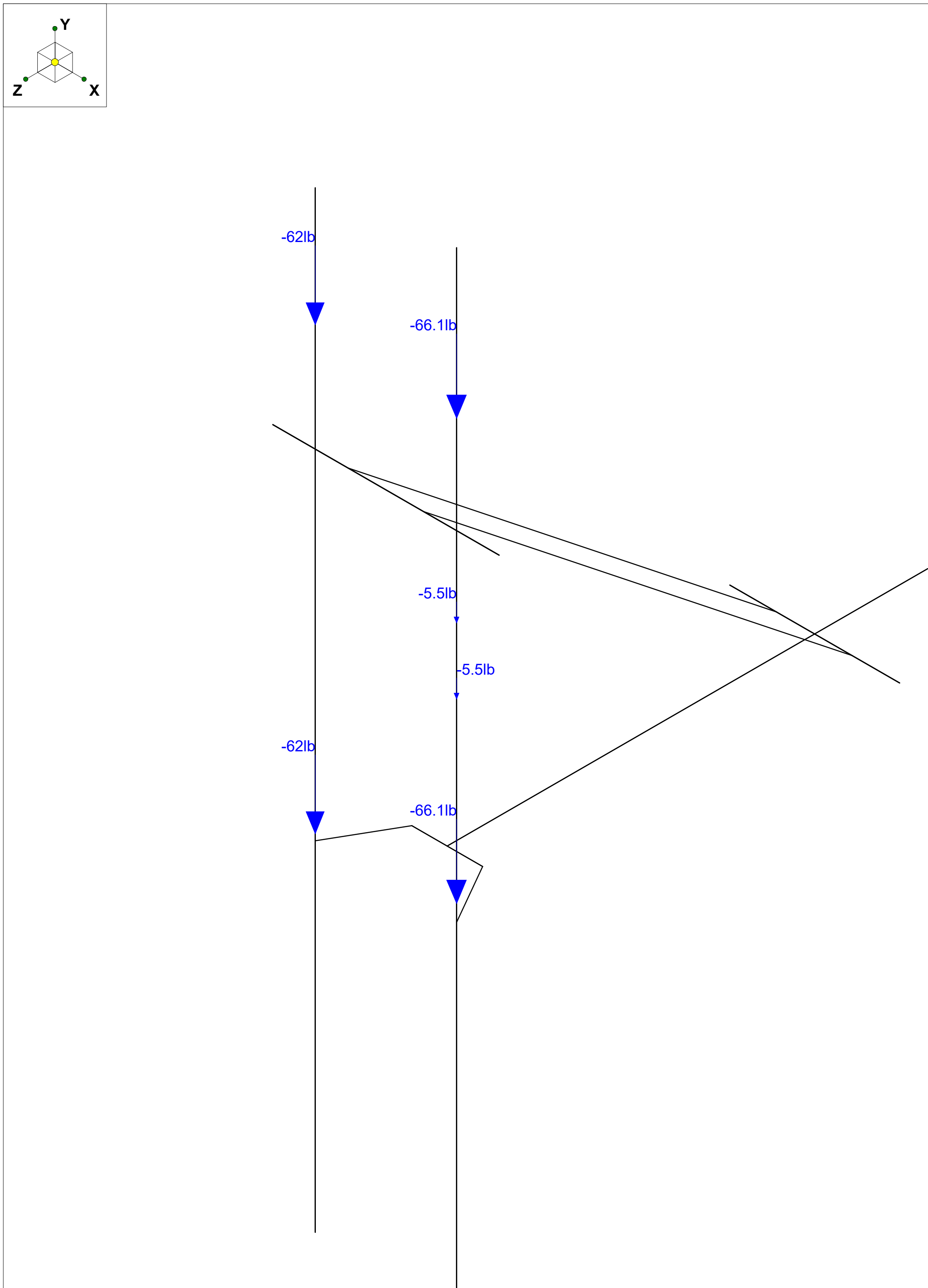


Loads: BLC 1, Dead
Envelope Only Solution

Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 7
BMH		Dec 13, 2018 at 12:02 PM
37518-2331.011.7191		375-2331.011.7191 - MOD_Wind L...

(Global) Model Settings

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

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

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N3	N5			PL6" x 0.38"	None	None	A36 Gr.36	Typical
2	M2	N5	N6			PL6" x 0.38"	None	None	A36 Gr.36	Typical
3	M3	N6	N4			PL6" x 0.38"	None	None	A36 Gr.36	Typical
4	M4	N2	N1			HSS4x4x3	None	None	A500 Gr.B...	Typical
5	C2	N9	N7			PIPE_2.0	None	None	A53 Gr.B	Typical
6	C1	N10	N8			PIPE_2.0	None	None	A53 Gr.B	Typical
7	M7	N13	N14			PIPE_2.0	None	None	A53 Gr.B	Typical
8	M8	N17	N18		90	L2.5x2.5x3	None	None	A36 Gr.36	Typical
9	M9	N20	N19		90	L2.5x2.5x3	None	None	A36 Gr.36	Typical
10	M10	N21	N20A		270	L4x3x4	None	None	A36 Gr.36	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M1						Yes			None
2	M2						Yes			None
3	M3						Yes			None
4	M4						Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
5	C2						Yes			None
6	C1						Yes			None
7	M7						Yes			None
8	M8	BenPIN	BenPIN				Yes			None
9	M9	BenPIN	BenPIN				Yes			None
10	M10						Yes			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	PL6" x 0.38"	7.5									Lateral
2	M2	PL6" x 0.38"	7.5									Lateral
3	M3	PL6" x 0.38"	7.5									Lateral
4	M4	HSS4x4x3	51									Lateral
5	C2	PIPE_2.0	96									Lateral
6	C1	PIPE_2.0	96									Lateral
7	M7	PIPE_2.0	24									Lateral
8	M8	L2.5x2.5x3	58.016									Lateral
9	M9	L2.5x2.5x3	58.016									Lateral
10	M10	L4x3x4	18									Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	None		-1.1			6			
2	Live	None								
3	Wind 0	None					12	20		
4	Wind 30	None					12	20		
5	Wind 60	None					12	20		
6	Wind 90	None					12	20		
7	Wind 120	None					12	20		
8	Wind 150	None					12	20		
9	Ice Load	None					6	10		
10	Ice 0	None					12	20		
11	Ice 30	None					12	20		
12	Ice 60	None					12	20		
13	Ice 90	None					12	20		
14	Ice 120	None					12	20		
15	Ice 150	None					12	20		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.4 D	Yes	Y		1	1.4																		
2	1.2 D + 1....	Yes	Y		1	1.2	2	1																
3	1.2 D + 1....	Yes	Y		1	1.2	3	1																
4	1.2 D + 1....	Yes	Y		1	1.2	4	1																
5	1.2 D + 1....	Yes	Y		1	1.2	5	1																
6	1.2 D + 1....	Yes	Y		1	1.2	6	1																
7	1.2 D + 1....	Yes	Y		1	1.2	7	1																
8	1.2 D + 1....	Yes	Y		1	1.2	8	1																
9	1.2 D + 1....	Yes	Y		1	1.2	3	-1																
10	1.2 D + 1....	Yes	Y		1	1.2	4	-1																
11	1.2 D + 1....	Yes	Y		1	1.2	5	-1																
12	1.2 D + 1....	Yes	Y		1	1.2	6	-1																

Load Combinations (Continued)

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
13	1.2 D + 1....	Yes	Y		1	1.2	7	-1																
14	1.2 D + 1....	Yes	Y		1	1.2	8	-1																
15	1.2 D + 1....	Yes	Y		1	1.2	9	1	10	1														
16	1.2 D + 1....	Yes	Y		1	1.2	9	1	11	1														
17	1.2 D + 1....	Yes	Y		1	1.2	9	1	12	1														
18	1.2 D + 1....	Yes	Y		1	1.2	9	1	13	1														
19	1.2 D + 1....	Yes	Y		1	1.2	9	1	14	1														
20	1.2 D + 1....	Yes	Y		1	1.2	9	1	15	1														
21	1.2 D + 1....	Yes	Y		1	1.2	9	1	10	-1														
22	1.2 D + 1....	Yes	Y		1	1.2	9	1	11	-1														
23	1.2 D + 1....	Yes	Y		1	1.2	9	1	12	-1														
24	1.2 D + 1....	Yes	Y		1	1.2	9	1	13	-1														
25	1.2 D + 1....	Yes	Y		1	1.2	9	1	14	-1														
26	1.2 D + 1....	Yes	Y		1	1.2	9	1	15	-1														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	713.056	11	1544.32	26	717.887	4	-1.082	14	3.043	13	1.147	5
2		min	-713.056	7	525.797	8	-717.887	10	-6.881	20	-3.029	5	-1.117	13
3	Totals:	max	713.056	11	1544.32	26	717.887	4						
4		min	-713.056	7	525.797	8	-717.887	10						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	M4	HSS4x4x3	.611	51	19	.132	51	z	5	99323.283	106812	12.662	12.662	1....	H1-1b
2	M1	PL6" x 0.38"	.274	0	7	.380	7.5	y	11	57757.121	73872	.585	9.234	1....	H1-1b
3	M3	PL6" x 0.38"	.263	7.5	11	.391	0	y	7	57757.121	73872	.585	9.234	1....	H1-1b
4	M7	PIPE_2.0	.246	4.5	5	.179	16		5	30625.434	32130	1.872	1.872	1....	H1-1b
5	C2	PIPE_2.0	.238	36	20	.118	36		7	14916.096	32130	1.872	1.872	2....	H1-1b
6	C1	PIPE_2.0	.238	34	22	.113	34		11	14916.096	32130	1.872	1.872	2....	H1-1b
7	M10	L4x3x4	.160	9	7	.033	9	y	7	48048.689	54756	1.795	4.805	1....	H2-1
8	M2	PL6" x 0.38"	.125	3.75	14	.568	3.75	y	7	57757.121	73872	.585	9.234	1....	H1-1b
9	M8	L2.5x2.5x3	.095	29.612	13	.025	58.016	y	5	13558.721	29192.4	.873	1.674	1....	H2-1
10	M9	L2.5x2.5x3	.094	28.403	5	.024	0	y	7	13558.721	29192.4	.873	1.674	1....	H2-1

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

Project # A37518-2331.011.7191
By BMH
Date: 12/14/18
v0.1, Effective 07/10/18

MOUNT TO TOWER CONNECTION CHECKS

REACTIONS

Px=	0.718	Kip
Py=	1.54	Kip
(Axial)Pz=	0.713	Kip
Mx=	13.76	Kip-in
My=	36.51	Kip-in
(Torque)Mz=	82.57	Kip-in

Number of Bolts = 4

WELD CHECKS

Standoff Member Type		Square	
Width	=	4	in
Depth (only for square members)	=	4	in
Assumed Weld Size	=	0.2500	
Capacity used		68.13%	

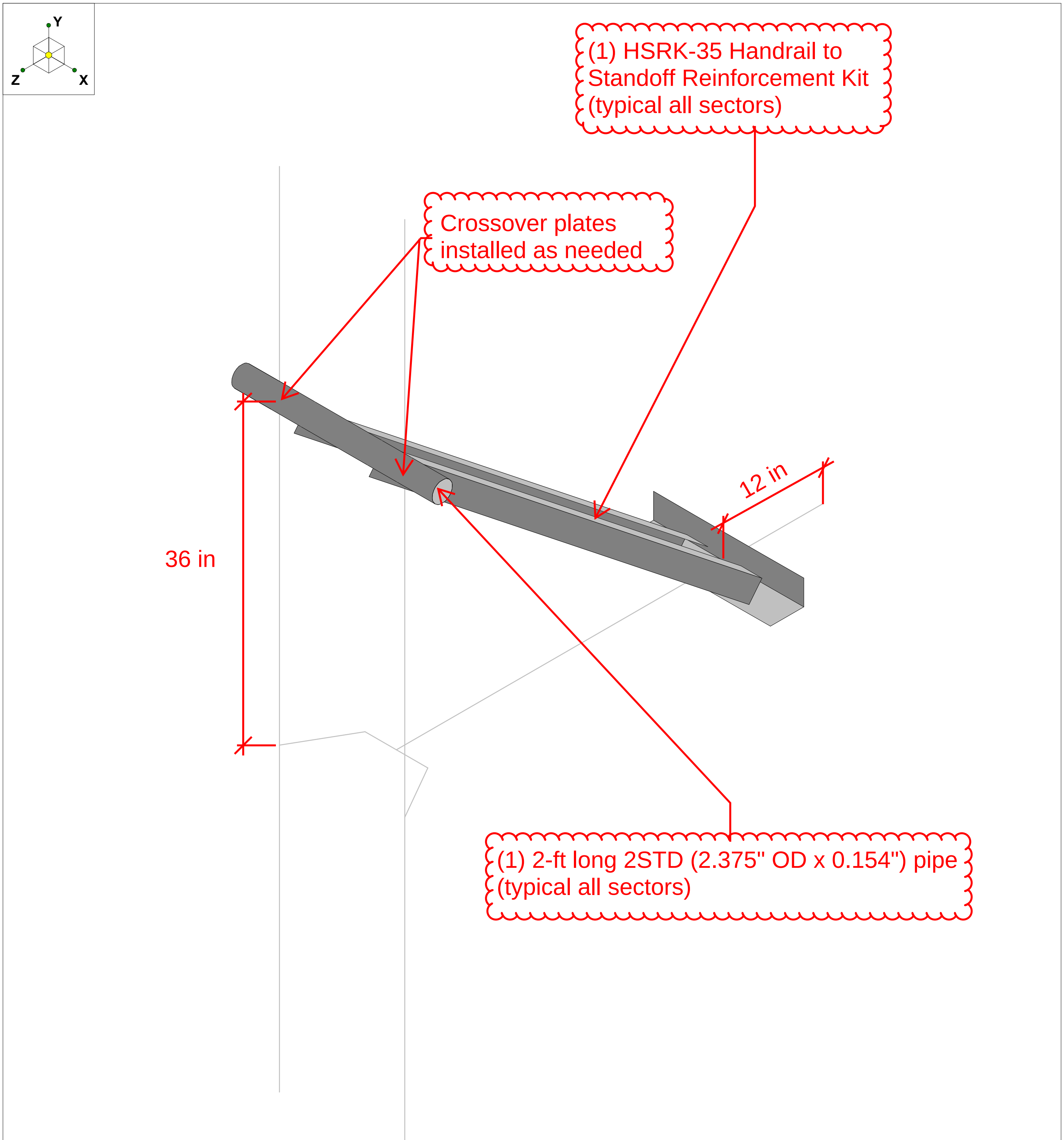
BOLT CHECKS

Tension Reaction	4.37	kip
Shear Reaction	5.27	kip
Bolt Type	A325N	
Bolt Diameter	0.625	in
Tensile Strength	20.7	kips
Shear Strength	12.4	kips
Reduced Tensile Strength	-	kips
Tensile Capacity Used	21.1%	
Shear Capacity Used	42.4%	

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

APPENDIX D

SUPPLEMENTAL MODIFICATION INFORMATION



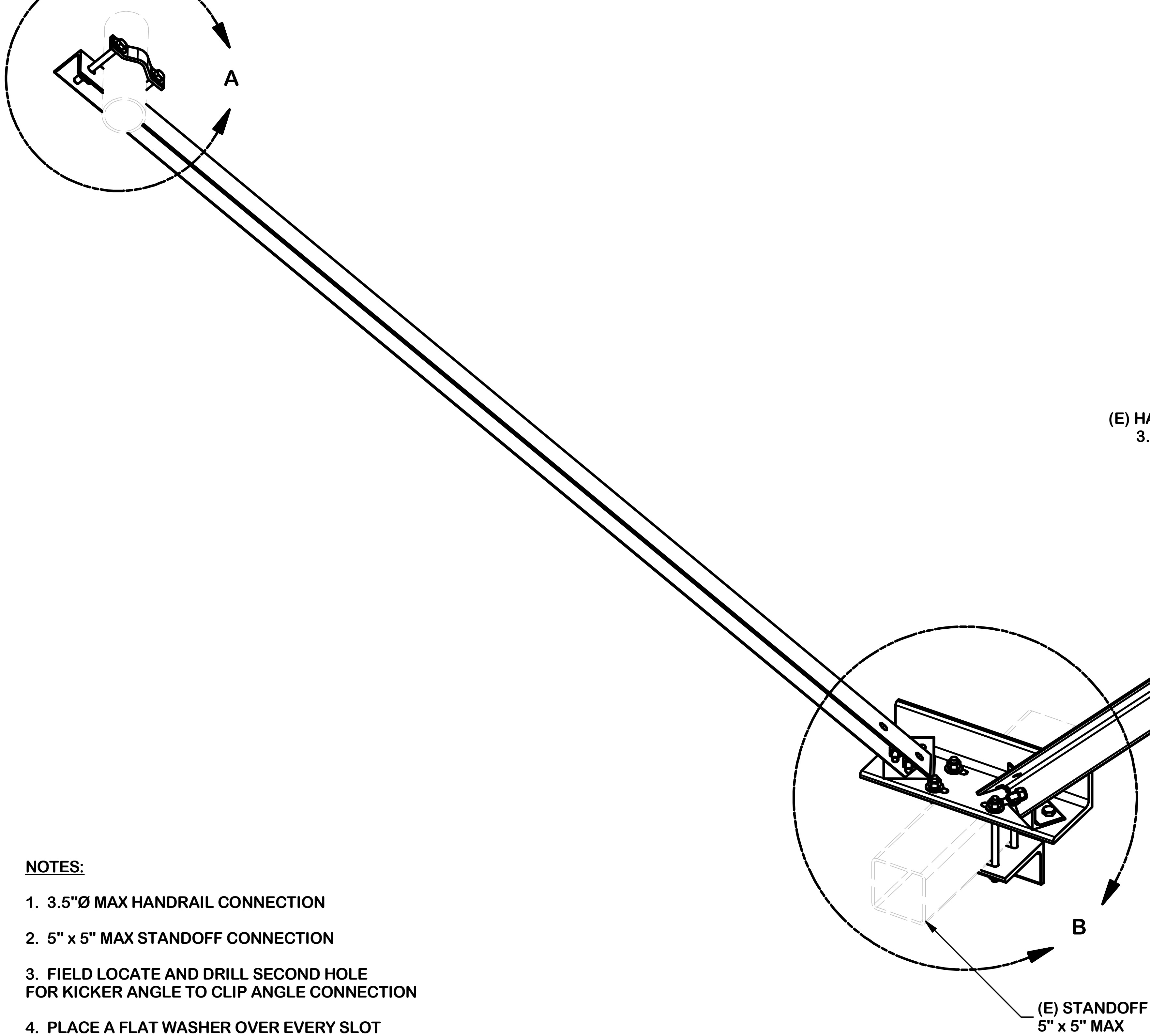
Envelope Only Solution

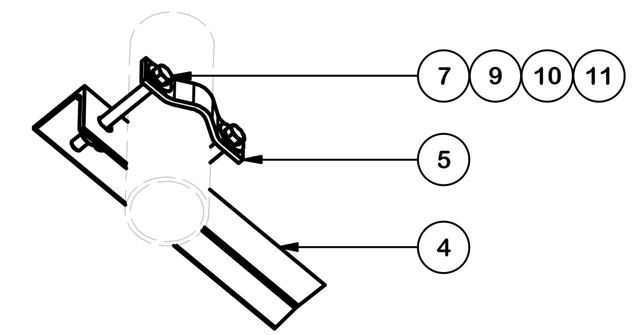
Paul J Ford and Company	823531- CT896/M&M Concrete Pole	SK - 8
BMH		Dec 13, 2018 at 12:02 PM
37518-2331.011.7191		375-2331.011.7191 - MOD_Wind L...

APPENDIX E

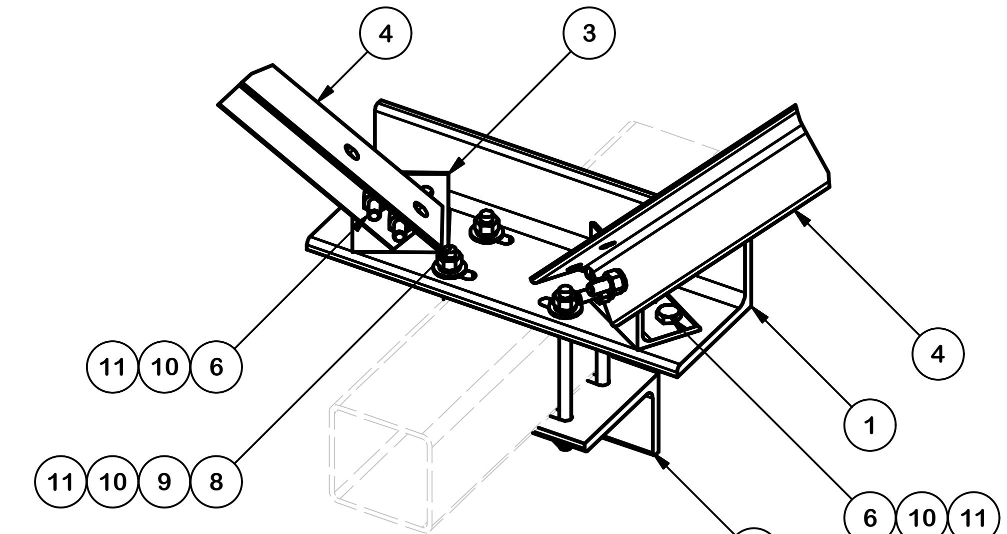
MANUFACTURER DRAWINGS (FOR REFERENCE ONLY)

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	X-KB35	KICKER BRACKET	18 in	25.32	25.32
2	1	X-BA35	BACKER ANGLE	9 in	12.45	12.45
3	2	X-UCA	CLIP ANGLE	4 in	1.94	3.89
4	2	X-KA314	KICKER ANGLE	96 in	41.67	83.35
5	2	ACP	CLAMP HALF	5 3/4 in	0.65	1.31
6	8	G1202	1/2" x 2" HDG HEX BOLT GR5	2 in	0.18	1.41
7	4	G1205	1/2" x 5" HDG HEX BOLT GR5 FULL THREAD	5 in	0.33	1.30
8	4	G12R-8	1/2" x 8" THREADED ROD (HDG.)		0.40	1.60
9	16	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	0.55
10	20	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.28
11	20	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.43
					TOTAL WT. #	141.05





DETAIL A



DETAIL B

NOTES:

1. 3.5"Ø MAX HANDRAIL CONNECTION

2. 5" x 5" MAX STANDOFF CONNECTION

3. FIELD LOCATE AND DRILL SECOND HOLE
FOR KICKER ANGLE TO CLIP ANGLE CONNECTION

4. PLACE A FLAT WASHER OVER EVERY SLOT

5. KIT INCLUDES STEEL AND HARDWARE FOR ONE SECTOR ONLY

TOLERANCE NOTES

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

DESCRIPTION
HANDRAIL TO STANDOFF
REINFORCEMENT KIT
(3" - 5" STANDOFF)

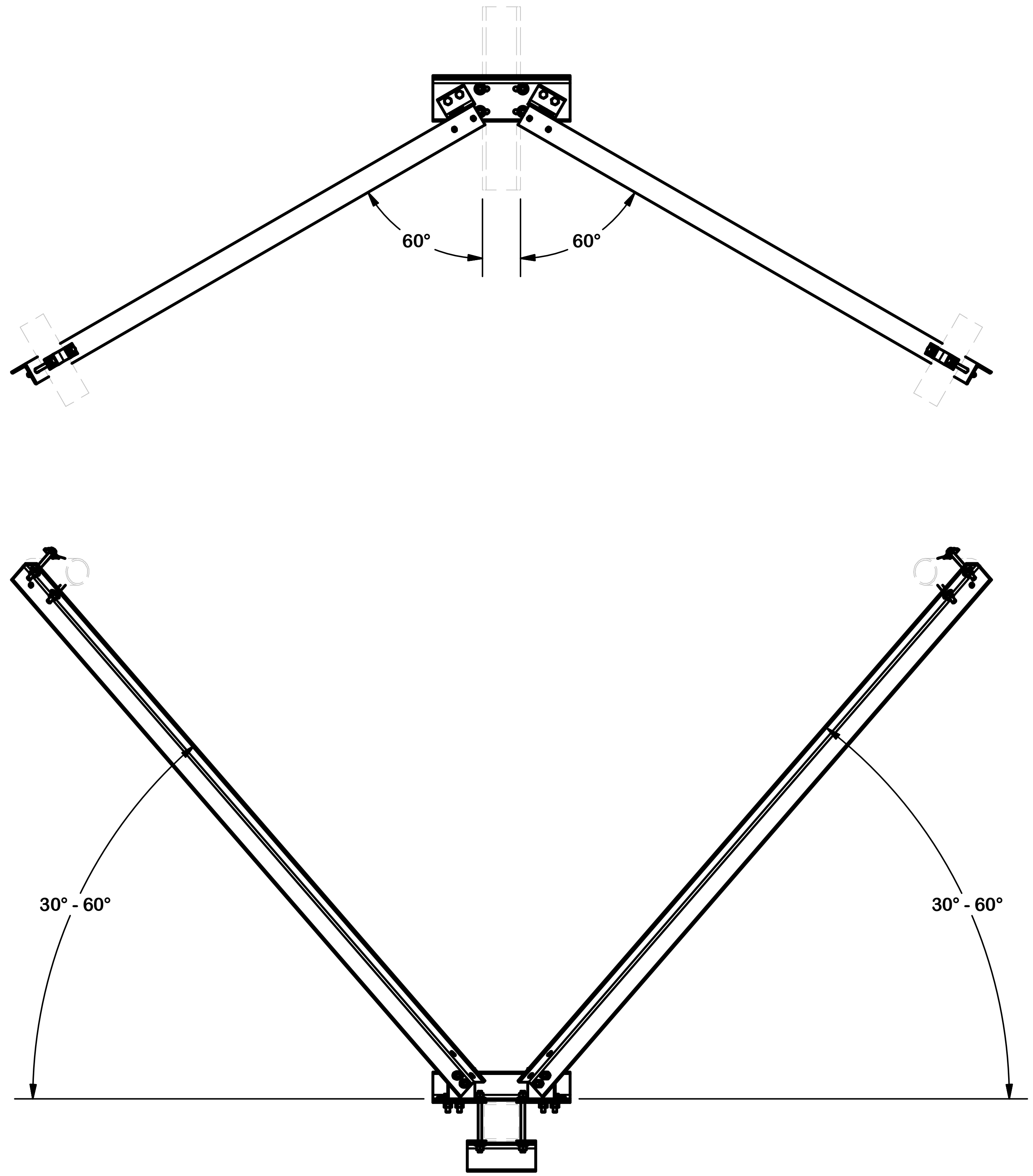
SITE PRO 1
A valmont COMPANY

Engineering
Support Team:
1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
5822	CSL3 6/29/2017	3RD PARTY	HSRK-35

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
87	02	SHOP	KAC 8/3/2017	HSRK-35



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

DESCRIPTION
HANDRAIL TO STANDOFF
REINFORCEMENT KIT
(3" - 5" STANDOFF)

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
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Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
5822	CSL3 6/29/2017	3RD PARTY	HSRK-35

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
87	02	SHOP	KAC 8/3/2017	HSRK-35

Exhibit C

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

T-Mobile Existing Facility

Site ID: CT11896A

CT896/M&M Concrete Pole
41 Padanaram Road
Danbury, CT 06811

October 30, 2018

EBI Project Number: 6218006913

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**10.33 %**

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting

environmental | engineering | due diligence

October 30, 2018

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

Emissions Analysis for Site: **CT11896A – CT896/M&M Concrete Pole**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **41 Padanaram Road, Danbury, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **41 Padanaram Road, Danbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **Ericsson AIR32 B2A/B66AA** & **Ericsson AIR21 B4A/B12P-B8P-4** for 1900 MHz (PCS), 2100 MHz (AWS) and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerline of the proposed antennas is **80 feet** above ground level (AGL).

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	80 feet	Height (AGL):	80 feet	Height (AGL):	80 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	230	Total TX Power(W):	230	Total TX Power(W):	230
ERP (W):	8,948.04	ERP (W):	8,948.04	ERP (W):	8,948.04
Antenna A1 MPE%	**5.87**	Antenna B1 MPE%	**5.87**	Antenna C1 MPE%	**5.87**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B4A/B12P-B8P-4	Make / Model:	Ericsson AIR21 B4A/B12P-B8P-4	Make / Model:	Ericsson AIR21 B4A/B12P-B8P-4
Gain:	11.5 / 15.5 dBd	Gain:	11.5 / 15.5 dBd	Gain:	11.5 / 15.5 dBd
Height (AGL):	80 feet	Height (AGL):	80 feet	Height (AGL):	80 feet
Frequency Bands	700 MHz / 2100 MHz (AWS)	Frequency Bands	700 MHz / 2100 MHz (AWS)	Frequency Bands	700 MHz / 2100 MHz (AWS)
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power(W):	80	Total TX Power(W):	80	Total TX Power(W):	80
ERP (W):	1,984.27	ERP (W):	1,984.27	ERP (W):	1,984.27
Antenna A2 MPE%	**1.73**	Antenna B2 MPE%	**1.73**	Antenna C2 MPE%	**1.73**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**7.60 %**
Sprint	**2.43** %
Clearwire	**0.30** %
Site Total MPE %:	**10.33 %**

T-Mobile Sector A Total:	7.60 %
T-Mobile Sector B Total:	7.60 %
T-Mobile Sector C Total:	7.60 %
Site Total:	10.33 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	80	20.43	PCS - 1900 MHz	1000.00	2.04%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	80	30.65	AWS - 2100 MHz	1000.00	3.06%
T-Mobile PCS - 1900 MHz GSM	2	583.57	80	7.66	PCS - 1900 MHz	1000.00	0.77%
T-Mobile 700 MHz LTE	2	282.51	80	3.71	700 MHz	467.00	0.79%
T-Mobile AWS - 2100 MHz UMTS	1	1,419.25	80	9.32	AWS - 2100 MHz	1000.00	0.94%
						Total:	**7.60%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	7.60 %
Sector B:	7.60 %
Sector C:	7.60 %
T-Mobile Maximum MPE % (Per Sector):	7.60 %
Site Total:	10.33 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.33%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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