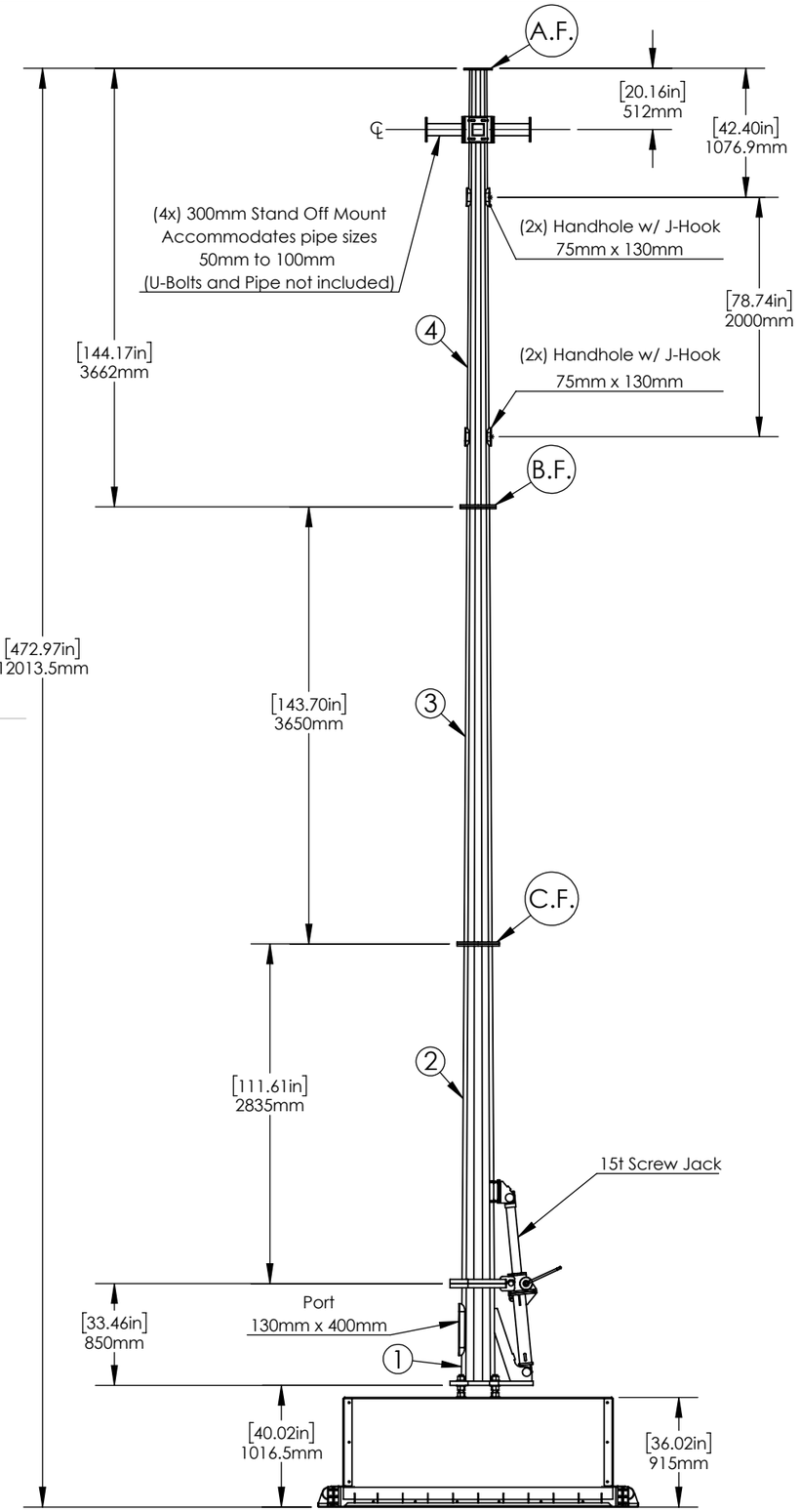
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	initial release	9/16/20	MGC
B			

165 Allworth Road, Allworth, NSW, 2425
Lot 341 DP 718769



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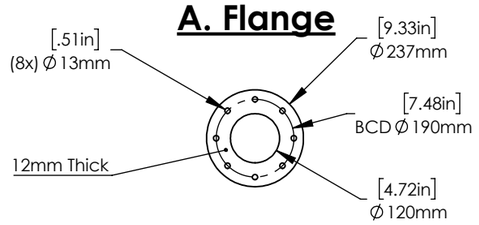

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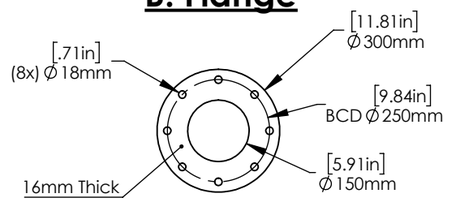

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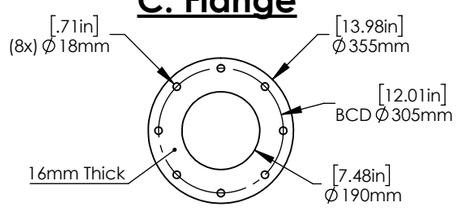
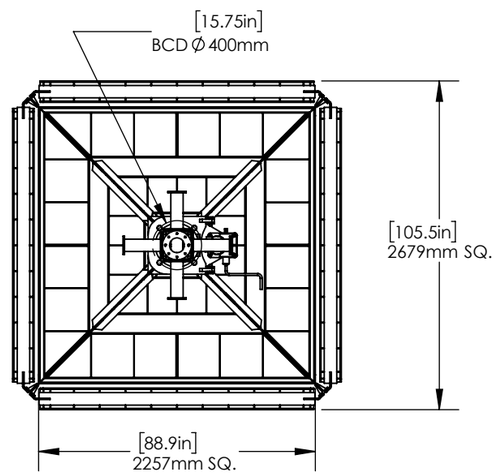




1. Survival Wind Speed: 110 MPH (49.2 m/s) (3 sec gust)
   - Structure Class - II
   - Topographic - 1 (Crest Height - NA)
   - Exposure - C

2. Design and Welding Codes:
   - TIA-222-G
   - AWS D1.1

3. Deflection: <2% at 60 MPH (26.8 m/s)

4. Material (or equivalent)
   - Pole: Q420B (ASTM A572 GR65)
   - Baseplate: Q345B (ASTM A572 GR50)
   - Splice Plates/ Flanges: Q345B (ASTM A572 GR50)

5. Anchor Bolts: (4X) M36x4 x 1000mm - GR 8.8
   - (3x) Nut (4x) Washer
   - Optional (1 1/2-6 x 39in Grade ASTM F1554 G55)
   - Hot Dip Galv. per ASTM F2329

6. Flange Bolts: (32X) M16x2 x 60mm - GR 8.8
   - (1X) Nut (2X)Washer
   - Optional (5/8-11 x 2.5in GR A325)
   - Hot Dip Galv. per ASTM F2329

7. Pole has 8 sides

8. Finish: Hot dip Galvanizing per ASTM A123

9. Pole Section Details

Pole Section	#1	#2	#3	#4
Thickness - (mm)/ (in)	0.197/ 5	0.197/ 5	0.197/ 5	0.197/ 5
Length - (m)/ (ft)	0.85/ 2.79	2.835/ 9.3	3.65/ 11.98	3.66/ 12
Top Dia. - (mm)/ (in)	270/ 10.63	234/ 9.2	188/ 7.4	142/ 5.6
Bottom Dia. - (mm)/ (in)	280/ 11	269/ 10.6	234/ 9.2	188/ 7.4
Min Slip - (mm)/ (in)		NA	NA	NA
Section Weight (kg)/ (lb)	153.5/ 338	149.5/ 329	110/ 242	107/ 235.4

CAD-generated drawing
do not manually update

ARE Telecom & Wind
1043 Grand Avenue, # 213
St. Paul, MN 55105 (651) 330-1263

Total Weight
Pole-572 kg (1258.5 lb)
AFS350-2568 lbs (1167 kg)
Does not include fasteners

MATERIAL See Notes
FINISH See Notes
DO NOT SCALE DRAWING

APPROVALS		DATE
DRAWN	MGC	9/16/20
CHECKED		
RESP ENG		
MFG ENG		
QUAL ENG		

12m 4SF AFS350 15t SJ

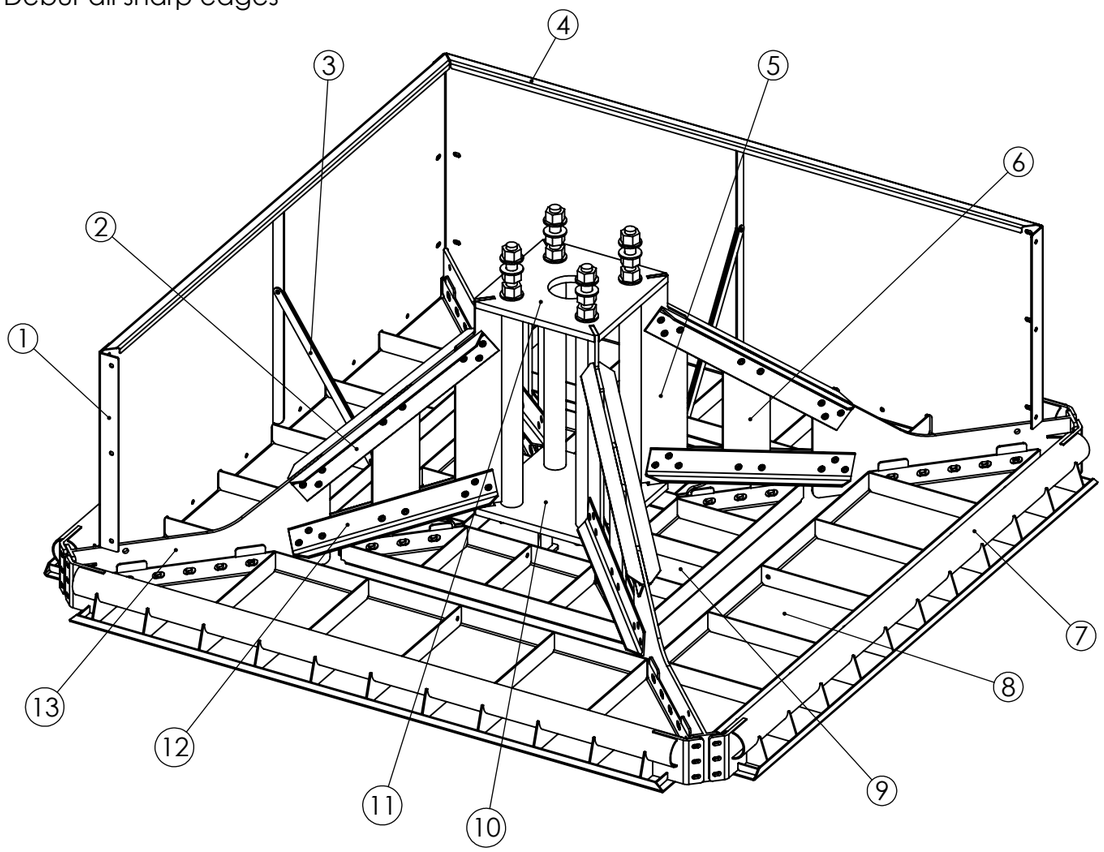
CAD file : AFS350 17_25m 3SF revA5
Details and dimensions not shown on this drawing can be found in CAD file.

scale NA | rev. A | size NA | sheet 1 of 3

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	initial release	9/16/20	MGC
B			

Notes:

1. All plate material shall shall have a minimum yield strength of 345 MPa (50 ksi)
2. Tube shall be 102mm x 5mm GR. Q345 (4.5" x 0.25" ASTM A500 Gr B)
3. All right angles shall be Q345 (ASTM A572 Gr 50) or equivalent
4. All welding shall conform to the minimum requirements of AWS D1.1
5. All welding shall be done by welders qualified under AWS specifications, using E80XX, low hydrogen electrodes
6. All components shall Hot Dip Galvanized in accordance with ASTM A123
7. Debur all sharp edges



AFS350 Bill of Materials

#	DESCRIPTION	QTY.	Weight (kg/ lbs)
1	Corner Bracket	4	2.5/ 5.5
2	Upper Chord	8	5.4/ 11.9
3	Brace	8	0.78/ 1.72
4	Sidewall	4	50.5/ 111.1
5	Anchor Spoke	4	27.3/ 60.1
6	Center Web	4	10.8/ 23.8
7	Outer Bearing Plate	4	58/ 127.6
8	Outer Ballast Tray	4	47/ 103.4
9	Inner Ballast Tray	4	18.3/ 40.3
10	Lower Splice Plate	1	47.11/ 103.6
11	Upper Splice Plate	1	37.7/ 83
12	Lower Chord	8	4.7/ 10.34
13	Truss Heel Plate	4	20.6/ 45.32

Ballast Requirements:

- Ballast Volume = 4.7 cu-m (6.1 cu-yds, 165 cu-ft)
- Unit Weight
  - cu-ft = 45.45 kg (100 lbs)
  - cu-yd = 1227.3 kg (2700 lbs)
  - cu-m = 1605.5 kg (3532 lbs)
- The foundation design is based upon an ultimate bearing pressure of 4000 pounds per square ft (PSF)

AFS350 Bolts, Nuts & Washers (other equivalent grades acceptable)

#	Unit	Bolt Size	Length	Width Across Flats	Thread Length	Grade	Coating	Nut Qty.	Washer Qty.	Bolt Qty.
14	Metric	M12x1.75	30mm	18mm	Full Thread	8.8	Hot Dip Galv.	56	112	56
14	Imperial	1/2-13	1 3/16"	7/8"	Full Thread	A325	Hot Dip Galv.	56	112	56
15	Metric	M12x1.75	60mm	18mm	Full Thread	8.8	Hot Dip Galv.	24	48	24
15	Imperial	1/2-13	2 3/8"	7/8"	Full Thread	A325	Hot Dip Galv.	24	48	24
16	Metric	M20x2.5	55mm	30mm	Full Thread	8.8	Hot Dip Galv.	72	144	72
16	Imperial	3/4-10	2 3/16"	1 1/8"	Full Thread	A325	Hot Dip Galv.	72	144	72
17	Metric	M36x2.5	1000mm	55mm	300mm	8.8	Hot Dip Galv.	12	16	4
17	Imperial	1 1/2-6	39"	2 3/16"	12"	A325	Hot Dip Galv.	12	16	4

CAD-generated drawing do not manually update

Does not include anchor bolts, templates or flange bolts

MATERIAL See Notes

FINISH See Notes

DO NOT SCALE DRAWING

APPROVALS		DATE
DRAWN	MGC	9/16/20
CHECKED		
RESP ENG		
MFG ENG		
QUAL ENG		

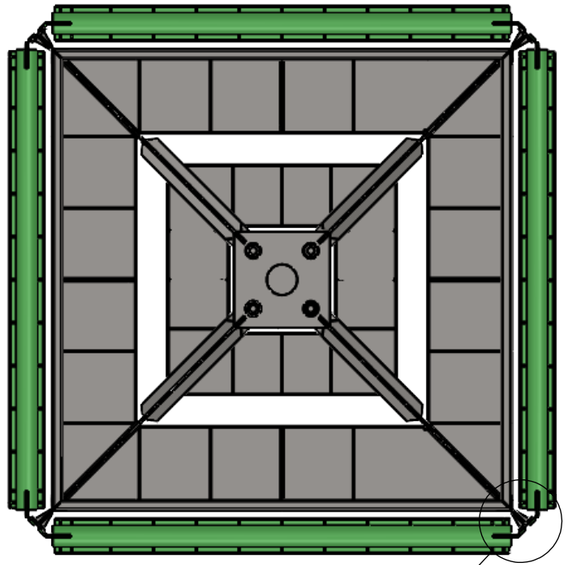
ARE Telecom & Wind
413 Wacouta St. Suite #440
St Paul, MN 55101 (651) 330 1263

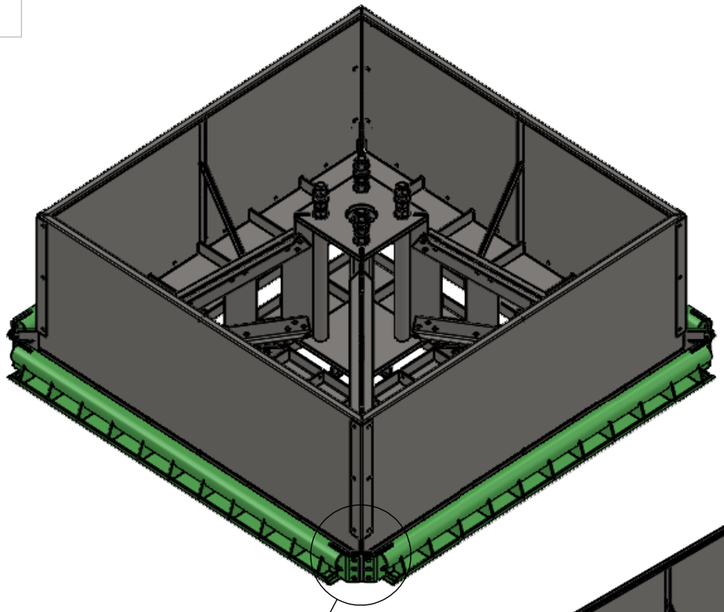
AFS350 BOM

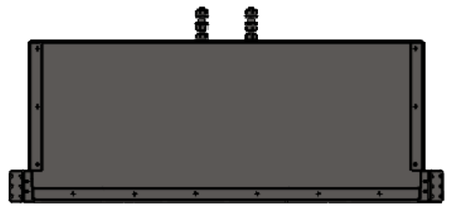
CAD file :

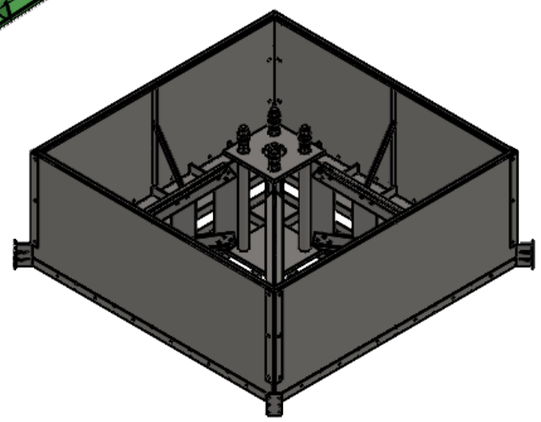
Details and dimensions not shown on this drawing can be found in CAD file

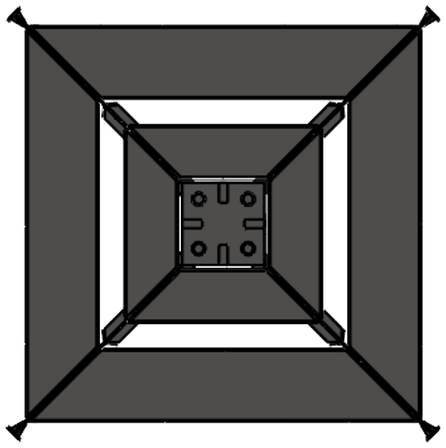
scale NA | rev. A | size NA |

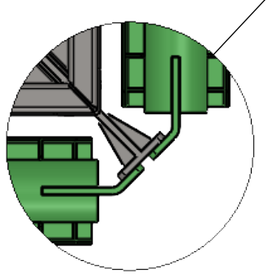












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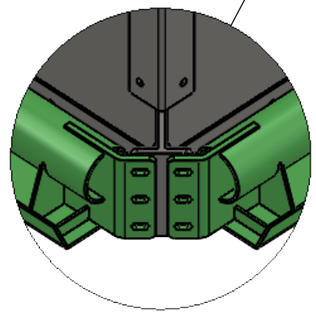

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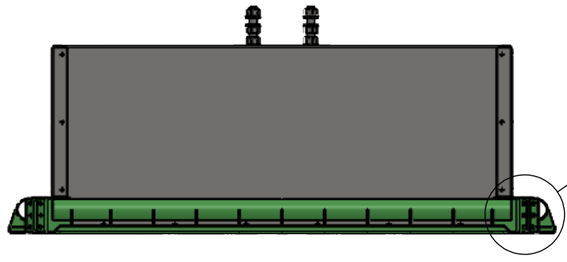

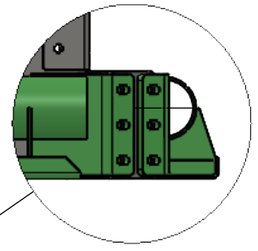

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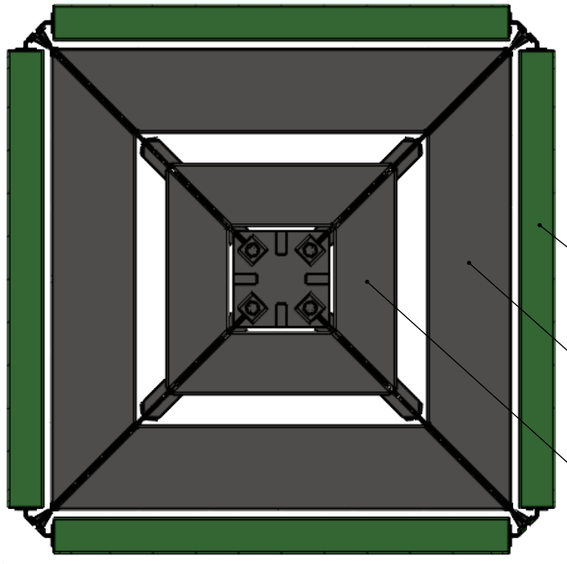

0.346 m^2
3.72 ft^2

0.710 m^2
7.639 ft^2

0.221m^2
2.38 ft^2

Total Surface Area
- 5.108 m^2
- 54.96 ft^2

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1043 Grand Avenue, # 213
St. Paul, MN 55105 (651) 330-1263

AFS350

Part #

scale NA | rev. A | size NA | sheet 3 of 3

PAUL J. FORD & COMPANY

Report Date: October 5, 2020

Client: ARE Telecom Incorporated
1043 Grand Ave #213
St. Paul, MN 55105
Attn: Dion Johnson
(651) 724-1322
djohnson@aretelecom.com

Structure: Proposed 12m (39.36-ft) Pole
Location: Lake Bathurst, New South Wales, Australia
Latitude, Longitude: -35.062513°, 149.644149°

PJF Project: A00020-0319.003.7205

Paul J. Ford and Company is pleased to submit this "**Structural Analysis Report**" to determine the tower stress level.

Proposed Appurtenance Loads:
The structure was analyzed with the proposed loading configuration shown in Table 1 of this report.

Summary of Analysis Results:
Proposed Structure: Pass – 45.4%
Proposed Foundation: Pass – 96.9%

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and ARE Telecom Incorporated. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Richard W. Hoffman, P.E.
Project Manager
rhoffman@pauljford.com

TABLE OF CONTENTS

1) INTRODUCTION

This structure is a 39.36 ft Monopole tower designed by ARE Wind and Telecom.

2) ANALYSIS CRITERIA

Pole Design Reference:	AS/NZS 1170
Importance Level:	2
Life:	50 years
Region:	A3
Ultimate ARI:	500 years
Ultimate VR:	45 m/s
Ice VR:	34 m/s
Serviceability VR:	37 m/s

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)	Note
37.7	37.7	4	Cambium	ePMP 2000 Smart Antenna	4	7/8	-
		4	tower mounts	3-ft Straight Arm Mounts			
31.2	31.2	2	Cambium	2-ft Standard Microwave Dish on Mount Pipe	2	CAT 5e	-

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
POLE AND FOUNDATION DRAWING	17.25m 3SF AFS350, Rev A5, 7/25/20	-	ARE TELECOM

3.1) Analysis Method

CheckPole (version 6.3.3), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

The pole flange plates, base plate and anchor rods were evaluated using ANSI/TIA-222-H, “Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures” methodology.

The foundation truss support arm was analyzed using RISA 3D, a commercially available analysis software package. The adequacy of the members making up the foundation truss support arm were checked using ANSI/AISC 360-16, “Specification for Structural Steel Buildings”.

3.2) Assumptions

1) Tower and structures have been properly maintained.
2) The configuration of antennas, mounts and other appurtenances are as specified in Table 1 and the referenced drawings.
3) For the purposes of this analysis, all coax is assumed to be run inside of the pole and thus shielded from the wind.

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 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	% Capacity	Pass / Fail
L1	39.36 - 22.296	Pole	TP9.833x7.876x0.1969	1	-	18.7	Pass
L2	22.296 - 3.4	Pole	TP12x9.833x0.1969	2	-	42.5	Pass
						Summary	
					Pole (L2)	42.5	Pass
					Rating =	42.5	Pass

Table 4 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Connection	22.3	38.6	Pass
1	Anchor Rods	3.4	45.4	Pass
1	Base Plate	3.4	34.3	Pass
1	Base Foundation Structural	0	78.6	Pass
1	Base Foundation Soil Interaction	0	96.9	Pass

Structure Rating (max from all components) =	96.9%

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

4.1) Recommendations

The pole and its foundation have sufficient capacity to carry the proposed load configuration. Install the pole and foundation as directed by ARE Telecom.

APPENDIX A

CHECKPOLE OUTPUT

----- MONOPOLE DATA -----

MATERIAL: STEEL
SHAPE: 8-SIDED
SEGMENTS: 3
SURFACE: GALVANIZED
TOTAL LENGTH: 12000 mm (TIP RL @ 12073 mm)
ELASTIC MODULUS: 200000 MPa
DENSITY: 7850 kg/m³
SHAFT MASS: 393 kg

SHAFT

ID	LENGTH	TOP ODAF	BASE ODAF	t	fy	TAPER	MASS	JOINT
01	5202 mm	200.1 mm	249.7 mm	5.0 mm	448 MPa	9.53 mm/m	149 kg	WELDED
02	5761 mm	249.7 mm	304.8 mm	5.0 mm	448 MPa	9.56 mm/m	204 kg	WELDED
03	1037 mm	304.8 mm	304.8 mm	5.0 mm	448 MPa	0.00 mm/m	40 kg	

< STRUCTURE BASE @ RL 0 mm (ABOVE GROUND) >

ACCESS

TYPE: NONE

CONNECTIONS

ANCHOR BOLTS

CONFIGURATION: CIRCULAR
DIAMETER: M36
QUANTITY: 4
PITCH CIRCLE DIAMETER: 400 mm
EMBEDMENT: 675 mm
YIELD STRESS (fya): 379 MPa
ULTIMATE STRESS (fua): 517 MPa

BASE PLATE

SHAPE: CIRCULAR
VOID: CIRCULAR
WELD: FILLET
WIDTH (Wp): 470 mm
VOID DIAMETER (dv): 200 mm
THICKNESS (tp): 35 mm
YIELD STRESS (fyp): 344 MPa (AS/NZS 3678 Table 9)
MASS: 37 kg

BACKING RING

CONFIGURATION: NONE

GUSSETS

CONFIGURATION: NONE

BEARING

TYPE: LEVELLING NUTS
GAP: 38 mm

----- SITE DATA -----

LOCATION

LATITUDE: -35.062500
LONGITUDE: 149.644100
ELEVATION: 818.00 m

DESIGN

REFERENCE: AS/NZS 1170
IMPORTANCE LEVEL: 2
LIFE: 50 YEARS

WIND

REGION: A3
ULTIMATE ARI: 500 YEARS

REGIONAL WIND SPEED (VR)

• Calculated as per AS/NZS 1170.2 Section 3.2.

ULTIMATE: 45 m/s
ICE: 34 m/s
SERVICEABILITY: 37 m/s

DIRECTION MULTIPLIER (Md)

• Calculated for Region A3 as per AS/NZS 1170.2 Section 3.3.

WIND	Md
N	0.85
NE	0.80
E	0.80
SE	0.80
S	0.80

SW 0.85
W 0.90
NW 1.00

TERRAIN/HEIGHT MULTIPLIER (Mz,cat)

• Calculated using averaging as per AS/NZS 1170.2 Section 4.2.3 and varies with height.

NORTH WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

NORTH EAST WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

EAST WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

SOUTH EAST WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

SOUTH WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

SOUTH WEST WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

WEST WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

NORTH WEST WIND: Mz,cat = 1.0207 (TC 2.00)

ZONE 1: TC 2 to 741.46 m

SHIELDING MULTIPLIER (Ms)

• Calculated as per AS/NZS 1170.2 Section 4.3 and varies with height.

NORTH WIND: Ms = 1.0

NORTH EAST WIND: Ms = 1.0

EAST WIND: Ms = 1.0

SOUTH EAST WIND: Ms = 1.0

SOUTH WIND: Ms = 1.0

SOUTH WEST WIND: Ms = 1.0

WEST WIND: Ms = 1.0

NORTH WEST WIND: Ms = 1.0

TOPOGRAPHIC MULTIPLIER (Mt)

• Calculated as per AS/NZS 1170.2 Section 4.4 and varies with height.

• Water Surface has been defined @ RL 0.00 m.

WIND	CRITICAL	TOPOGRAPHY	H	Lu	x	SHIELDING	Mh	Mt
N	NNE	Escarpment	139.00 m	614.29 m	25.00 m	-	1.1776 → 1.1684	1.1776 → 1.1684
NE	ENE	Ridge	138.00 m	330.00 m	0.00 m	-	1.3319 → 1.3013	1.3319 → 1.3013
E	ESE	Ridge	135.50 m	261.46 m	0.00 m	-	1.4113 → 1.3645	1.4113 → 1.3645
SE	ESE	Ridge	135.50 m	261.46 m	0.00 m	-	1.4113 → 1.3645	1.4113 → 1.3645
S	SSE	Ridge	131.00 m	491.67 m	-25.00 m	-	1.2040 → 1.1910	1.2040 → 1.1910
SW	WSW	Ridge	100.50 m	280.68 m	0.00 m	-	1.2842 → 1.2538	1.2842 → 1.2538
W	WSW	Ridge	100.50 m	280.68 m	0.00 m	-	1.2842 → 1.2538	1.2842 → 1.2538
NW	WNW	Ridge	87.00 m	300.00 m	25.00 m	-	1.2168 → 1.1950	1.2168 → 1.1950

ICE

REGION: N/A

----- SHAFT DRAG -----

• Monopole Shaft Drag Factor (Cd) has been calculated as per AS/NZS 1170.2 Table E4.

----- AREA LOADS -----

LOAD A01: ePMP 2000 Smart Antenna on 3-ft (0.91m) Straight Arm Mount

CL RL: 11.50 m
MASS: 29.6 kg
OFFSET: 914 mm @ 0°

WIND	EPA	Wu	Ws
N	0.24 m²	0.30 kN	0.20 kN
NE	0.24 m²	0.33 kN	0.22 kN
E	0.24 m²	0.36 kN	0.24 kN

SE	0.24 m²	0.36 kN	0.24 kN
S	0.24 m²	0.27 kN	0.18 kN
SW	0.24 m²	0.34 kN	0.23 kN
W	0.24 m²	0.38 kN	0.26 kN
NW	0.24 m²	0.43 kN	0.29 kN

LOAD A02: ePMP 2000 Smart Antenna on 3-ft (0.91m) Straight Arm Mount

CL RL: 11.50 m
MASS: 29.6 kg
OFFSET: 914 mm @ 90°

WIND	EPA	Wu	Ws
N	0.24 m²	0.30 kN	0.20 kN
NE	0.24 m²	0.33 kN	0.22 kN
E	0.24 m²	0.36 kN	0.24 kN
SE	0.24 m²	0.36 kN	0.24 kN
S	0.24 m²	0.27 kN	0.18 kN
SW	0.24 m²	0.34 kN	0.23 kN
W	0.24 m²	0.38 kN	0.26 kN
NW	0.24 m²	0.43 kN	0.29 kN

LOAD A03: ePMP 2000 Smart Antenna on 3-ft (0.91m) Straight Arm Mount

CL RL: 11.50 m
MASS: 29.6 kg
OFFSET: 914 mm @ 180°

WIND	EPA	Wu	Ws
N	0.24 m²	0.30 kN	0.20 kN
NE	0.24 m²	0.33 kN	0.22 kN
E	0.24 m²	0.36 kN	0.24 kN
SE	0.24 m²	0.36 kN	0.24 kN
S	0.24 m²	0.27 kN	0.18 kN
SW	0.24 m²	0.34 kN	0.23 kN
W	0.24 m²	0.38 kN	0.26 kN
NW	0.24 m²	0.43 kN	0.29 kN

LOAD A04: ePMP 2000 Smart Antenna on 3-ft (0.91m) Straight Arm Mount

CL RL: 11.50 m
MASS: 29.6 kg
OFFSET: 914 mm @ 270°

WIND	EPA	Wu	Ws
N	0.24 m²	0.30 kN	0.20 kN
NE	0.24 m²	0.33 kN	0.22 kN
E	0.24 m²	0.36 kN	0.24 kN
SE	0.24 m²	0.36 kN	0.24 kN
S	0.24 m²	0.27 kN	0.18 kN
SW	0.24 m²	0.34 kN	0.23 kN
W	0.24 m²	0.38 kN	0.26 kN
NW	0.24 m²	0.43 kN	0.29 kN

LOAD A05: 2-ft Standard MW on Mount Pipe

CL RL: 9.50 m
MASS: 36.0 kg
OFFSET: 153 mm @ 0°

WIND	EPA	Wu	Ws
N	0.77 m²	0.91 kN	0.61 kN
NE	0.77 m²	1.01 kN	0.68 kN
E	0.77 m²	1.11 kN	0.75 kN
SE	0.77 m²	1.11 kN	0.75 kN
S	0.77 m²	0.84 kN	0.57 kN
SW	0.77 m²	1.05 kN	0.71 kN
W	0.77 m²	1.18 kN	0.80 kN
NW	0.77 m²	1.32 kN	0.89 kN

LOAD A06: 2-ft Standard MW on Mount Pipe

CL RL: 9.50 m
MASS: 36.0 kg
OFFSET: 153 mm @ 180°

WIND	EPA	Wu	Ws
N	0.77 m²	0.91 kN	0.61 kN
NE	0.77 m²	1.01 kN	0.68 kN
E	0.77 m²	1.11 kN	0.75 kN
SE	0.77 m²	1.11 kN	0.75 kN
S	0.77 m²	0.84 kN	0.57 kN
SW	0.77 m²	1.05 kN	0.71 kN
W	0.77 m²	1.18 kN	0.80 kN
NW	0.77 m²	1.32 kN	0.89 kN

----- ANALYSIS ----------

- Elastic Critical Buckling Load (Ncr) is 147.12 kN.
- Minimum First Mode Natural Frequency (n1) is 1.4539 Hz for 1.2 G + Wu.
- Maximum Ultimate Moment (M*) is 84.85 kNm @ RL 73 mm under North West Wind for 1.2 G + Wu.
- Maximum Ultimate Torsion (T*) is 0.00 kNm.

• Maximum Ultimate Shear (V*) is 11.13 kN @ RL 73 mm under North West Wind for 1.2 G + Wu.

• Maximum Ultimate Axial (N*) is 6.87 kN @ RL 73 mm under North Wind for 1.2 G + Wu.

• Maximum Serviceability Rotation (θ*) is 1.6504° @ RL 12073 mm under North West Wind for G + Ws.

• Maximum Serviceability Deflection (δ*) is 0.2322 m @ RL 12073 mm under North West Wind for G + Ws.

• Ratio of attachment area to shaft area in top third exceeds 10% (315.78%), such that cross-wind response can be ignored as per CSA S37 Annex N.2.1.

----- SHAFT DESIGN (AS/NZS 4600) -----

• Monopole PASSES with a critical utilisation of [49.20%] @ RL 73 mm under North West Wind for 1.2 G + Wu.

----- CONNECTION DESIGN (AS 4100) -----

• Anchor Bolts PASS with a critical utilisation of [63.11%] @ 45° under North West Wind for 1.2 G + Wu.

• Base Plate FAILS under the following conditions:

LOAD CASE 01: 1.2 G + Wu

WIND	ANGLE	FACE	BOLT M*	EFF. WIDTH	STRESS	UTILISATION
W	45°	02	9.08 kNm	95.2 mm	311.57 MPa	[100.64%]
NW	45°	02	10.15 kNm	95.2 mm	348.20 MPa	[112.47%]

LOAD CASE 02: 0.9 G + Wu

WIND	ANGLE	FACE	BOLT M*	EFF. WIDTH	STRESS	UTILISATION
W	45°	02	9.03 kNm	95.2 mm	309.79 MPa	[100.06%]
NW	45°	02	10.10 kNm	95.2 mm	346.30 MPa	[111.86%]

----- FATIGUE DESIGN (LRFD LTS-1) -----

MEAN WIND SPEED: 4.2 m/s

• Based on measurements recorded 29.37 km away (-34.8085, 149.7311) at Goulburn Airport AWS (070330) between 1990-2019 and sourced from BOM.

• AASHTO LRFD LTS-1 Section 11.7.2 does not require monopoles shorter than 55 ft (16.76 m) to be designed for fatigue, such that these results are informative only.

• Infinite Life criteria not met under the following conditions:

LOAD CASE 04: Wf

NORTH WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

NORTH EAST WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

EAST WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

SOUTH EAST WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

SOUTH WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

SOUTH WEST WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

WEST WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

NORTH WEST WIND

RL	MOMENT	DETAIL	DESCRIPTION	STRESS	INFINITE LIMIT	FINITE LIFE	UTILISATION
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
1110 mm	12.35 kNm	DETAIL 4.3	WELDED JOINT	31.89 MPa	31 MPa	263.99 years	[102.87%]
73 mm	14.28 kNm	DETAIL 5.4	FILLET WELDED PLATE	36.88 MPa	18 MPa (Ki = 7.33)	60.53 years (Kf = 3.50)	[204.89%]

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APPENDIX B

ADDITIONAL CALCULATIONS

Monopole Flange Plate Connection

Elevation = 18.896 ft.

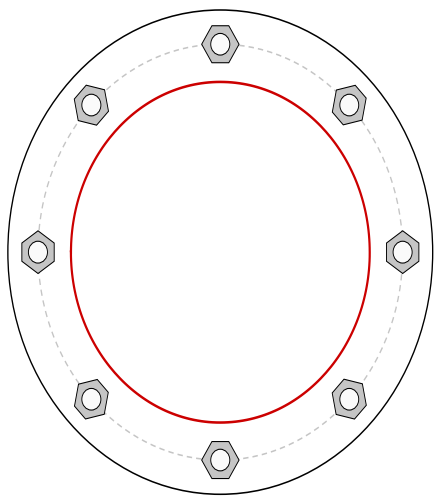
BU #	
Site Name	
Order #	

TIA-222 Revision	H

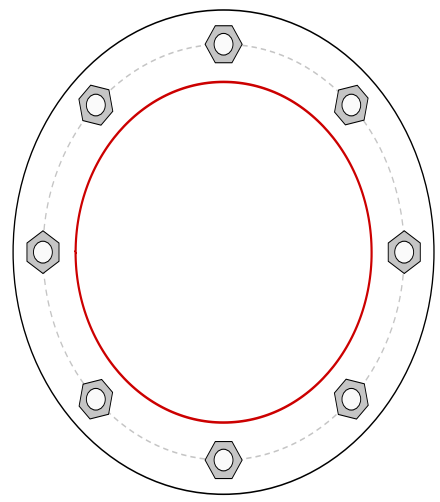
Applied Loads	
Moment (kip-ft)	16.71
Axial Force (kips)	0.90
Shear Force (kips)	1.71

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(8) 5/8" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 12" BC

Top Plate Data

13.976" OD x 0.63" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Top Pole Data

9.833" x 0.1969" 8-sided pole (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

13.976" OD x 0.63" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

9.833" x 0.1969" 8-sided pole (A572-50; Fy=50 ksi, Fu=65 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	8.23	
Allowable (kips)	20.34	
Stress Rating:	**38.6%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	14.37	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**30.4%**	**Pass**
Tension Side Stress Rating:	**14.8%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	14.37	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**30.4%**	**Pass**
Tension Side Stress Rating:	**14.8%**	**Pass**

Analysis Date: 10/2/2020

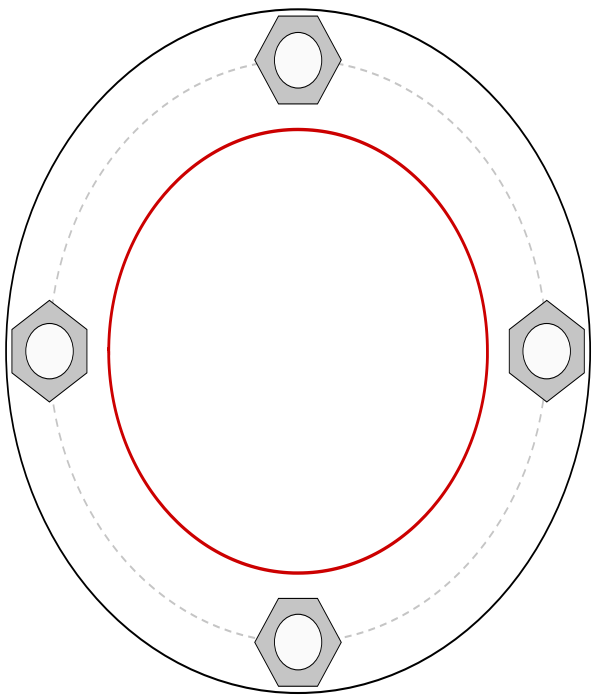
Monopole Base Plate Connection

Site Info	
BU #	
Site Name	
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.5

Applied Loads	
Moment (kip-ft)	54.40
Axial Force (kips)	1.44
Shear Force (kips)	2.36

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(4) 1-1/2" ø bolts (F1554-55 N; Fy=55 ksi, Fu=75 ksi) on 15.75" BC

Base Plate Data

18.5" OD x 1.375" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

12" x 0.1969" 8-sided pole (A572-50; Fy=50 ksi, Fu=65 ksi)

Analysis Results

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

Pu_c = 41.66	ϕPn_c = 87.47	**Stress Rating**
Vu = 0.59	ϕVn = 39.36	**45.4%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	16.2	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**34.3%**	**Pass**

Analysis Date: 10/2/2020

FOUNDATION BEARING AND OVERTURNING CHECK

Pole Base Reactions and Height

Pole base moment, Mu	56.9	ft-k	77.1	kNm
Pole axial load, Pu	1.475	k	6.561	kN
Pole shear load, Vu	2.419	k	10.760	kN
Base of pole ht	3.4	ft		
OTM at base of fdn	65.1	ft-k	88.3	kNm

Foundation Information

Foundation wall height	36	in
Foundation base width	88.86	in
Gap between Inner and Outer Base Frames	6	in
Extension tray width	6.21	in
Extension tray length	88.86	in
Ballast depth	36	in
Ballast volume	161.5	cu ft
Ballast unit wt	100	pcf
Total ballast wt	16.2	kips
Foundation steel wt	1980	lbs
Foundation ext. tray weigth	510	lbs
Fdn tot wt	2.49	kips
Factored pole, fdn and ballast weight, 0.9D	17.88	kips
e	3.642	ft
0.5 fdn w + tray d	4.220	ft
Overturning?	STABLE	

Check Foundation Bearing

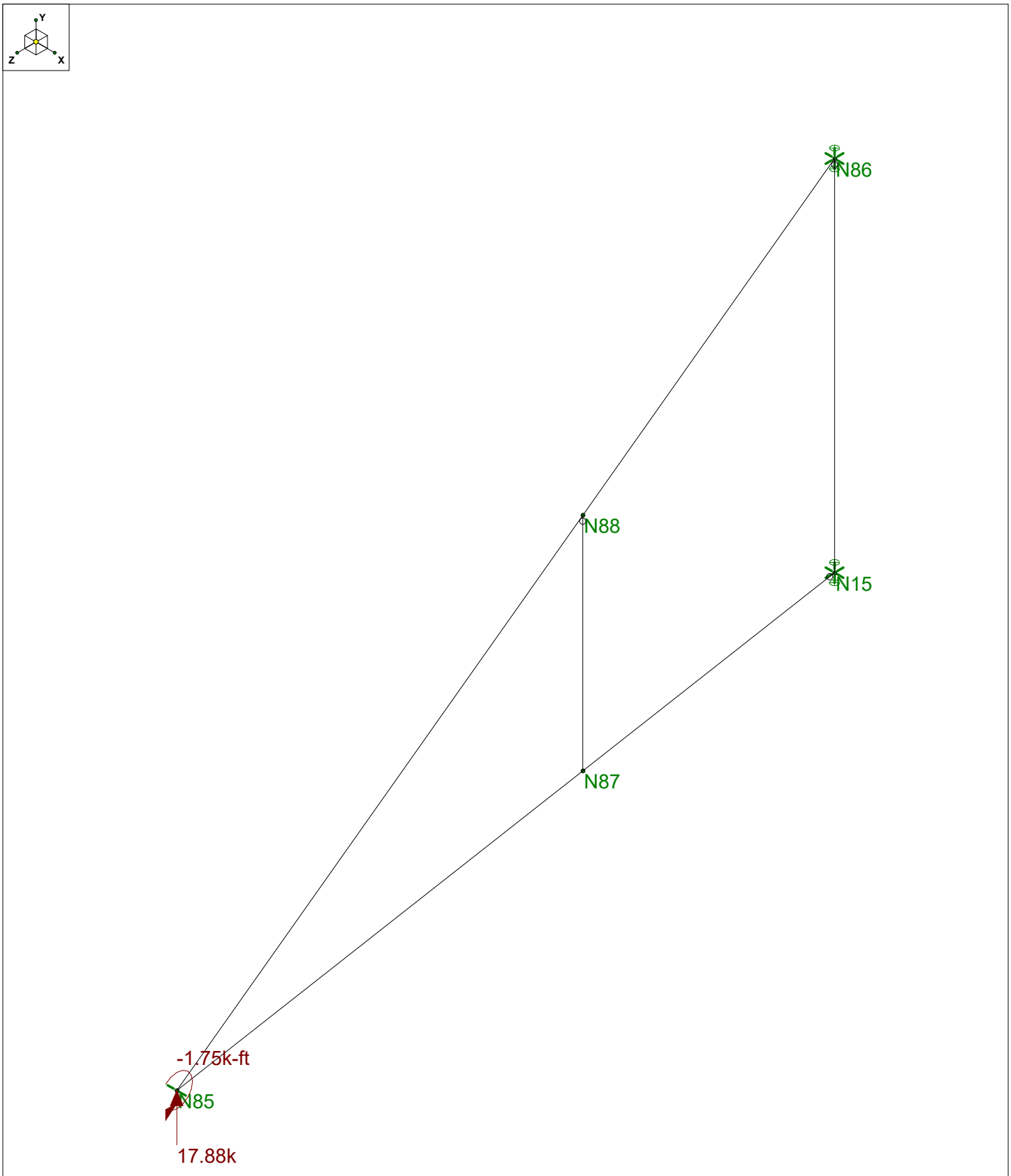
phi	0.5			
Ultimate bearing pressure	4	ksf	191.2	kPa

Wind into the Side

Bearing area	9.22	sq ft		
Ultimate bearing pressure	1.94	ksf	92.7	kPa
Factored nominal bearing capacity	2	ksf	95.6	kPa
% capacity	96.9%	OK		

Wind into the Corner

Bearing area	11.4	sq ft		
Ultimate bearing pressure	1.57	ksf	74.9	kPa
Factored nominal bearing capacity	2	ksf	95.6	kPa
% capacity	78.4%	OK		



Loads: BLC 1, BLC1

Paul J. Ford and Company	Lake Bathurst	SK - 1
		Oct 5, 2020 at 9:38 AM
A00020-0319.003.7205		A00020-0319.003 - ARE Ballast Fo...

(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 (mm^2)	92903.412
Merge Tolerance (mm)	3.048
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 (mm/sec^2)	9814.58
Wall Mesh Size (mm)	304.801
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 13th(360-05): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (mm)	101.6
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 (mm)	Not Entered
Add Base Weight?	Yes
Ct X	.049
Ct Z	.049
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

Joint Loads and Enforced Displacements (BLC 1 : BLC1)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/...
1	N85	L	Y	17.88
2	N85	L	Mx	-1.75
3	N87	L	Y	0

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	p1	N15	N86			CH PIPE76X18	None	None	Q345-B	Typical
2	LL1	N86	N85			LL_100X63X6X0	None	None	Q235-B	Typical
3	LL2	N15	N85		180	LL_100X63X6X0	None	None	Q235-B	Typical
4	PL1	N87	N88		90	PL 12 x 345	None	None	Q235-B	Typical

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	58	1.2
7	Q235-B	29000	11154	.3	.65	.49	34	1.5	58	1.2
8	Q345-B	29000	11154	.3	.65	.49	50	1.5	65	1.2

Member Section Forces

	LC	Member Label	Sec	Axial[k]	y Shear[k]	z Shear[k]	Torque[k-ft]	y-y Moment[k-ft]	z-z Moment[k-ft]
1	1	p1	1	0	0	-.094	0	0	0
2			2	0	0	-.094	0	-.044	0
3			3	0	0	-.094	0	-.088	0
4			4	0	0	-.094	0	-.133	0
5			5	0	0	-.094	0	-.177	0
6	1	LL1	1	41.289	.424	0	0	0	-.177
7			2	41.289	.424	0	0	0	-.632
8			3	38.977	.143	0	0	0	-.945
9			4	38.977	.143	0	0	0	-1.099
10			5	38.977	.143	0	0	0	-1.253
11	1	LL2	1	-34.198	.05	0	0	0	0
12			2	-34.198	.05	0	0	0	-.044
13			3	-32.025	.808	0	0	0	1.921
14			4	-32.025	.808	0	0	0	1.209
15			5	-32.025	.808	0	0	0	.497
16	1	PL1	1	1.193	-1.99	0	0	0	-2.322
17			2	1.193	-1.99	0	0	0	-1.741
18			3	1.193	-1.99	0	0	0	-1.161
19			4	1.193	-1.99	0	0	0	-.58
20			5	1.193	-1.99	0	0	0	0

Member AISC 13th(360-05): LRFD Steel Code Checks

	LC	Member	Shape	UC Max	Loc[m...	Shear ...	Loc[m...	Dir	phi*Pnc[k]	phi*Pnt[k]	phi*Mn...	phi*Mn...	Cb	Eqn
1	1	p1	CH_PIPE7...	.012	576.2...	.001	0		217.03	228.767	14.301	14.301	1	H1-1b
2	1	LL1	LL_100X6...	.769	1306....	.012	0	y	63.071	91.208	3.985	7.355	1.294	H1-1a
3	1	LL2	LL_100X6...	.786	414.1...	.024	414.1...	y	65.085	91.208	3.985	4.597	1.646	H1-1a
4	1	PL1	PL 12 x 345	.048	0	.025	0	y	94.081	196.36	1.933	55.568	1.667	H1-1b

APPENDIX C

POLE AND FOUNDATION DRAWING

NEW 39.36' (12 M) MONOPOLE

LAKE BATHURST, NEW SOUTH WALES, AUSTRALIA

LAT: -35° 3' 45.00"; LONG: 149° 38' 38.76"

PJF PAUL J. FORD & COMPANY
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Phone 614.221.6679
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ARE TELECOM INCORPORATED
1043 GRAND AVE #213 ST. PAUL, MN 55105
(651) 724-1322

PROJECT CONTACTS

STRUCTURE OWNER:
ARE TELECOM INCORPORATED
CONTACT: DION JOHNSON AT DJOHNSON@ARETELECOM.COM
PH: (651) 724-1322

ENGINEER OF RECORD:
PJFTELECOM@PAULJFORD.COM

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
N-1	GENERAL NOTES
S-1	NEW MONOPOLE PROFILE
S-2	FLANGE DETAILS
S-3	DIRECT EMBED DETAILS

TOWER MANUFACTURER: ARE TELECOM
TOWER MANUFACTURER PROJECT #: 1525

WIND DESIGN DATA	
REFERENCE STANDARD	AS/NZS 1170
IMPORTANCE LEVEL	2
LIFE	50 YEARS
REGION	A3
ULTIMATE ARI	500 YEARS
ULTIMATE VR	45 m/s
ICE VR	34 m/s
SERVICEABILITY VR	37 m/s

PRESUMPTIVE SOIL PARAMETERS	
NET ULTIMATE BEARING (PSF)	4000 (191.2 kPa)
SOIL DENSITY (PCF)	100
FRICTION ANGLE (°)	30
GROUNDWATER TABLE	BELOW FOUNDATION

FACTORED BASE REACTIONS	
SHEAR (KIPS)	2.42 (10.76 kN)
AXIAL (KIPS)	1.48 (6.57 kN)
MOMENT (KIP-FT)	56.9 (77.14 kNm)

REV	DATE	DESCRIPTION

LAKE BATHURST, NEW SOUTH WALES, AUSTRALIA
NEW 39.36' (12 M) MONOPOLE

PROJECT No:	A00020-0333.004.7205
DRAWN BY:	TAN
DESIGNED BY:	RWH
CHECKED BY:	TJD
DATE:	10/1/2020

TITLE SHEET

T-1

V1.0 00020-0319.003.DWG

GENERAL NOTES:

1. ALL INFORMATION SHOWN IS TO BE COORDINATED BY THE CONTRACTOR AND OWNER. IF INFORMATION IS CONFLICTING, THE STRICTER PROVISION SHALL GOVERN. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF ARE TELECOM AND PAUL J. FORD AND COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.

2. DO NOT SCALE DRAWINGS.

3. FIELD WELDING IS NOT PERMITTED UNLESS APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.

4. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES, WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.

5. THE STRUCTURAL INTEGRITY OF THE DESIGN EXTENDS TO THE COMPLETE CONDITION ONLY. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.

6. AERIAL AND UNDERGROUND UTILITIES AND FACILITIES MAY OR MAY NOT BE SHOWN ON THE DRAWINGS. THE GC SHALL TAKE EVERY PRECAUTION TO PRESERVE AND PROTECT THESE ITEMS, WHICH MAY INCLUDE AERIAL OR UNDERGROUND POWER LINES, TELEPHONE LINES, WATER LINES, SEWER LINES, CABLE TELEVISION FACILITIES, PIPELINES, STRUCTURES AND OTHER PUBLIC AND PRIVATE IMPROVEMENTS WITHIN OR ADJACENT TO THE WORK AREA. THE RESPONSIBILITY FOR DETERMINING THE ACTUAL ON-SITE LOCATION OF THESE ITEMS SHALL REST EXCLUSIVELY WITH THE GC.

STEEL NOTES

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", ANSI/AISC 360 AND TO THE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", ANSI/AISC 303.

2. ALL REQUIRED ITEMS SHALL BE FABRICATED PER THE MATERIALS SPECIFIED BELOW, UNO ON THE DETAIL DRAWING SHEETS. IF THE FABRICATOR FINDS FOR ANY COMPONENT THAT THE MATERIALS HAVE NOT BEEN CLEARLY SPECIFIED, THE FABRICATOR SHALL SUBMIT AN RFI TO THE EOR TO CONFIRM THE REQUIRED MATERIAL.

   ALL STRUCTURAL ELEMENTS SHALL BE NEW AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, UNO:

POLE SHAFT STEEL:	ASTM A572 GRADE 65 (FY = 65 KSI)
BASE PLATE STEEL:	ASTM A572 GRADE 50 (FY = 50 KSI)
ANCHOR RODS:	ASTM F1554 GRADE 55 (FY = 55 KSI)
FLANGE PLATES:	ASTM A572 GRADE 50 (FY = 50 KSI)
BOLTS:	ASTM A325X
PLATE:	ASTM A572 GRADE 50 (FY = 50 KSI)
PIPES:	ASTM A500 GRADE 42 (FY = 42 KSI)
HSS:	ASTM A500 GRADE 46 (FY = 46 KSI)
ALL OTHER STEEL SHAPES:	ASTM A572 GRADE 50 (FY = 50 KSI)
WELDING ELECTRODES:	E80XX / E8XT-XX

3. ALL WELD DESIGN, WELD DETAILING AND WELDING SHALL CONFORM TO THE LATEST EDITION OF AWS D1.1

4. AFTER FABRICATION, HOT-DIP GALVANIZE ALL STEEL ITEMS, UNO. GALVANIZE PER ASTM A123, ASTM A153/A153M, OR ASTM A653 G90, AS APPLICABLE. ASTM A490 BOLTS SHALL NOT BE HOT-DIP GALVANIZED BUT SHALL INSTEAD BE COATED WITH MAGNI 565 OR EOR APPROVED EQUIVALENT, PER ASTM F2833.

5. ALL COMPLETE JOINT PENETRATION GROOVE WELDS CONTAINED IN JOINTS AND SPLICES SHALL BE TESTED 100 PERCENT BY ULTRASONIC TESTING PRIOR TO AND AFTER GALVANIZING.

6. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY ABRASIONS, CUTS, FIELD DRILLING, AND FIELD WELDING SHALL BE TOUCHED UP WITH TWO COATS OF ZRC-BRAND (OR APPROVED EQUIVALENT) ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3 MILS; DRY 1.5 MILS APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.

ERECTION NOTES:

1. ALL CONSTRUCTION MEANS AND METHODS, INCLUDING BUT NOT LIMITED TO ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS, SHALL BE THE RESPONSIBILITY OF THE GC RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION), INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

2. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE, FOUNDATION AND ITS COMPONENT PARTS DURING INSTALLATION.

3. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED, UNO. CONFLICTING NOTES SHALL BE BROUGHT TO THE ATTENTION OF THE EOR AND THE OWNER'S POC.

4. ALL JOINTS USING ASTM A325 OR A490 BOLTS, U-BOLTS, V-BOLTS, THREADED RODS, AND ANCHOR RODS SHALL BE SNUG TIGHTENED, UNO.

5. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED SNUG TIGHTENED ASTM A325 OR A490 BOLTS, U-BOLTS, V-BOLTS, THREADED RODS, AND ANCHOR RODS.

6. ALL JOINTS ARE BEARING TYPE CONNECTIONS UNO. IF NO BOLT LENGTH IS GIVEN IN THE BILL OF MATERIALS, THE CONNECTION MAY INCLUDE THREADS IN THE SHEAR PLANES, AND THE GC IS RESPONSIBLE FOR SIZING THE LENGTH OF THE BOLT.

7. ALL PROPOSED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.

8. IF ASTM A325 OR A490 BOLTS, AND/OR THREADED RODS ARE SPECIFIED TO BE PRE-TENSIONED, THESE SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE RCSC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS.

GEOTECHNICAL AND SOIL NOTES:

1. THIS FOUNDATION DESIGN WAS BASED ON THE SOIL PARAMETERS LISTED ON SHEET T-1. A GEOTECHNICAL REPORT WAS NOT PROVIDED FOR THE SITE. THEREFORE, THE FOUNDATION DESIGN IS BASED UPON AN ASSUMED BEARING PRESSURE. THE PREPARED SUBGRADE (FOUNDATION BEARING SURFACE) SHALL HAVE A MINIMUM ULTIMATE BEARING PRESSURE AS NOTES ON SHEET T-1.

2. THE MATERIAL BELOW THE FOUNDATION SHALL BE VERIFIED BY A GEOTECHNICAL ENGINEER TO ACHIEVE ADEQUATE DESIGN CAPACITY. IF THE SOIL CONDITIONS DO NOT MEET THE PRESUMPTIVE SOIL PARAMETERS, PAUL J. FORD AND COMPANY SHALL BE CONTACTED IMMEDIATELY TO DETERMINE THE SIGNIFICANCE IN DEVIATION.

GENERAL FOUNDATION NOTES:

1. THE FOUNDATION DESIGN HAS BEEN DEVELOPED IN ACCORDANCE WITH GENERALLY ACCEPTED PROFESSIONAL ENGINEERING PRINCIPLES AND PRACTICES.

2. WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS. THE FOUNDATION CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE LOCAL BUILDING OFFICIALS FOR ANY INSPECTIONS THAT MAY BE REQUIRED.

3. THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED ON THESE DRAWINGS. BY ACCEPTANCE OF THIS PROJECT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED TO DO THIS WORK IN THE JURISDICTION IN WHICH THE WORK IS TO BE PERFORMED.

4. CONTRACTOR SHALL REFER TO AMERICAN RESOURCE & ENERGY (ARE) ASSEMBLY AND INSTALLATION INSTRUCTIONS FOR THE FOUNDATION SYSTEM BEING INSTALLED AT THE SITE.

5. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.

6. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. REFER TO THE ARE ASSEMBLY AND INSTALLATION INSTRUCTIONS (SEE NOTE 4).

7. BACKFILL / BALLAST MATERIAL SHALL HAVE A MINIMUM UNIT WEIGHT OF 100 POUNDS PER CUBIC FOOT (PCF).

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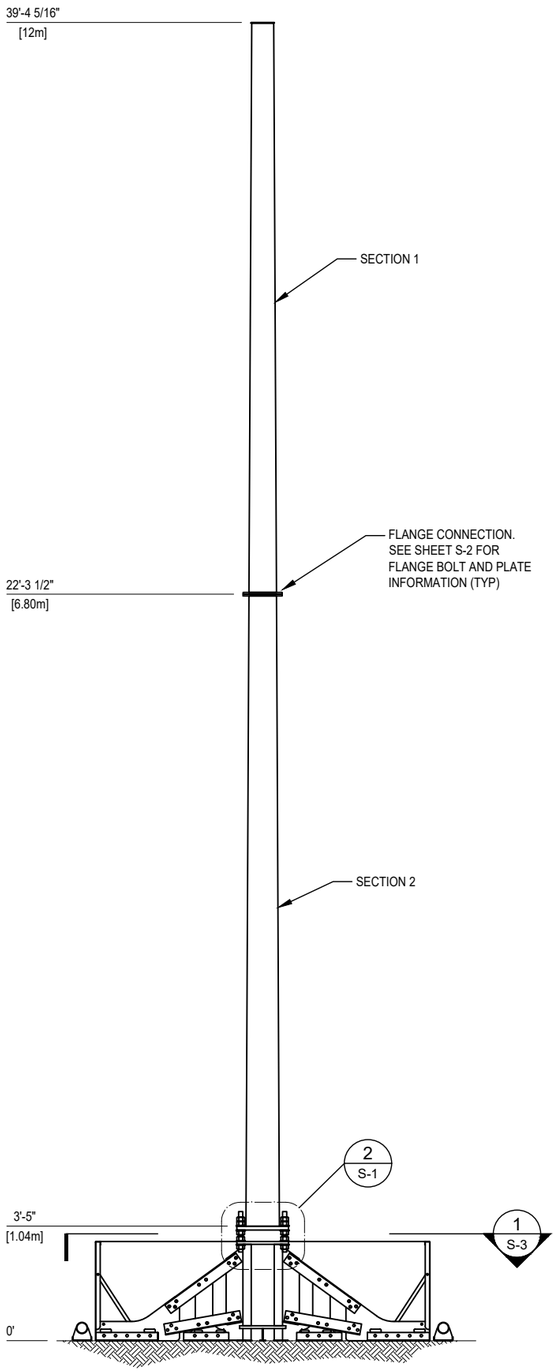
PROJECT No:	A00020-0333.004.7205
DRAWN BY:	TAN
DESIGNED BY:	RWH
CHECKED BY:	TJD
DATE:	10/1/2020

GENERAL NOTES

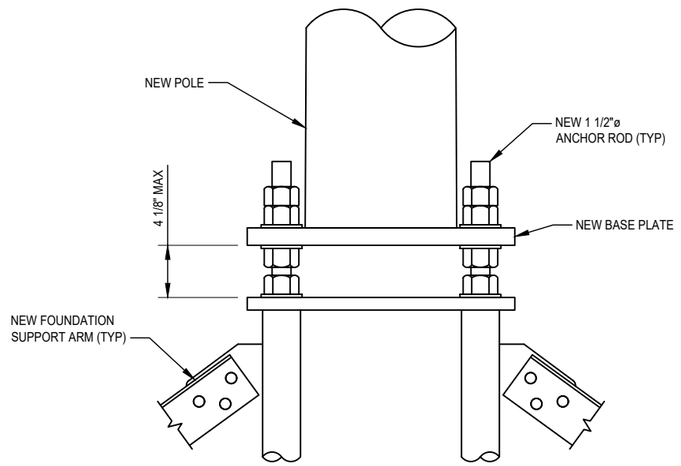
N-1

REV	DATE	DESCRIPTION

V1.0 00020-0319.003.DWG



POLE ELEVATION 1 / S-1



POLE TO FOUNDATION CONNECTION 2 / S-1

MANUFACTURER POLE SPECIFICATIONS

TAPER	0.114666 IN/FT
BASE PLATE STEEL	ASTM A572, GR 50
ANCHOR RODS	ASTM F1554, GR 55
FLANGE BOLTS	ASTM A325

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT / m)	POLE SHAFT THICKNESS (IN / mm)	LAP SPLICE (FT)	DIAMETER ACROSS FLATS (IN / mm)		POLE GRADE (KSI)	FLANGE PLATE GRADE (KSI)	POLE SHAPE
				@ TOP	@ BOTTOM			
1	17.064 (5.20)	0.1969 (5)	-	7.876 (200.1)	9.833 (249.7)	65	50	8-SIDED
2	18.898 (5.79)	0.1969 (5)	-	9.833 (249.7)	12.000 (305)	65	50	8-SIDED

NOTE: SHAFT END DIAMETERS AND OVERALL LENGTH ARE TO THE CENTER OF SPLICE AND HAVE NOT BEEN ADJUSTED TO ACCOUNT FOR FLANGE THICKNESS

ANTENNA LIST

ELEV	QTY	ANTENNA	COAX
37.7'	4	ePMP 2000 SMART ANTENNA	(4) 7/8"
	4	3-FT STRAIGHT ARM MOUNTS	
31.2'	2	2-FT STANDARD MW DISH ON MOUNT PIPE	(2) CAT 5E

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MONOPOLE PROFILE

S-1

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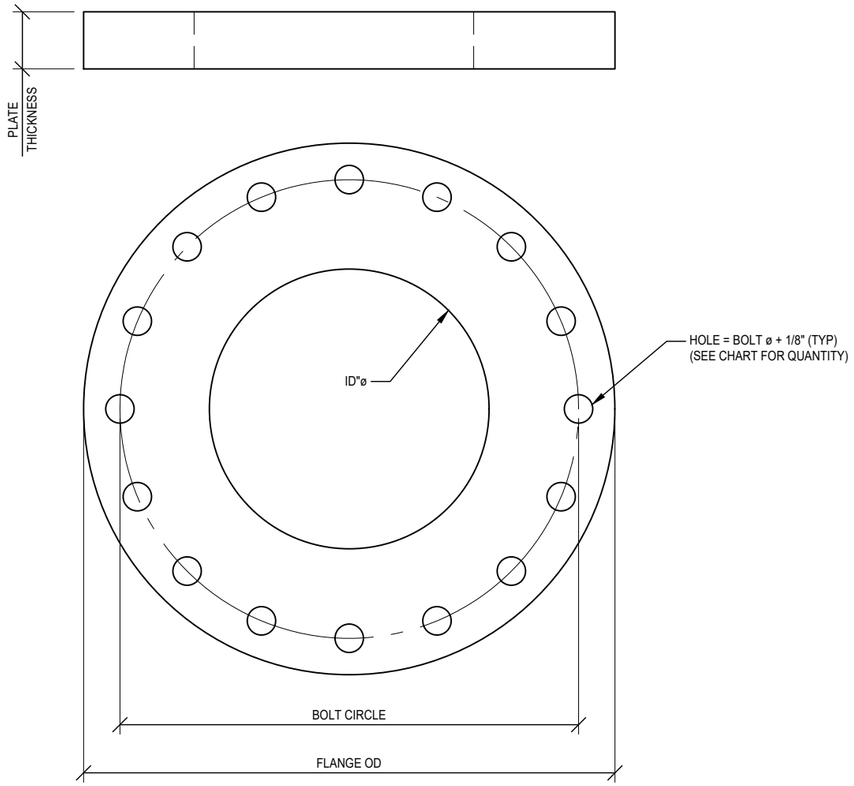
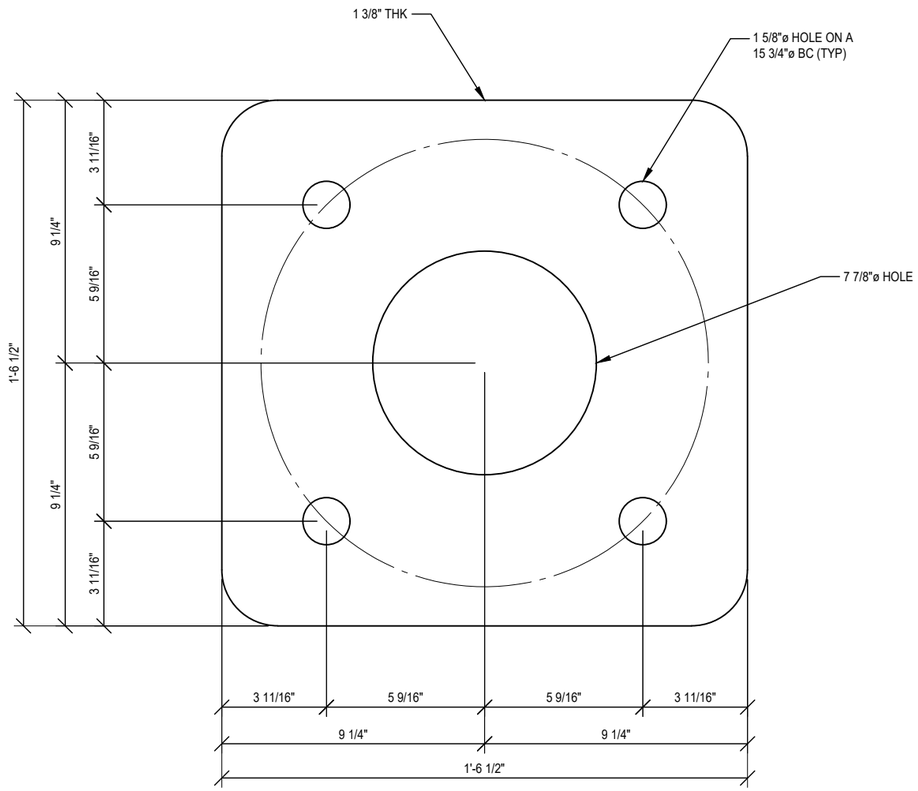


FLANGE PLATE DETAIL



BASE PLATE DETAIL

FLANGE PLATE CHART						
ELEVATION	PLATE			BOLT DATA		
	OD (in)	ID (in)	THICKNESS (in)	QTY	DIAMETER (in)	BOLT CIRCLE (in)
22'-3 1/2"	13.97	7.480	0.630	8	0.625	12.008

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FLANGE DETAILS

S-2

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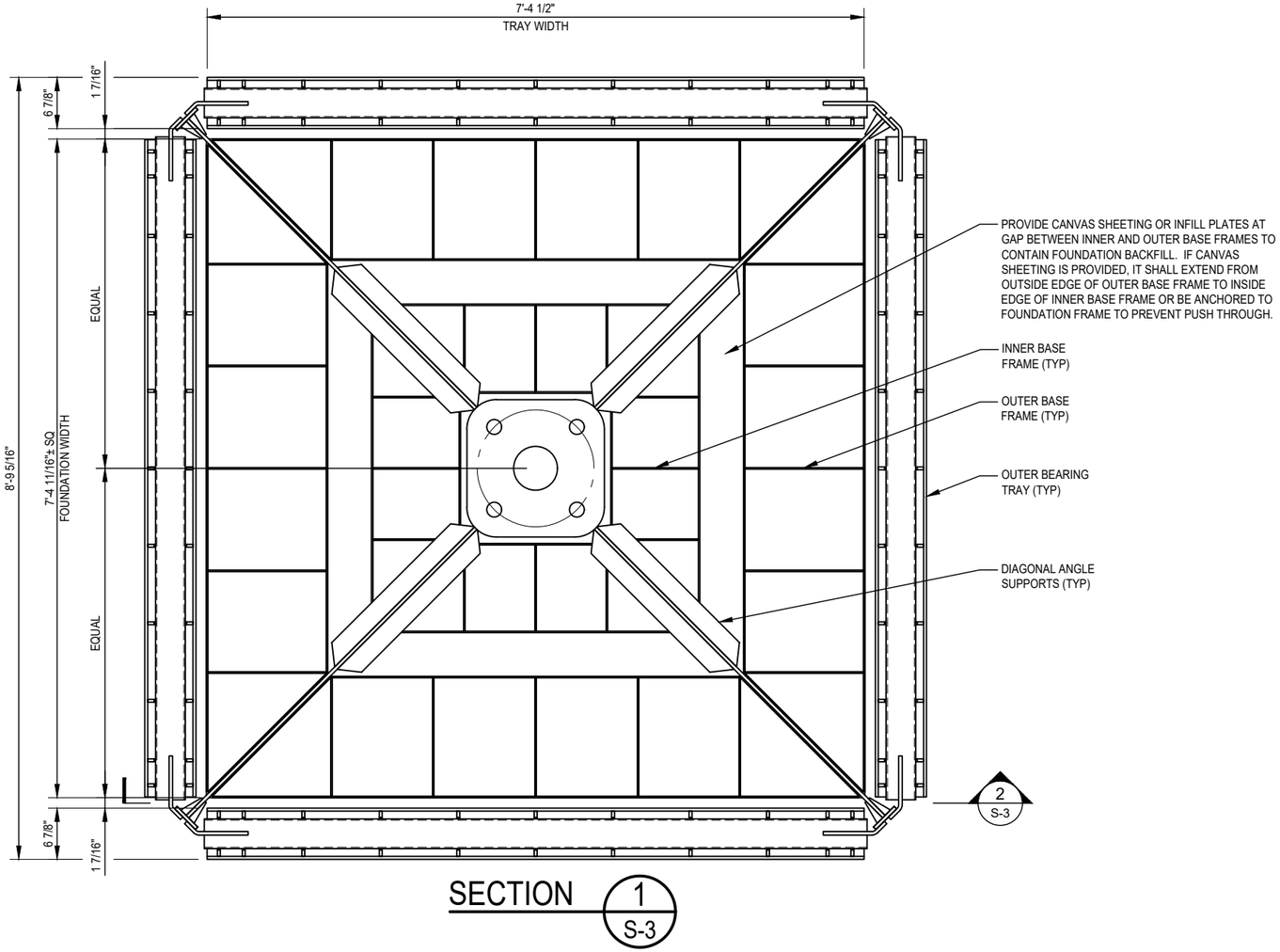
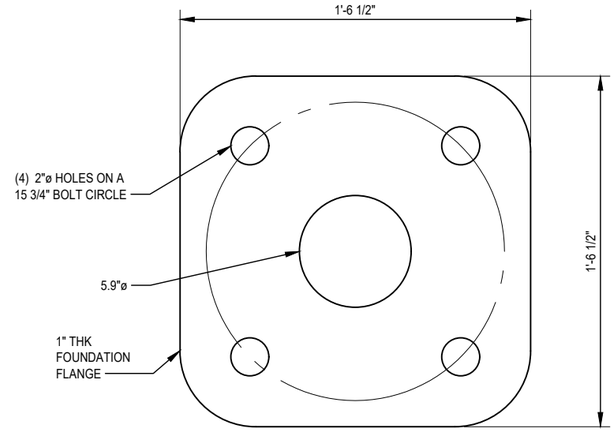
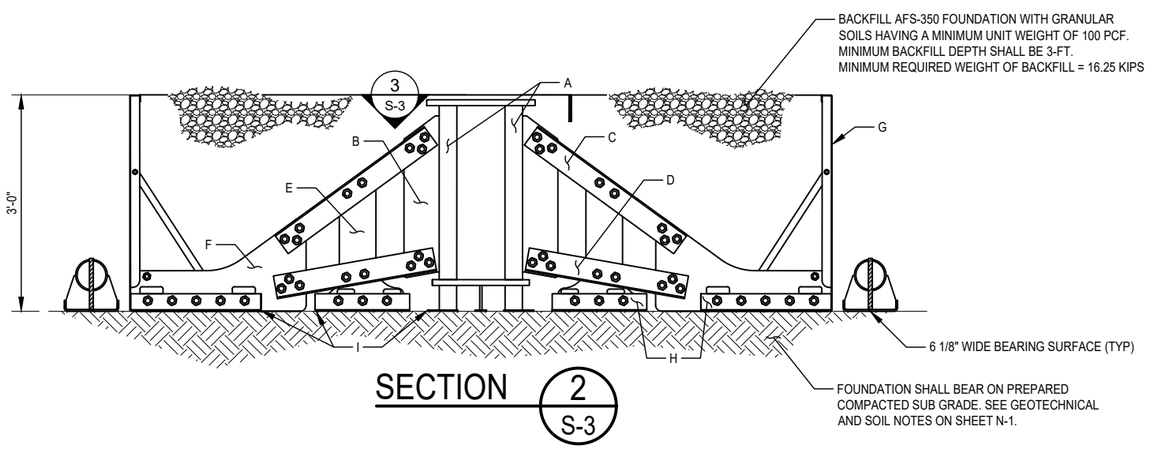


SECTION 1 S-3

MEMBER SCHEDULE			
MEMBER	DESCRIPTION	MATERIAL SPECIFICATION *	LENGTH
A	3.00"ø x 0.71" THK WALL PIPE	Q345B	31.5"
B	0.472" THK x 6" PLATE	Q345B	26.5"
C	LL 4 x 2.5 x 1/4	Q345B	31.5"
D	LL 4 x 2.5 x 1/4	Q345B	27.6"
E	0.472" THK x 6.24" PLATE	Q345B	24.6"
F	0.472" THK x 6.9" PLATE	Q345B	30.3"
G	SIDEWALL	Q345B	25.6"
H	0.197" THK x 1.18" PLATE	Q345B	26.9"
I	BEARING PLATES	Q345B	46.5"
* MATERIAL EQUIVALENTS	Q345B = ASTM A572 GR 50 (Fy = 50 KSI)		
ALL STRUCTURAL BOLTS SHALL CONFORM TO ASTM A325 BOLTS, OR EQUIVALENT, UNO. CONSULT ARE FABRICATION DRAWINGS FOR BOLT QUANTITIES AND SIZES			



SECTION 3 S-3



SECTION 2 S-3

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