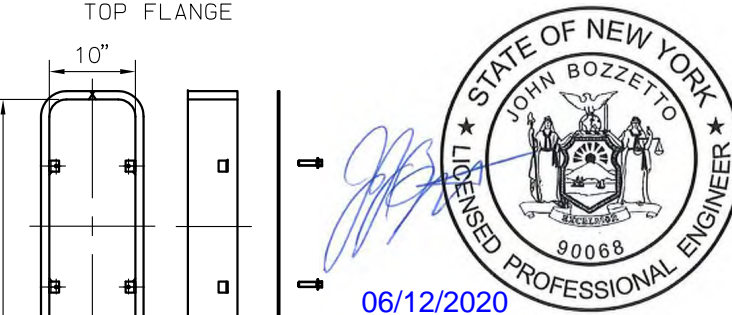
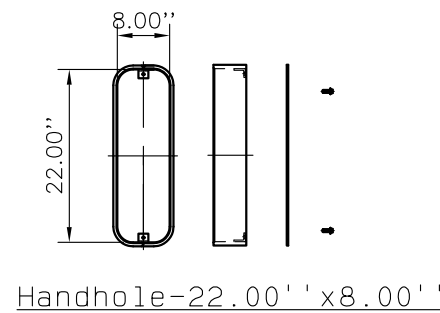
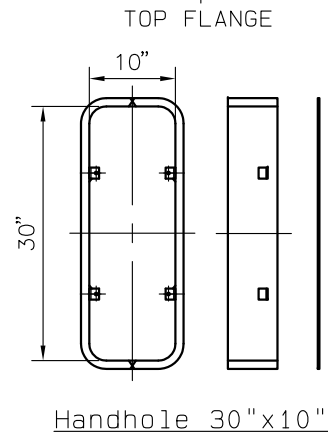
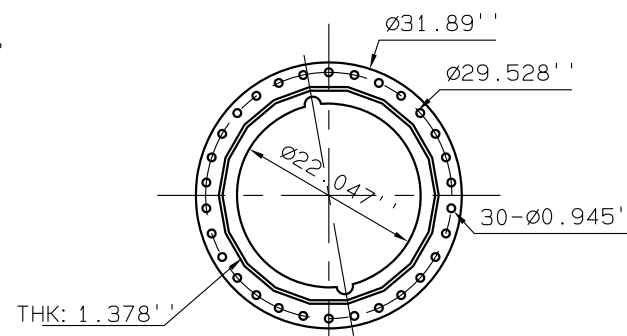
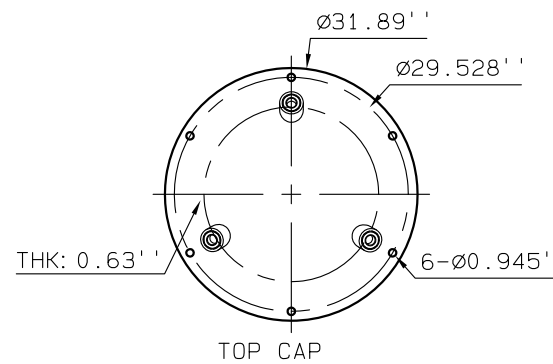
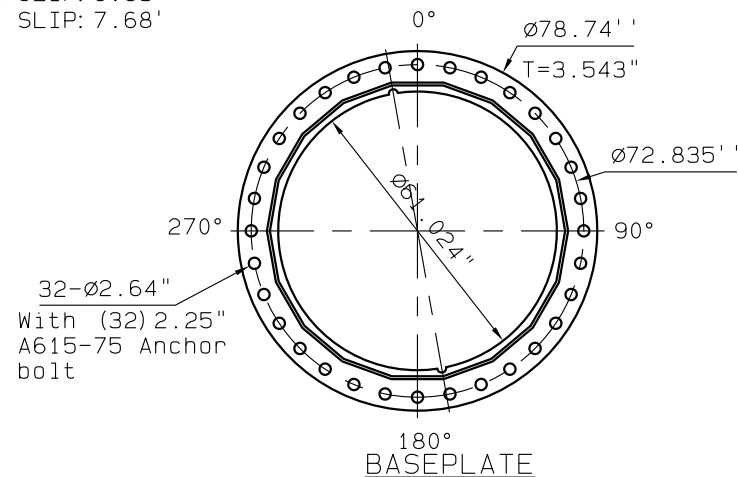
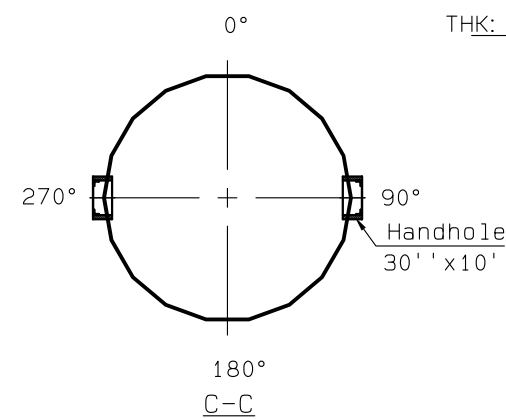
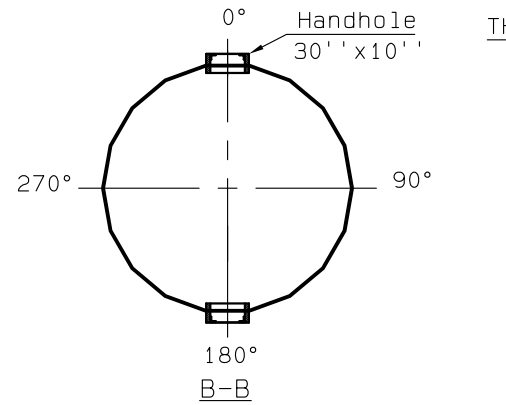
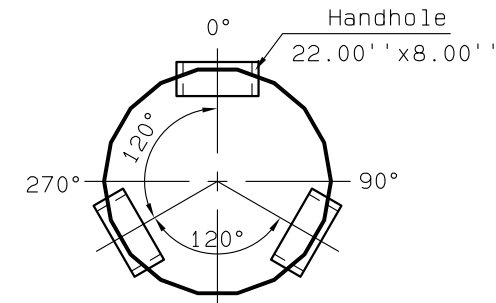
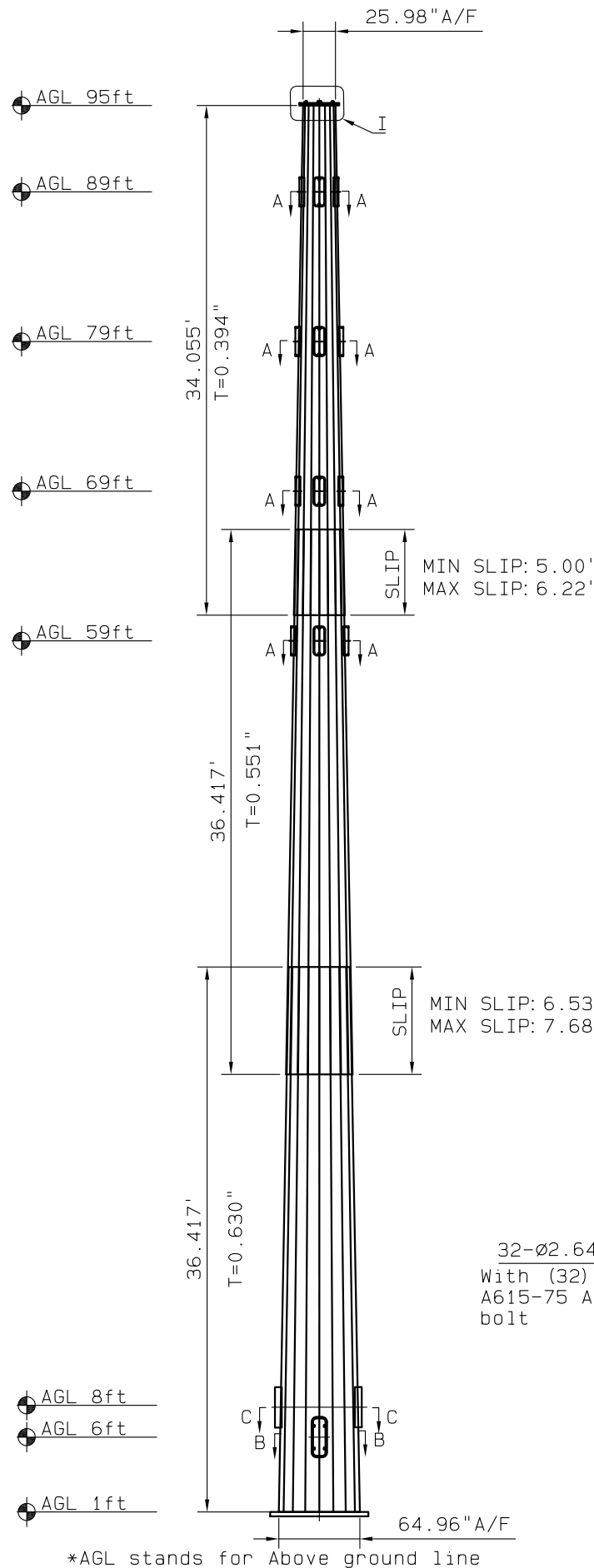
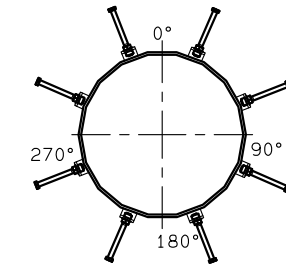


Tower Design Notes:

1. Material:  
 Pole shaft: ASTM A572 GR65  
 Baseplate: GR50 or Q345B; Top Flange: Q235B
2. Pole section has 18 sides
3. Finished: Galvanizing per ASTM A123  
 Lightning Rod will be copper-clad
4. All fasteners will be with metric unit according to Chinese standard GB 5783/5782.

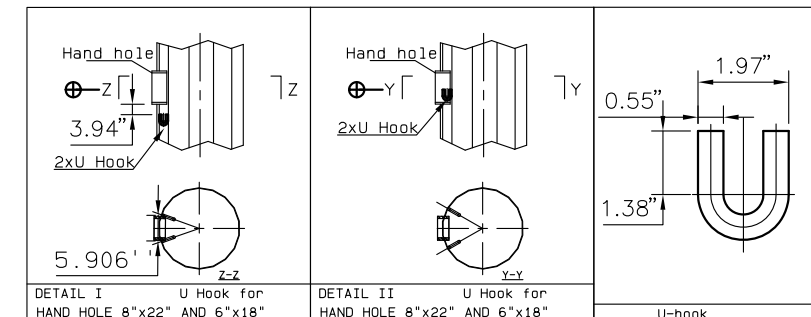


Warning: It is a violation of the law of the State of New York for any person, unless acting under the direction of a licensed professional engineer to alter an item in any way.



Work Steps and Climbing System Detail

1. Climbing System is centered at 40 Degrees - detail found on separate drawing.
2. Working steps are placed ~55'-67' below the appurtenance access center. Extra step bolts are placed ~ 71' above working working steps for convenience.
3. Working steps (6~8) at the same elevation may not be evenly spaced.



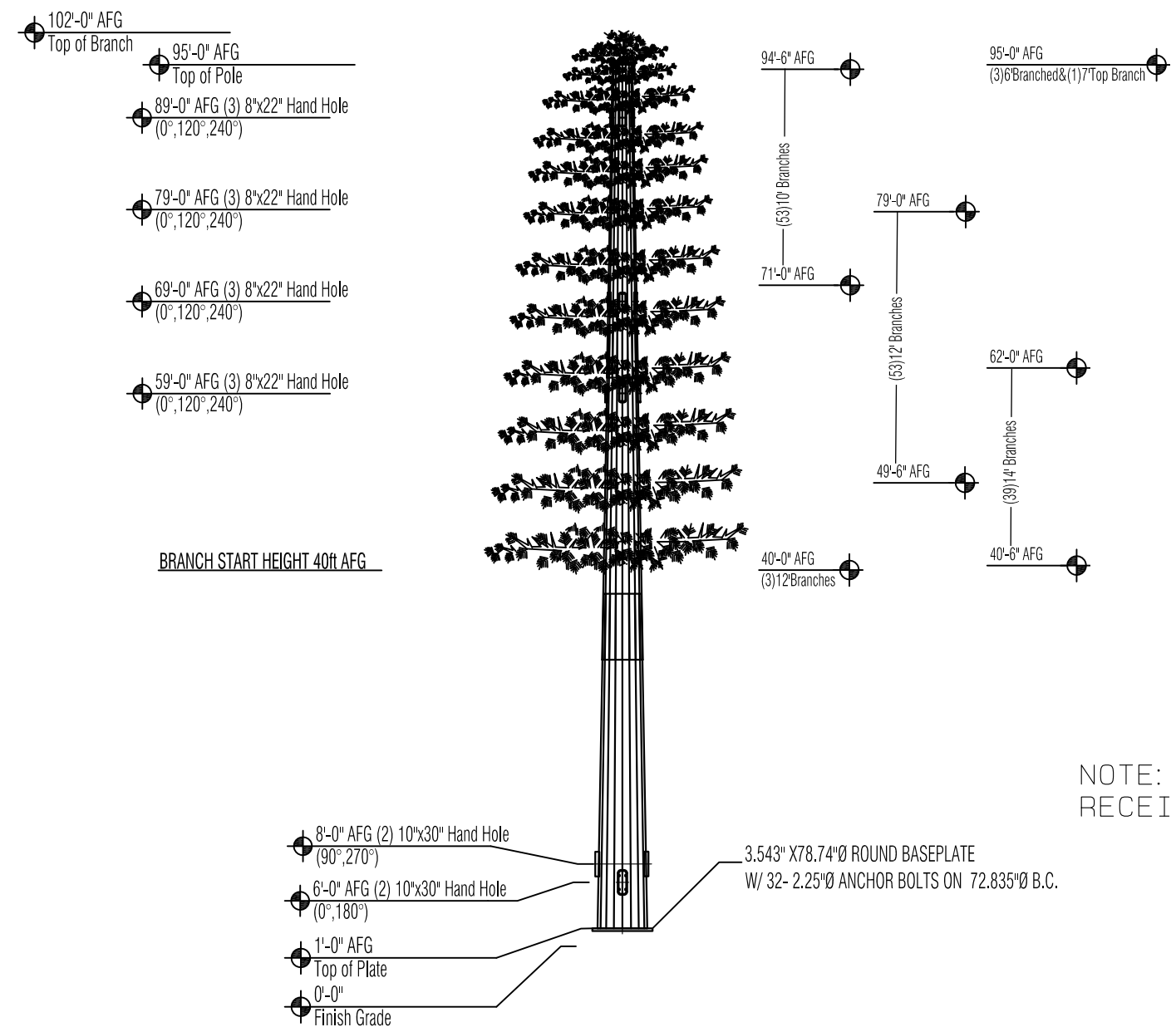
1. U Hook use detail I as priority, if conflicts with slip joint, then use detail II.

Please refer to separate drawing for step bolts with safety system

Site No.: NY170  
 Site name: Nelsonville  
 Site Coordinates: 41.42230556°, -76.941°  
 Site Address: 15 Rockledge Road, Nelsonville, NY

5	Safety Device	TBD
4	Step Bolts	1
3	Handhole 22.00' x 8.00'	12
2	Hand Hole 30' x 10'	4
1	Pole	1

NO	PART NO.	DESCRIPTION	WEIGHT	QTY
		<b>AMBOR</b> Ambor Structures amborstructures.com		
CLIENT		Insite		
TITLE		95ft 100mph.Pine		
DRAWN	JW	2020.3.16	MATERIAL	MANUFACTURING ORDER
ENGR	ZHJ	2020.3.16	THK (mm)	
CHECKED	ZHJ	2020.3.16	WT (kg)	
REV	ID	DATE	REVISION DESCRIPTION	SPECIFICATIONS
			SCALE	VERSION: A



NOTE: BRANCHES AND BRANCH RECEIVERS DESIGN BY OTHERS



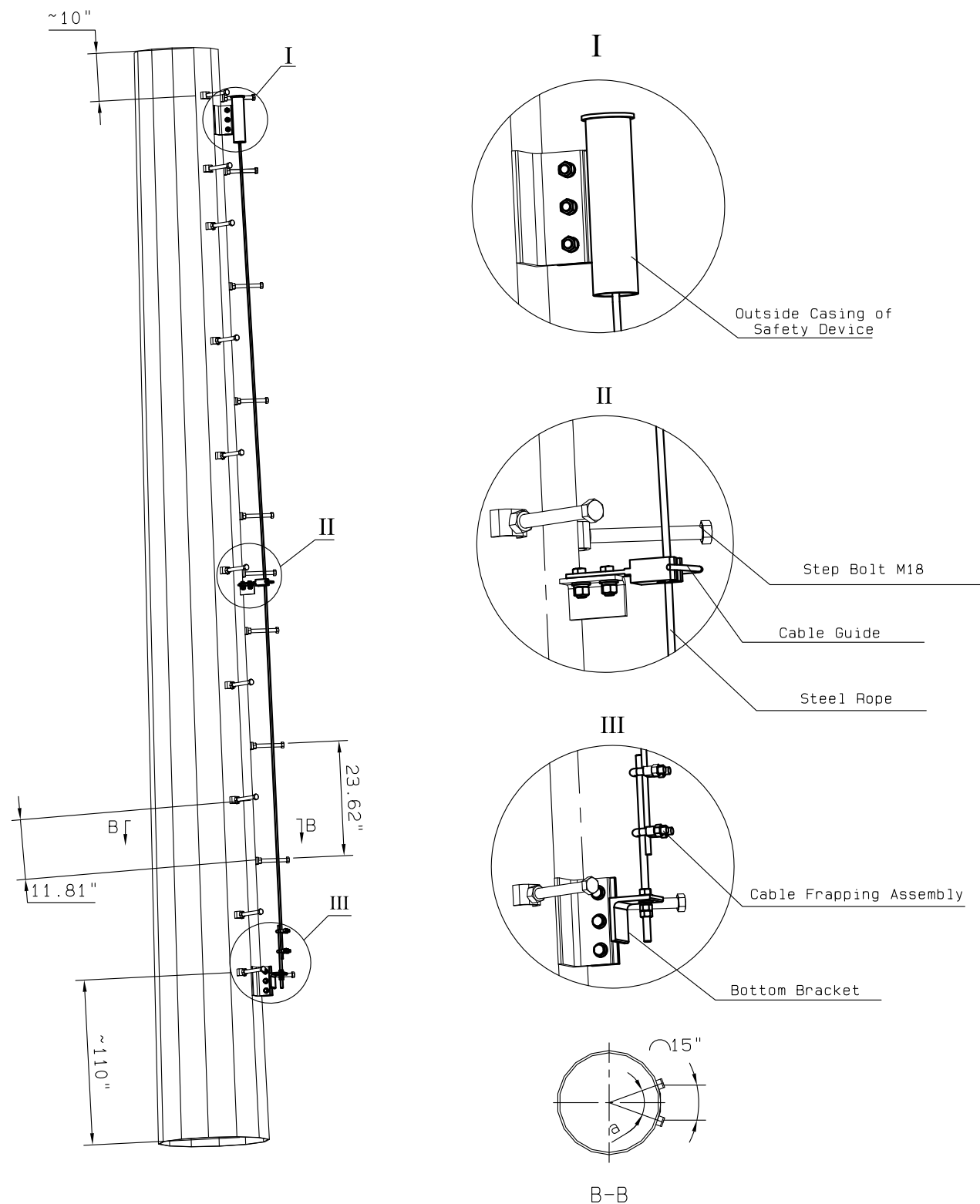
06/12/2020  
Warning: It is a violation of the law of the State of New York for any person, unless acting under the direction of a licensed professional engineer to alter an item in any way.

**AMBOR** 上海安伯工业设备有限公司  
Shanghai Ambor Manufacturing Ltd.  
www.ambor.cn

CLIENT	Insite
TITLE	Branch for 95ft 100mph Pine

REV ID	DATE	REVISION DESCRIPTION	SPECIFICATIONS	SCALE	VERSION

DRAWN	ZHJ	2020.6.12	MATERIAL		MANUFACTURING ORDER
ENGR	ZHJ	2020.6.12	THK (mm)		
CHECKED	JW	2020.6.12	WT (kg)		



Note:

1. Arc length between two sides step bolt brackets is around 15". The angle "a" will be no bigger than 120°
2. Vertical distance between two step bolts on same side is around 23.62"
3. Vertical distance between two step bolts on different sides is around 11.81"
4. All fasteners will be with metric unit per Chinese standard GB 5783/5782.

Site No.: NY170  
 Site name: Nelsonville  
 Site Coordinates: 41.42230556°, -76.941°  
 Site Address: 15 Rockledge Road, Nelsonville, NY



06/12/2020

Warning: It is a violation of the law of the State of New York for any person, unless acting under the direction of a licensed professional engineer to alter an item in any way.

**AMBOR** 上海安伯工业设备有限公司  
 Shanghai Ambor Manufacturing Ltd.  
 www.ambor.cn

CLIENT	Vertical Bridge
TITLE	Step Bolts with Safety System

DRAWN	HY	2020.03.18	MATERIAL		MANUFACTURING ORDER
ENGR			THK (mm)		
CHECKED			WT (kg)		
REV ID	DATE	REVISION DESCRIPTION	SPECIFICATIONS	SCALE	VERSION: A

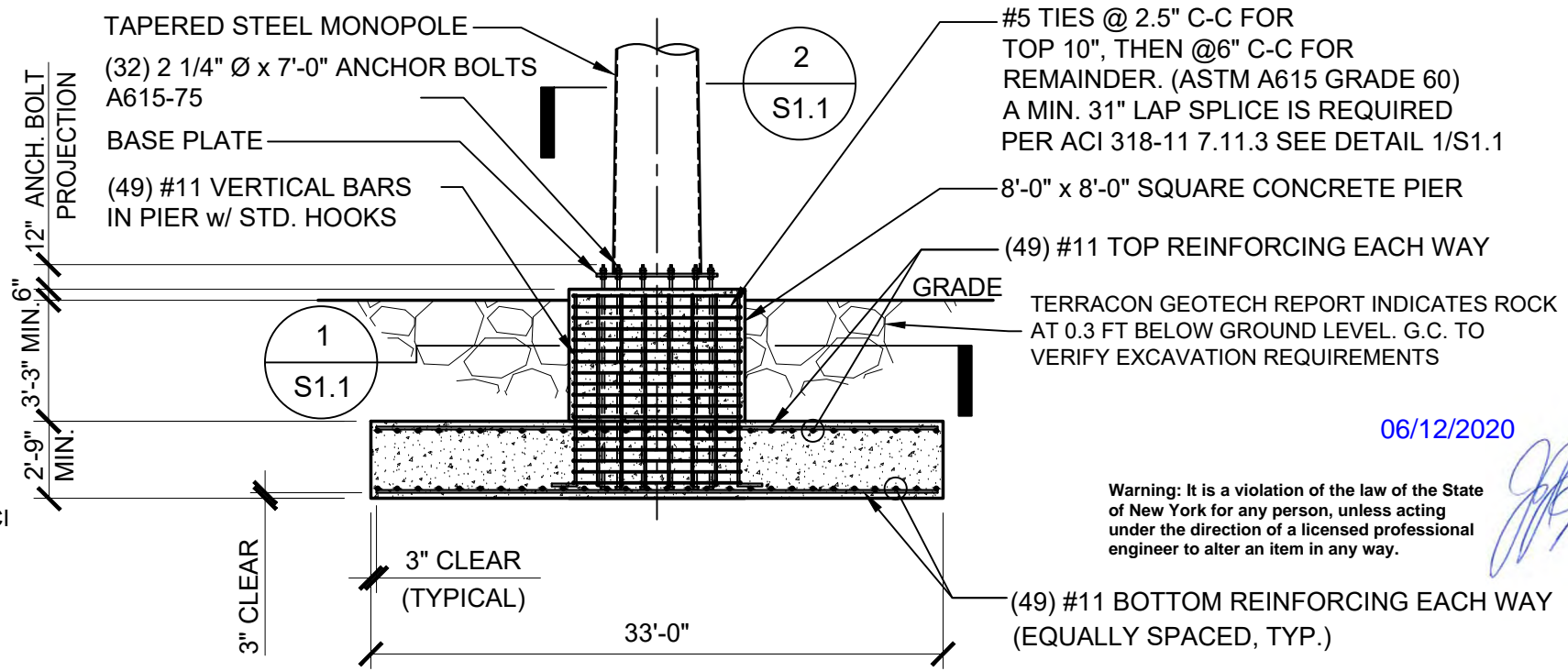
**GENERAL NOTES:**

- FOUNDATION DESIGN PER 2015 INTERNATIONAL CODES WITH THE 2017 NEW YORK STATE UNIFORM CODE SUPPLEMENT AND PER SOIL REPORT BY TERRACON PROJECT NO. J5205013 DATED MARCH 9, 2020.

**SOIL PARAMETERS:**

TOP	BOT.	UNIT WT. (PCF)	NET ALLOWABLE BEARING (PSF)	COHESION (PSF)	FRICTION ANGLE (DEG.)
0	6	125	50,000	0	20

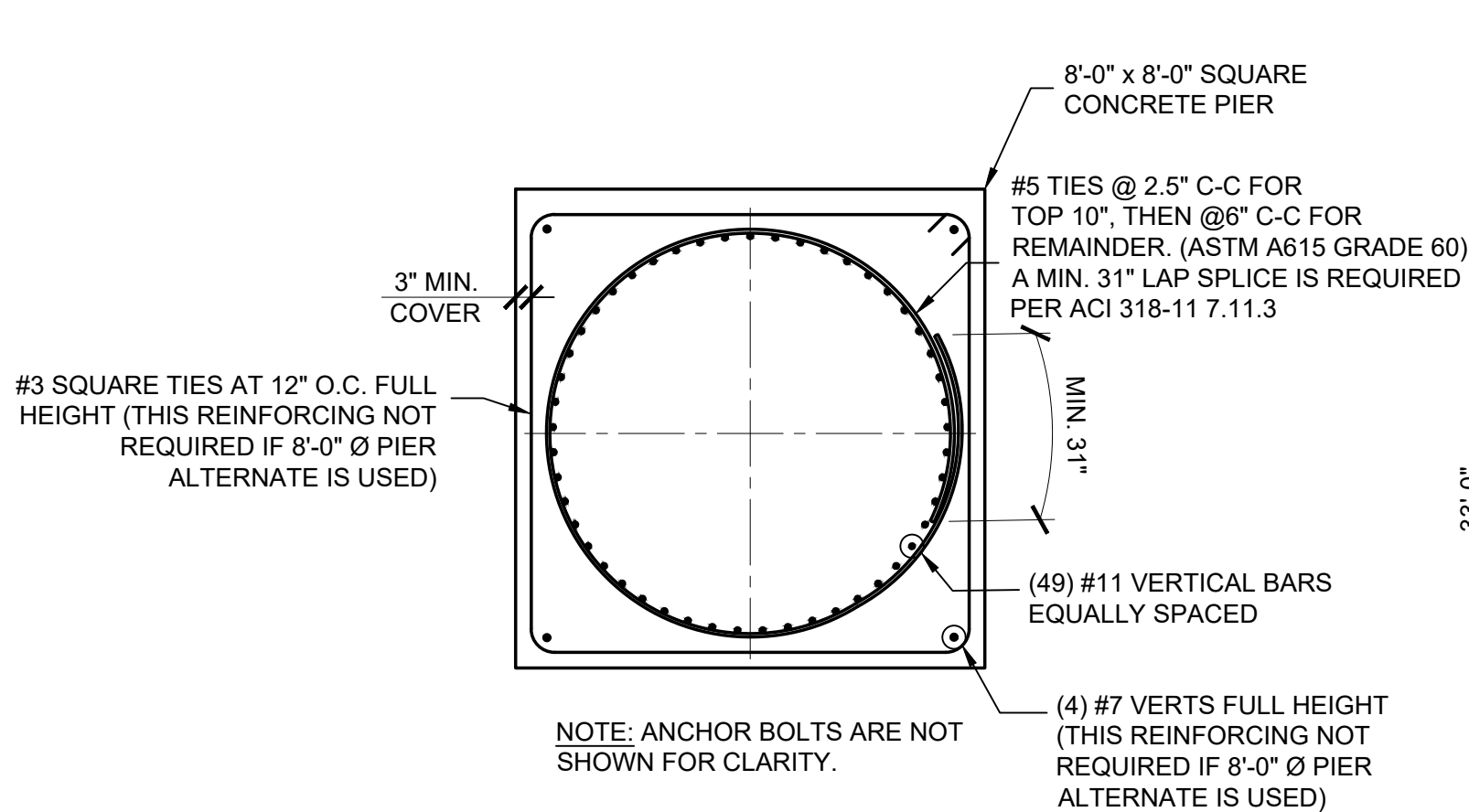
- CONCRETE SHALL BE 4500 P.S.I. (MINIMUM) @ 28 DAYS COMPRESSIVE STRENGTH.
- FOUNDATION INSTALLATION SHALL BE OBSERVED BY AN ENGINEER FROM TERRACON.
- MAT/PIER FOUNDATION INSTALLATION SHALL BE IN ACCORDANCE WITH ACI 318 LATEST EDITION.
- ALL REINFORCING SHALL BE A.S.T.M. A615 GRADE 60.
- REFER TO SOIL REPORT FOR PROPER PREPARATION AND INSTALLATION REQUIREMENTS.
- CONTRACTOR IS RESPONSIBLE FOR SHORING WORK ETC.
- ROCK LAYER IS ENCOUNTERED AT 0.3 FT PER THE GEOTECHNICAL REPORT BY TERRACON. G.C. TO CONFIRM ON ANY SPECIAL EQUIPMENT REQUIRED FOR EXCAVATION.



06/12/2020

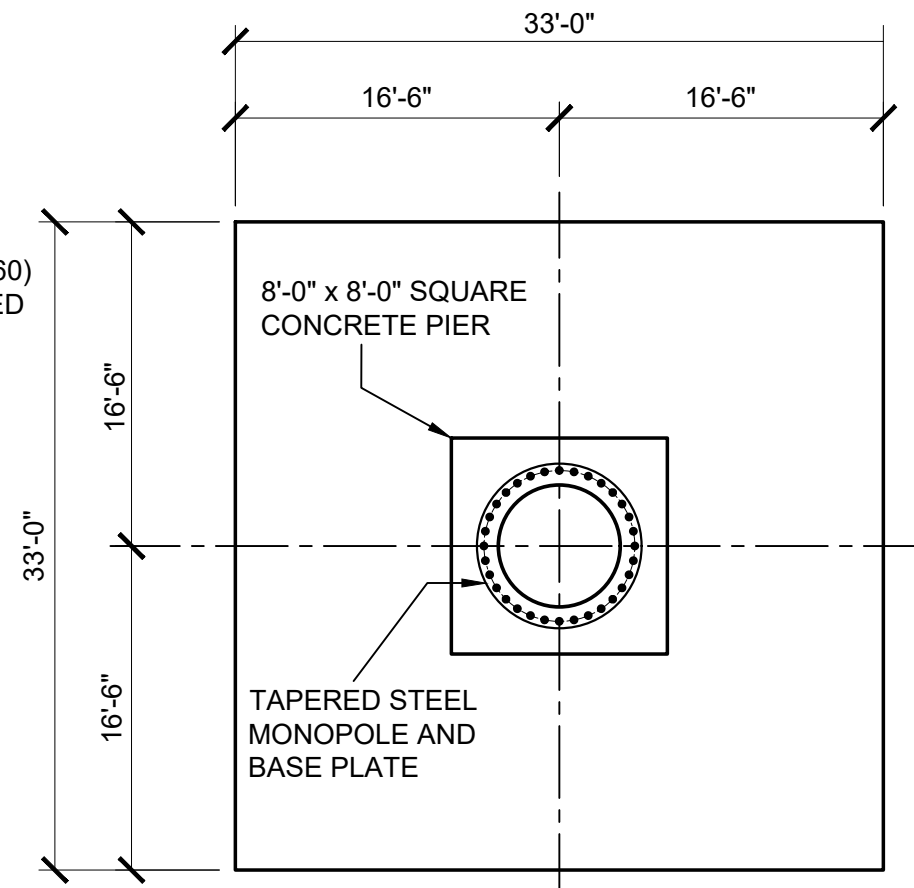
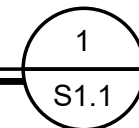
**SPREAD FOUNDATION**

NOT TO SCALE



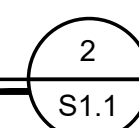
**SECTION 1**

NOT TO SCALE



**SECTION 2**

NOT TO SCALE



Revisions:  
NO: DESCRIPTION: DATE:

DATE:	03/20/20
SITE NAME (LOCATION):	NY 170 NELSONVILLE PINE
JOB NAME:	15 ROCKLEDGE ROAD, NELSONVILLE, NY 10516
DRAWING TITLE:	MONOPOLE CELL TOWER - FOUNDATION DESIGN
DRAWN BY:	MH
REVIEWED BY:	JB
SCALE:	NOT TO SCALE

SHEET NUMBER:

**S-1.1**

**GENERAL NOTES:**

- FOUNDATION DESIGN PER 2015 INTERNATIONAL CODES WITH THE 2017 NEW YORK STATE UNIFORM CODE SUPPLEMENT AND PER SOIL REPORT BY TERRACON PROJECT NO. J5205013 DATED MARCH 9, 2020.

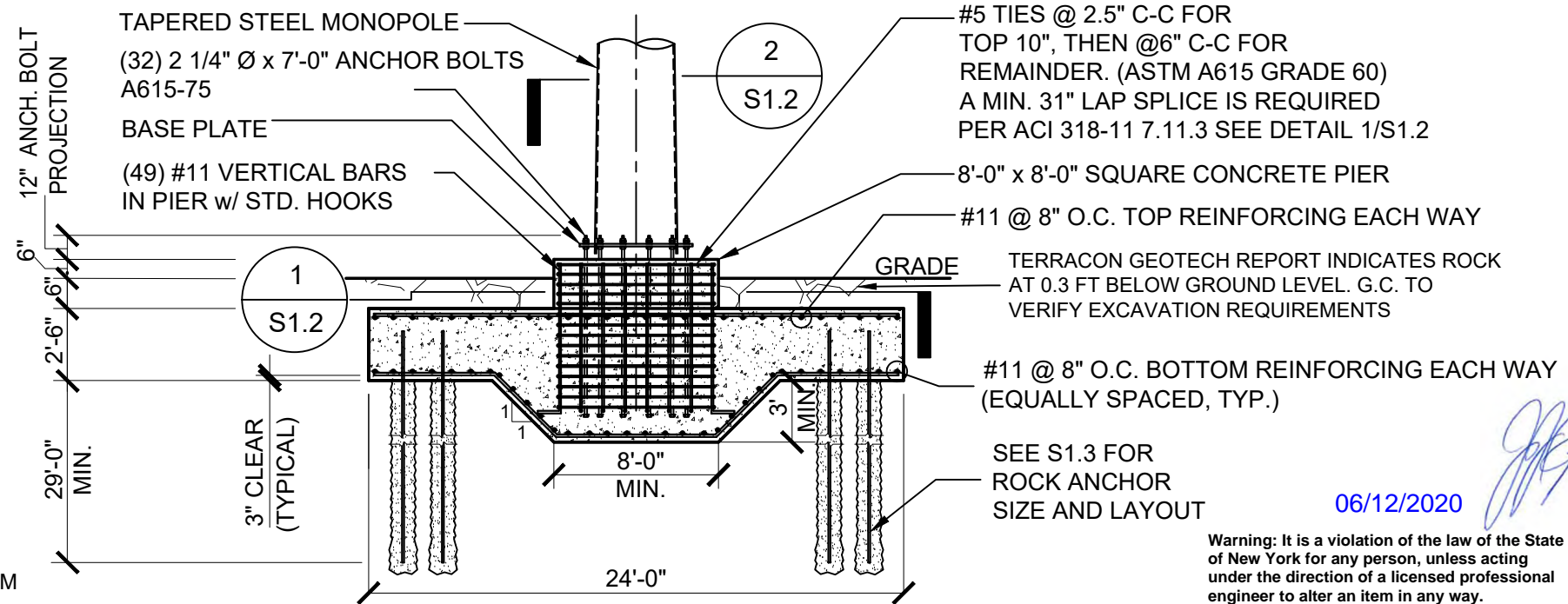
SOIL PARAMETERS:

TOP	BOT.	UNIT WT. (PCF)	NET ALLOWABLE BEARING (PSF)	COHESION (PSF)	FRICTION ANGLE (DEG.)
0	6	125	50,000	0	20

ROCK ANCHOR DESIGN PARAMETERS:

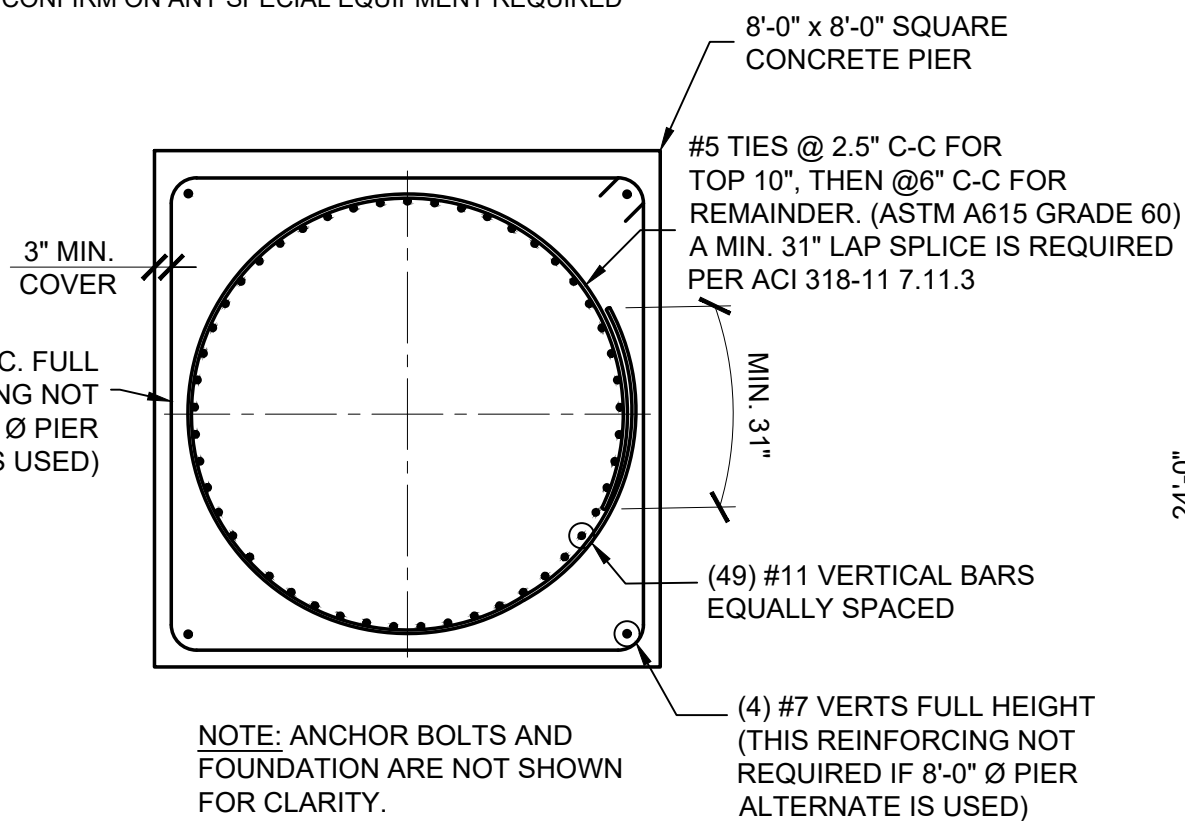
ALLOWABLE BOND STRENGTH (KSF)	GROUT COMPRESSIVE STRENGTH (PSI)
10	5,000

- CONCRETE SHALL BE 4500 P.S.I. (MINIMUM) @ 28 DAYS COMPRESSIVE STRENGTH.
- FOUNDATION INSTALLATION SHALL BE OBSERVED BY AN ENGINEER FROM TERRACON.
- MAT/PIER FOUNDATION INSTALLATION SHALL BE IN ACCORDANCE WITH ACI 318 LATEST EDITION.
- ALL REINFORCING SHALL BE A.S.T.M. A615 GRADE 60.
- REFER TO SOIL REPORT FOR PROPER PREPARATION AND INSTALLATION REQUIREMENTS.
- CONTRACTOR IS RESPONSIBLE FOR SHORING WORK ETC.
- ROCK LAYER IS ENCOUNTERED AT 0.3 FT PER THE GEOTECHNICAL REPORT BY TERRACON. G.C. TO CONFIRM ON ANY SPECIAL EQUIPMENT REQUIRED FOR EXCAVATION.



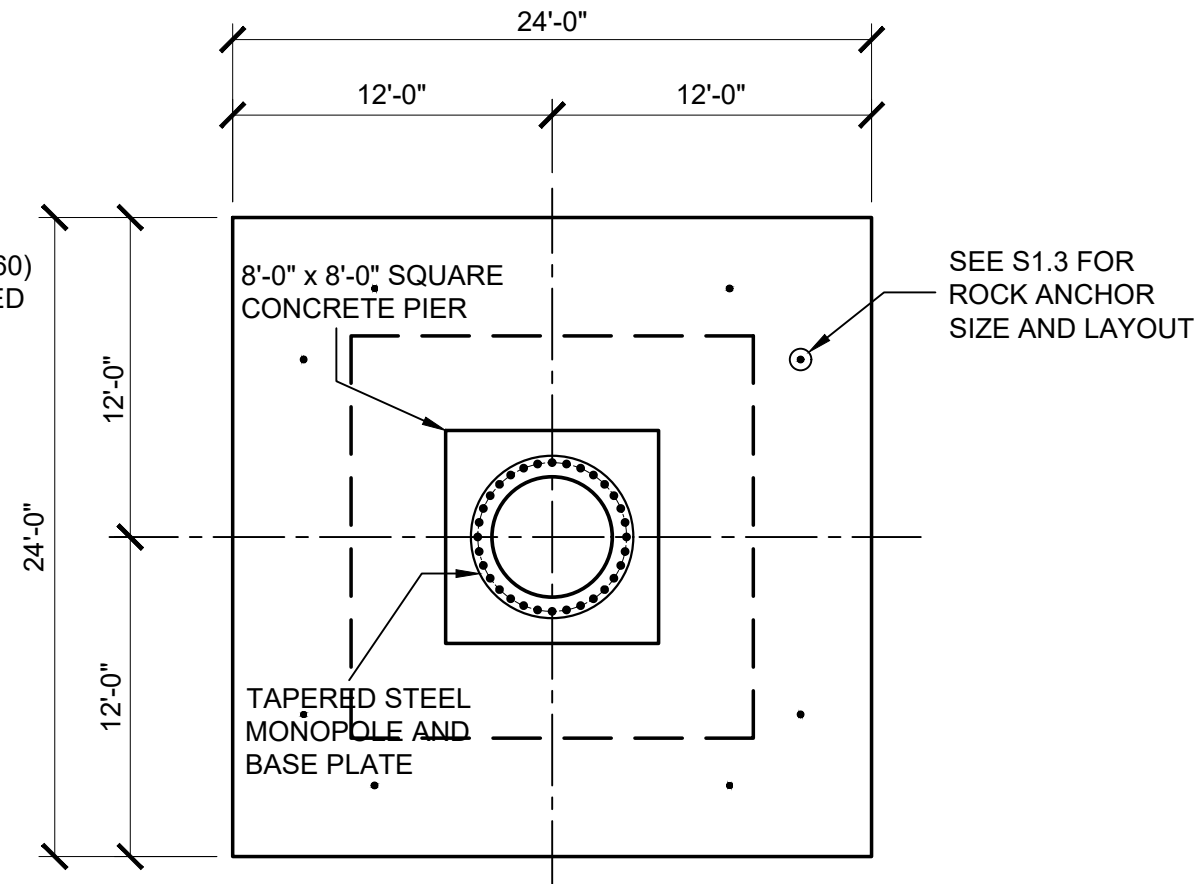
**SPREAD FOUNDATION**

NOT TO SCALE



**SECTION 1**

NOT TO SCALE



**SECTION 2**

NOT TO SCALE

Warning: It is a violation of the law of the State of New York for any person, unless acting under the direction of a licensed professional engineer to alter an item in any way.

06/12/2020



Revisions:

NO: DESCRIPTION: DATE:

DATE: 03/20/20

SITE NAME (LOCATION): NY 170 NELSONVILLE PINE  
15 ROCKLEDGE ROAD, NELSONVILLE, NY 10516

JOB NAME: MONOPOLE CELL TOWER - FOUNDATION DESIGN

DRAWING TITLE: SPREAD FOUNDATION WITH ROCK ANCHOR DETAIL AND SECTION

DRAWN BY: MH  
REVIEWED BY: JB  
SCALE: NOT TO SCALE

SHEET NUMBER:

**S-1.2**



Revisions:

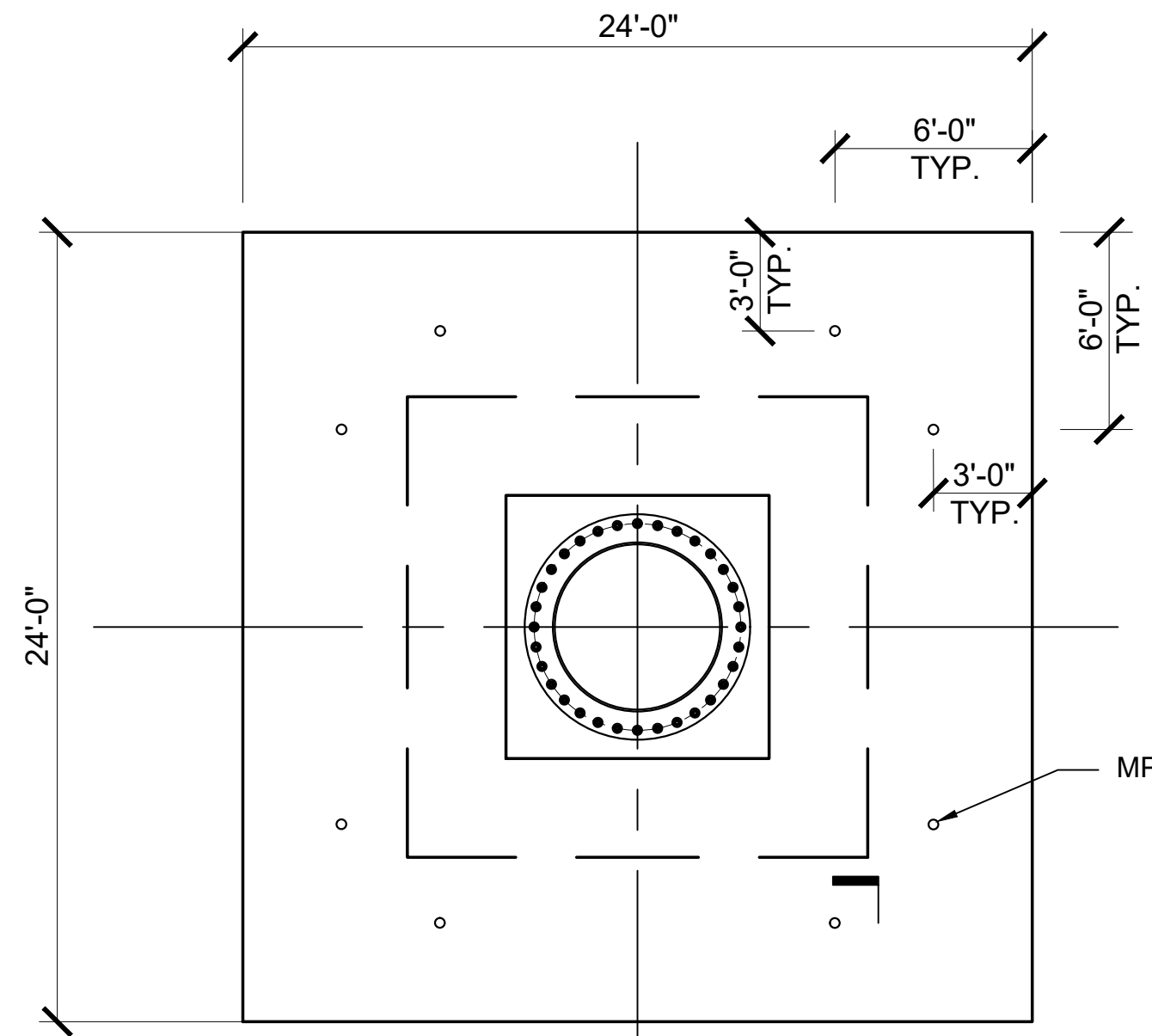
NO: DESCRIPTION: DATE:

MICROPILE/ROCK ANCHOR SCHEDULE				
MARK	TYPE	SIZE	MIN. EMBED <sup>3</sup>	MIN. ULTIMATE DESIGN LOAD
MP-1	CON-TECH / TITAN IBO	103 / 78 RIGHT THREADS	22'-0"	365 KIPS

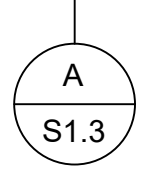
**NOTES:**

1. TEST PILE SHALL DEMONSTRATE A CAPACITY EQUAL TO OR GREATER THAN THE MINIMUM DESIGN LOAD.
2. THE MAXIMUM TEST LOAD SHALL NOT EXCEED THE MAXIMUM YIELD STRENGTH OF THE ANCHOR ROD.
3. THE MIN. EMBEDDED LENGTH INCLUDED 1'-0" OVER-BORE AND 1'-0" OF IGNORED LENGTH FOR BOND STRENGTH PER GEOTECHNICAL REPORT.

Warning: It is a violation of the law of the State of New York for any person, unless acting under the direction of a licensed professional engineer to alter an item in any way. 06/12/2020

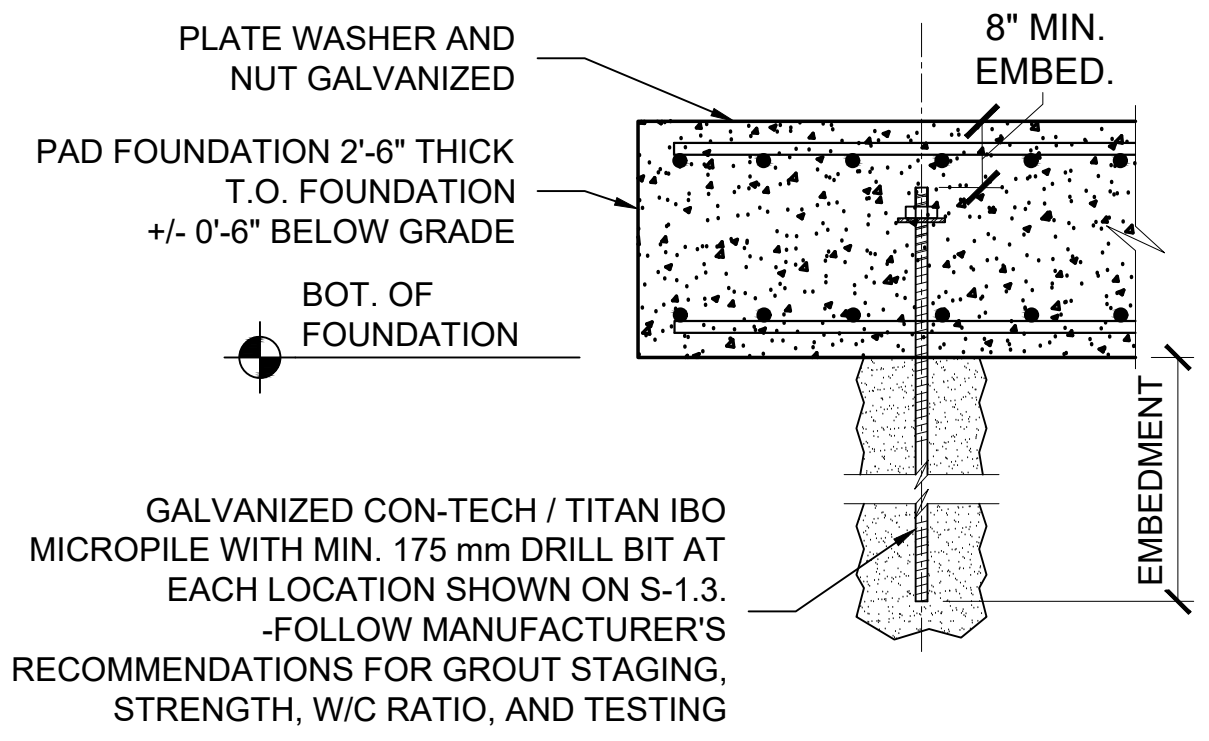


MP-1 (TOTAL OF (8))



**ROCK ANCHOR FOUNDATION PLAN**

**NOTE:**  
ALL DIMENSIONS TO BE FIELD VERIFIED.



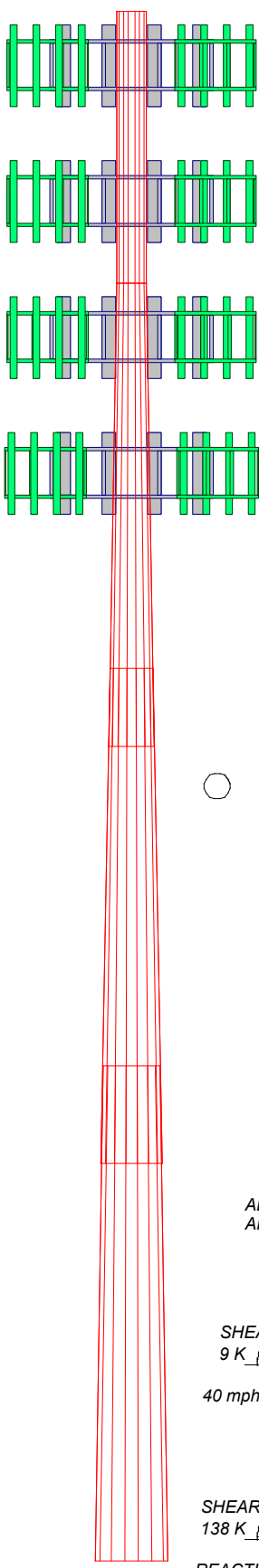
**SECTION 'A'**

DATE:	03/20/20
SITE NAME (LOCATION):	NY 170 NELSONVILLE PINE
JOB NAME:	15 ROCKLEDGE ROAD, NELSONVILLE, NY 10516
DRAWING TITLE:	MONOPOLE CELL TOWER - FOUNDATION DESIGN
DRAWN BY:	MH
REVIEWED BY:	JB
SCALE:	NOT TO SCALE

SHEET NUMBER:  
**S-1.3**

Section	1	2	3	4	29.6
Length (ft)	20.000	34.055	36.417	36.431	14.0
Number of Sides	18	18	18	18	14.0
Thickness (in)	0.197	0.394	0.551	0.630	14.0
Socket Length (ft)	25.984	5.722	7.182	49.129	14.0
Top Dia (in)	25.984	40.795	53.354	64.961	14.0
Bot Dia (in)	25.984	40.795	53.354	64.961	14.0
Grade	A572-65	A572-65	A572-65	A572-65	A572-65
Weight (K)	1.1	4.8	9.7	14.0	29.6

115.0 ft  
95.0 ft  
60.9 ft  
30.2 ft  
1.0 ft



**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
Top Crown	115	(40)12'Branch	87.46 - 73.56
(3)6'Branch	115 - 113.91	200 sq ft	81
(37)10'Branch	113.91 - 100.5	(39)12'Branch	73.56 - 60
250 sq ft	111	(17)14'Branch	70 - 60
200 sq ft	101	(17)14'Branch	60 - 50
(36)10'Branch	100.5 - 87.46	(17)14'Branch	50 - 40
250 sq ft	91		

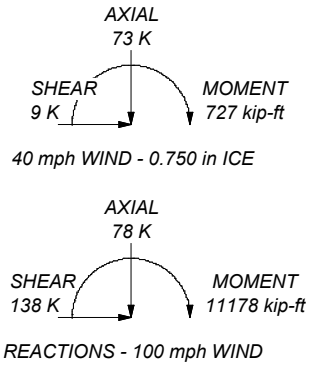
**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in Putnam County, New York.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 100 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Assume that there will be a 3 foot caisson reveal.
11. TOWER RATING: 97.4%

ALL REACTIONS ARE FACTORED



Warning: It is a violation of the law of the State of New York for any person, unless acting under the direction of a licensed professional engineer to alter an item in any way.

**bennett&pless** **Bennett & Pless**  
 750 Park of Commerce Dr #200  
 Boca Raton, FL 33487  
 Phone: (605) 540-4623  
 FAX:

Job: <b>95ft of 115ft.100mph pine</b>		
Project: <b>NY170 Nelsonville</b>		
Client: <b>Insite</b>	Drawn by: <b>Chunhui Song</b>	App'd:
Code: <b>TIA-222-G</b>	Date: <b>03/17/20</b>	Scale: <b>NTS</b>
Path:		Dwg No. <b>E-1</b>

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b> 95ft of 115ft.100mph pine	<b>Page</b> 1 of 13
	<b>Project</b> NY170 Nelsonville	<b>Date</b> 09:55:09 03/17/20
	<b>Client</b> Insite	<b>Designed by</b> Chunhui Song

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in Putnam County, New York.

Basic wind speed of 100 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.000 ft.

Nominal ice thickness of 0.750 in.

Ice thickness is considered to increase with height.

Ice density of 56.00 pcf.

A wind speed of 40 mph is used in combination with ice.

Temperature drop of 50.00 °F.

Deflections calculated using a wind speed of 60 mph.

Installation per TIA/EIA-222 and AISC Specifications..

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

Assume that there will be a 3 foot caisson reveal..

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

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

## Options

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

## Tapered Pole Section Geometry



<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	2 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	115.000-95.000	20.000	0.00	18	25.984	25.984	0.197	0.787	A572-65 (65 ksi)
L2	95.000-60.945	34.055	5.72	18	25.984	40.795	0.394	1.575	A572-65 (65 ksi)
L3	60.945-30.249	36.417	7.18	18	37.519	53.354	0.551	2.205	A572-65 (65 ksi)
L4	30.249-1.000	36.431		18	49.129	64.961	0.630	2.520	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	26.355	16.112	1353.638	9.155	13.200	102.548	2709.057	8.058	4.227	21.472
	26.355	16.112	1353.638	9.155	13.200	102.548	2709.057	8.058	4.227	21.472
L2	26.324	31.978	2645.756	9.085	13.200	200.436	5294.993	15.992	3.880	9.856
	41.364	50.486	10411.320	14.343	20.724	502.380	20836.339	25.248	6.487	16.477
L3	40.539	64.674	11166.678	13.124	19.060	585.874	22348.049	32.343	5.633	10.22
	54.092	92.376	32540.042	18.745	27.104	1200.562	65122.900	46.197	8.420	15.277
L4	52.959	96.968	28816.182	17.217	24.958	1154.604	57670.281	48.493	7.538	11.967
	65.866	128.621	67248.945	22.837	33.000	2037.847	134586.377	64.323	10.324	16.39

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 115.000-95.000 0				1	1	1			
L2 95.000-60.945				1	1	1			
L3 60.945-30.249				1	1	1			
L4 30.249-1.000				1	1	1			

### Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.250 in
Number of bolts	32
Embedment length	72.000 in
f <sub>c</sub>	4.50 ksi
Grout space	0.000 in
Base plate grade	A572-50
Base plate thickness	3.543 in
Bolt circle diameter	72.835 in
Outer diameter	78.740 in

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	3 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

Base Plate Data	
Inner diameter	61.024 in
Base plate type	Plain Plate

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub>		Weight klf
							In Face	Out Face	
LDF-50A (1 5/8 FOAM)	C	No	Yes	Inside Pole	111.000 - 5.000	12	No Ice	0.000	0.00
							1/2" Ice	0.000	0.00
							1" Ice	0.000	0.00
LDF-50A (1 5/8 FOAM)	C	No	Yes	Inside Pole	101.000 - 5.000	16	No Ice	0.000	0.00
							1/2" Ice	0.000	0.00
							1" Ice	0.000	0.00
LDF-50A (1 5/8 FOAM)	C	No	Yes	Inside Pole	91.000 - 5.000	14	No Ice	0.000	0.00
							1/2" Ice	0.000	0.00
							1" Ice	0.000	0.00
LDF-50A (1 5/8 FOAM)	C	No	Yes	Inside Pole	81.000 - 5.000	16	No Ice	0.000	0.00
							1/2" Ice	0.000	0.00
							1" Ice	0.000	0.00
Safety line 3/8	C	No	Yes	CaAa (Out Of Face)	115.000 - 5.000	1	No Ice	0.037	0.00
							1/2" Ice	0.137	0.00
							1" Ice	0.238	0.00
Step pegs	C	No	Yes	CaAa (Out Of Face)	115.000 - 5.000	1	No Ice	0.075	0.00
							1/2" Ice	0.175	0.00
							1" Ice	0.275	0.00

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight K
			ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	
L1	115.000-95.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.250	0.27
L2	95.000-60.945	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.831	1.45
L3	60.945-30.249	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.453	1.51
L4	30.249-1.000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.841	1.24

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight K
			in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	4 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	115.000-95.000	A	1.684	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.722	0.43
L2	95.000-60.945	A	1.632	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	26.068	1.71
L3	60.945-30.249	A	1.548	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	23.497	1.75
L4	30.249-1.000	A	1.387	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	18.472	1.42

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
---------------	----------------------	-------------	-------------------------	--------------------------	-----------------------

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
250 sq ft	C	None		0.00	111.000	No Ice	250.000	250.000	3.50
						1/2" Ice	270.000	270.000	3.70
						1" Ice	290.000	290.000	3.90
*****									
200 sq ft	C	None		0.00	101.000	No Ice	200.000	200.000	2.50
						1/2" Ice	210.000	210.000	2.70
						1" Ice	220.000	220.000	2.90
*****									
250 sq ft	C	None		0.00	91.000	No Ice	250.000	250.000	3.50
						1/2" Ice	270.000	270.000	3.70
						1" Ice	290.000	290.000	3.90
*****									
200 sq ft	C	None		0.00	81.000	No Ice	200.000	200.000	2.50
						1/2" Ice	210.000	210.000	2.70
						1" Ice	220.000	220.000	2.90
*****									
Top Crown	C	None		0.00	115.000	No Ice	15.000	15.000	0.06
						1/2" Ice	0.000	0.000	0.00
						1" Ice	0.000	0.000	0.00
(3)6'Branch	C	None		0.00	113.910 - 115.000	No Ice	7.500	7.500	0.12
						1/2" Ice	0.000	0.000	0.00
						1" Ice	0.000	0.000	0.00
(37)10'Branch	C	None		0.00	100.500 - 113.910	No Ice	188.700	188.700	2.44
						1/2" Ice	0.000	0.000	0.00
						1" Ice	0.000	0.000	0.00
(36)10'Branch	C	None		0.00	87.460 - 100.500	No Ice	183.600	183.600	2.38
						1/2" Ice	0.000	0.000	0.00

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	5 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			Horz Lateral ft	Vert ft						
(40)12'Branch	C	None			0.00	73.560 - 87.460	1" Ice	0.000	0.000	0.00
							No Ice	260.000	260.000	3.36
							1/2" Ice	0.000	0.000	0.00
(39)12'Branch	C	None			0.00	60.000 - 73.560	1" Ice	0.000	0.000	0.00
							No Ice	253.500	253.500	3.28
							1/2" Ice	0.000	0.000	0.00
(17)14'Branch	C	None			0.00	60.000 - 70.000	1" Ice	0.000	0.000	0.00
							No Ice	141.100	141.100	1.63
							1/2" Ice	0.000	0.000	0.00
(17)14'Branch	C	None			0.00	50.000 - 60.000	1" Ice	0.000	0.000	0.00
							No Ice	141.100	141.100	1.63
							1/2" Ice	0.000	0.000	0.00
(17)14'Branch	C	None			0.00	40.000 - 50.000	1" Ice	0.000	0.000	0.00
							No Ice	141.100	141.100	1.63
							1/2" Ice	0.000	0.000	0.00
							1" Ice	0.000	0.000	0.00
***										

## Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	6 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

<i>Comb. No.</i>	<i>Description</i>
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	115 - 95	Pole	Max Tension	27	0.00	0.00	-0.00
			Max. Compression	26	-12.22	0.00	0.00
			Max. Mx	8	-8.96	-479.03	0.00
			Max. My	2	-8.96	0.00	479.03
			Max. Vy	8	43.25	-479.03	0.00
			Max. Vx	2	-43.25	0.00	479.03
			Max. Torque	4			-0.00
L2	95 - 60.9449	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.38	0.00	0.00
			Max. Mx	8	-28.58	-2582.43	0.00
			Max. My	2	-28.58	0.00	2582.43
			Max. Vy	8	98.41	-2582.43	0.00
			Max. Vx	2	-98.41	0.00	2582.43
			Max. Torque	6			0.00
L3	60.9449 - 30.2493	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-52.32	0.00	6205.93
			Max. Mx	8	-52.32	-6205.93	0.00
			Max. My	2	-52.32	0.00	6205.93
			Max. Vy	8	134.97	-6205.93	0.00
			Max. Vx	2	-134.97	0.00	6205.93
			Max. Torque	6			0.00
L4	30.2493 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-77.80	0.00	11177.93
			Max. Mx	8	-77.80	-11177.93	0.00
			Max. My	2	-77.80	0.00	11177.93
			Max. Vy	8	137.76	-11177.93	0.00
			Max. Vx	2	-137.76	0.00	11177.93
			Max. Torque	6			0.00

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	7 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	2	77.89	0.00	137.71
	Max. H <sub>x</sub>	20	77.89	137.71	0.00
	Max. H <sub>z</sub>	2	77.89	0.00	137.71
	Max. M <sub>x</sub>	2	11177.93	0.00	137.71
	Max. M <sub>z</sub>	8	11177.93	-137.71	0.00
	Max. Torsion	6	0.00	-119.26	68.86
	Min. Vert	5	58.42	-68.86	119.26
	Min. H <sub>x</sub>	8	77.89	-137.71	0.00
	Min. H <sub>z</sub>	14	77.89	0.00	-137.71
	Min. M <sub>x</sub>	14	-11177.93	0.00	-137.71
	Min. M <sub>z</sub>	20	-11177.93	137.71	0.00
	Min. Torsion	10	-0.00	-119.26	-68.86

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	64.91	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	77.89	0.00	-137.71	-11177.93	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	58.42	0.00	-137.71	-11133.80	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	77.89	68.86	-119.26	-9680.37	-5588.96	0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	58.42	68.86	-119.26	-9642.15	-5566.90	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice	77.89	119.26	-68.86	-5588.96	-9680.37	-0.00
0.9 Dead+1.6 Wind 60 deg - No Ice	58.42	119.26	-68.86	-5566.90	-9642.15	-0.00
1.2 Dead+1.6 Wind 90 deg - No Ice	77.89	137.71	0.00	0.00	-11177.93	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	58.42	137.71	0.00	0.00	-11133.80	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	77.89	119.26	68.86	5588.96	-9680.37	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	58.42	119.26	68.86	5566.90	-9642.15	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	77.89	68.86	119.26	9680.37	-5588.96	-0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	58.42	68.86	119.26	9642.15	-5566.90	-0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	77.89	0.00	137.71	11177.93	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	58.42	0.00	137.71	11133.80	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	77.89	-68.86	119.26	9680.37	5588.96	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	58.42	-68.86	119.26	9642.15	5566.90	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	77.89	-119.26	68.86	5588.96	9680.37	-0.00

<p><b>tnxTower</b></p> <p><b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:</p>	<p><b>Job</b></p> <p>95ft of 115ft.100mph pine</p>	<p><b>Page</b></p> <p>8 of 13</p>
	<p><b>Project</b></p> <p>NY170 Nelsonville</p>	<p><b>Date</b></p> <p>09:55:09 03/17/20</p>
	<p><b>Client</b></p> <p>Insite</p>	<p><b>Designed by</b></p> <p>Chunhui Song</p>

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.6 Wind 240 deg - No Ice	58.42	-119.26	68.86	5566.90	9642.15	-0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	77.89	-137.71	0.00	0.00	11177.93	0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	58.42	-137.71	0.00	0.00	11133.80	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	77.89	-119.26	-68.86	-5588.96	9680.37	0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	58.42	-119.26	-68.86	-5566.90	9642.15	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	77.89	-68.86	-119.26	-9680.37	5588.96	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	58.42	-68.86	-119.26	-9642.15	5566.90	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	73.20	0.00	0.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	73.20	0.00	-8.65	-727.12	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	73.20	4.33	-7.49	-629.71	-363.56	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	73.20	7.49	-4.33	-363.56	-629.71	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	73.20	8.65	0.00	0.00	-727.12	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	73.20	7.49	4.33	363.56	-629.71	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	73.20	4.33	7.49	629.71	-363.56	-0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	73.20	0.00	8.65	727.12	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	73.20	-4.33	7.49	629.71	363.56	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	73.20	-7.49	4.33	363.56	629.71	-0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	73.20	-8.65	0.00	0.00	727.12	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	73.20	-7.49	-4.33	-363.56	629.71	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	73.20	-4.33	-7.49	-629.71	363.56	-0.00
Dead+Wind 0 deg - Service	64.91	0.00	-27.72	-2247.15	0.00	0.00
Dead+Wind 30 deg - Service	64.91	13.86	-24.01	-1946.09	-1123.57	0.00
Dead+Wind 60 deg - Service	64.91	24.01	-13.86	-1123.57	-1946.09	-0.00
Dead+Wind 90 deg - Service	64.91	27.72	0.00	0.00	-2247.15	0.00
Dead+Wind 120 deg - Service	64.91	24.01	13.86	1123.57	-1946.09	0.00
Dead+Wind 150 deg - Service	64.91	13.86	24.01	1946.09	-1123.57	-0.00
Dead+Wind 180 deg - Service	64.91	0.00	27.72	2247.15	0.00	0.00
Dead+Wind 210 deg - Service	64.91	-13.86	24.01	1946.09	1123.57	0.00
Dead+Wind 240 deg - Service	64.91	-24.01	13.86	1123.57	1946.09	-0.00
Dead+Wind 270 deg - Service	64.91	-27.72	0.00	0.00	2247.15	0.00
Dead+Wind 300 deg - Service	64.91	-24.01	-13.86	-1123.57	1946.09	0.00
Dead+Wind 330 deg - Service	64.91	-13.86	-24.01	-1946.09	1123.57	-0.00

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-64.91	0.00	0.00	64.91	0.00	0.000%

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	9 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
2	0.00	-77.89	-137.71	0.00	77.89	137.71	0.000%
3	0.00	-58.42	-137.71	0.00	58.42	137.71	0.000%
4	68.86	-77.89	-119.26	-68.86	77.89	119.26	0.000%
5	68.86	-58.42	-119.26	-68.86	58.42	119.26	0.000%
6	119.26	-77.89	-68.86	-119.26	77.89	68.86	0.000%
7	119.26	-58.42	-68.86	-119.26	58.42	68.86	0.000%
8	137.71	-77.89	0.00	-137.71	77.89	0.00	0.000%
9	137.71	-58.42	0.00	-137.71	58.42	0.00	0.000%
10	119.26	-77.89	68.86	-119.26	77.89	-68.86	0.000%
11	119.26	-58.42	68.86	-119.26	58.42	-68.86	0.000%
12	68.86	-77.89	119.26	-68.86	77.89	-119.26	0.000%
13	68.86	-58.42	119.26	-68.86	58.42	-119.26	0.000%
14	0.00	-77.89	137.71	0.00	77.89	-137.71	0.000%
15	0.00	-58.42	137.71	0.00	58.42	-137.71	0.000%
16	-68.86	-77.89	119.26	68.86	77.89	-119.26	0.000%
17	-68.86	-58.42	119.26	68.86	58.42	-119.26	0.000%
18	-119.26	-77.89	68.86	119.26	77.89	-68.86	0.000%
19	-119.26	-58.42	68.86	119.26	58.42	-68.86	0.000%
20	-137.71	-77.89	0.00	137.71	77.89	0.00	0.000%
21	-137.71	-58.42	0.00	137.71	58.42	0.00	0.000%
22	-119.26	-77.89	-68.86	119.26	77.89	68.86	0.000%
23	-119.26	-58.42	-68.86	119.26	58.42	68.86	0.000%
24	-68.86	-77.89	-119.26	68.86	77.89	119.26	0.000%
25	-68.86	-58.42	-119.26	68.86	58.42	119.26	0.000%
26	0.00	-73.20	0.00	0.00	73.20	0.00	0.000%
27	0.00	-73.20	-8.65	0.00	73.20	8.65	0.000%
28	4.33	-73.20	-7.49	-4.33	73.20	7.49	0.000%
29	7.49	-73.20	-4.33	-7.49	73.20	4.33	0.000%
30	8.65	-73.20	0.00	-8.65	73.20	0.00	0.000%
31	7.49	-73.20	4.33	-7.49	73.20	-4.33	0.000%
32	4.33	-73.20	7.49	-4.33	73.20	-7.49	0.000%
33	0.00	-73.20	8.65	0.00	73.20	-8.65	0.000%
34	-4.33	-73.20	7.49	4.33	73.20	-7.49	0.000%
35	-7.49	-73.20	4.33	7.49	73.20	-4.33	0.000%
36	-8.65	-73.20	0.00	8.65	73.20	0.00	0.000%
37	-7.49	-73.20	-4.33	7.49	73.20	4.33	0.000%
38	-4.33	-73.20	-7.49	4.33	73.20	7.49	0.000%
39	0.00	-64.91	-27.72	0.00	64.91	27.72	0.000%
40	13.86	-64.91	-24.01	-13.86	64.91	24.01	0.000%
41	24.01	-64.91	-13.86	-24.01	64.91	13.86	0.000%
42	27.72	-64.91	0.00	-27.72	64.91	0.00	0.000%
43	24.01	-64.91	13.86	-24.01	64.91	-13.86	0.000%
44	13.86	-64.91	24.01	-13.86	64.91	-24.01	0.000%
45	0.00	-64.91	27.72	0.00	64.91	-27.72	0.000%
46	-13.86	-64.91	24.01	13.86	64.91	-24.01	0.000%
47	-24.01	-64.91	13.86	24.01	64.91	-13.86	0.000%
48	-27.72	-64.91	0.00	27.72	64.91	0.00	0.000%
49	-24.01	-64.91	-13.86	24.01	64.91	13.86	0.000%
50	-13.86	-64.91	-24.01	13.86	64.91	24.01	0.000%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003899



<p><b>tnxTower</b></p> <p><b>Bennett &amp; Pless</b>  750 Park of Commerce Dr #200  Boca Raton, FL 33487  Phone: (605) 540-4623  FAX:</p>	<b>Job</b>	95ft of 115ft.100mph pine	<b>Page</b>	10 of 13
	<b>Project</b>	NY170 Nelsonville	<b>Date</b>	09:55:09 03/17/20
	<b>Client</b>	Insite	<b>Designed by</b>	Chunhui Song

3	Yes	4	0.0000001	0.00001584
4	Yes	5	0.0000001	0.00005592
5	Yes	5	0.0000001	0.00001829
6	Yes	5	0.0000001	0.00005592
7	Yes	5	0.0000001	0.00001829
8	Yes	4	0.0000001	0.00003899
9	Yes	4	0.0000001	0.00001584
10	Yes	5	0.0000001	0.00005592
11	Yes	5	0.0000001	0.00001829
12	Yes	5	0.0000001	0.00005592
13	Yes	5	0.0000001	0.00001829
14	Yes	4	0.0000001	0.00003899
15	Yes	4	0.0000001	0.00001584
16	Yes	5	0.0000001	0.00005592
17	Yes	5	0.0000001	0.00001829
18	Yes	5	0.0000001	0.00005592
19	Yes	5	0.0000001	0.00001829
20	Yes	4	0.0000001	0.00003899
21	Yes	4	0.0000001	0.00001584
22	Yes	5	0.0000001	0.00005592
23	Yes	5	0.0000001	0.00001829
24	Yes	5	0.0000001	0.00005592
25	Yes	5	0.0000001	0.00001829
26	Yes	4	0.0000001	0.00000001
27	Yes	4	0.0000001	0.00014470
28	Yes	4	0.0000001	0.00014762
29	Yes	4	0.0000001	0.00014762
30	Yes	4	0.0000001	0.00014470
31	Yes	4	0.0000001	0.00014762
32	Yes	4	0.0000001	0.00014762
33	Yes	4	0.0000001	0.00014470
34	Yes	4	0.0000001	0.00014762
35	Yes	4	0.0000001	0.00014762
36	Yes	4	0.0000001	0.00014470
37	Yes	4	0.0000001	0.00014762
38	Yes	4	0.0000001	0.00014762
39	Yes	4	0.0000001	0.00001623
40	Yes	4	0.0000001	0.00009340
41	Yes	4	0.0000001	0.00009340
42	Yes	4	0.0000001	0.00001623
43	Yes	4	0.0000001	0.00009340
44	Yes	4	0.0000001	0.00009340
45	Yes	4	0.0000001	0.00001623
46	Yes	4	0.0000001	0.00009340
47	Yes	4	0.0000001	0.00009340
48	Yes	4	0.0000001	0.00001623
49	Yes	4	0.0000001	0.00009340
50	Yes	4	0.0000001	0.00009340

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection ft	Gov. Load Comb.	Tilt °	Twist °
L1	115 - 95	1.30	39	1.27	0.00
L2	95 - 60.9449	0.86	39	1.13	0.00
L3	66.6667 - 30.2493	0.40	39	0.72	0.00
L4	37.4311 - 1	0.12	39	0.36	0.00

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b> 95ft of 115ft.100mph pine	<b>Page</b> 11 of 13
	<b>Project</b> NY170 Nelsonville	<b>Date</b> 09:55:09 03/17/20
	<b>Client</b> Insite	<b>Designed by</b> Chunhui Song

### Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			ft	°	°	ft
115.000	Top Crown	39	1.30	1.27	0.00	15964
114.455	(3)6'Branch	39	1.28	1.27	0.00	15964
113.910	(3)6'Branch	39	1.27	1.26	0.00	15964
111.000	250 sq ft	39	1.21	1.25	0.00	15964
107.205	(37)10'Branch	39	1.12	1.23	0.00	10240
101.000	200 sq ft	39	0.99	1.19	0.00	5701
100.500	(37)10'Branch	39	0.98	1.18	0.00	5504
93.980	(36)10'Branch	39	0.84	1.12	0.00	4091
91.000	250 sq ft	39	0.79	1.08	0.00	4031
87.460	(36)10'Branch	39	0.72	1.04	0.00	4065
81.000	200 sq ft	39	0.61	0.94	0.00	4132
80.510	(40)12'Branch	39	0.60	0.93	0.00	4137
73.560	(40)12'Branch	39	0.49	0.82	0.00	4211
70.000	(17)14'Branch	39	0.44	0.77	0.00	4250
66.780	(39)12'Branch	39	0.40	0.72	0.00	4275
65.000	(17)14'Branch	39	0.38	0.69	0.00	4279
60.000	(39)12'Branch	39	0.32	0.62	0.00	4269
55.000	(17)14'Branch	39	0.26	0.56	0.00	4255
50.000	(17)14'Branch	39	0.21	0.50	0.00	4242
45.000	(17)14'Branch	39	0.17	0.44	0.00	4228
40.000	(17)14'Branch	39	0.14	0.38	0.00	4226

### Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	ft		°	°
L1	115 - 95	6.44	2	6.32	0.00
L2	95 - 60.9449	4.30	2	5.63	0.00
L3	66.6667 - 30.2493	1.99	2	3.57	0.00
L4	37.4311 - 1	0.59	2	1.77	0.00

### Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			ft	°	°	ft
115.000	Top Crown	2	6.44	6.32	0.00	3285
114.455	(3)6'Branch	2	6.38	6.30	0.00	3285
113.910	(3)6'Branch	2	6.31	6.29	0.00	3285
111.000	250 sq ft	2	5.99	6.21	0.00	3285
107.205	(37)10'Branch	2	5.57	6.11	0.00	2107
101.000	200 sq ft	2	4.91	5.90	0.00	1171
100.500	(37)10'Branch	2	4.86	5.88	0.00	1131
93.980	(36)10'Branch	2	4.20	5.57	0.00	839
91.000	250 sq ft	2	3.91	5.40	0.00	825
87.460	(36)10'Branch	2	3.59	5.16	0.00	831

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b> 95ft of 115ft.100mph pine	<b>Page</b> 12 of 13
	<b>Project</b> NY170 Nelsonville	<b>Date</b> 09:55:09 03/17/20
	<b>Client</b> Insite	<b>Designed by</b> Chunhui Song

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			ft	°	°	ft
81.000	200 sq ft	2	3.03	4.69	0.00	842
80.510	(40)12'Branch	2	2.99	4.65	0.00	843
73.560	(40)12'Branch	2	2.46	4.10	0.00	856
70.000	(17)14'Branch	2	2.21	3.82	0.00	862
66.780	(39)12'Branch	2	1.99	3.57	0.00	866
65.000	(17)14'Branch	2	1.88	3.44	0.00	867
60.000	(39)12'Branch	2	1.58	3.09	0.00	864
55.000	(17)14'Branch	2	1.31	2.77	0.00	860
50.000	(17)14'Branch	2	1.07	2.47	0.00	856
45.000	(17)14'Branch	2	0.86	2.18	0.00	852
40.000	(17)14'Branch	2	0.67	1.91	0.00	851

### Compression Checks

### Pole Design Data

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	A	P <sub>u</sub>	φP <sub>n</sub>	Ratio P <sub>u</sub> / φP <sub>n</sub>
	ft		ft	ft		in <sup>2</sup>	K	K	
L1	115 - 95 (1)	TP25.984x25.984x0.197	20.000	114.000	149.4	16.112	-8.96	163.00	0.055
L2	95 - 60.9449 (2)	TP40.795x25.984x0.394	34.055	114.000	101.6	47.376	-28.58	1036.01	0.028
L3	60.9449 - 30.2493 (3)	TP53.354x37.519x0.551	36.417	114.000	77.6	86.913	-52.32	3123.35	0.017
L4	30.2493 - 1 (4)	TP64.961x49.129x0.63	36.431	114.000	67.6	113.908	-67.11	4871.49	0.014

### Pole Bending Design Data

Section No.	Elevation	Size	M <sub>ux</sub>	φM <sub>ux</sub>	Ratio M <sub>ux</sub> / φM <sub>ux</sub>	M <sub>uy</sub>	φM <sub>uy</sub>	Ratio M <sub>uy</sub> / φM <sub>uy</sub>
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	115 - 95 (1)	TP25.984x25.984x0.197	479.03	585.65	0.818	0.00	585.65	0.000
L2	95 - 60.9449 (2)	TP40.795x25.984x0.394	2582.43	2737.27	0.943	0.00	2737.27	0.000
L3	60.9449 - 30.2493 (3)	TP53.354x37.519x0.551	6205.93	6575.54	0.944	0.00	6575.54	0.000
L4	30.2493 - 1 (4)	TP64.961x49.129x0.63	8855.58	9883.08	0.896	0.00	9883.08	0.000

### Pole Shear Design Data

Section No.	Elevation	Size	Actual V <sub>u</sub>	φV <sub>n</sub>	Ratio V <sub>u</sub> / φV <sub>n</sub>	Actual T <sub>u</sub>	φT <sub>n</sub>	Ratio T <sub>u</sub> / φT <sub>n</sub>
	ft		K	K		kip-ft	kip-ft	
L1	115 - 95 (1)	TP25.984x25.984x0.197	43.25	552.09	0.078	0.00	1174.08	0.000
L2	95 - 60.9449 (2)	TP40.795x25.984x0.394	98.41	1759.92	0.056	0.00	5489.80	0.000
L3	60.9449 -	TP53.354x37.519x0.551	134.97	3228.61	0.042	0.00	13189.17	0.000

<b>tnxTower</b>  <b>Bennett &amp; Pless</b> 750 Park of Commerce Dr #200 Boca Raton, FL 33487 Phone: (605) 540-4623 FAX:	<b>Job</b> 95ft of 115ft.100mph pine	<b>Page</b> 13 of 13
	<b>Project</b> NY170 Nelsonville	<b>Date</b> 09:55:09 03/17/20
	<b>Client</b> Insite	<b>Designed by</b> Chunhui Song

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L4	30.2493 (3) 30.2493 - 1 (4)	TP64.961x49.129x0.63	136.73	4281.08	0.032	0.00	19823.25	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	115 - 95 (1)	0.055	0.818	0.000	0.078	0.000	0.879	1.000	4.8.2 ✓
L2	95 - 60.9449 (2)	0.028	0.943	0.000	0.056	0.000	0.974	1.000	4.8.2 ✓
L3	60.9449 - 30.2493 (3)	0.017	0.944	0.000	0.042	0.000	0.962	1.000	4.8.2 ✓
L4	30.2493 - 1 (4)	0.014	0.896	0.000	0.032	0.000	0.911	1.000	4.8.2 ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	115 - 95	Pole	TP25.984x25.984x0.197	1	-8.96	163.00	87.9	Pass	
L2	95 - 60.9449	Pole	TP40.795x25.984x0.394	2	-28.58	1036.01	97.4	Pass	
L3	60.9449 - 30.2493	Pole	TP53.354x37.519x0.551	3	-52.32	3123.35	96.2	Pass	
L4	30.2493 - 1	Pole	TP64.961x49.129x0.63	4	-67.11	4871.49	91.1	Pass	
							Summary		
							Pole (L2)	97.4	Pass
							<b>RATING =</b>	<b>97.4</b>	<b>Pass</b>

<b>Base/Flange Plate</b>	Plate Type	<b>Baseplate</b>
	Pole Diameter	64.961 in
	Pole Thickness	0.63 in
	Plate Diameter	78.74 in
	Plate Thickness	3.54 in
	Plate Fy	50 ksi
	Weld Length	0.3125 in
	$\phi_s$ Resistance	899.11 k-in
	Applied	535.92 k-in
	<b>Stiffeners</b>	#

<b>Bolts</b>	#	<b>32</b>
	Bolt Circle (R)adial / (S)quare	72.835 in R
	Diameter	2.25 in
	Hole Diameter	2.64 in
	Type	A615-75
	Fy	75 ksi
	Fu	100 ksi
	$\phi_s$ Resistance	259.82 k
	Applied	232.55 k
	<b>Reinforcement</b>	#
<b>Extra Bolts</b>	#	0

Code Rev. **G**

Date **3/17/2020**  
 Engineer **CS**  
 Site # **NY170**  
 Site Name **Nelsonville**

Moment **11178.0 k-ft**  
 Axial **78.0 k**  
 Shear **138.0 k**

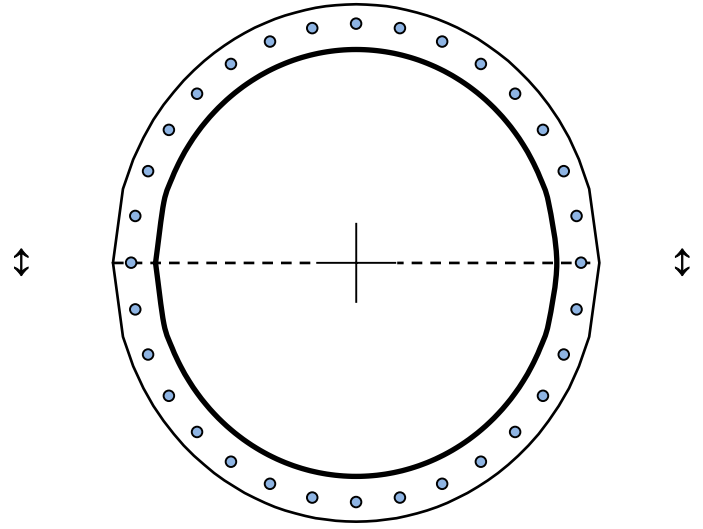


Plate Stress Ratio: **0.60** (Pass)

Bolt Stress Ratio: **0.90** (Pass)

## Anchor bolt length calculation

**PROJECT/ POLE TYPE:**                    **Monopole**

Reference: According to the code ACI 318-14 (25.4.2.3), for deformed bars, we can get below information:

The user may easily construct simple, useful expressions. For example, in all structures with normalweight concrete ( $\lambda = 1.0$ ), uncoated reinforcement ( $\psi_e = 1.0$ ), No. 7 or larger bottom bars ( $\psi_t = 1.0$ ) with  $f'_c = 4000$  psi and Grade 60 reinforcement, the equations reduce to

$$\ell_d = \frac{(60,000)(1.0)(1.0)}{20(1.0)\sqrt{4000}}d_b = 47d_b$$

or

$$\ell_d = \frac{3(60,000)(1.0)(1.0)}{40(1.0)\sqrt{4000}}d_b = 71d_b$$

Thus, as long as minimum cover of  $d_b$  is provided along with a minimum clear spacing of  $2d_b$ , or a minimum clear cover of  $d_b$  and a minimum clear spacing of  $d_b$  are provided along with minimum ties or stirrups, then  $\ell_d = 47d_b$ . The penalty for spacing bars closer or providing less cover is the requirement that  $\ell_d = 71d_b$ .

Many practical combinations of side cover, clear cover, and confining reinforcement can be used with 12.2.3 to produce significantly shorter development lengths than allowed by 12.2.2. For example, bars or wires with minimum clear cover not less than  $2d_b$  and minimum clear spacing not less than  $4d_b$  and without any confining reinforcement would have a  $(c_b + K_{tr})/d_b$  value of 2.5 and would require a development length of only  $28d_b$  for the example above.

So when the project satisfy below requirements:

1. The anchor bolts is for No.7 or larger bottom bars.
2. With minimum clear cover not less than  $2d_b$  and minimum clear spacing not less than  $4d_b$ .
3. Compressive strength of the concrete is 4000 psi.
4. Deformed bar is grade 60

The development length  $L_d$  should be

$$L_d \geq 28 d_b$$

where  $d_b$  is the bar diameter

For this project,

Rebar size	=	1.410	in
Grade of bar	Fy=	60	ksi
Usage of bar	=	1.00	
The required development length of rebars:			
$L_d = F_y/60 * usage * d_b * 28$	=	39.48	in
Clear cover	=	3.0	in
Tie size	=	0.625	in
Anchor bolt size	=	2.250	in
Anchor bolt circle diameter	=	72.835	in
Anchor bolt template diameter	=	78.835	in
Seismic Design Category	=	B	
Min. inside bend dia. plus standard/seismic hook length (ACI 318-14 25.3.2)	=	0.000	in
Min. Rebar cage diameter	=	84.245	in
Min. Caisson Diameter	=	7.742	ft
Caisson diameter used	=	8.0	ft
Clear spacing between rebar and anchor bolt	=	3.875	in
The req'd minimum anchor bolt length with 12" length protrusion	=	57.19	in

Calculate by :	CS
Date:	3/17/2020

PROJECT No: 20.03.008.014  
 PROJECT NAME: NY170 - Nelsonville Pine  
Ambor/Insite  
 DATE: 3/17/2020 12:37

ENG: CS  
 CHK: JB  
 PAGE: of

TIA-222-G

**SINGLE GLOBAL FOUNDATION WITH PIER(S) CHECKS - MONOPOLE**

Global Tower Reactions		Factored Loads		Calculated Reactions		Factored Resistance		SF=2.34
Code Rev	Maximum Moment	11,178.00	k-ft	Disturbing Moment	12,075.0	14,695.4	k-ft	PASS 82.2%
TIA-G	Axial Load	78.00	kips	Maximum Bearing	4.47	75.00	kips	PASS 6.0%
	Shear Load	138.00	kips	Lateral (Sliding)	138.00	206.35	kips	PASS 66.9%
				Pad Shear	887.2	1,113.2	kips	PASS 79.7%
				Punching Shear	111.9	2,189.1	kips	PASS 5.1%
	Pier Rebar Check	11,695.5	k-ft	Flexural Capacity	13,675.6		k-ft	PASS 85.5% [GOVERNS]
	Pad Rebar Required	(35) # 11 @ 11.47 in		Actual Pad Rebar	(49) # 11 bars @ 8.1 in			PASS 73.6%

Soil Parameters	Soils Report	Pier Geometry	Pad Geometry
Cohesion	0.0 psf (0.0 kPa)	Qty of Piers	1
$\phi$	20.0 °	Width (Bp)	8.00 ft
Frost/Ignored Depth	4.00 ft (1.22 m)	Height (Hp)	3.25 ft
Water Level	99.00 ft (30.18 m)	Pier above grade	0.50 ft
Soil Dry Density ( $\gamma_{dry}$ )	0.125 kcf (19.6 kN/m <sup>3</sup> )	Pier Type	R (Rnd or Sq)
Soil Sub Density ( $\gamma_{sub}$ )	0.063 kcf (9.83 kN/m <sup>3</sup> )	<input type="checkbox"/> (use equivalent square for pad flexure)	
All. Bearing Pressure	50.000 ksf (2394.0 kPa)	Rebar	Pier
Bearing Safety Factor	2	Rebar Type	ASTM
Concrete Parameters		Cover to Tie	3.00 inches
f <sub>c</sub>	4.500 ksi (31.0 MPa)	Pier Tie Size	5
f <sub>y</sub>	60.00 ksi (413.7 MPa)	Pier Vertical Size	11
Dry Density ( $\gamma_{dry}$ )	0.150 kcf (23.6 kN/m <sup>3</sup> )	Pier Vertical Qty	49 1.06%
Sub Density ( $\gamma_{sub}$ )	0.088 kcf (13.8 kN/m <sup>3</sup> )	Pad	ASTM
		Bar Size	11
		Bar Qty	49
		Pad bar qty is one layer in one direction	

Volume of Concrete/Soil	Concrete (117.9cuyd)		
	1 Pier	Mat	Soil
Depth (above)	0.50	--	-- ft
Depth (dry)	3.25	2.75	3.25 ft
Depth (submerged)	0.00	0.00	0.00 ft
Volume (above)	25.13	--	-- ft <sup>3</sup>
Volume (dry)	163.36	2,994.75	3635.68 ft <sup>3</sup>
Volume (submerged)	0.00	0	0.00 ft <sup>3</sup>
Total	188	2995	3636 ft <sup>3</sup>

Pad Flexure	Value	Unit	Wgt of Rebar
Distance (edge to pier)	12.500	ft	35,375 lbs
B' = 3/2(B-2e)	7.767	ft	
Force	1721.7	kips	
Disturbing Moment	6686.41	kip-ft	
Ku	259.60		
$\rho$	0.00500		
4/3 $\rho$ if $\rho < \rho_{min}$	0.00666		
$\rho_{min} \geq 0.0018$	0.00180		35 Qty
As Required (based on $\rho$ )	55.283	in <sup>2</sup>	11.47 in c/c
As Actual	76.440	in <sup>2</sup>	$\phi Mn = 9,089$ kip-ft

Calculations	TIA-G Method	EIA-F Method
Axial Download	78.0	-- kips
Wgt of Concrete	477.5	-- kips
Wgt of Soil	422.0	-- kips
Total Download (P1)	1157.4	-- kips
Total Download (P2)	868.0	-- kips
Passive Force Moment	47.7	-- k-ft

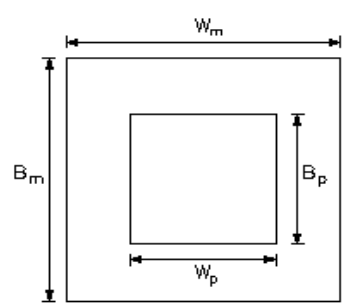
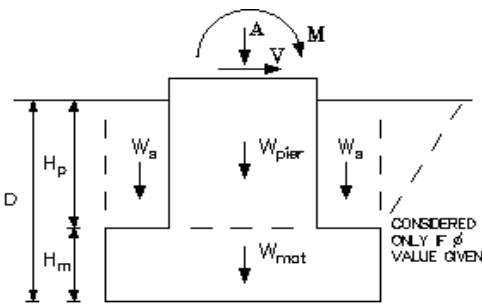
Bearing Capacity Check	Value	Unit
Calculate ecc e = M/P1 (1.2D+1.6W)	10.00	-- ft
1) q <sub>max</sub> = Ortho Direction	2.75	-- ksf
2) q <sub>max</sub> = Diagonal Direction	3.31	-- ksf
Calculate ecc e = M/P1 (0.9D+1.6W)	13.38	-- ft
1) q <sub>max</sub> = Ortho Direction	4.30	-- ksf
2) q <sub>max</sub> = Diagonal Direction	4.47	-- ksf
q factored	75.00	-- ksf

Overturning Stability Check	Value	Unit
a) Resisting Moment Arm (d)	16.5	-- ft
a) Moment Resistance = P2 x d	14855.4	-- k-ft
a) Disturbing Moment (about edge)	12075.0	-- k-ft
b) Moment Resistance (ortho)	14695.4	-- k-ft
b) Moment Resistance (diagonal)	18768.8	-- k-ft
b) Disturbing Moment (about center)	12075.0	-- k-ft

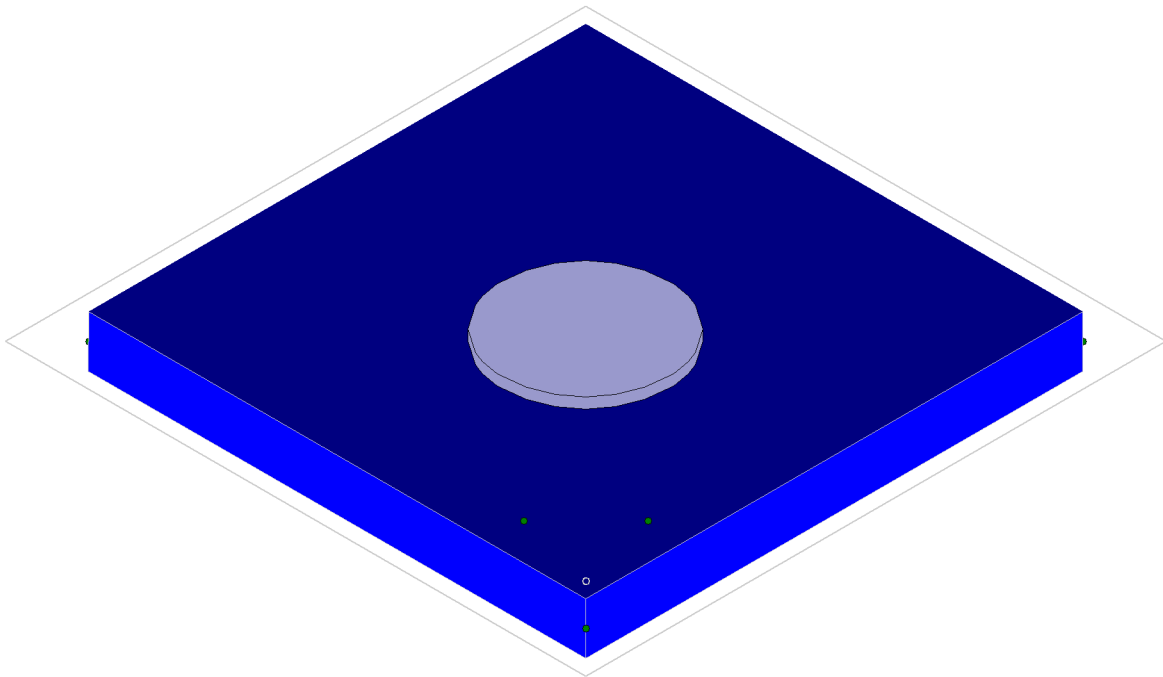
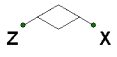
Note: The moment is derived from a moment diagram that considers the ortho q<sub>max</sub> trapezoidal distribution underneath the pad to edge of square pier.

Check for 1-Way Shear	Value	Unit
Shear Area (b x d) =	76.83	-- ft <sup>2</sup>
Factored shear force =	887.21	-- kips
Factored shear resistance	1113.2	-- kips

Check for 2-Way Shear (Punching)	Value	Unit
Shear Area (b <sub>o</sub> x d)	75.54	-- ft <sup>2</sup>
Factored Shear Force	111.93	-- kips
Factored Shear Resistance	2189.1	-- kips



M =	11178.0 k-ft
A =	78.0 kips
V =	138.0 kips
Bp =	8.00 ft
Wp =	8.00 ft
Hp =	3.25 ft
Bm =	33.00 ft
Wm =	33.00 ft
Hm =	2.75 ft
D =	6.00 ft



Results for LC 4, Strength@45Deg

B&P

CS

20.03.008.014

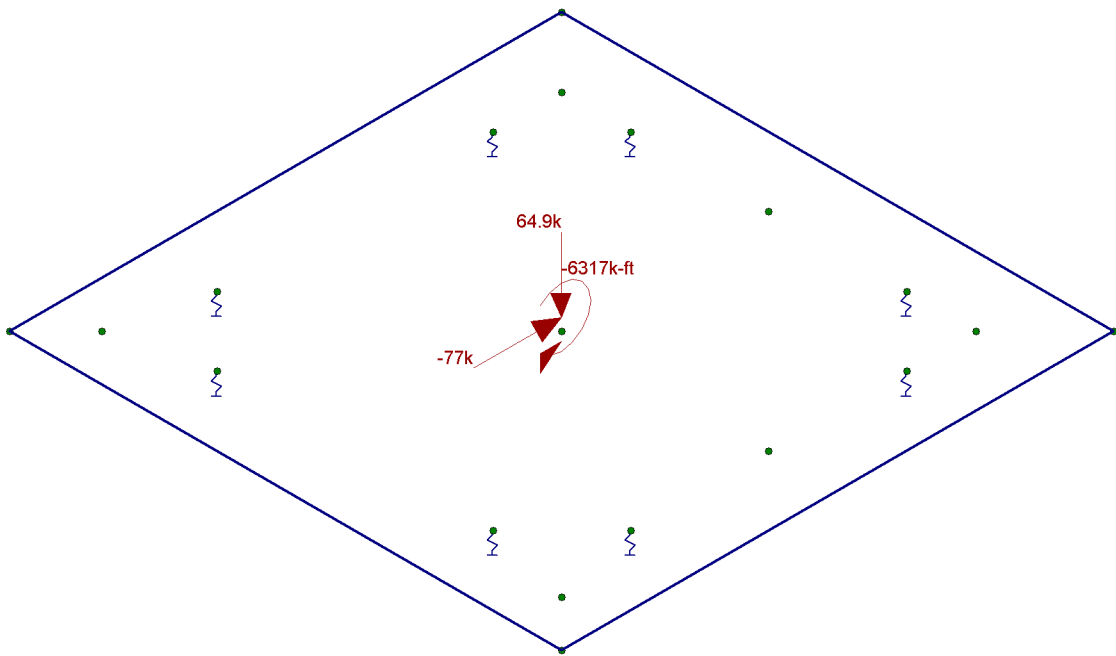
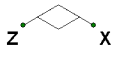
NY170 Nelsonville Pine  
Rendered Foundation

SK - 1

Mar 19, 2020 at 5:58 PM

RockAnchorPad monopole.r3d



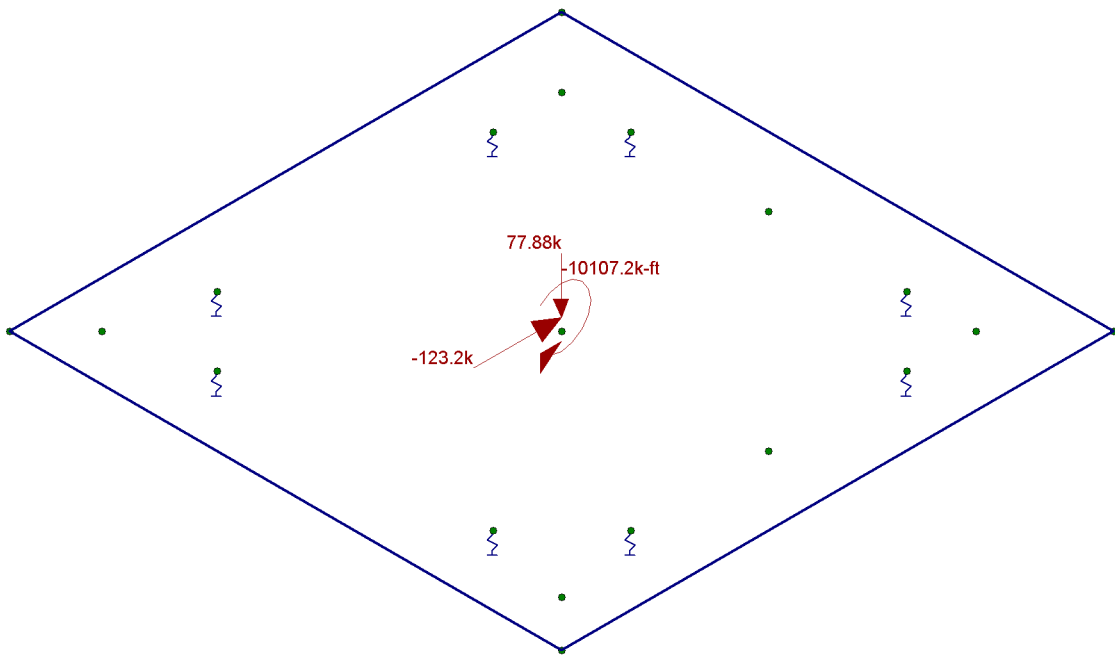
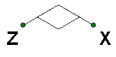


Loads: LC 1, Service

B&P
CS
20.03.008.014

NY170 Nelsonville Pine
Serevice Load @ 0 Degree

SK - 2
Mar 19, 2020 at 6:15 PM
RockAnchorPad monopole.r3d

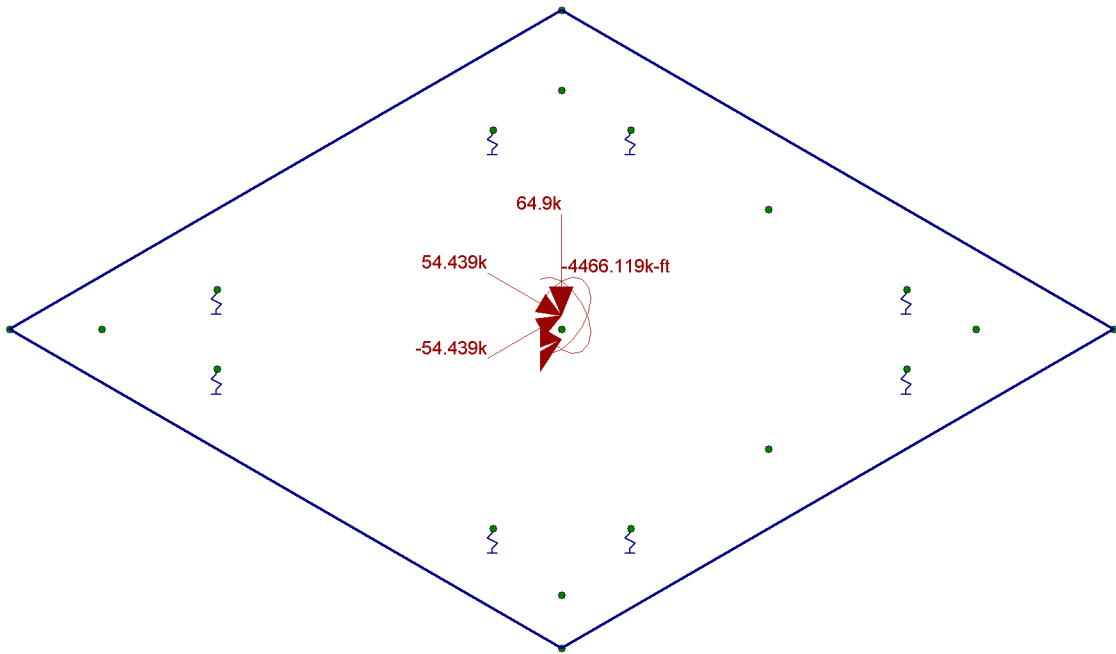
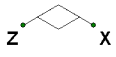


Loads: LC 2, Strength

B&P
CS
20.03.008.014

NY170 Nelsonville Pine
Strength Load @ 0 Degree

SK - 3
Mar 19, 2020 at 6:15 PM
RockAnchorPad monopole.r3d

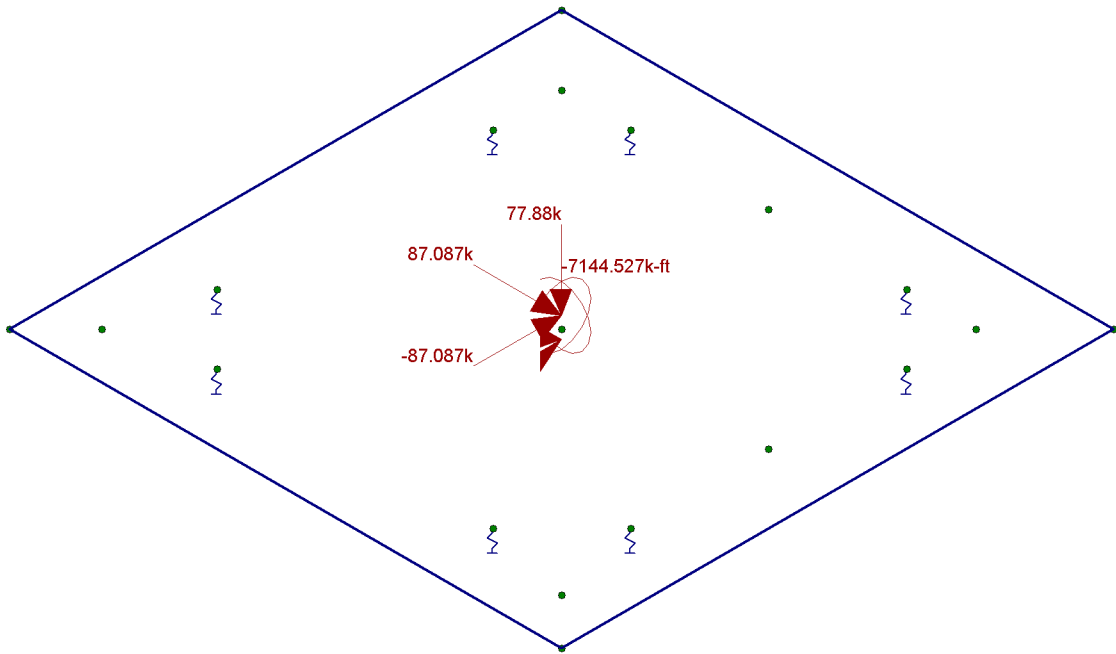
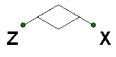


Loads: LC 3, Service@45Deg

B&P
CS
20.03.008.014

NY170 Nelsonville Pine
SERVICE Load @ 45 Degree

SK - 4
Mar 19, 2020 at 6:16 PM
RockAnchorPad monopole.r3d

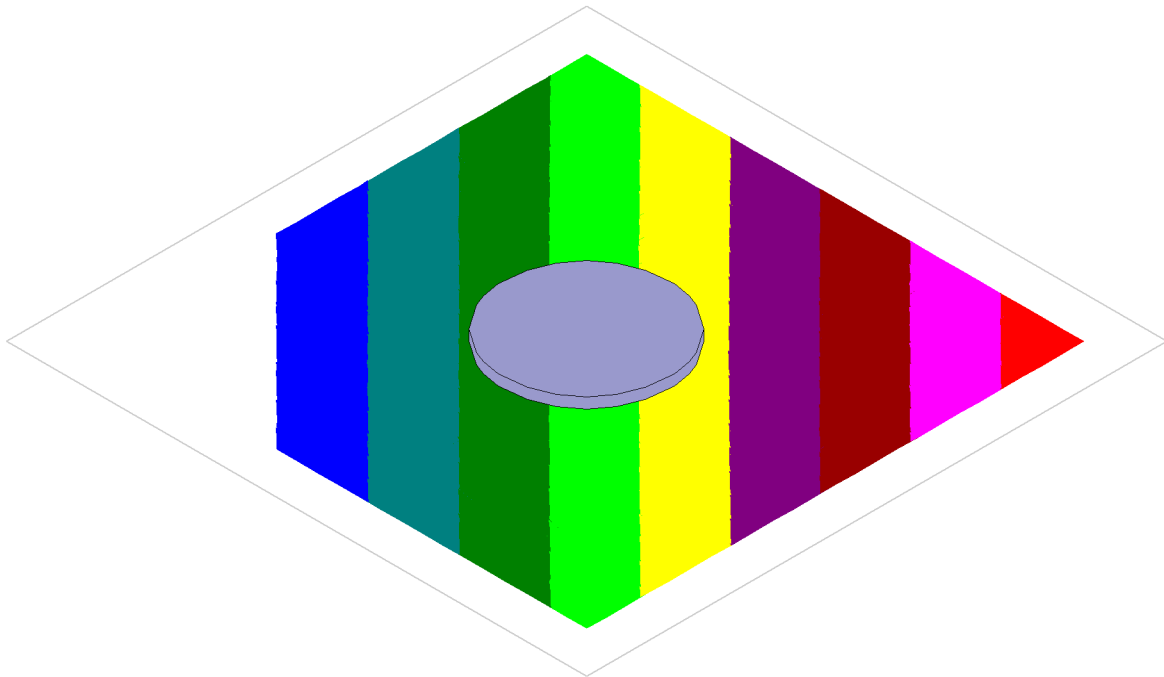
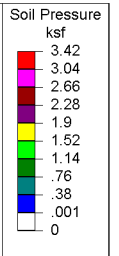
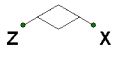


Loads: LC 4, Strength@45Deg

B&P
CS
20.03.008.014

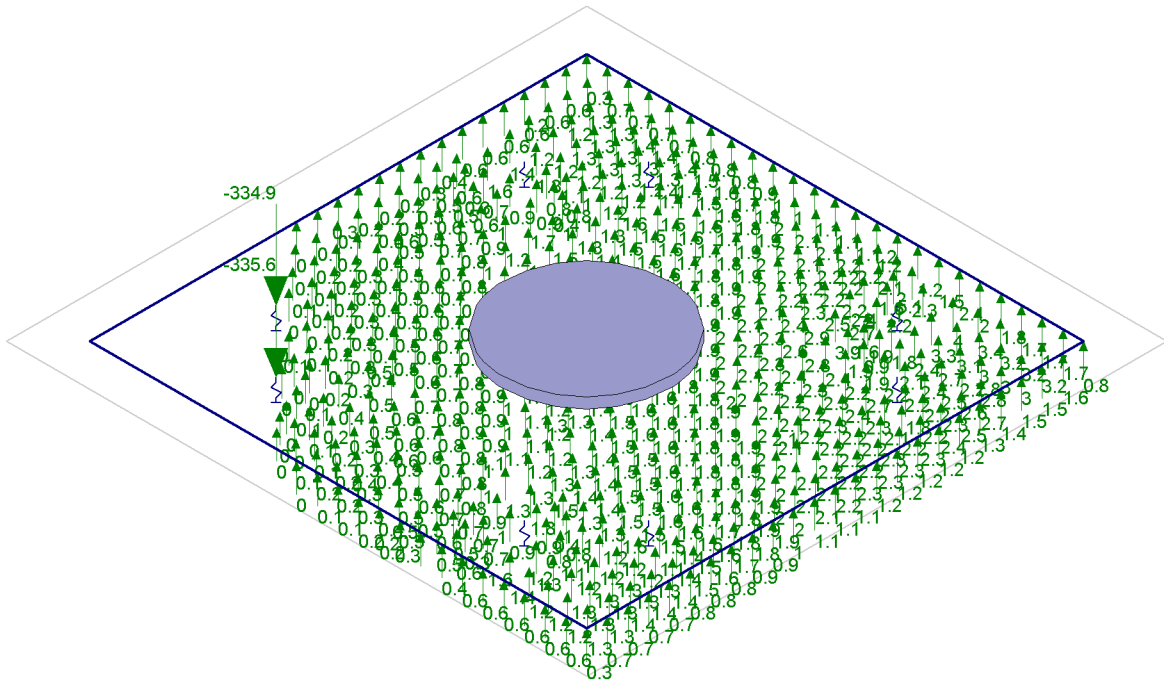
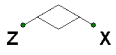
NY170 Nelsonville Pine
Strength Load @ 45 Degree

SK - 5
Mar 19, 2020 at 6:16 PM
RockAnchorPad monopole.r3d



Results for LC 4, Strength@45Deg

B&P	NY170 Nelsonville Pine Soil Bearing Pressure	SK - 6
CS		Mar 19, 2020 at 6:02 PM
20.03.008.014		RockAnchorPad monopole.r3d



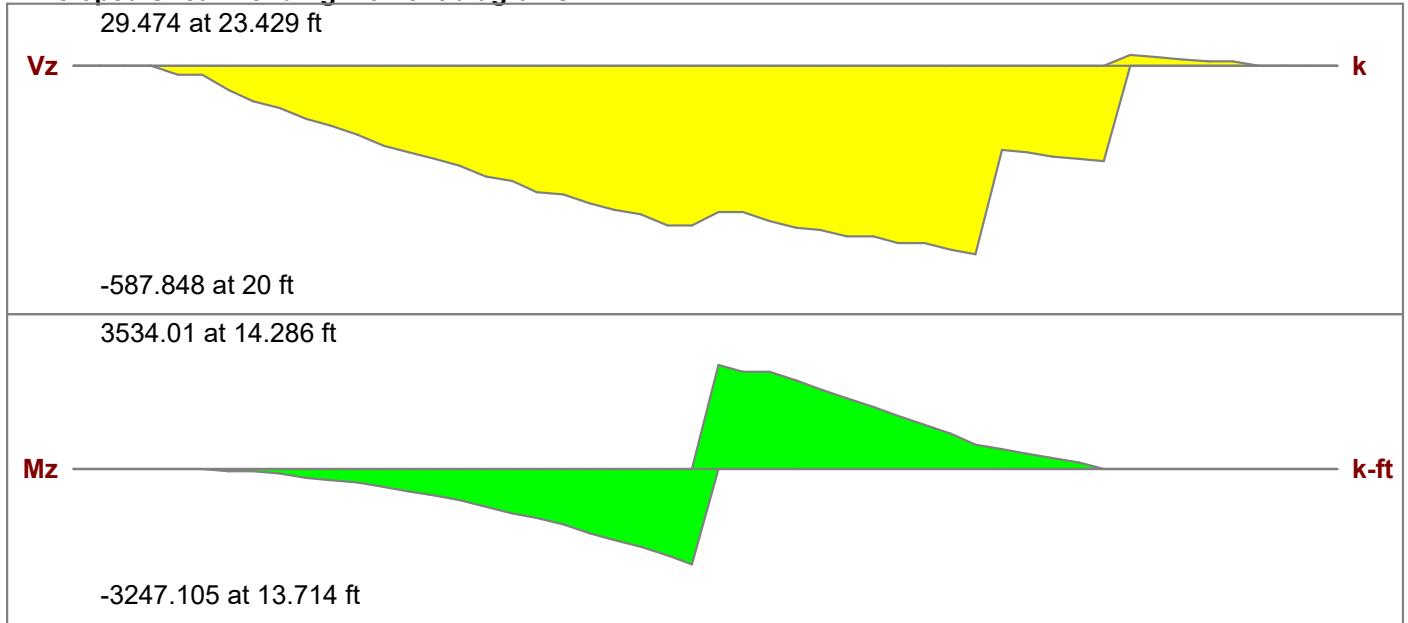
Results for LC 4, Strength@45Deg  
 Y-direction Reaction units are k and k-ft

B&P	NY170 Nelsonville Pine Rock Anchor Reactions	SK - 7
CS		Mar 19, 2020 at 6:04 PM
20.03.008.014		RockAnchorPad monopole.r3d



Strip:	<b>DS1</b>	Max Top bar Spac.:	<b>8 in</b>	Stress Block:	<b>Rectangular</b>
Material:	<b>Conc4500NW</b>	Min Top bar Spac.:	<b>5 in</b>	Rebar Orientation:	<b>0</b>
Strip Width:	<b>VARIABLES</b>	Max Bot bar Spac.:	<b>8 in</b>	Rebar Spacing Inc:	<b>2 in</b>
Total Cuts:	<b>50</b>	Min Bot bar Spac.:	<b>5 in</b>	Design Rule:	<b>Typical</b>

**Enveloped Shear/Bending Moment diagrams**



**ACI 318-14 Code Check**

Top Bending Check	<b>0.550</b>	Bot Bending Check	<b>0.505</b>	1 Way Shear Check	<b>0.770</b>
Gov Mu Top	<b>3534.01 k-ft</b>	Gov Mu Bot	<b>-3247.105 k-ft</b>	Gov Vu	<b>587.848 k</b>
phi*Mn Top	<b>6427.168 k-ft</b>	phi*Mn Bot	<b>6427.168 k-ft</b>	phi*Vn	<b>763.049 k</b>
Governing Cut	<b>DS1-X26</b>	Governing Cut	<b>DS1-X25</b>	Governing Cut	<b>DS1-X36</b>
Governing LC	<b>4</b>	Governing LC	<b>4</b>	Governing LC	<b>4</b>
Cut Width	<b>288 in</b>	Cut Width	<b>288 in</b>	Cut Width	<b>288.39 in</b>
Tension Bar Fy	<b>60 ksi</b>	Concrete Weight	<b>.15 k/ft^3</b>	Top Cover	<b>0 in</b>
Shear Bar Fy	<b>60 ksi</b>	λ	<b>1</b>	Bottom Cover	<b>0 in</b>
F'c	<b>4.5 ksi</b>	E_Concrete	<b>4066.84 ksi</b>	Rho Top Prvd	<b>0.00763</b>
Flex. Rebar Set	<b>ASTM A615</b>	Rho Bot Prvd	<b>0.00763</b>	Prvd Top Bar Spac.	<b>#11@8in</b>
		Prvd Bot Bar Spac.	<b>#11@8in</b>		

**Bending Steel Req/Prvd, Units: in^2)**

Cut Label	Top As Reqd	Top As Prvd	Bot As Reqd	Bot As Prvd	Rho Reqd(T/S)	Rho Reqd(Flex)	Rho Prvd(Gross)
<b>DS1-X26</b>	<b>30.852</b>	<b>57.774</b>	<b>NA</b>	<b>57.774</b>	<b>0.00180</b>	<b>0.00180</b>	<b>0.01337</b>
<b>DS1-X25</b>	<b>NA</b>	<b>57.774</b>	<b>28.269</b>	<b>57.774</b>	<b>0.00180</b>	<b>0.00180</b>	<b>0.01337</b>



**Rock Anchor Design**



**Design Codes:** TIA-222-G-2 (Rev G)  
IBC 2015

**Job:** NY170 Nelsonville Pine  
**Client :** Insite

**Date:** 3/20/2020

**CTS/TITAN IBO Micropiles info**

Pile Type	Tension & Compression
Micropile Size	<b>103/78R</b>
Min. Drill bit diameter (d)	175 mm
Min. Drill bit diameter (d)	6.89 in
$\phi$	0.50 Sect 9.4.1
# of Piles	1

**Table 1 - Enlargement Factor**

#	Soil Type	Multiplier
1	Medium & coarse gravel	2.0
2	sand & gravelly sand	1.5
3	cohesive soil (clay, marl)	1.4
4	weathered rock	1.0

**SOIL PARAMETERS - Per Terracon Project No. J5205013**

Elevation Below Grade - From (ft)	Elevation Below Grade - From (ft)	Ultimate Skin Friction (psi)	Soil type (Table 1)	Enlargement Factor	$\phi R_n$ (kips)
5.0	27.0	140.0	4	1	400.00
<b><math>\phi R_n</math> per Pile (kips)</b>					400.00
<b>TOTAL <math>\phi R_n</math> Pile Group - SOIL (kips)</b>					<b>400.00</b>
<b>TOTAL <math>\phi R_n</math> Pile Group - STEEL (kips)</b>					<b>461.88</b>

**SOIL CONTROLS**