



AFS 130

30' Tilt-Up Pole

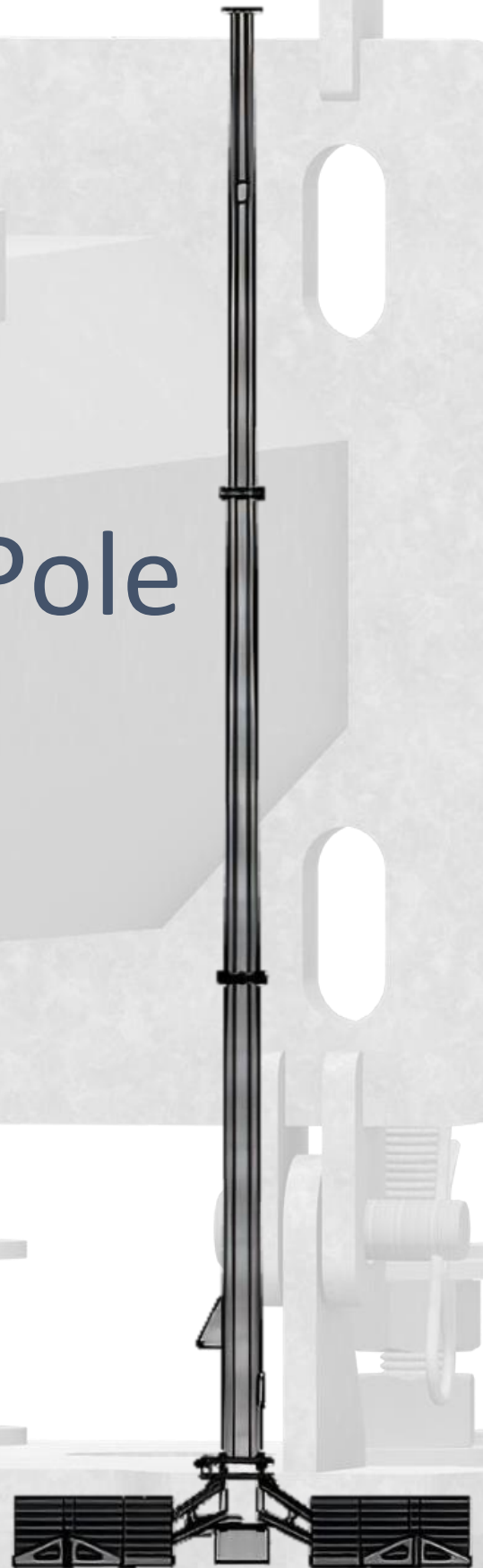


Table of Contents

Recommended Tools/Equipment List	1
Bill of Materials	2-3
Installation Instructions	4-10
Torque Specifications	11
Technical Drawings	12

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Recommended Tools/Equipment List

Wrenches/Ratchets:

- Wrench Set
- 8" Pipe Wrench
- 20mm+ Crescent Wrench
- 56mm+ Crescent Wrench
- 1/2" or 3/4" Socket Set
- Socket/Ratchet Universal
- Socket Extensions
- Torque Wrench

Power Tools:

- 1/2" or 3/4" Impact Driver

Iron Working Tools:

- 36" Crowbar
- Adjustable Spud Wrench
- 3# Hammer
- 8" Round Metal File
- 8" Flat Metal File
- 36" Cheater Pipe

Rigging:

- (2) 8' Nylon Slings
- (4) 3 Ton Shackles

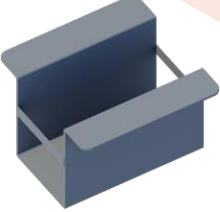
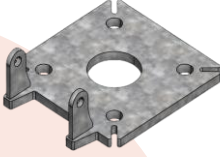
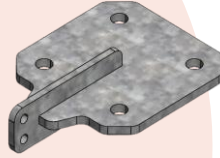
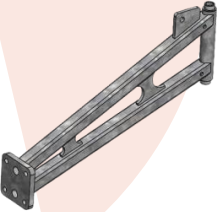

Site and Foundation Equipment:


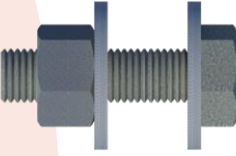


Equipment required is site specific

NOTE: Tools and equipment lists are suggestions. Required tools/equipment is the responsibility of the installer and will vary depending on installation specifications.





Contact ARE at (651) 330-1263 or email: sales@are-structures.com with questions or to setup a training call.

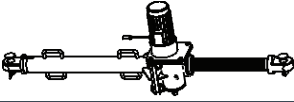


Bill of Materials

ITEM	NAME	QTY
	Assy Support Pedestal	1
	Upper Splice Plate	1
	Lower Splice Pole	1
	Outrigger Leg	4
	Ballast Plate	4

ITEM	NAME	QTY
	Splice Plate and Outrigger Bolt Assy (M24x3x355 Hex Bolt (4). M24 Flat Washer (4); M24 Hex Nut (3))	4
	Ballast Tray and Pole Bolt Assy (M16x2x20 Hex Bolt (1); M16 Flat Washer (2); M16 Hex Nut (1))	40
	M20x80 Clevis Pin	2
	5mm Cotter Pin	2

Lift Assist Options: (Sold Separately)

ITEM	NAME	QTY
	5T Hydraulic Ram	1
	Hydraulic Power Unit (12v)	1
	M20x80 Cylinder Pin	2
	5mm Cotter Pin	2

ITEM	NAME	QTY
	5T Screw Jack (Hand Crank)	1
	M20x80 Cylinder Pin	
	5mm Cotter Pin	2

Bill of Materials Cont'd:

Pole Section #1 -Qty.1

209 lbs. (95 kg)
9.35 ft. (2.850 mm)



Pole Section #2 -Qty.1

134 lbs. (61 kg)
9.35 ft. (2.850 mm)



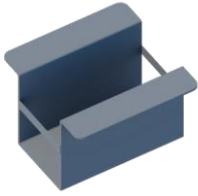
Pole Section #3 -QTY.1

108 lbs. (49 kg)
9.35 ft. (2.850 mm)



Installation Instructions

Splice Plates and Outrigger Arms:



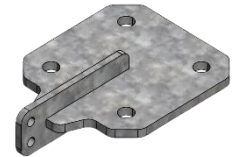
Support Pedestal

1. Locate support pedestal, lower splice plate, and four (4) M24x3x355 hex bolts with one (1) M24 flat washers. (Use of support pedestal not required but is helpful.)



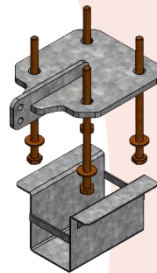
M24x3x355 hex bolt with M24 washer

2. Insert four (4) M24x3x355 hex bolts with M24 flat washers upward, through lower splice plate from bottom. Rest lower splice plate, with all hex bolts inserted, on top of support pedestal (2a-b).

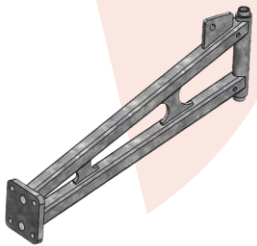
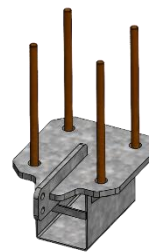


Lower Splice Plate

2a.



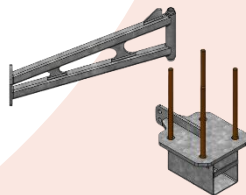
2b.



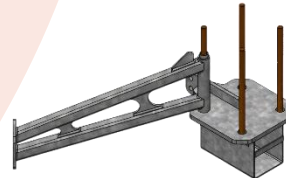
Outrigger Leg

3. Align outrigger leg tubes with the upward facing M24x3x355 hex bolts. Carefully thread the bolts through the outrigger leg tubes to prevent damage to the hex bolts (3a-b). Repeat process three (3) additional times to attach four (4) outrigger legs to lower splice plate (3c).

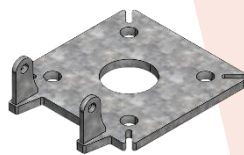
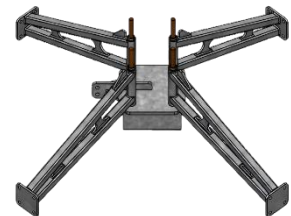
3a.



3b.

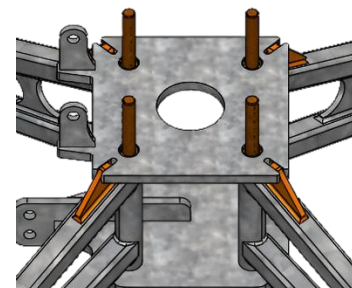
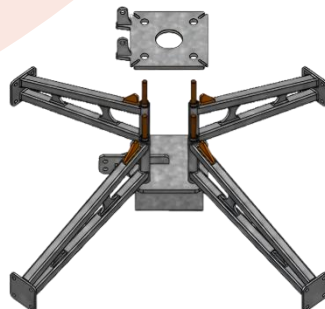


3c.

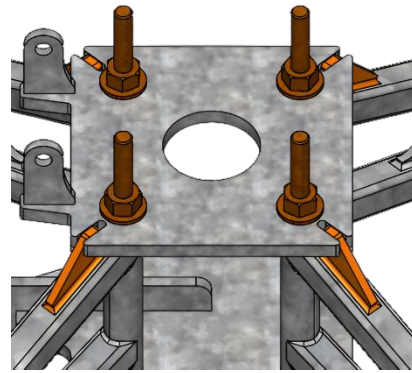
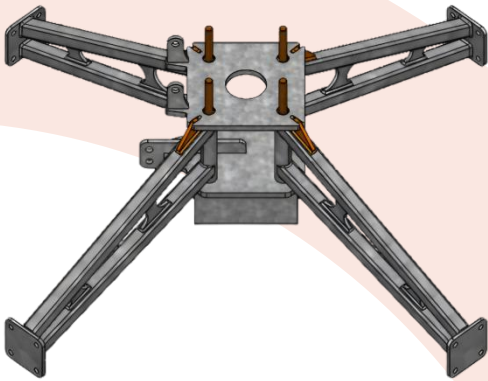


Upper Splice Plate

4. Align/Place upper splice plate with upper ends of M24 bolts used in the previous step. Use upper splice plate key slots, and outriggers' vertical keys to correctly index outrigger leg spacing and permanently set outrigger leg alignment.

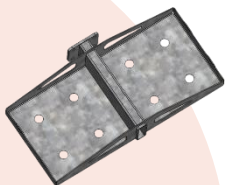


5. Add M24 flat washer and M24 hex nut to the end of M24 hex bolt and tighten to secure foundation. Tighten all bolts to torque specifications provided on Pg. 11 of this installation manual.

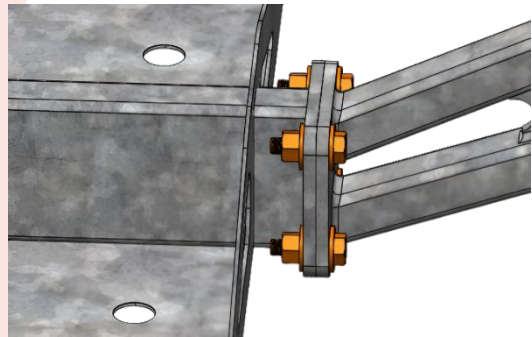
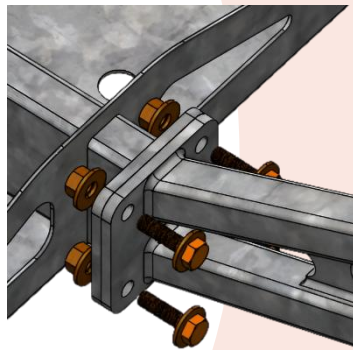


Ballast Trays:

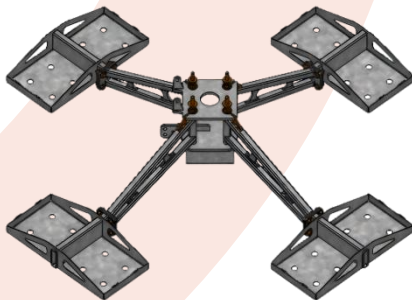
6. Insert M16x2x60 hex bolt and M16 flat washer through outrigger leg flange and through ballast tray flange. Complete bolt attachment with M16 flat washer and M16 hex nut.



Ballast Tray

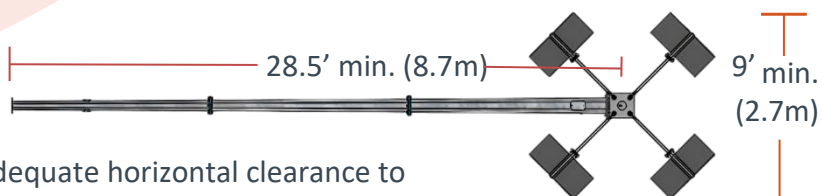


7. Perform the procedure four times for each of the four legs. Tighten all bolts to torque specifications provided on Pg. 11 of this installation manual.



Tower Base:

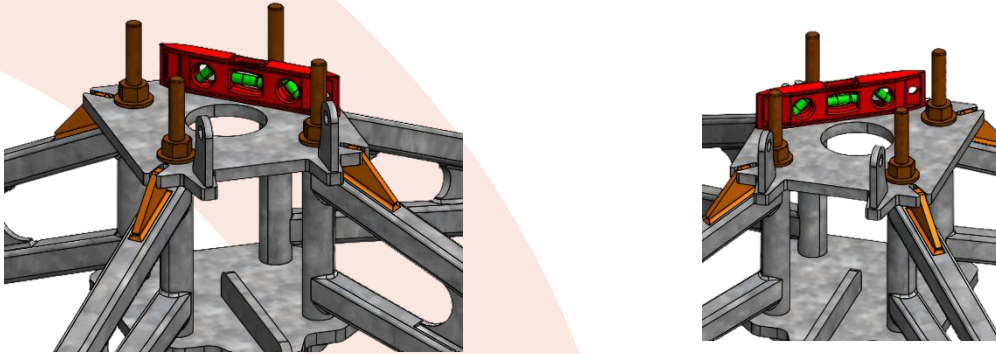
8. Position base assembly on properly prepared location.



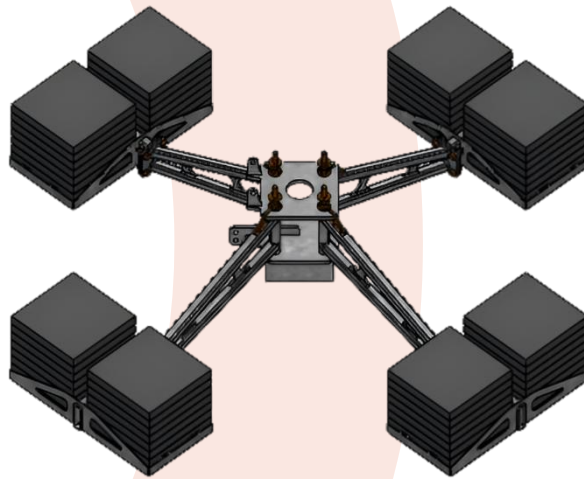
NOTE: Ensure there is adequate horizontal clearance to assemble the full length of the pole. Once assembled the pole will extend 28.5' (8.7m) from center of base and be approx... 24.11" (0.62m) off ground.

Tower Base Cont'd:

9. Check base for plumb and adjust as necessary.



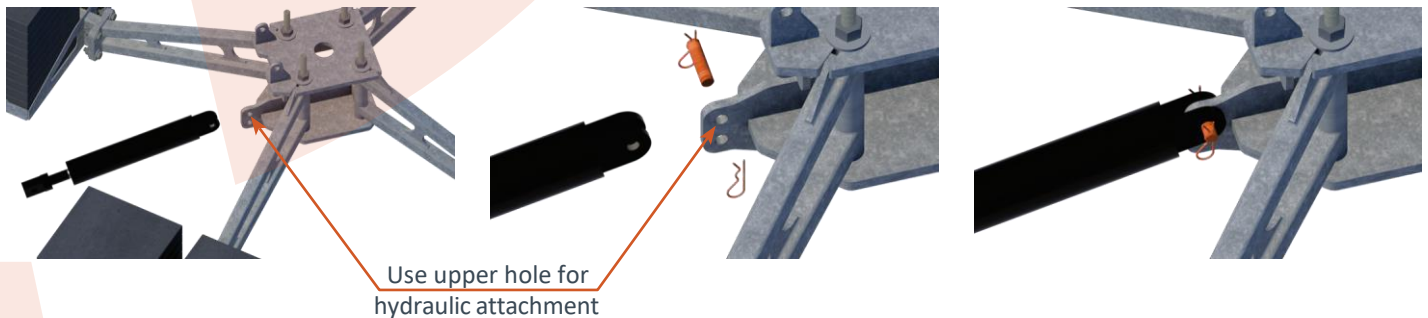
10. Add equal ballast to all four (4) ballast trays, per technical specifications provided.



Lift Assist:

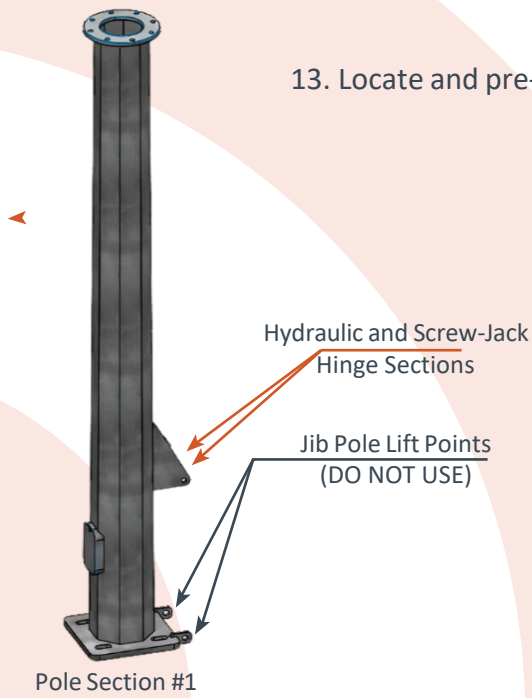
NOTE: Hydraulic ram or screw-jack should be shipped and received in the retracted (shortest) position. If this is not how it is received, you need to hookup the hydraulic control system of the hydraulic ram (per instructions provided in the system product manual) or work the screw-jack to fully retract the unit prior to moving forward with assembly.

11. Attach the hydraulic ram (upper attachment hole only) or screw-jack (either attachment hole) to the lower splice plate using one (1) M20x80 CYLINDER PIN and two (2) 5mm cotter pins as shown below.

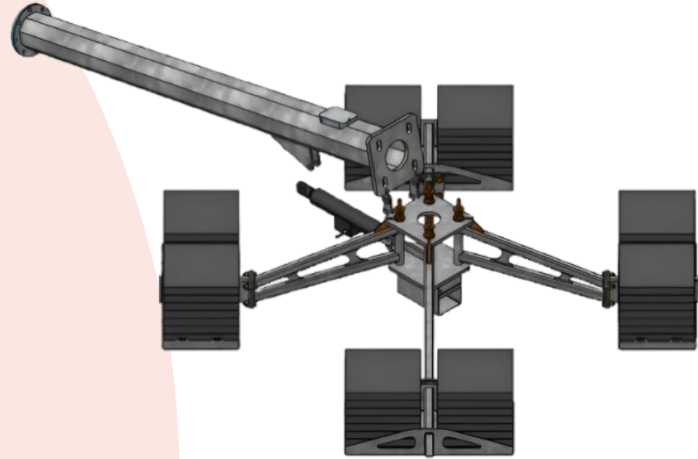


12. Allow the connected hydraulic ram or screw-jack to pivot and rest on the ground.

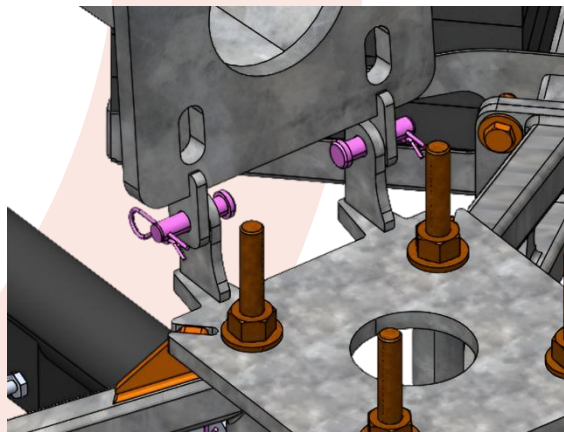
13. Locate and pre-position first pole section so the section can be lifted into place.



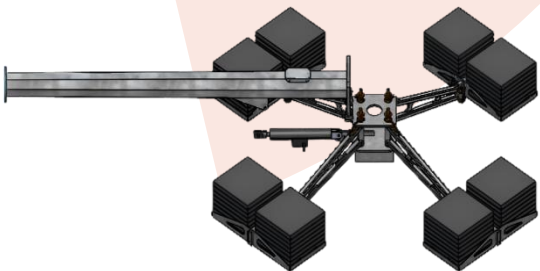
14. Lift the first pole section into position and align with the open hinge on the upper splice plate.



15. Use two (2) M20x80 clevis pins, and two (2) 5mm cotter pins to complete the hinge between the first pole section and the upper splice plate.

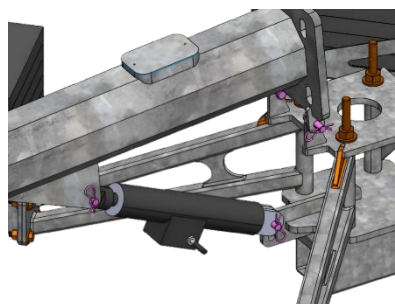


16. Pre-position one (1) M20x80 cylinder pin, and two (2) 5mm cotter pin for easy access prior to starting the next step.



17. Lift/Pivot the end of the first pole section upwards to approx... 90° relative to the base.

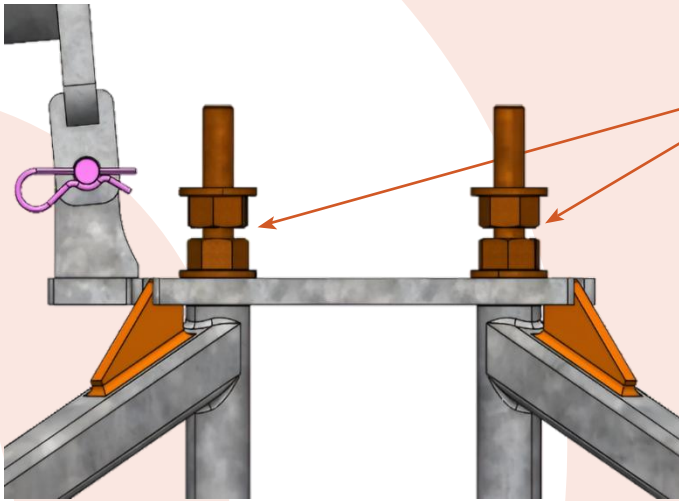
18. Lift/Pivot the hydraulic ram or screw-jack upwards to align the hole on the piston head with the hole in the lifting lug located on the side of the first pole section. Adjust the free end of the pole section up or down slightly to align and pin the connection with the pre-positioned M20x80 cylinder pin, and 5mm cotter pins.



Connecting First Section:



19. Add one (1) M24 hex nut and one (1) M24 flat washer to the top of each of the four (4) M24x3x445 hex bolts used to assemble top and bottom splice plates to the outrigger legs completed in earlier steps.



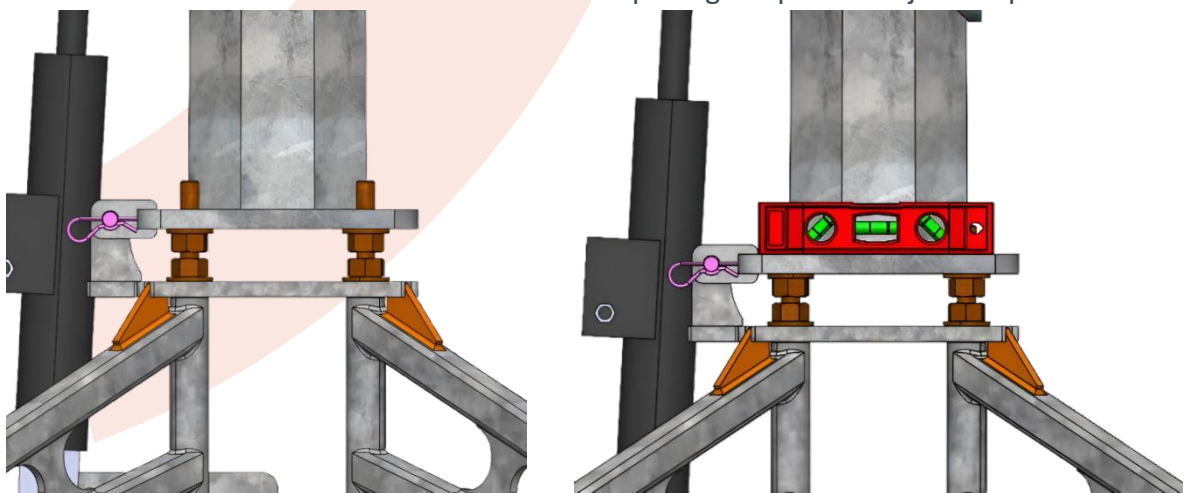
NOTE: Leave a consistent 3mm gap between pole flange bottom hex nuts and flat washers and the top of the hex nut used to complete base assembly in earlier steps.

20. Connect the hydraulic power unit to a 12v power supply following the instructions provided in the 10T Hydraulic Raising System Product Manual.

21. Raise the first pole section to its vertical position using the hydraulic ram or screw-jack. Ensure the system is operating properly without binding or twisting. **DO NOT FORCE IF BINDING OR TWISTING DEVELOPS.**

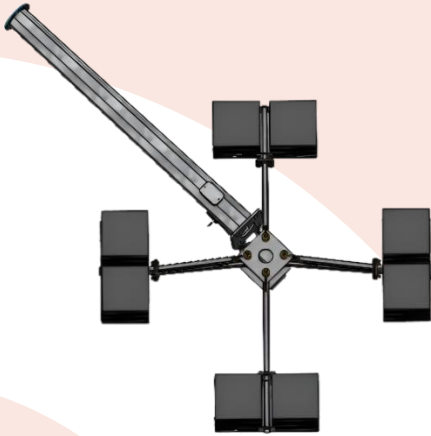
22. When the first pole is vertical and resting on the flange washers and nuts, check that the pole is plumb. Adjust the flange nuts with an open ended or crescent wrench to bring the pole into plumb. All four washers must touch and support the flange before moving forward with the next step.

NOTE: Do not check plumb using the side(s) of the pole. The pole is tapered from top to bottom and will not provide you with accurate measurements. Use bottom or top flange of pole to adjust for plumb.



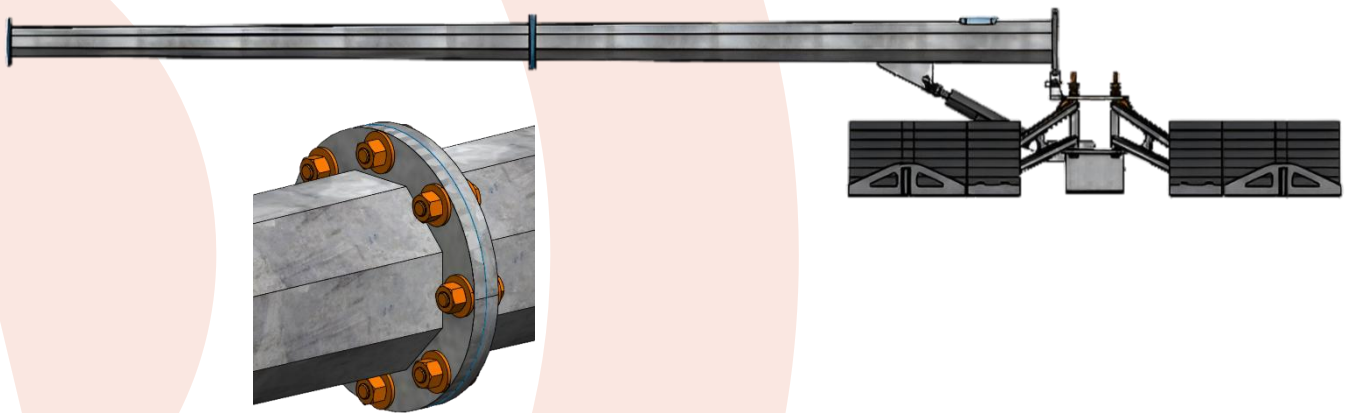
23. Once properly adjusted, return the first pole section to the horizontal position using the hydraulic ram or screw-jack. **DO NOT DISCONNECT HYDRAULIC RAM OR SCREW-JACK.**

Additional Sections:



24. Locate and pre-position the two (2) remaining pole sections. Each section and flange are marked respectively. Marks on each flange will align with marks on the corresponding flange ensuring the pole will be straight when fully assembled.

25. Elevate the second pole section into position and secure the upper and lower flanges using eight (8) M16x20 hex bolts, sixteen (16) M16 flat washers and eight (8) M16 hex nuts. Tighten each bolt to torque specifications provided on Pg. 11 of this installation manual. Add shims as needed per TIA code.



26. Elevate the third pole section into position and secure the upper and lower flanges using eight (8) M16x20 hex bolts, sixteen (16) M16 flat washers and eight (8) M16 hex nuts. Tighten each bolt to torque specifications provided on Pg. 11 of this installation manual. Add shims as needed per TIA code.

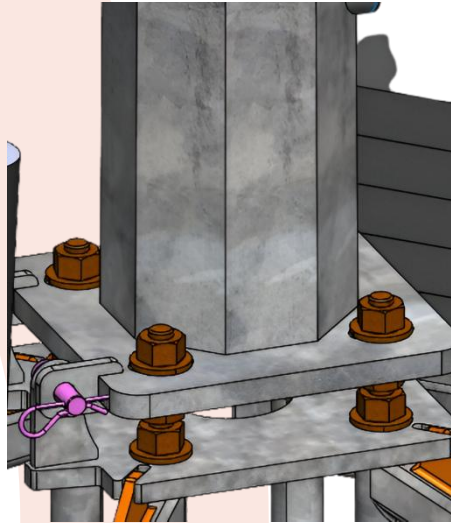


NOTE: At this point, the pole is stable and ready for any/all accessories or additional equipment to be installed. Combined weight of all equipment, mounting systems, fasteners, cables, etc. shall not exceed the engineered specifications provided and accepted at the time of purchase.

Raising Completed Tower:

27. Raise the completed tower into the vertical position using the hydraulic ram or screw-jack. The tower should return to the same position established in step #22 when adjusting for plumb.

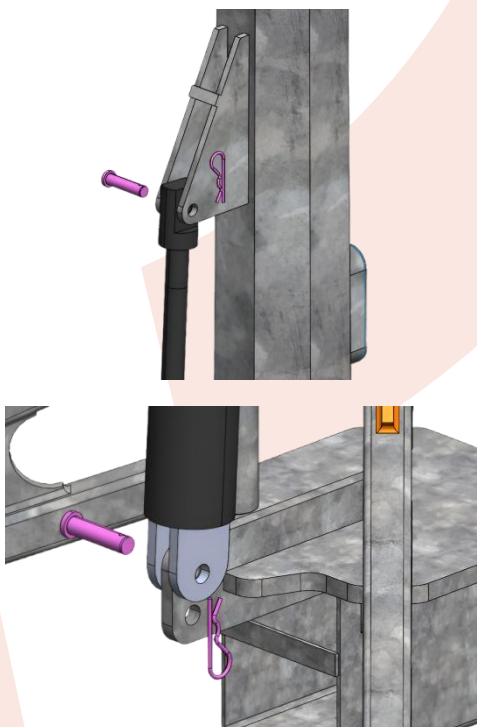
28. Add four (4) M24 flat washers and four (4) M24 hex nuts to the ends of the four (4) M24x3x445 hex bolts used to assemble top and bottom splice plates to the outrigger legs. Tighten each bolt to torque specifications provided on Pg. 11 of this installation manual.



Removing Raising System:

NOTE: Raising systems are not weatherproof and should be removed and stored after installation. Use care and caution when removing the hydraulic ram or screw-jack from the tower.

29. After all base flange nuts have been torqued to specifications, adjust the hydraulic ram or screw-jack to create a small amount of slack in the upper and/or lower connection points. Remove one of the lower cotter pins and then the cylinder pin. (It may be necessary to remove the second cotter pin and then forcefully drive the cylinder pin out of the hole if tension cannot be released by adjusting the hydraulic ram or screw-jack.)



Repeat the same procedure to remove the upper cotters and cylinder pin.



Torque Specifications

Recommended Bolt Torque for Anchor Bolts:

Bolt Size (mm)	Width Across Flats (mm)	Net Area (mm ²)	Yield Stress (MPa)	Tension Force (N)	Recommend Torque (N*m)	Pretension Force (N)
20	30	245	355 (45#)	86904	174	43452
24	36	353	355 (45#)	125138	300	62569
27	41	459	355 (45#)	163087	440	81544
30	46	561	355 (45#)	199013	597	99507
33	50	694	380 (GR55)	263720	870	131860
36	55	817	355 (45#)	289929	1044	144964
42	65	1121	355 (45#)	397955	1671	198978
48	75	1473	355 (45#)	522915	2510	261458
56	85	2030	355 (45#)	720650	4036	360325

Recommended Bolt Torque for Grade 8.8 Connection Bolts:

Bolt Size (mm)	Width Across Flats (mm)	Net Area (mm ²)	Yield Stress (MPa)	Tension Force (N)	Recommend Torque (N*m)	Pretension Force (N)
10	16	58	640 (8.8)	37120	37	18560
12	18	84	640 (8.8)	53952	65	26976
16	24	157	640 (8.8)	100480	161	50240
20	30	245	640 (8.8)	156672	313	78336
24	36	353	640 (8.8)	225600	541	112800
27	41	459	640 (8.8)	294016	794	147008
30	46	561	640 (8.8)	353784	1076	179392
33	50	694	640 (8.8)	444160	1466	222080
36	55	817	640 (8.8)	522688	1882	261344
42	65	1121	640 (8.8)	717440	3013	358720
48	75	1473	640 (8.8)	942720	4525	471360
56	85	2030	640 (8.8)	1299200	7276	649600



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