

## ASSEMBLY INSTRUCTION FOR STEEL GALVANIZED HIGHMAST POLES

### 1- SCOPE

For galvanized steel polygonal poles;

- Foundation.
- Unloading of the poles.
- Assembly of the poles.
- Erection of the pole to the Foundation (Anchor Bolt).

### 2- APPLICATION for

Polygonal galvanized steel poles.

### 3- INSTRUCTION

#### 3.1- PREPARATION of the FOUNDATION

After your order prepare your foundation according to the project provided to you.

- Perform excavation if necessary.
- Perform molding if necessary.
- Perform reinforcing acc. to the project.
- Establish anchor bolt by using templates.
- Pour the concrete. Enti recommends minimum 7 day wait after concrete is poured for proper curing.

Pole foundation types:

- reinforced
- concrete caisson.
  - pad foundation.
  - pier type foundation.
  - mat foundation.

**IMPORTANT:** Provide your soil report to the designer.

The anchor bolts and templates will be provided by Enti. Templates are for orientation purposes of the anchor bolts.



For more picture visit [www.highmast.net](http://www.highmast.net)

For detailed info about template and anchor bolt visit <http://www.enti.com.tr/destek>

### 3.2- UNLOADING

When delivering the poles to assembly site, special care should be taken during the unloading to prevent any damage to the pole or its component parts.

Necessary equipment for unloading:

- Required capacity Crane
- Required capacity rope.
- Hard wood lumber.
- Minimum 2 people.

**IMPORTANT** : Never roll the poles off the truck or drop the sections on the ground.

Poles should be unloaded at the proper location and aligned as required for easy installation.

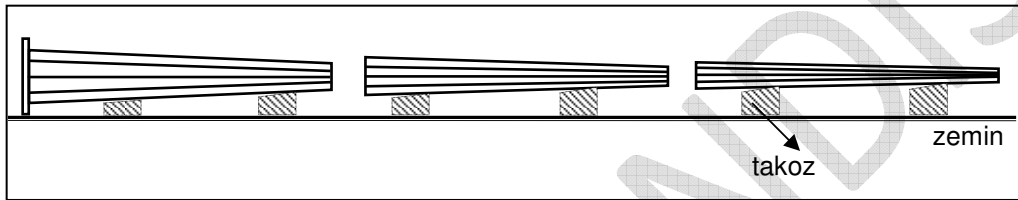


Figure-1

### 3.3- SLIP JOINT ASSEMBLY – joining the pole parts

Slip joint assembly is used for poles that have more than one piece.

Required Equipments;

- Required capacity Crane
- Required capacity rope.
- Hard wood lumber.
- Adequate capacity rope.
- Big hammer.
- Minimum 3 people.
- Jacking device. (Tirfor/Griphoist)

**The proper amount of joint overlap required (design overlap value), L:** 1.5 times of the diameter of the female part.

**Tolerance:** Overlap in the range of 10% less than the design value as well as 10% over the design value is acceptable.

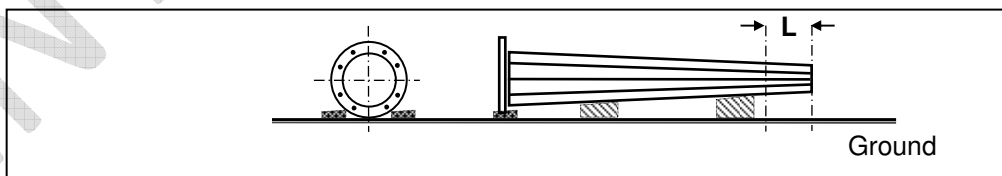


Figure-2

The male tube section should be marked with chalk or non-permanent marker to indicate the proper overlap into the female tube section. Prior to jacking, check the inside of the female slip joint for galvanizing debris or other debris. Debris may form a wedge during slip joint assembly and may inhibit achieving proper joint overlap.

Several methods are available for jacking the pole tube sections together depending on the pole design, section sizes, and the availability of equipment. Mechanical jacking devices are acceptable.

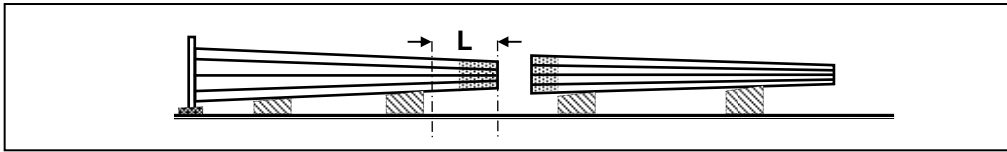


Figure-3

Lubricants applied to the slip joint may be used at the contractor's discretion. Care should be taken to not use a lubricant that will leak from the assembled slip joint and stain the galvanized finish. Soapy water may be utilized, however, a heavier lubricant like water soluble clear grease may prove to be more effective. The contractor will assume all responsibility for any stains to the pole finish.

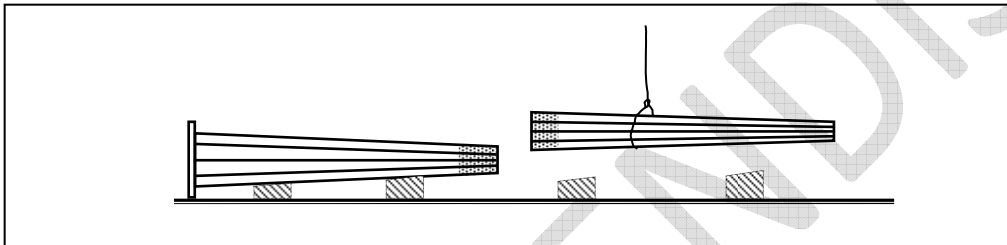


Figure-4

The female tube section should be aligned and its large end slipped over the small end of the male tube section. The longitudinal weld seams must be aligned the full length of the pole. The pole tube sections should be worked up and down to help bring the sections together. The alignment and pulling force must be even and steady. The pulling will be facilitated by flexing the joint either by lifting the small end of the pole slightly, or by lifting the joint slightly. The slip joint should be pulled until the application of additional pulling pressure produces little or no movement. The minimum and maximum insertion should be within +/- 10% of the design slip joint per the provided by Enti.

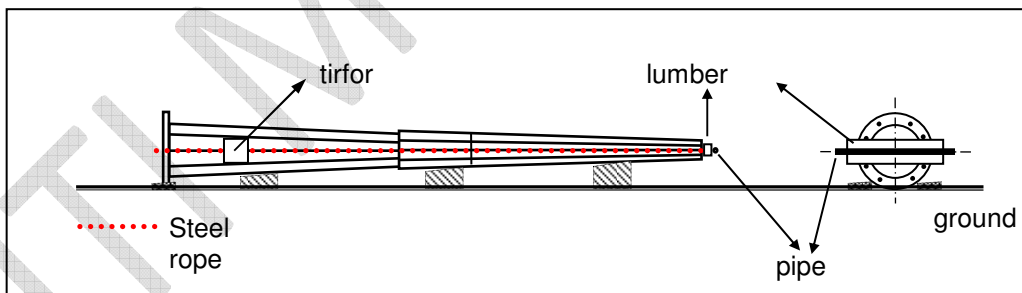


Figure-5

Equal forces should be applied by the two tirfor simultaneously.

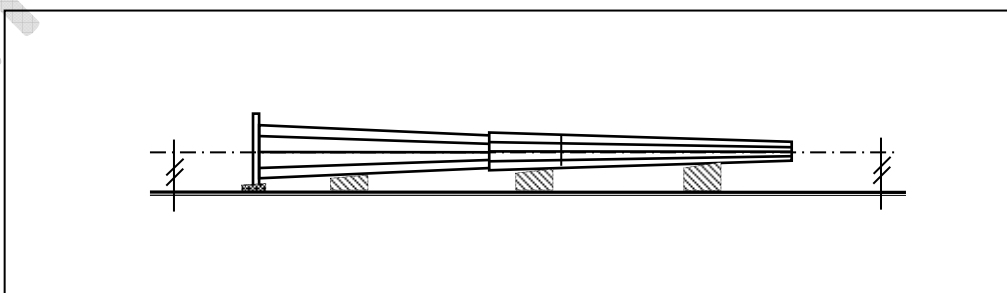


Figure-6



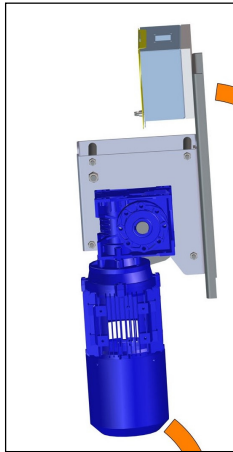


### 3.4- INSTALLING ACCESSORIES

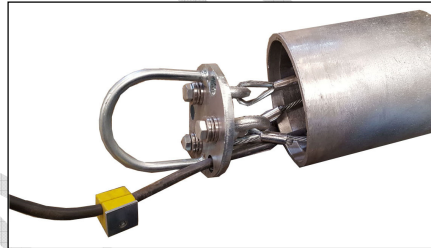
First of all unpack all components and check your pack list with the package delivered to you. Ensure there is no missing part.



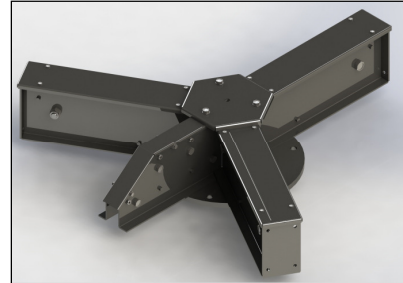
High mast pole system parts



Winch System



Swivel



Top Frame



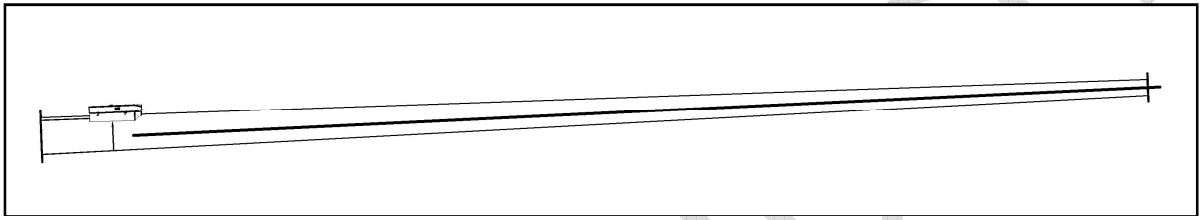
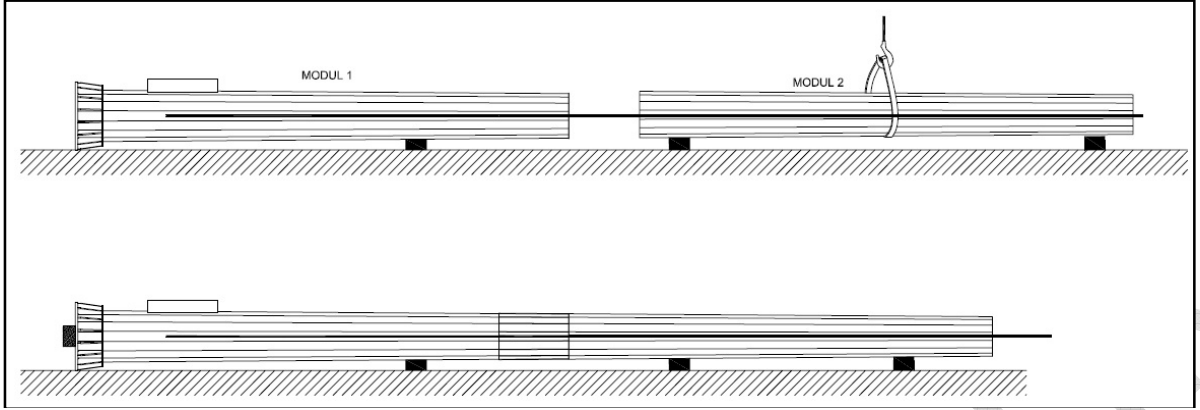
Ring ve Latches



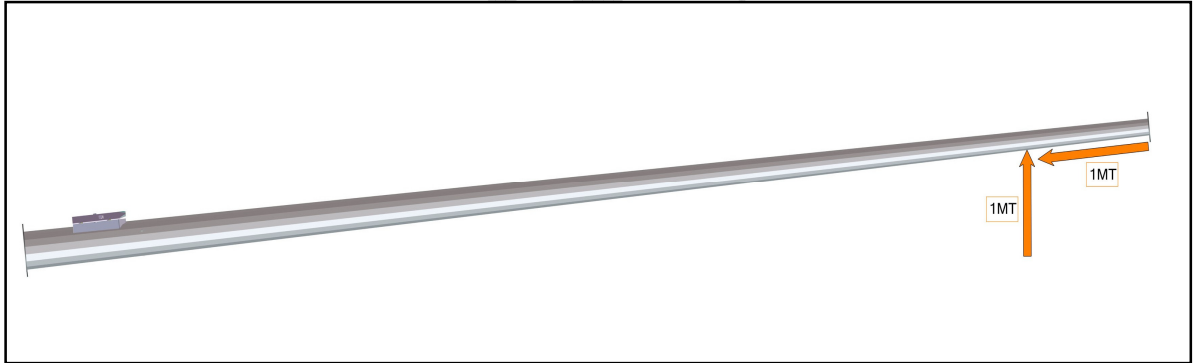
Steel Rope



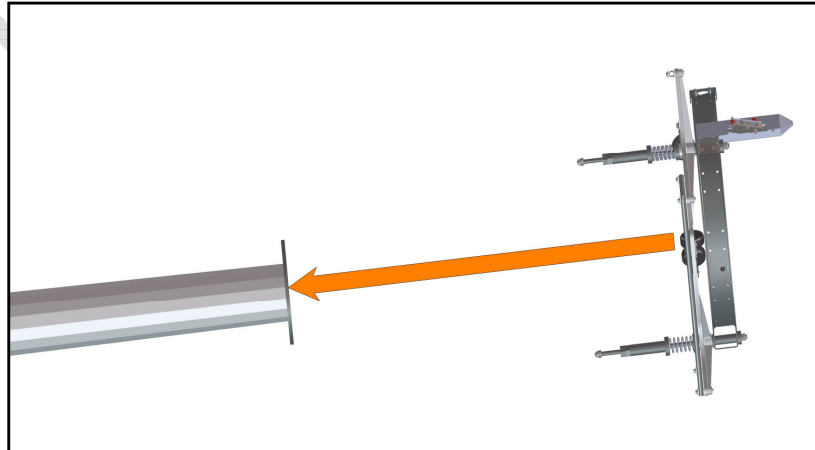
Junction box and warning light arm

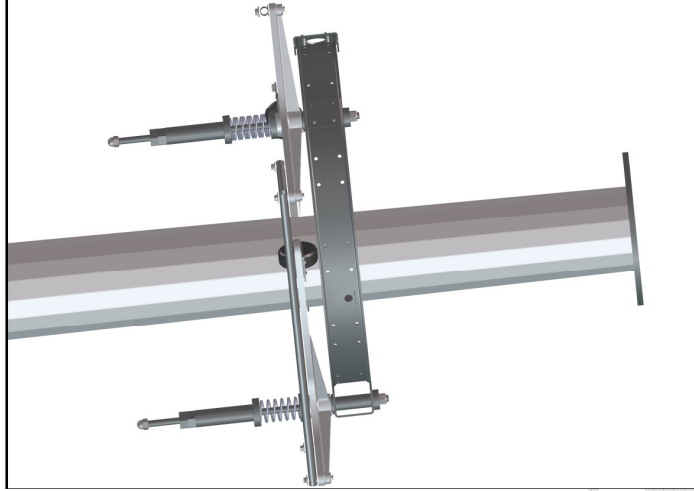


You need to install guide rope through inside the pole. This guide rope will be used for transmitting steel ropes and electrical cables through down the pole inside.

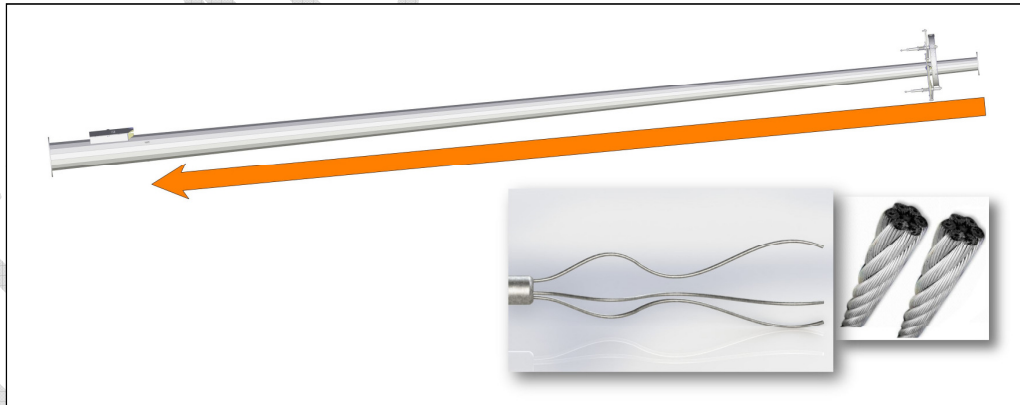
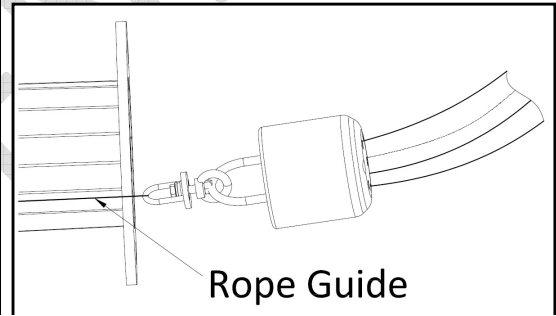
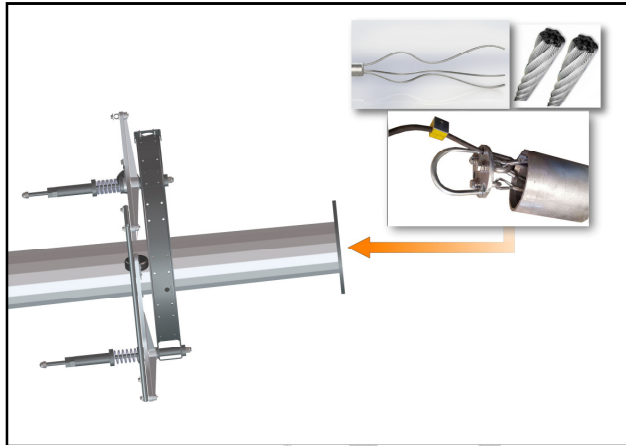


Orient the pole that its top will be 1 meter above the ground. You can use wooden or steel support for this aligned position. Be sure that pole cover is facing up.



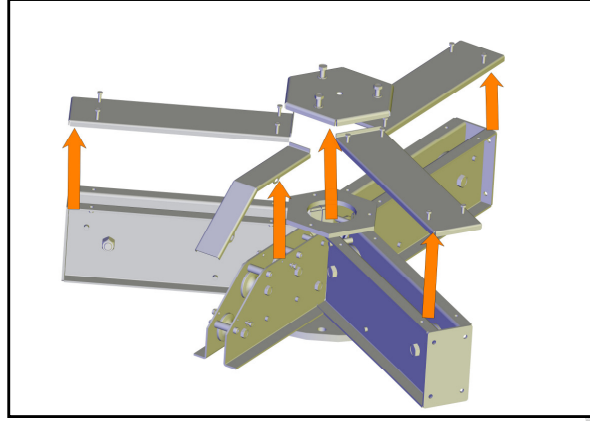


Slide the ring over the top of the pole and move 1 meter down – see drawing.

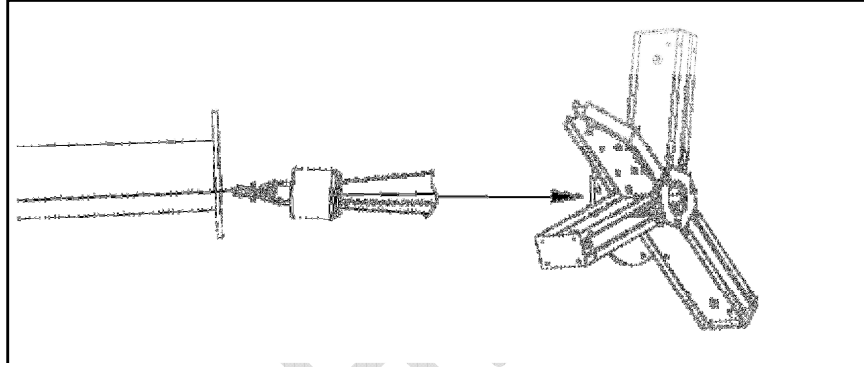


Uncoil and extend steel ropes and electric cables without twisting which are fixed to swivel. (Fix electric cable to the swivel if it's not fixed) Lay steel rope and electric cables ground along the pole.

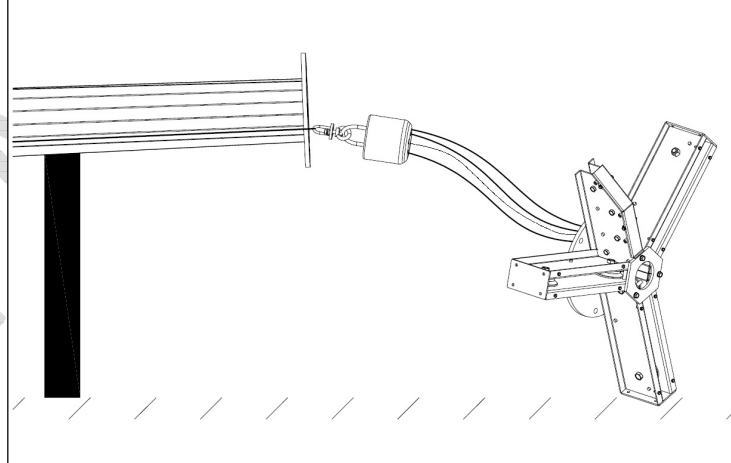
Insert swivel into the pole, from top side. Fix guide rope that is inside the pole, to the swivel., be sure that there is no twisting and inflexion.



Open the top frame covers.

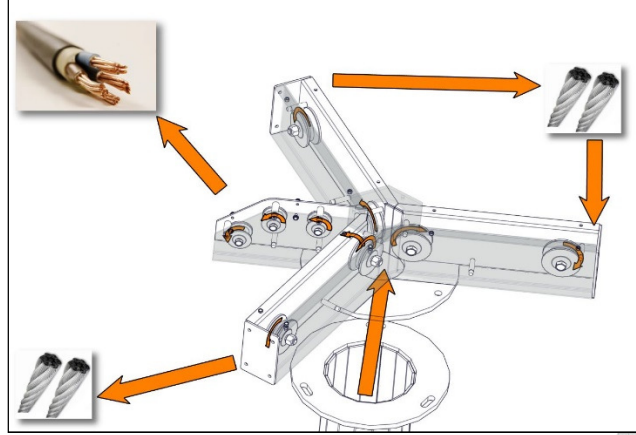


Position top frame just in front of the pole top flange securely.

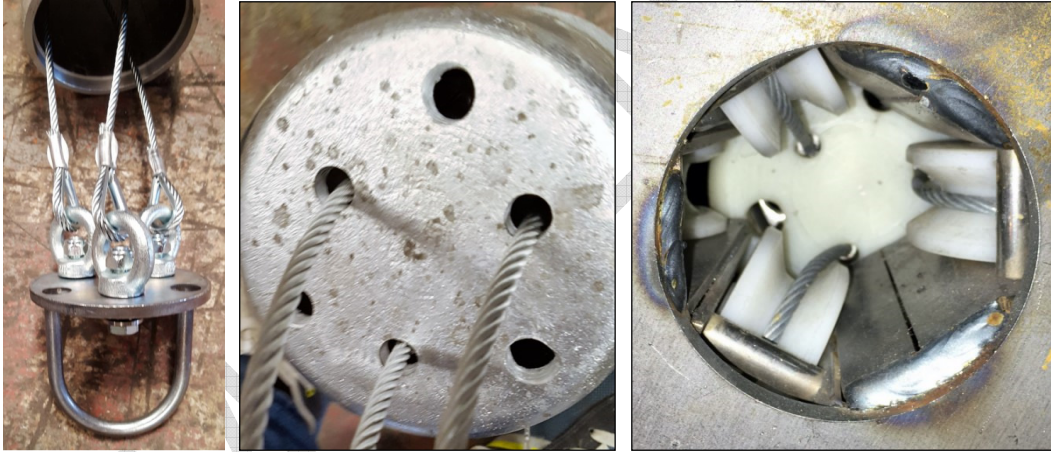


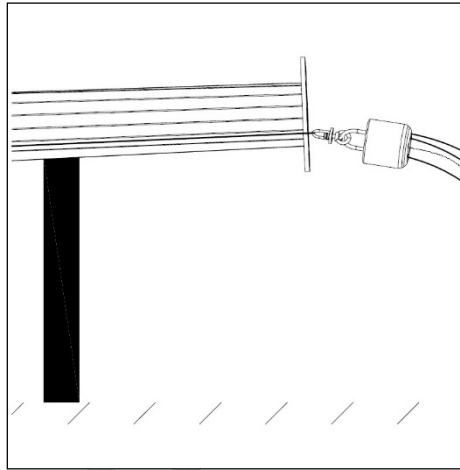
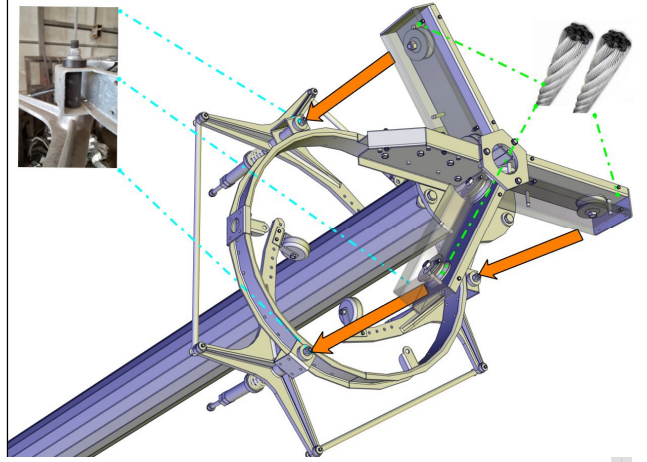
Thread 3 steel rope and electric cable through bottom hole of the top frame and transmit through pulleys of the top frame, and finally down through the top frame brackets. Do not allow the cable to go outside the cable keepers/guides. Be sure the steel ropes and cables are not crossed and wrapped around each other.



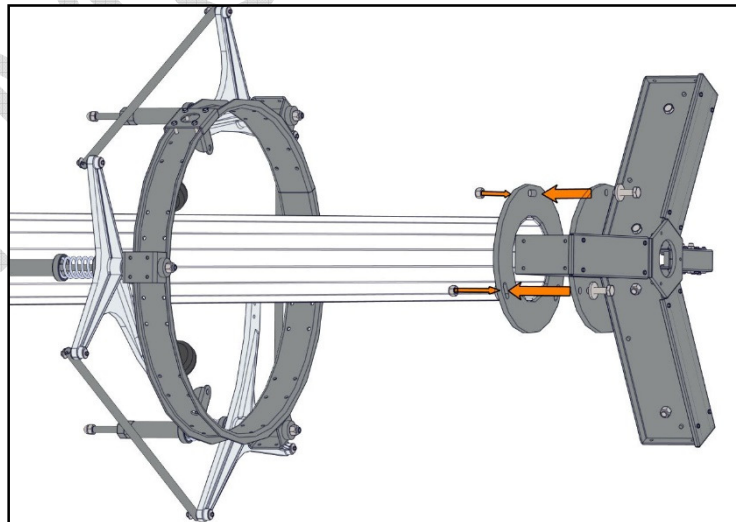


Insert the steel ropes through the corresponding spring bumper, and pull them down the side of the pole. Again insert the electric cable through hole on the ring.



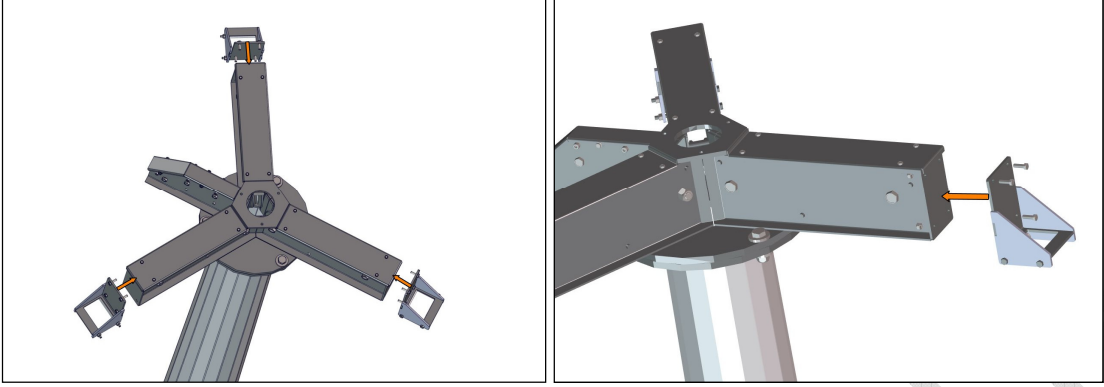


Fix guide rope to the swivel.

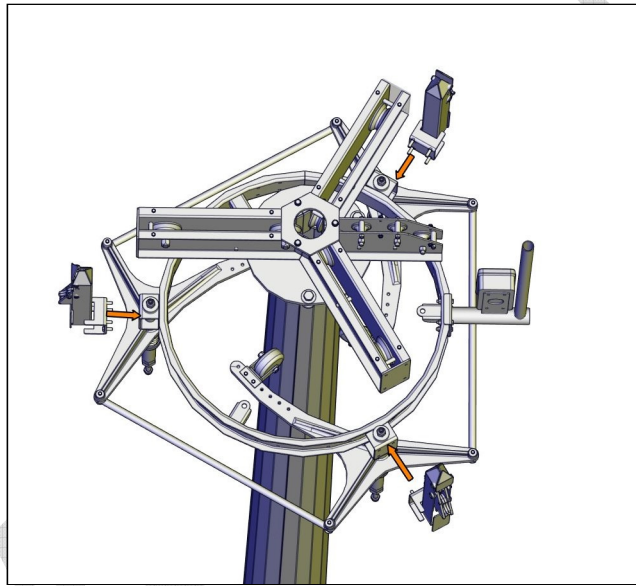


Fix top frame to the Top flange with bolts. Orient top frame acc. To your projector orientation.

Use the guide rope to pull the swivel down the pole. Pull the guide rope until the swivel reach to the bottom of the pole.

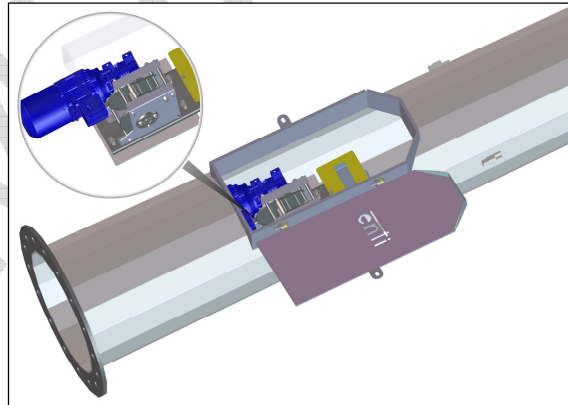
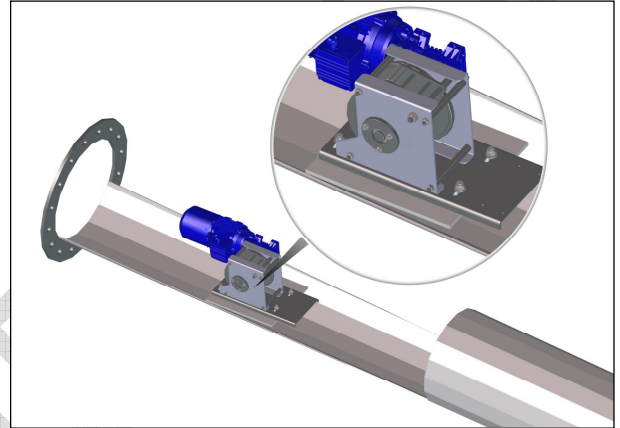
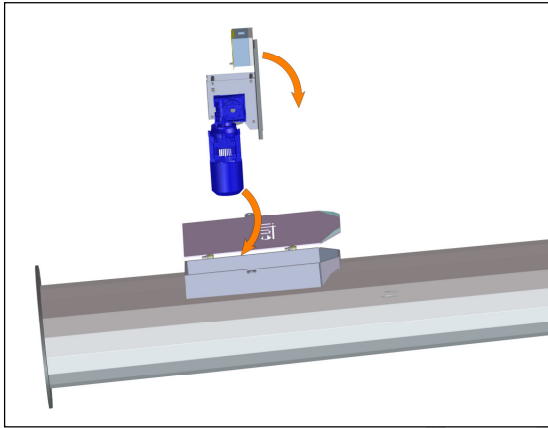
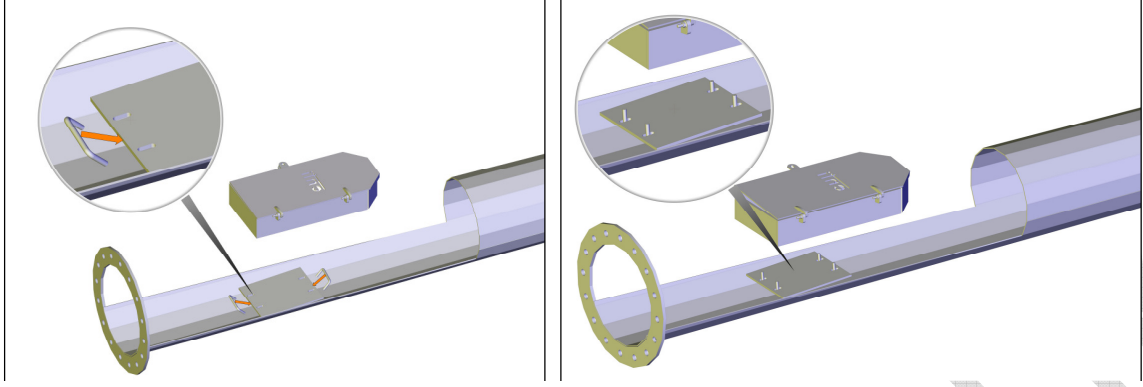


Fix Latch Plates



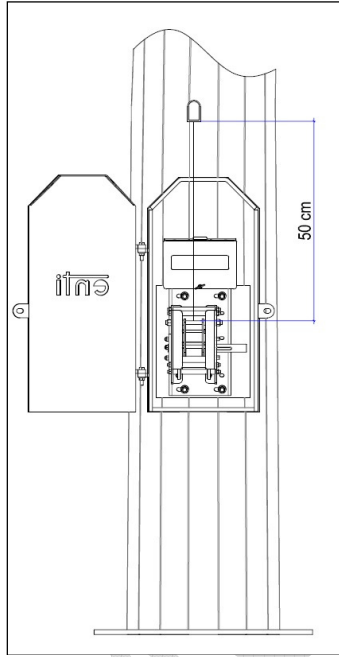
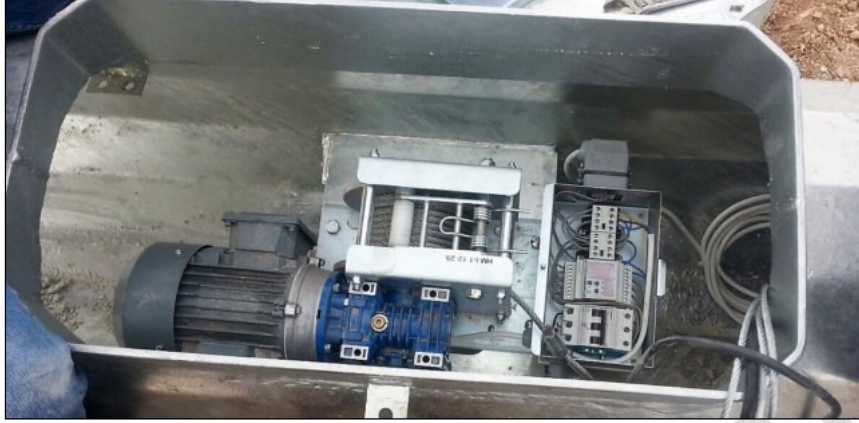
Fix Latch Systems

Fix ring to the top frame, by using latch.

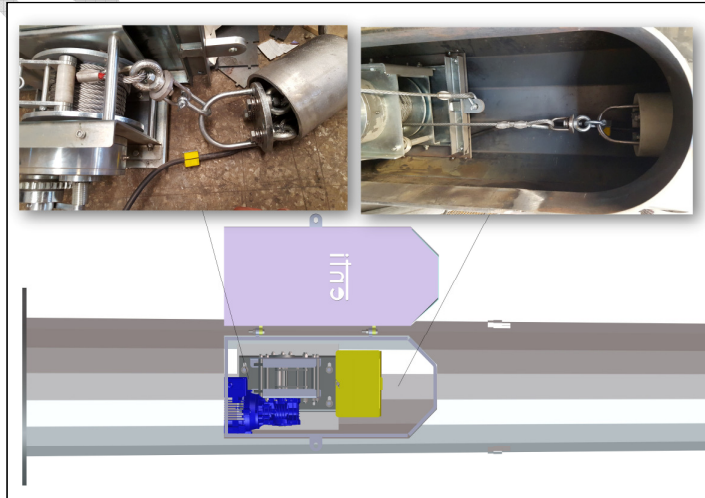


Install the winch system to its mount plate inside the pole



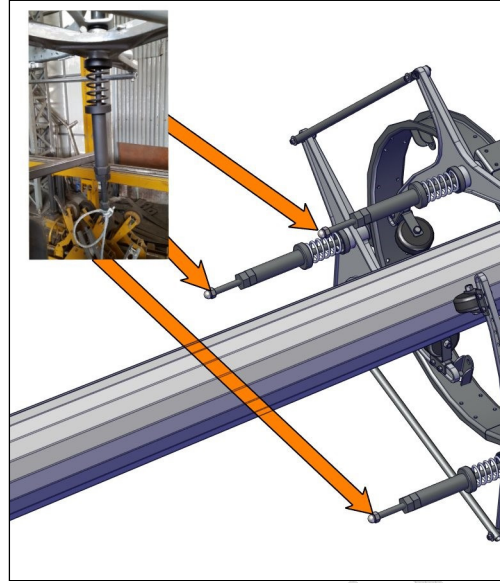


Uncoil the steel rope on the drum, rotate the winch drum until the winch rope is 50 cm free from the drum.

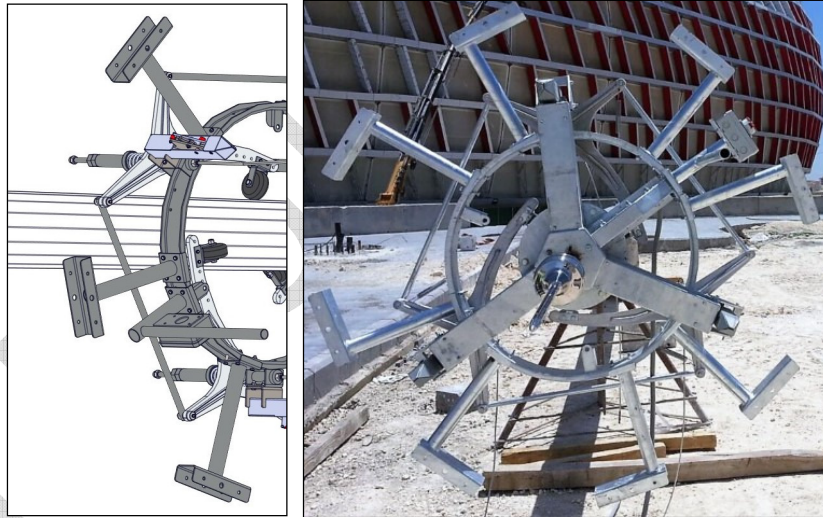


Connect steel rope of the winch to the swivel bottom.

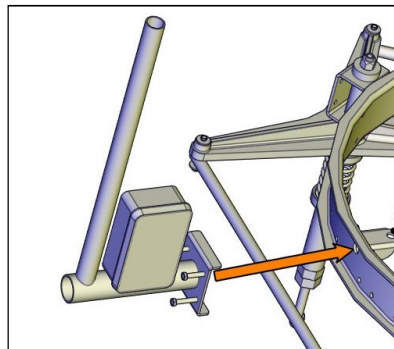




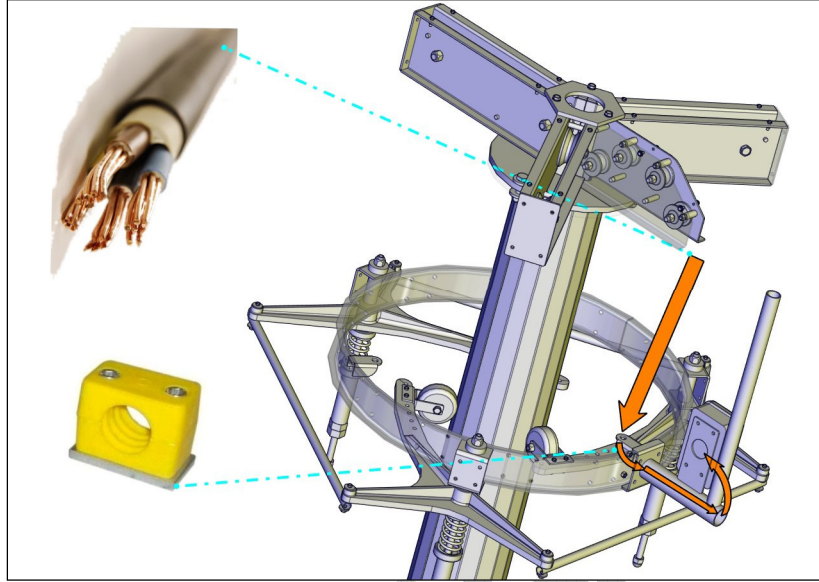
Stretch steel ropes after spring bumper (Pull the steel ropes as tight as possible), make a small loop on each steel rope two turns below the spring bumper, and secure the loop with U-bolt steel rope clamp. Use two clamp for each loop.



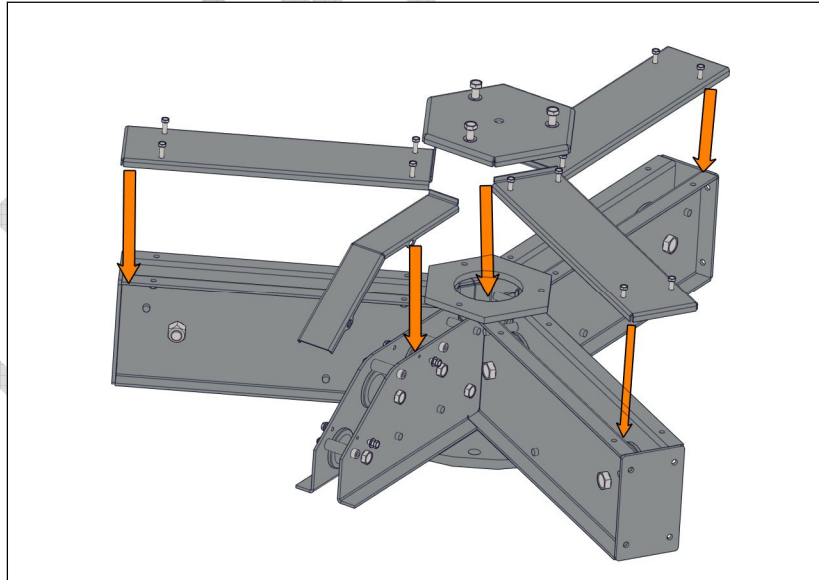
Install the projector brackets to the ring.



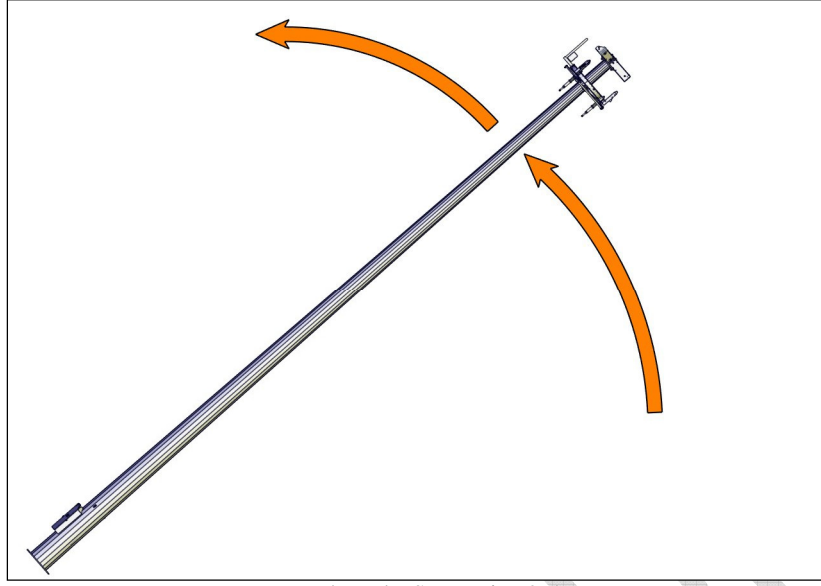
Install the junction box arm to the ring.



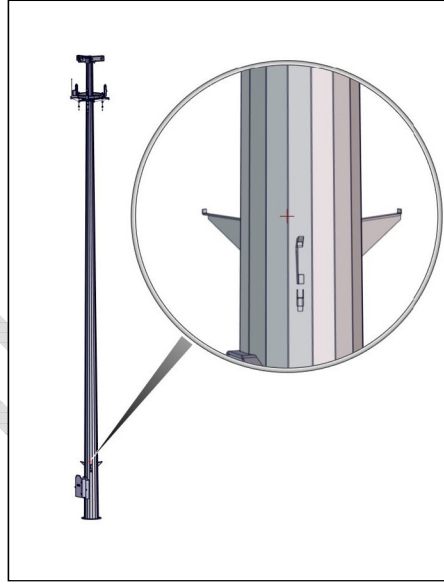
Stretch the electric cable and thread through the hole that is aligned with junction box arm. Fix electric cable to this hole by tape or electric cable clamp. Connect electric cable to the junction box.



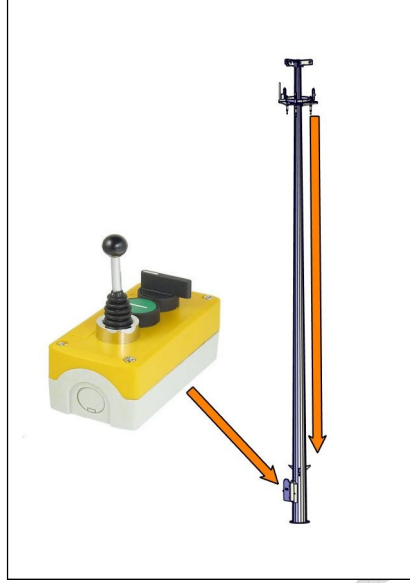
Install the top frame top covers and lightning rod.



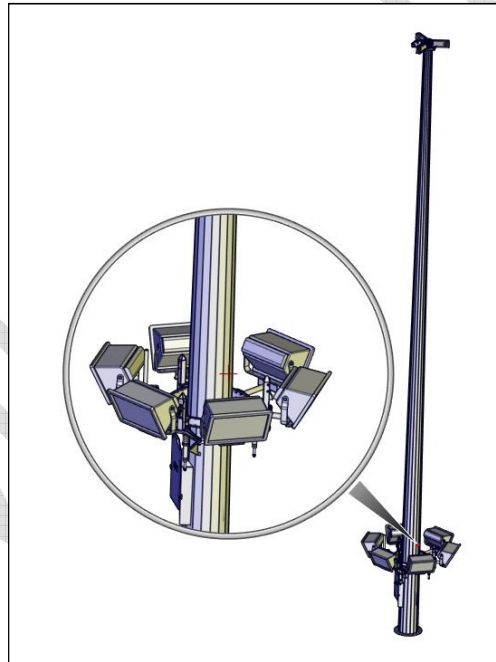
Erect the pole. See section 3-5.



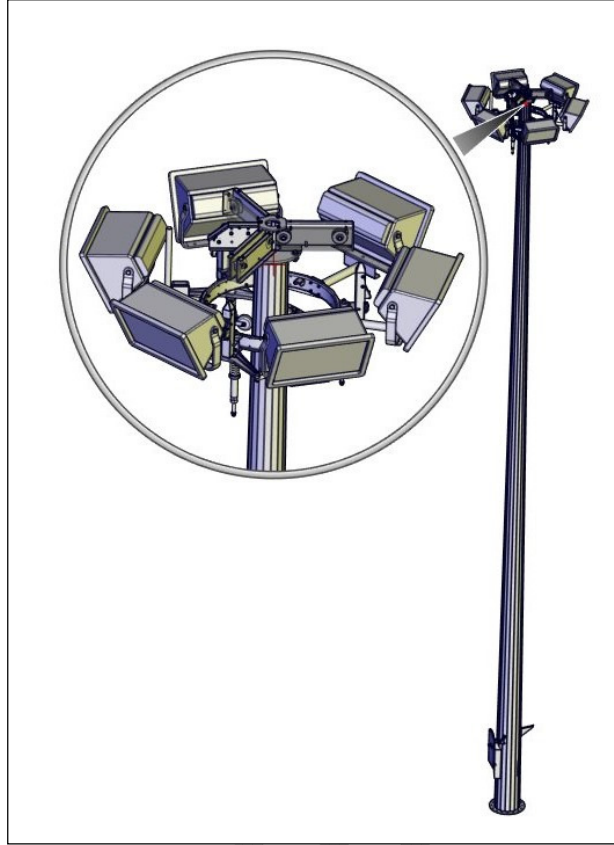
Install the base stoppers.



Lower the ring.



Install Projectors, connect electric cables. Make alignment adjustment to the ring.



Raise the ring and test latch system.



### 3.5- FOUNDATION ERECTION

Preparation of the nuts of the anchor bolts.

Aligning nuts: 4 nuts will be above the others. These nuts will be used to plumb the pole while erection. See Figure-7.

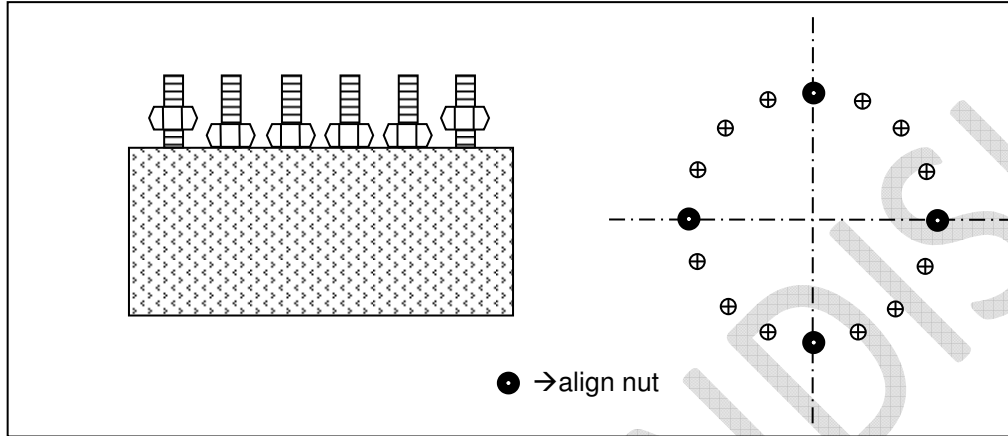
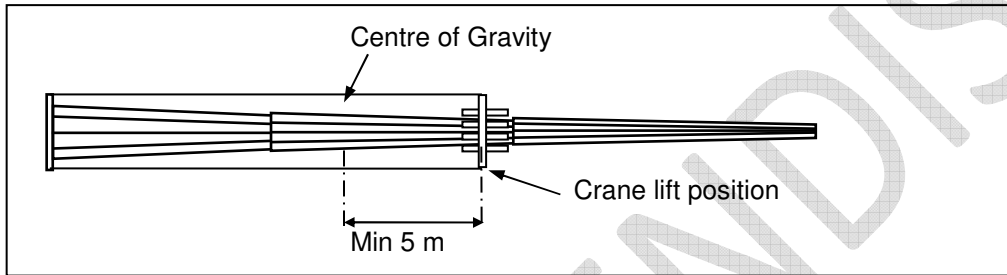


Figure-7



The base of the pole must be fixed to the crane lift position to prevent slip off the part while lifting. See Figure – 8.

**Figure-8**

### Crane Selection

Parameters:

- Pole length,
- Pole weight,
- Accessories,
- Ground topography,

**IMPORTANT: Ask for advice for Crane number and selection.**



