

(AFS-300) ASSEMBLED FOUNDATION SYSTEM

Installation Manual

Telecom-Small Wind

(Above Grade)



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Important!

- READ THESE INSTRUCTIONS IN THEIR ENTIRETY BEFORE ASSEMBLING THE AFS300 FOUNDATION AND TOWER.
- **WARNING:** PROPERTY DAMAGE, SERIOUS INJURY OR DEATH MAY RESULT FROM IMPROPER USE. THEREFORE, IT IS HIGHLY RECOMMENDED THAT TOWER AND RAISING/ LOWERING SYSTEM BE INSTALLED AND OPERATED BY TRAINED PROFESSIONALS

Safety and Maintenance

- Prior to each use verify that Grip Hoist operates as outlined in the product manual and that the Cable is free of debris and burrs.
- Grip Hoist shall be serviced by authorized personnel only or by customers with written permission from the manufacturer.
- Visually inspect the entire lifting/ lowering system including tower/ foundation connection brackets for wear and damage prior to each use.
- Ensure that all fasteners are properly secured, and that the Grip Hoist is oriented in the correct position.
- It is the operator's responsibility to ensure that no one walks underneath the tower during the raising and lowering process and that common safety measures are taken while operating the Grip Hoist.
- The operator must be observant of any unusual sounds, vibrations or erratic system behavior during normal operating conditions. If any of the aforementioned is observed, stop immediately and assess the situation. If no obvious solution to the problem can be found, contact **ARE Telecom** for further assistance.
- Remove Grip Hoist and Cable assembly from tower when not in use and store in a dry location to prevent corrosion
- Contact **ARE Telecom** directly for replacement parts or warranty related issues.

Design Loads

- Shipping Weight (Tower and Foundation)..... 1285 kg (2827 lbs)
- Design Wind Speed..... 51.5 m/sec (115 mph)
- Backfill/ Ballast Material - Bulk Density..... 16kN/ m3 (2700 lb/ yd3)
- Ballast Volume..... 4.6 m3 (6 yd3)
- Minimum Allowable Soil Bearing Pressure..... 80 kPa (1671 lbf/ ft2)

- Tower Reactions
 - Vertical (Fz)..... 4.9 kN (1.1 kip)
 - Horizontal (Fx)..... 8663 kN (1.88 kip)
 - Moment (My) 59,656 Nm (44 kip-ft)

- Maximum Tower Top Horizontal Thrust Load 2758 N (620 lbs)
- Maximum Tower Top Weight 159 kg (350 lbs)
- Minimum Grip Hoist Capacity..... 3.5 Ton

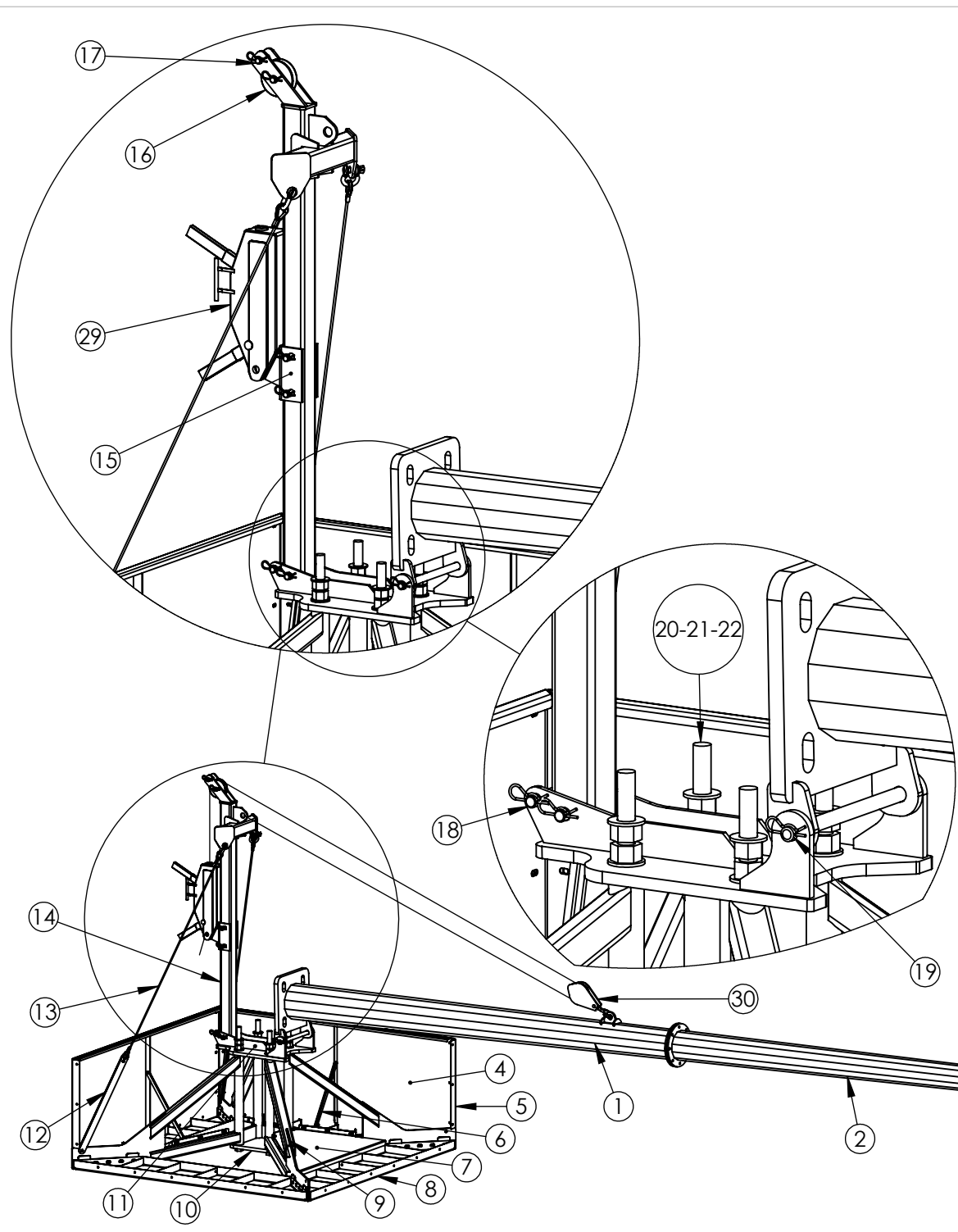
Geotechnical Investigation

- It is recommended that a site study be conducted to verify that the soil parameters equal or exceed the requirements shown above.

Required Items not Included

- Ground Rod and wire clip
- #2 solid copper wire
- Terminal lug for attaching #2 solid copper wire

**Note: Tower grounding shall be done in accordance with the requirements of the local authority.
A 10mm (.375 in) hole is located on the lower foundation hinge plate for connecting the ground wire.**



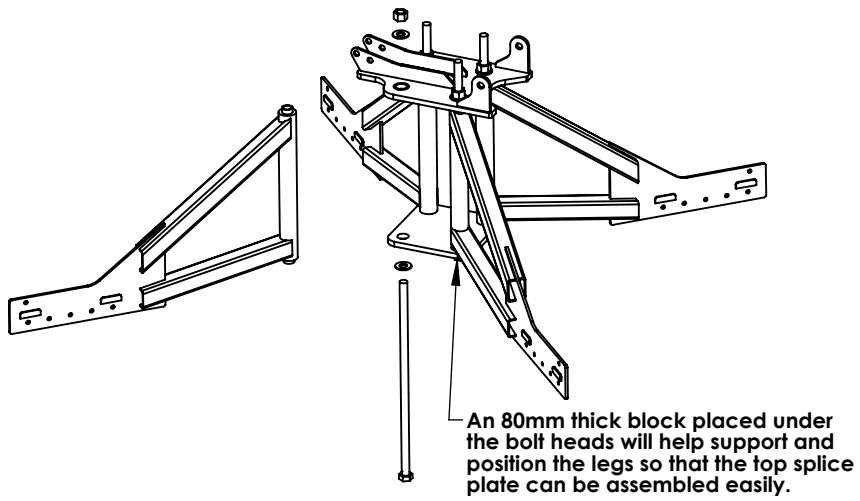
AFS300 Bill of Materials

Part #	Qty	Description
1	1	Base Section
2	1	Mid Section
3	1	Top Section
4	4	Side Wall
5	4	Corner Brace
6	8	Wall Brace
7	4	Central Tray
8	4	Outer Bearing Tray
9	4	Support Leg
10	1	Lower Splice Plate
11	1	Upper Splice Plate
12	4	Guy Wire Link
13	2	10mm Guy Wire & 6t Shackle
14	1	Gin Pole
15	1	Hoist Bracket
16	1	Sheave
17	2	25mm x 85mm Clevis Pin & Cotter
18	4	25mm x 175mm Clevis Pin & Cotter
19	1	30mm x 465mm Clevis Pin & Cotter
20	4	M36 x 1000mm Hex Bolt Gr. 8.8
21	12	M36 Hex Nut
22	16	M36 Washer
23	24	M16 x 60mm Hex Bolt Gr. 8.8
24	24	M16 Hex Nut
25	48	M16 Washer
26	68	M10 x 35mm Hex Bolt Gr. 8.8
27	68	M10 Hex Nut
28	136	M10 Washer

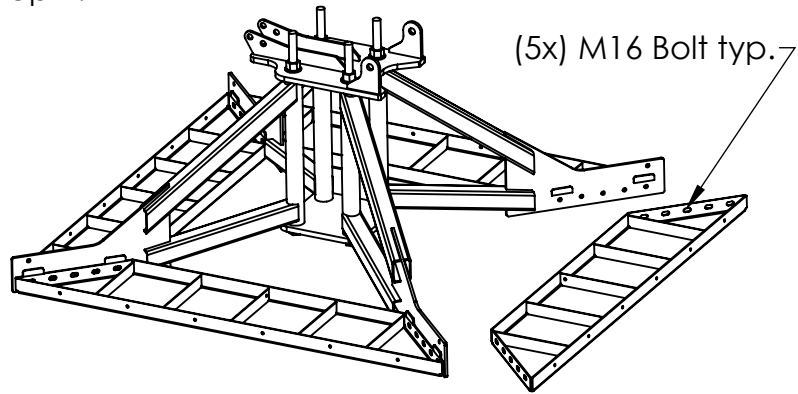
Ancillary Components

29	1	3.5t Grip Hoist w/ 16mm x 20m Cable & Hook
30	1	6t Snatch Block

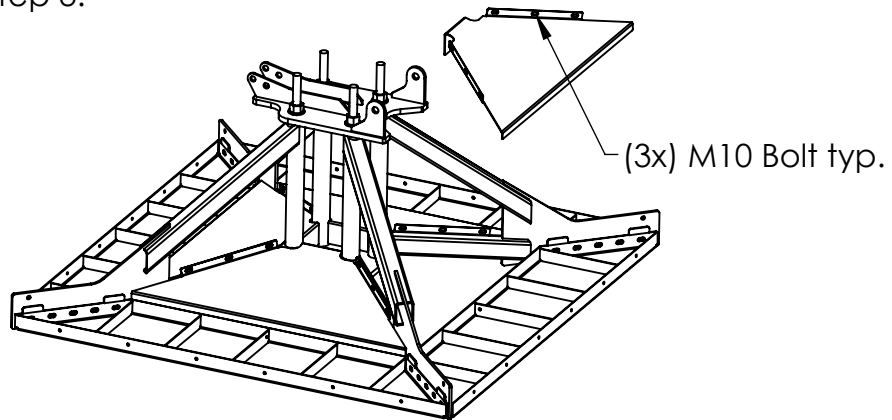
Step 1.



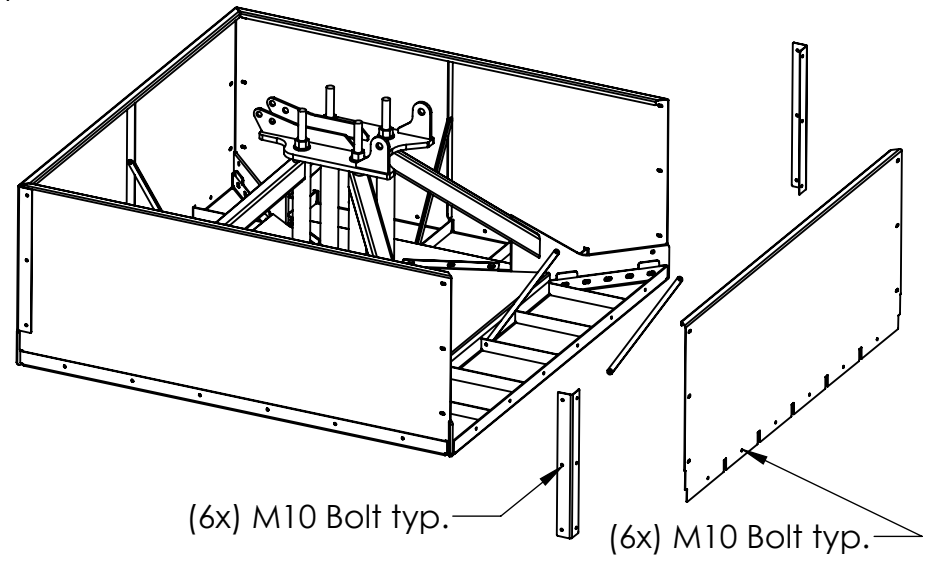
Step 2.



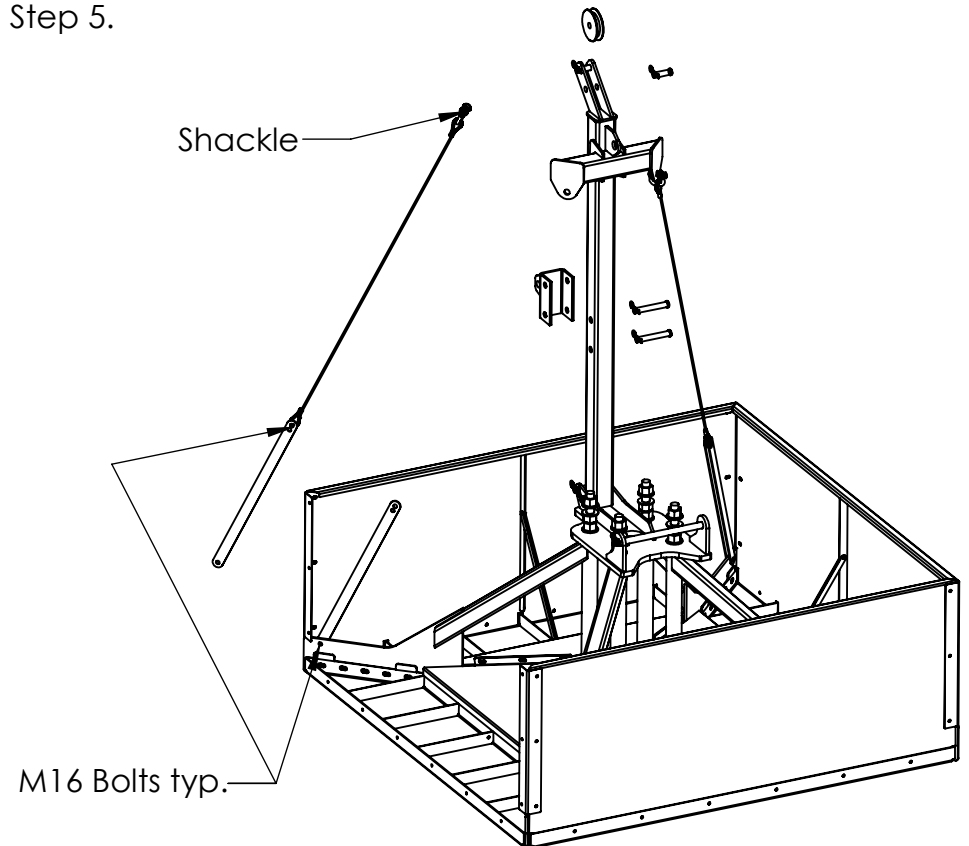
Step 3.



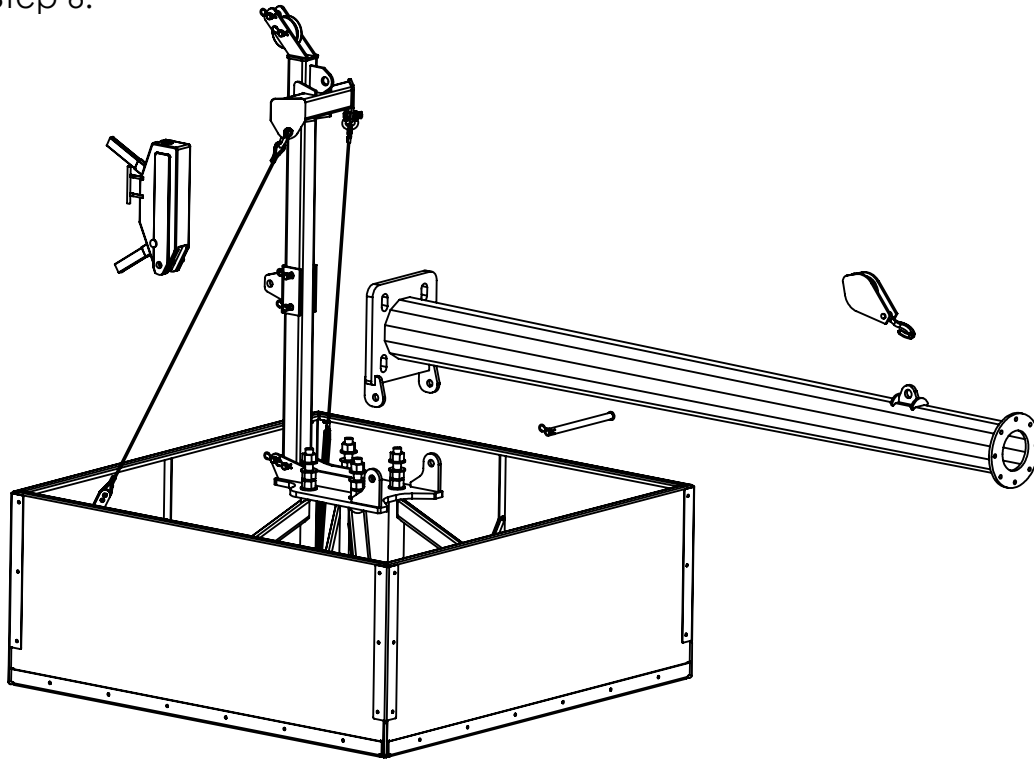
Step 4.



Step 5.



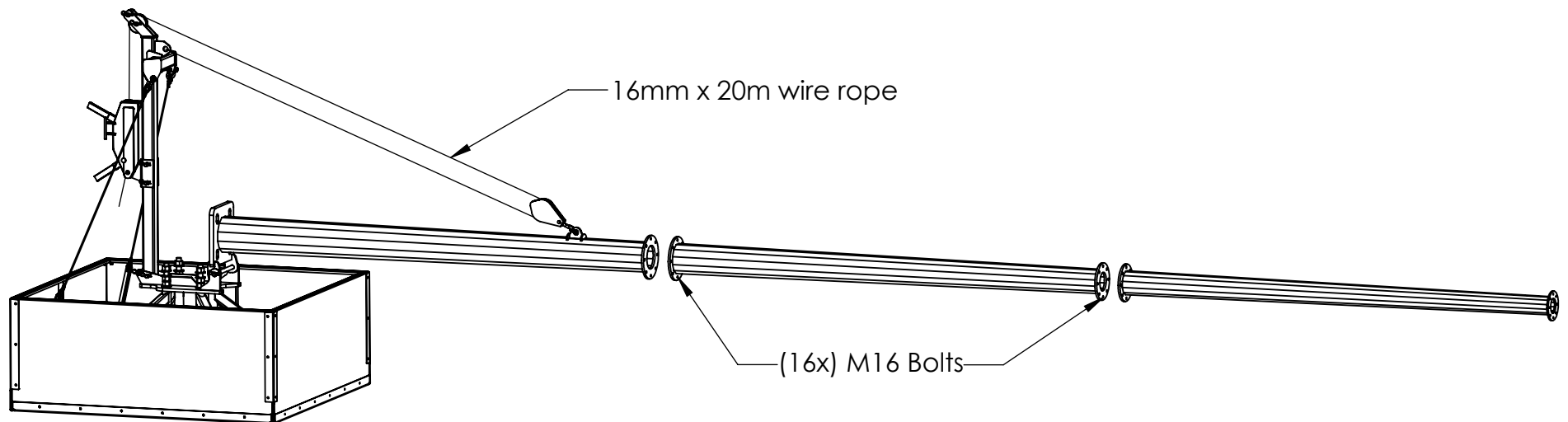
Step 6.



Assembly Steps

1. Assemble support legs between upper and lower splice plates using (4x) M36 anchor bolts. **(Note: An 80mm thick support block placed under the M36 anchor bolt heads and lower splice plate will help support and position the legs).**
2. Connect outer bearing trays to support arms using M16 hex bolts.
3. Bolt central trays together using M10 hex bolts
4. Bolt sidewalls to outer bearing trays using M10 hex bolts then bolt corner braces and internal diagonal braces using M10 hex bolts.
5. Secure gin pole to top splice plate using 25mm x 175mm clevis pin and cotter then connect guy wire cables to cable link using M16 hex bolts. Connect shackles to gin pole cross arm and attach sheave using 25mm x 175mm clevis and cotter. Raise gin pole into vertical position and secure in place using 25mm x 175mm clevis pin. Secure Hoist bracket using (2x) 25mm x 175 clevis pin.
6. Pin lower tower section to hinge tabs using 30mm x 465mm clevis pin. Make sure to support free end of pole prior to connecting the grip hoist, cable and snatch block. **(At this point ballast can be added once all bolts are tightened to specified torque value)**
7. Assemble mid and top pole sections using M16 hex bolts. **(Make sure to align weld seams)**

Step 7.



Preloaded High Strength Structural bolts

- The bolts shall be in accordance with **DIN 6914 / ISO 7412**.
- The bolts shall be installed and preloaded in accordance with **BS EN 1090-2:2008** Execution of steel structures and aluminum structures - Part 2: Technical requirements for steel structures.
- The slip resistances of the structural bolts were calculated in accordance with **EN 1993-8: 2005**. It is understood that the steel will be hot dipped galvanized after fabrication and a bitumen coating will be applied. The bitumen coating is not suitable on the surface of these joints and therefore it is necessary to mask the faying areas prior to the application of the bitumen paint.
- The friction coefficient factor is taken as **0.2** which is recommended for hot dipped galvanized surfaces.

Preloaded bolt installation

- The contact surfaces shall be free from all contaminants, such as oil, dirt or paint.
- Burrs that would prevent solid seating of the connecting parts shall be removed.
- The preloading force required for an **M24 bolt is 198kN** and shall be preloaded using the torque control method or other methods described in **EN 1090-2:2008**.

Torque control method

- In the torque control method the torque is applied in two steps.
 1. The first step, after bedding of the joint, is to apply a torque of up to **75%** of the required torque value to all the bolts.
 2. The second step is to apply an additional torque to each bolt such that the total applied to the bolt is up to **110%** of the required nominal torque value.
The **extra 10%** is to offset the subsequent torsional relaxation of preload in the connection when the tightening wrench is removed.

Bolt Torque and Preload Requirements					
Bolt Size (Gr 8.8)	Width Across Flats "Wrench Opening" mm (in)	Torque Coefficient	Torque N-m (ft-lb)	Torque 75% N-m (ft-lb)	Torque 110% N-m (ft-lb)
M36x4	55 (2.1875)	0.2	1900 (1401)	1425 (1051)	2090 (1541)
M16x2	36 (1.5)	0.2	220 (162)	165 (122)	242 (179)
M10x1.5	16 (0.625)	0.2	40 (30)	NA	NA

Note: All bolts shall use a flat washer between the bolt head and part and between the nut and part.