

LOT 3 #: GALVANIZED POLE FITTINGS FOR TELESCOPIC POLE

General

This specification represents the minimum requirements for the works. The Supplier shall provide equipment, which meets or exceeds these minimum requirements. These items are being sought as additions to existing networks; it is essential to maintain compatibility with existing hardware and line design, as well as with established local work practices and methods.

Line Cross-arm Assemblies for Telescopic Pole (11.2 m)

Pole fittings for telescopic pole shall be galvanized and there is no need of painting and concreting at site.

Double Pole Assemblies

Pole fittings for Double pole Assembles		
	Items	Quantity
1	DP Top Cross Arm Assembly (11.2 m)	
i	ISMC 100x50, 3650 mm length complete with necessary holes	2 Nos.
ii	Sets of full clamp	2 sets
iii	Sets of GI nuts and bolts, 16 mm dia, 175 mm long, complete with one flat washer and one spring washer along with 20 mm dia GI pipe for the clamps	4 Sets
iv	MS flat string bracing, 50x6 mm, 268 mm length complete with necessary holes for fixing insulator	6 Nos.
v	Sets of GI nuts and bolts, 16 mm dia, 150 mm long, complete with one flat washer and one spring washer along with 20 mm dia GI pipe for bolting MS flat and disc insulator	6 Sets
2	DP cross Bracing Assembly (11.2)	
i	MS angle 65x65x6 mm, 2346 mm length complete with necessary holes	1 No.
ii	MS angle 65x65x6 mm, 2400 mm length complete with necessary holes	1 No.
iii	MS angle 65x65x6 mm, 2746 mm length complete with necessary holes	2 Nos.
iv	Half Clamp to suit different section of the pole with 8 sets of GI nuts and bolts, 16mm dia, complete with one flat washer and one spring washer.	4 Nos.
v	Sets of GI nuts and bolts, 16 mm dia, 35 mm long, complete with one flat washer and one spring washer	5 Sets

Details are given in drawing BPC-DDCS-2021-19/3-21



Drilling

In addition, each pole of all lengths shall have a 20mm diameter hole drilled near to the bottom, 600mm above ground line, for earthing purposes.

Bolts, Nuts and Washers

All bolts, nuts and washers, supplied under this Specification shall comply with the following:

The bolts and nuts shall comply with ISO 4016. Mechanical properties shall be in accordance with ISO 898. The dimensions and characteristics in this Specification are intended to describe typical ISO metric bolts, nuts, and washers, such as are commonly used in the construction of electrical distribution lines, plant and equipment. The safe working shear stress of bolts is taken as 120 MPa, with the area of the bolt measured at the root of the thread. The table below shows the ultimate tensile strength, the tensile stress areas, the safe working tensile loads and the safe working shear loads for the bolts covered by this Specification. The ultimate shear strength has been assumed to be 75% of the ultimate tensile load and a factor of safety of 2.5 has been applied:

Bolt Size	Ultimate Tensile Stress (N/mm²)	Tensile Stress Area (mm²)	Ultimate Tensile Strength (kN)	Working Tensile Load (kN)	Safe Working Shear Load (kN)
M16	400	157.0	62	25	18
M18	400	204.0	81	32	24
M20	400	245.0	98	39	29

Screw threads shall be parallel throughout their length. They shall be so formed that, after galvanising, the nut can be easily screwed by hand over the whole length of thread, without excessive play. Before despatch from the works, one washer shall be fitted to each bolt and a nut shall be screwed on the whole threaded length and left in that position. Washers shall be round, flat, of mild steel, unless where otherwise specified.



Galvanizing

Galvanising shall be in accordance with ISO 1459 and ISO 1461. The zinc coating shall not be less than 600 g/m² of steel surface area.

The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath, which could have a deleterious effect on the durability of the zinc coating.

Before pickling, all welding, drilling, cutting, grinding must be completed and all grease, paint, varnish, oil and welding slag completely removed. All protuberances, which would affect the life of galvanising, should also be removed.

To avoid the danger of white rust, galvanised material shall be stacked during transport and stored in such a manner as to permit adequate ventilation.

Galvanised steel items shall be thoroughly checked for damage before transport to the work site.

Any material found to be damaged shall be returned to its source. Cracked, flaked or scratched surfaces shall not be acceptable.

Galvanised steel shall be handled carefully during loading, transporting and unloading, and shall not be dropped on the ground, or dragged or scraped along the ground or any surface.

Painting

After manufacture, all poles not galvanised shall be painted for protection against corrosion.

The poles shall be thoroughly cleaned by wire brush and the weld flux, if any, shall be removed. Phosphating treatment shall then be given, followed by light wiping by wet cloth. In accordance to the preparation of steel substrates before application of paints and related products ISO8502-4:1999

After drying, poles shall be coated with bituminous preservative paint on the inside as well as on the outside surface over the length of pole, which is buried in the pole foundation; ie, below ground. The ground line position shall be at approximately 1/6 of the total pole length.

The remaining exposed outside surface shall be painted with one coat of red oxide anti-rust primer with a dry film thickness of 40 Micrometers, prior to delivery, in accordance with ISO 12944-7 Paints and Varnishes - Corrosion protection of steel structures by protective paint systems - Part 7: Execution and supervision of paint work - ISO 12944-7:1998.



Identification Marks

The following identification marks shall be legibly engraved/ punched/ embossed on each pole at a height of 3m from bottom end of the pole, before painting:

1. Manufacturer's name/Trade mark
2. Year of manufacture
3. Batch Number

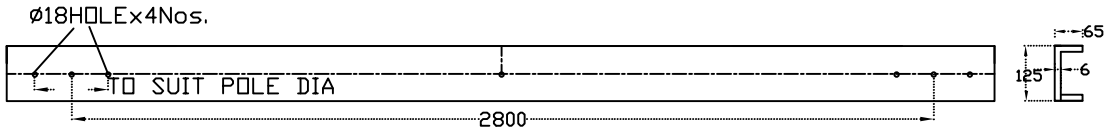
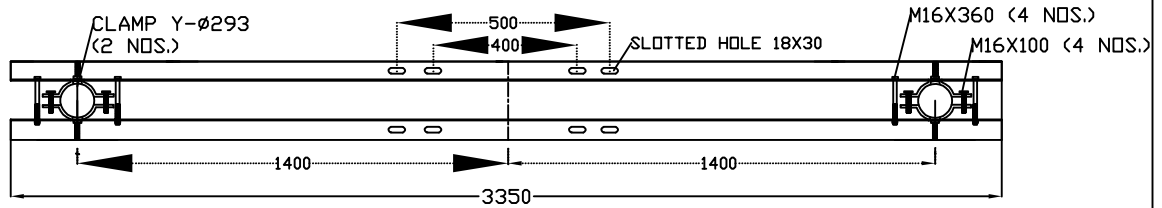
The size of the letters shall be at least 5mm and the depth of engraving/height of embossing shall be such that the text remains legible after painting.

Quality Control

All poles shall be inspected by an inspector appointed by the Purchaser. The Supplier shall assist the work of the Purchaser's inspector by providing copies of all relevant Standards, and allowing the inspector full use of the necessary tapes, measures and laboratory equipment, together with ample space and assistance in the handling of poles for inspection. Any costs incurred by the Supplier in aiding the inspector shall be deemed to be included in the individual pole price.

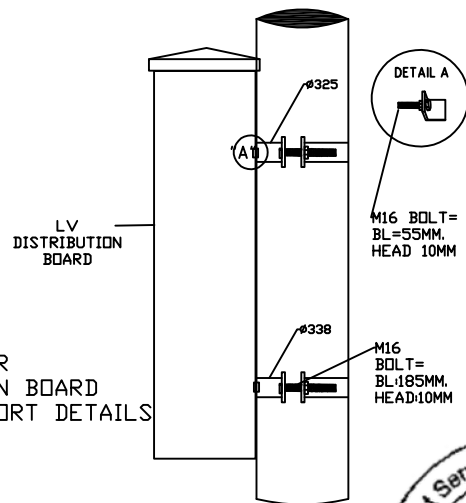
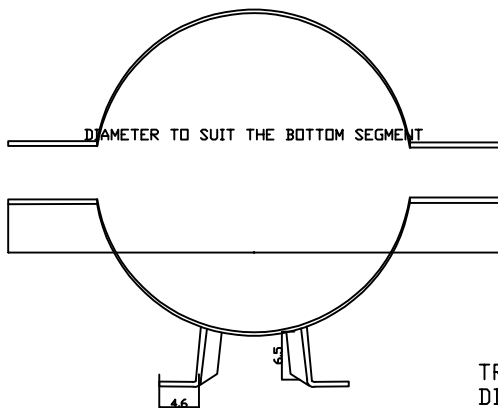
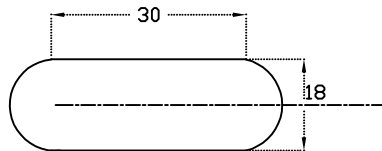
Poles as delivered to the designated stores shall be free of all damage to protective paint coating, and shall not be out of straight by more than one thousandth of the length of the pole.





TRANSFORMER SUPPORT CROSSARM CHANNEL (ISMC 125x65) - 2 NOS - ELEVATION

SLOT DETAILS FOR TRANSFORMER SUPPORT




TRANSFORMER DISTRIBUTION BOARD CLAMP SUPPORT DETAILS

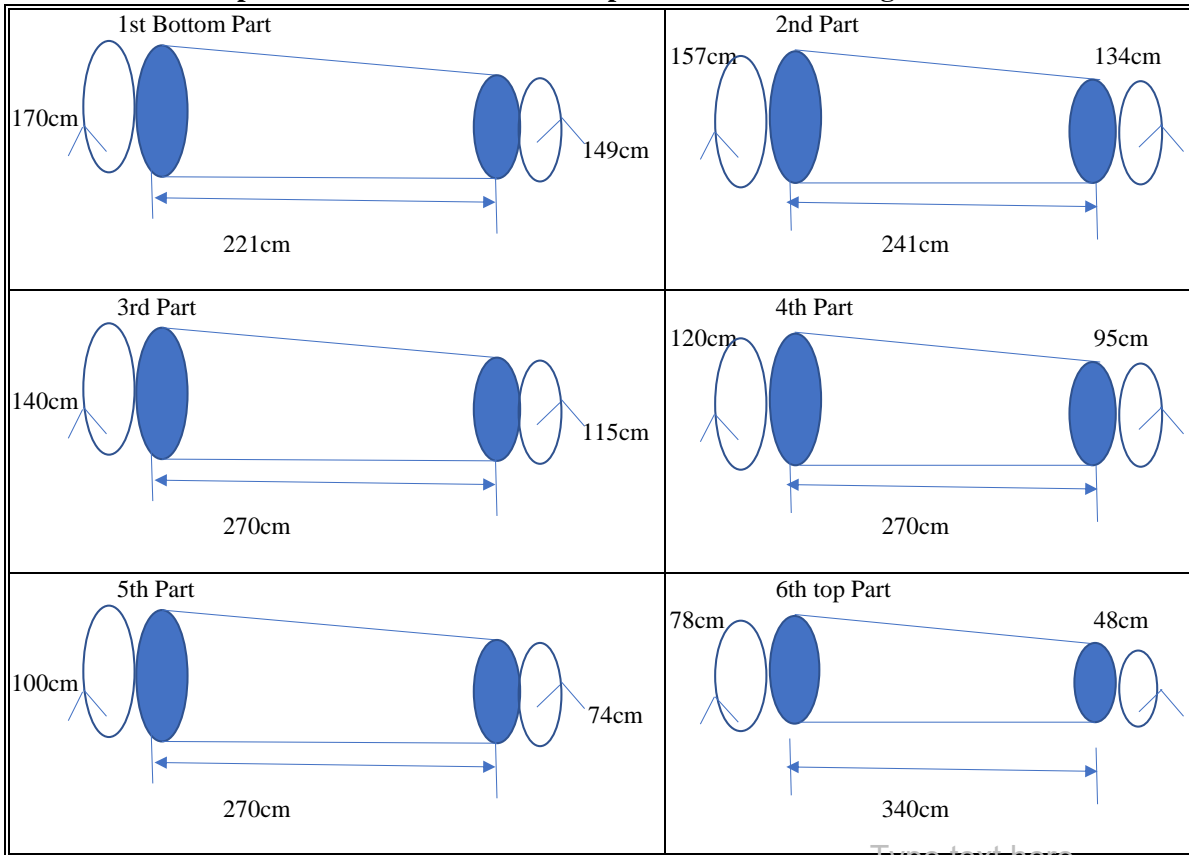
NOTES

1. DIMENSIONS AS SHOWN ARE IN mm.
2. DRAWING IS NOT TO SCALE.
3. The hole centre to hole centre 400mm for trfs upto 25 kVA, 500mm for trfs above 25kVA



		BHUTAN POWER CORPORATION LIMITED		ENGINEERING AND RESEARCH DEPARTMENT	
				TITLE : DISTRIBUTION DESIGN & CONSTRUCTION STANDARD	
				SUBSTATION (1 or 3 PHASE) STRUCTURE CROSS-ARM ASSEMBLY FOR 11.2 M TELESCOPIC POLE	
TITLE	NAME	DATE			
DESIGNED BY					
CHECKED BY					
APPROVED BY			DRAWING NO. BPC-DDCS-2020-19/13-21		REVISION 2020

Different parts Measurement of Telescopic Pole 13 Meter Long



Note: The circumference measurement is from the outer part of the pole.

