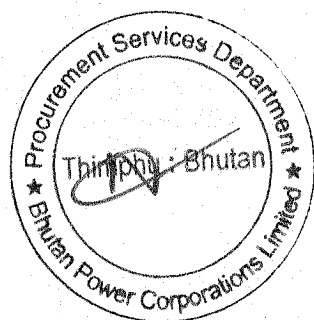


TECHNICAL SPECIFICATIONS

Lot 2: POLE FITTINGS



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.

Anti-climbing devices

In order to prevent unauthorized person from climbing any of the supports of HT lines and substations, anti-climbing devices are provided to each pole. Anti-climbing device shall be a clamp with protruding spikes installed at the height of 3.5 m-4 m above the ground level for lines and below 3 m for substations. Details are shown in drawing no. BPC-DDCS-2022-16/4-5

Clamps

The clamps shall be designed and manufactured to properly fit the channels on the poles at the expected height. The internal diameter of semi-circle ring part in clamp shall be designed to suit the outer diameter of poles at the expected height. The clamps shall be adjustable to be used for some range of poles diameters so that such universal design will reduce the number of clamp sizes. The size of bolt and nut for pole clamps shall be equal or more than M16.

Clamps for Galvanized Telescopic Pole

The recommended clamp for telescopic pole is categorized into three types as stipulated below: All materials shall be galvanized. Details are given in drawing no. BPC-DDCS-2022-16/5-5.

Full Clamp

This clamp shall be designed to suit for mounting two steel channels on the double pole structures such as cross arm assemblies for lines and substations. This clamp consists of two sets of bolt and nut (comprised of a full threaded bolt, a flat washer, a spring washer and a nut) provided to support the cross-arms. Welding of bolts on the clamps shall not be allowed. These bolts-heads shall not bulge on the internal surface of the ring after assembly. Another two sets of bolt and nut (comprised of a full thread bolt, a nut, a spring washer and a two flat washers) shall be provided for coupling the half-round rings.

Half-Clamp

A semicircle clamps shall be designed for mounting one steel channel/ angle on the single or double pole structures. This clamp will consist of two sets of bolt and nut (comprised of a full thread bolt, a nut, a spring washers and two flat washers). The clamp shall be designed to fit the single channel on poles and the space of bolting part between clamp and channel may be designed at approximately $\frac{1}{4}$ of the outer diameter of pole.

Stay Clamp Assembly

Stay clamp assembly for telescopic pole consist of stay clamp and the V-hanger.

Clamps for Steel swaged Pole

- “M” clamp is used for supporting two channels on the double pole structures such as cross arms and transformer platform.
- “U+M” clamp is used for supporting single cross arm channel on single pole structure. It is a combination of “U” clamp and “M” clamp.
- “Full clamp” is used for supporting intermediate supports for cross bracing. ABS handle support and equipment supports.
- Stay clamp consist of two “U” clamps.

The detail of clamps used for steel swaged pole is given in the drawing no. BPC-DDCS-2022-15/7-7

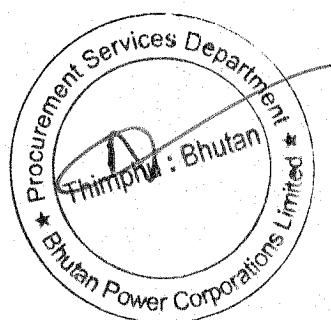
Line Cross-arm Assemblies for Steel Swaged Pole.

Single Pole Assemblies

Single pole structure is used for small angle or tangent lines. Single pole assembly shall consist of following items:

Pole fittings for Single pole assemblies		
	Items	Quantity
A	SP Top Hamper Assembly	
i	ISMC 100 x 50, welded in L-shape	1 No.
ii	“U+M” clamp with GI nuts and bolts, 16 mm dia, 125 mm long, complete with one flat washer and one spring washer	1 Set
B	SP Cross Arm Assembly	
i	ISMC 100x50, 1620 mm length complete with necessary hole	1 No.
ii	U+M” clamp with GI nuts and bolts, 16 mm dia, 125 mm long, complete with one flat washer and one spring washer	1 Set

Details are given in drawing no. BPC-DDCS-2022-18/1-11

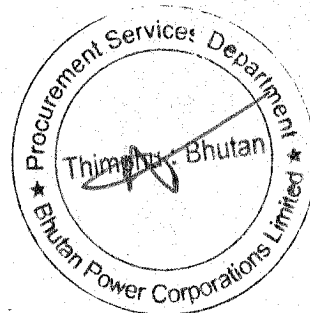


Double Pole Assemblies

Double pole will be used for large angle lines or at the dead end point on MV distribution lines.

Pole Fittings for Double Pole Assemblies		
	Items	Quantity
1	DP Top Cross arm Assembly (10 m)	
i	ISMC 100x50, 3150 mm length complete with necessary holes	2 Nos
ii	"M" Clamp	4 Nos
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 clamps	4 sets
iv	MS flat string bracing, 50 x 6 mm, 227 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 20mm dia pipe for bolting MS flat and disc insulator	6 Sets
2	DP cross Bracing Assembly (10 m)	
i	MS angle 50x50x6 mm, 2030 mm length complete with necessary holes	1 No.
ii	MS angle 50x50x6 mm, 2000 mm length complete with necessary holes	1 No.
iii	MS angle 50x50x6 mm, 2919 mm length complete with necessary holes	2 Nos.
iv	Full clamp (pole dia 114.3 mm outer dia)	2 Nos.
v	Full clamp (pole dia 165.1 mm outer dia)	2 Nos.
vi	Sets of GI nuts and bolts, 16 mm dia, 100 mm long, completed with one flat washer and one spring washer	8 sets
vii	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 no. BPC-DDCS-2022-18/2-11



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.

Single Pole Assemblies

Pole fittings for Single-Pole Assemblies		
	Items	Quantity
A	SP Top cross arm Assembly (11.2 m)	
i	ISMC 100 x 50, 300 mm length complete with necessary holes	1 No.
ii	Set of half clamp with GI nuts and bolts, 16 mm dia, 105 mm long, complete with one flat washer and one spring washer	1 Set
B	SP Lower Cross Arm Assembly (11.2)	
i	ISMC 100x50, 1620 mm length complete with necessary holes	1 No.
ii	A set of half clamp with GI nuts and bolts, 16 mm dia, and 127 mm long, complete with one flat washer and one spring washer	1 Set

Details are given in drawing no. BPC-DDCS-2022-19/1-21

Double Pole Assemblies

Pole fittings for Double pole Assemblies		
	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-2022-19/3-21

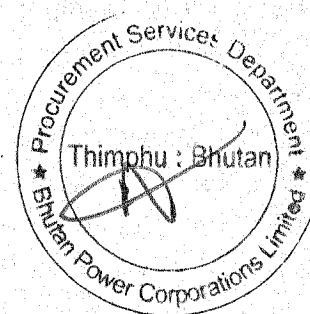
Line Cross-Arm Assemblies for Telescopic Pole (12 meter)

12 meter telescopic poles is used with shielding wire and the arrangement of the shielding wire for the single pole assembly will be hanged by U-Bolt on the top side of pole. A "U" bracket with M16 hook bolt and nut shall be provided under hardware fittings. The top segment of 12m pole shall have holes for a through bolt (M16) for the suspension clamp. For double pole structure, the shield wire will be stringed on the top cross-arm by a preformed assembly comprising of a preformed dead-end termination, an eye-thimble and a cross arm strip.

Single Pole Assemblies

Pole fittings for Single pole Assemblies		
	Items	Quantity
A	SP Shielding Arrangement	
i	200 mm long, 16 mm dia bolts threaded at both ends	1 No.
ii	U-type connector of 75x50x6 mm with 12 mm dia and 17.5 mm dia holes	1 Set
iii	L-Bolt of 10 mm dia, 35 mm long threaded.	1 Set
B	SP Top Cross arm Assembly (12 m)	
i	ISMC 100x50, 1000 m long	1 No.
ii	Set of half clamp with GI nuts and bolts, 16 mm dia, complete with one flat washer and one spring washer.	1 Set
iii	Bracing angle ISA 40x40x5, 892 mm long with full clamping arrangement with necessary nuts and bolts	1 No.
C	SP Lower Cross Arm Assembly (12 m)	
i	ISMC 100x50, 1650 mm length complete with necessary holes	1 No.
ii	Set of half Clamp with GI nuts and bolts, 16 mm dia, complete with one flat washer and one spring washer.	1 Set

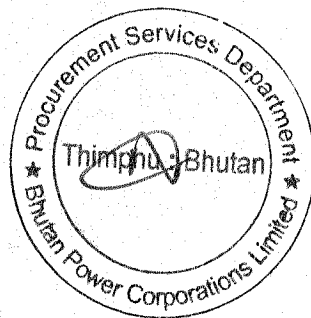
Details are given in drawing no. BPC-DDCS-2022-19/5-12



Double Pole Assemblies

Pole fittings for Double pole Assemblies		
	Items	Quantity
A	DP Shielding Arrangement	
i	ISMC 75x40x2283 mm long	1 No.
ii	Sets of half clamp with GI nuts and bolts, 16 mm dia, complete with one flat washer and one spring washer	2 sets
iii	Sets of cross arm strap with thimble socket	2 Sets
iv	Shielding wire preform	2 Nos.
B	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
C	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 no. BPC-DDCS-2022-19/8-21



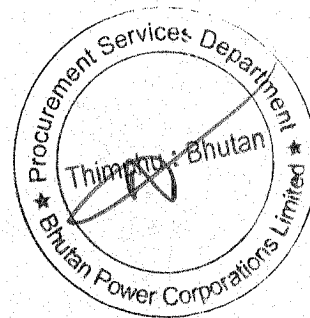
Substation structure Assemblies

Substation structure will be used for mounting the transformer, lightning arrestors, drop out fuse and transformer distribution board. There shall be proper interface between transformer base channel and mounting platform on the pole.

All the complete set of assembly, including cross-arm, transformer platforms, clamps for cross-arms, tension straps, Stay clamps, bolts, nuts and washers, etc. shall be designed as shown on relevant drawings. Following are the details of fittings for IS poles and similar fittings are also used for telescopic poles as shown in the drawings.

Pole fittings for Substation structure Assemblies		
	Items	Quantity
A	Substation Pole Top Cross Arm Assembly	
i	ISMC 100x50, 3110 mm length complete with necessary holes	2 Nos.
ii	"M" clamp	4 Nos.
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 clamp	4 Sets
iv	Sets of MS flat string bracing, 50x6mm, 227 mm length complete with necessary holes	6 Sets
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
B	Substation equipment Mounting assembly	
i	ISMC 75x40, 3110 mm length complete with necessary holes	3 Nos.
ii	"U+M" Clamp	6 Nos.
iii	Sets of GI nuts and bolts, 16 mm dia, 125 mm long, complete with one flat washer and one spring washer.	12 sets
C	Transformer platform Assembly	
i	ISMC 125x65, 3110 mm length complete with necessary holes	2 Nos.
ii	"M" Clamp	4 Nos.
iii	Sets of GI nuts and bolts, 16 mm dia, 240 mm long, complete with one flat washer and one spring washer	4 Sets

Details are given on drawing no. BPC-DDCS-2022-18 & BPC-DDCS-2022/19



Load Break Switch/Air Break Switch Assemblies

LBS/ABS/is mounted on double pole structure in vertical configuration. Assembly includes items shown in drawing no. BPC-DDCS-2022-18/8-11 & BPC-DDCS-2022-19/18-21, 19/19-21, 19/20-1, 19/21-21

Auto Re-closer Assemblies

The auto recloser (AR) is either mounted on double or single pole structures. For double pole mounting, the mounting platform will be similar to that of transformers. Auto recloser tank and the PT tank shall be provided with base channels similar to transformers with anchor bolts and nuts to fit on the mounting platform. Typical ARCB installation is shown in drawing no. BPC-DDCS-2022-18/10-11 & 2011-11

Stay Assembly

Stay assembly is installed at dead-end and angular locations to counter balance the load on the supports due to pulling of the conductors so that supports remain straight in vertical position without bending in any direction. They are also provided at mid span support as a protection against the wind load. The stay set (Line Guy set) will consist of the following components:

Description	33 kV & 11 kV
Anchor rod	2.5 m long with 20 mm dia. GI rod
Stay Plate	300 x 300 x 6 mm with 22 mm hole at its centre
Turn buckle, eye bolt with nuts	20 mm dia. G.I rod, 460 mm long
Bow with welded channel (V-hanger) only for telescopic structure	16 mm dia. GI rod. The apex or top of the bow shall be bent at an angle of 10R. The other end shall be welded with proper and good quality welding to a G.S. Channel 200 mm long having dimension of 100 x 50 x 6 mm. the Channel shall have 2 holes of 18 mm dia. at its centre.
Thimble 2 Nos.	1.5 mm thick GI sheet into a size of 75 x 22 x 40 mm and shaped as per standard
Preform 4 Nos.	Preform suitable for stay wire

Details are given on drawing no. BPC-DDCS-2022-22

