

BILL OF MATERIALS-1
For 11 kV DP structure Kit as per Drg No. SIC/DL/WSO 18/29-7-85

Sl No	Particulars MS Angle/Flat in mm	Qty	Wt/Mtr in Kgs	Total Wt/Set in kgs	16 mm Hexagonal Bolt & Nut	Qty	20 mm Class 'A' GI Pipe in Length	Clamps made out of 50x6 mm MS Flat
1	2	3	4	5	6	7	8	9
1	HT power x-arm out of 65x65x6 size 2.34 mtrs Long	2	5.8	27.14	175 mm Long	6	120 mm 2 Nos	type-CDP-1 2 Nos. 2.16 kg/set
					50 mm Long	6	60 mm 3 Nos	
2	Brace X-arm (Horizontal member) 50x50x6 size 1.6 mtrs Long	2	4.5	14.4	65 mm Long	8		type-CDP-2 2 Nos.
3	Brace X-arm (cross member) 50x50x6 size 2.8 mtrs Long	2	4.5	25.2	50 mm long	5		
4	Strain Plate 50x8 size 0.375 mtrs Long	3	3.2	3.49				6 mm thick washer 1No.

Note :

1. All holes are of 18 mm for 16 mm bolts
2. All Slotted holes are of 18x35 mm long
3. The weights given are for raw materials as per ISI structural steel hand book

BILL OF MATERIALS -2

FOR 100 TO 300 kVA TRANSFORMER CENTER KIT (For double pole TC Structure)

SL. No	Particulars	Qty	MS Angle Flat in mm	Wt/Mtr in Kgs	Length/ piece in mm x Nos	total wt/set in kgs	16 mm dia Hexagonal Bolt & Nut Length in mm	Qty in No	20 mm dia. Class 'A' GI Pipe Length in mm/Qty
1	HT Power Cross arm & strain plate	1 Set	65x65x6	5.8	2,700x2	31.2	175	4	0
			50x6	2.4	375x3	2.7	50	6	0
2	a) GOS Frame	1 No.	45x45x6	4	2,350x2	18.8	75	4	0
			40x40x5	3	340x2	2.04	0	0	0
			40x40x5	3	70x4	0.84	0	0	0
			40x40x5	3	60x6	1.08	0	0	0
	b) Pin insulator support	1 Set	50x6	2.4	400x3	2.88	0	0	0
	c) LA Fixing X-arm	1 Set	50x50x6	4.5	2,350x1	10.58	0	0	0
			45x45x6	5	70x2	0.56	0	0	0
	d) GOS & LA Support X-arm & Clamp for fixing on to the pole	1 Set	65x65x6	5.8	1,025x2	11.86	0	0	0
			50x6	2.4	436x2	2.15	65	4	0
	e) GOS & LA Supporting Brace	1Set	45x45x6	4	1,260x2	10.08	50	4	0
	f) HG Fuse Fixing X-arm	1 Set	65x65x6	5.8	2,350x1	13.63	0	0	0
			65x65x6	5.8	70x2	0.812	85	2	0
	g) HG Fuse support X-arm & Clamp for fixing on to pole	1 Set	65x65x6	5.8	925x2	10.73	0	0	0
			50x6	2.4	496x2	2.27	65	4	4
	h) GOS, LA & HG Fuse supporting brace & clamp for fixing to pole	1 Set	45x45x6	4	1,360x2	10.88	0	0	4
			50x6	2.4	463x1	2.41	0	0	
			0		285x2	1.37	65	4	
3	Transformer belting angle Clamp for fixing on to pole	1 Set	45x45x6	4	2,700x2	21.6	0	0	0
			45x45x6	4	500x2	4	40	4	
			50x6	2.4	493x2	2.44	65	4	
4	a)Transformer seating channel supporting cleat X-arm & clamp for fixing on to pole GOS (ISMC)	1 Set	100x50x4.7	9.2	2,700x2	49.69	225	7	185 mm
			65x65x6	5.8	310x2	3.6	0	0	3 No
			50x6	2.4	523x2	2.44	65	4	0
5	a) GOS Handle supporting X-arm & clamp for fixing on to pole GOS	1 Set	65x65x6	5.8	1,150x1	5.89	0	0	0
			50x6	2.47	548x1	1.32	65	2	0
	b)Handle supporting X-arm brace & clamp for fixing on to pole	1 Set	45x45x6	4	1800x1		0	0	0
			50x6	2.4	560x1	6.11	0	0	0
			50x6	2.4	320x1		65	2	0

Note :

233.962

- 1) The bill of materials are prepared as per Dgr No..KEB/SIC/WS/022/date :12.9.86
- 2) The weights given are for raw materials as per ISI structural Hand book.
- 3) All holes are of 18 mm & solt holes 18x35 mm to suit 16 mm unless otherwise stated
- 4) Bolts required to fix LA's & G.O.S down take off pipe are not included as the same are to be supplied along with equipments,
- 5) LT.4 pin X-arm & clamp are also not included as they are readily available.

BILL OF MATERIALS-3
3 Pole Structure for Transformer

Sl No	Particulars	Unit	MS Angle Flat in mm	Wt/Mtr in Kgs	Length /Nos in mm	Wt/Set in Kgs
1	2	3	4	5	6	7
1	HT Side power Cross-arm and strain plate	1 Set	50x50x6 50x6	4.5 2.4	1280x3 463x2	17.28 2.22
2	GOS Support Cross arm & Clamp for fixing on to the pole	1 Set	65x65x6 50x6	5.8 2.4	2000x2 463x2	23.2 2.09
3	GOS Frame	2 Nos	45x45x6 45x45x6 45x45x6 45x45x6	4 4 4 4	2350x4 310x4 70x8 60x12	37.6 4.96 2.24 2.28
4	GOS Supporting Cross arm and Clamp	1 Set	45x45x6 50x6 50x6	4 2.4 2.4	1360x4 498x2 285x2	21.76 2.39 1.37
5	a) GOS Handle Supporting Cross arm Brace and Clamps	1 No	65x65x6 50x6	5.8 2.4	2000x1 423x2	11.6 1.26
	b) GOS Handle Supporting Cross arm brace and Clamps		45x45x6 50x6	4 2.4	1000x2 50x1	8.00 1.34
			50x6	2.4	320x1	0.77
6	Brace Cross Member and Clamps	1 Set	50x50x6 50x6	4.5 2.4	2700x2 493x2	24.3 2.31

BILL OF MATERIALS**FOR 25 TO 63 kVA TRANSFORMER CENTRE KIT** (This BoM is suitable for 25 to 63 kVA)

Sl. No	Particulars	Qty	MS Angle/ Flat	Wt/Mtr in Kgs
1	HT + LT side power X-arm	1 Set 2 No	65x65x6	5.8
2	P.I support X-arm	1 No	50x50x6	4.5
3	Belting cross arm and belting support X-arm	1 Set 4 No	45x45x6 50x50x6	4 4.5
4	Transformer Seating and Transformer seating angle support X-arm	1 Set 4 No	65x65x6	5.8
5	Distribution box Fixing Clamps	0	0	
6	GI Pipe	0	20x5	
7	H Frame	Set	0	

Note :

1. The bill of materials are prepared as per DRG No.SIC/WS/017/date 28.6.85.
- 2.The weights given are for raw materials as per ISI structural steel Hand book.
3. All holes are of 18 mm for 16 mm bolts.
4. All slotted holes are of 18x35 mm long.
5. Bolts required to fix Las are not included as the same are to be supplied along with the material.
- 6 Since the D.O.L.O cut out is being fixed on the pervious support of the T.C an

MATERIALS-4

for Conventional Transformer Only, Separate BoM- 6 is furnished for Star R

Length/ Piece in mtr x No	Total Wt/Set in kgs	16 mm dia Hexgonal No.Bolt & Nut	Qty	20 mm class 'A' GI pipe	Qty	Clamp made out of 50x6 mm MS flat No	Qty
2.7x2	31.32	175	7	120	3	0	0
2.7x2 (0.06x3)	12.96	65	4	0	0	460	2
2.7x2 0.5x2	21.6 4.5	50 65	4 4	0 0	0 0	0 465	0 2
2.7x2 0.285x2	31.32 3.19	12 50	7 4	0 160	0 3	0 465	0 2
0	0	120		0	3	536	2
160	0	0		0	3	0	0
1 No	62.69	0	0	0	0	0	0

g with LAs

d depending on whether it is single support & DP structure provision for D.O.L.O :

ated

Wt/Set in Kgs
0
2.16
0 2.23
0 2.23
2.6
0
0

fixing X

**BILL OF MATERIALS-5
H.FRAME**

Sl. No	Particulars	Unit	MS Angle Flat in mm	Wt/Mtr in Kgs	Length in mm	Wt/Set in Kgs
1	2	3	4	5	6	7
1	GOS- H Frame Fixing Cross-Arm	No	65x65x6	5.8	1200x2	13.92
		No	50x6	2.4	473x2	2.27
2	GOS H Frame Fixing Cross arm Clamps Brace Fish Plate	No	45x45x5	3.4	1360x2	9.25
		No	50x6	2.4	503x2	2.41
		No	50x6	2.4	285x2	1.37
3	GOS Frame	No	45x45x5	3.4	2350x2	15.98
		No	45x45x5	3.4	310x2	2.11
		No	45x45x5	3.4	70x4	0.95
		No	45x45x5	3.4	60x6	1.22
4	GOS Handle Frame Fixing Cross-arm	No	65x65x6	5.8	1100x1	6.38
	Clamp for above	No	50x6	2.4	548x1	1.32
5	GOS Handle Frame Fixing Cross set arm Brace Clamps Fish Plate	No	45x45x5	3.4	1000x1	3.40
		No	50x6	2.4	558x1	1.34
		No	50x6	2.4	320x1	0.77
6	MS Bolts & Nuts 16mm with washers	Kgs	16*50 16*65 16*150	3 Nos 12 Nos 6 Nos		

62.69

Note

- 1 The hole have to be provided at locations as mentioned in the drawings
- 2 All holes are in mm and slot holes 18*35 ,, to suit 16mm unless otherwise stated.
- 3 the weight mentioned in the BoM is as per Steel Table
- 4 The Bolts & Nuts shall confirm ISS

BILL OF MATERIALS - 6

25/63 kVA TC Structure suitable for mounting Star Rated 25 & 63kVA Transformers

Sl. No.	Part No.	Part No.	Wt/Mtr in Kgs	BESCOM for 3 Star Rated Transformers as approved in PFC/ADB	
				Qty/set	Approx wt in Kg
1	MS Angle 65x65x6mm x 2700 mm - HT side Power X arms	T1	5.8	1 No	31.32
	MS Angle 65x65x6mm x 2700 mm - LT side Power X arms		5.8	1 No	
2	MS Angle 50x50x6mm x 2700 mm - PI Support X arms	T2	4.5	1 No	12.15
	MS Cleat 50x50x6mm x 70 mm		4.5	3 Nos	0.945
3	MS Angle 45x45x6mm x 2700 mm Belting X arms	DTC-10	4	2 No	21.6
4	MS Angle 45x45x6mm x 500 mm Belting support X arms	DTC-9	4	2 No	4.5
5	MS Channel 100x50x4.7 (ISMC) mm x 2700mm Transformer seating	T4	9.2	2 No	49.68
6	MS Angle 65x65x6mm x 310 mm Transformers seating support X arms	DTC-11	5.8	2 No	3.6
KIT DETAILS					
7	MS Flat 50x6mm x 450mm	2	2.4	2 No	2.16
8	MS Flat 50x6mm x 465mm	3	2.4	4 No	4.46
9	MS Flat 50x6mm x 535mm	4	2.4	2 No	2.6
10	L&R MS Angle 65x65x6mm x 1025mm GOS & LA Support X-Arms	DTC-4	5.8	2 No	11.89
11	MS Angle 45x45x5 mm x 1360 mm HG Fuse Support	DTC-8	3.4	1+1 No	9.248
12	L&R MS Angle 65x65x6mm x 1100 mm GOS Handle Support X arms Brace	DTC-13	5.8	1 No	6.38
13	L&R MS Angle 45x45x5mm x 1000 mm GOS Handle Support X arms Brace	DTC-14	3.4	1 No	3.400
11kV H Frame Set details					
14	MS Angle of size 45x45x6 mm x 2350 mm	DTC-3	4	2 No Each	18.8
	40x40x5mm 340mm		3	2 No Each	2.04
	40x40x5mm 70mm		3	4 No Each	0.84
	40x40x5mm 60mm		3	6 No Each	1.08
Clamps					
15	MS Flat 50x6mm x 560 mm	5	2.4	2 No	2.7
16	MS Flat 50x6mm x 498 mm	1	2.4	2 No	2.39
17	MS Flat 50x6mm x 465 mm	3	2.4	2 No	2.22
FISH PLATE FOR 'H' Frame - GOS Mounting Frames					
a) 285 mm				2 No	1.368
b) 320 mm				1 No	0.768
TOTAL a) Structure Steel					196.139
MS Bolts & Nuts Including H Frame					
18	a) 16mm x 175mm			7 No	10 Kgs
	b) 16mm x 65mm			12 No	
	c) 16mm x 200mm			7 No	
	d) 16mm x 50mm			4 No	
	e) 12mm x 50mm			4 No	
TOTAL b) Bolt and nut					10 Kgs

Note: 1) The weight indicated is before punching of the holes.

2) Tolerance of ±4% is allowed on the weight.

BILL OF MATERIALS-7

SINGLE POLE MOUNTED TRANSFORMER STRUCTURAL MATERIALS ON 9 MTRS. LONG RCC POLE (SQ. SECTION) FOR 25/63 kVA TC SET

Part No.	MS Angle size in mm	Length in mm	Quantity	Wt / Mtr.	Weight in kg.
1	50x50x6	850	1	4.5	3.825
2	50x50x6	1150	2	4.5	10.35
3	50x50x6	850	2	4.5	7.65
4	45x45x5		Not Applicable		
5	45x45x5	700	2	3.4	4.76
6	45x45x5	1321	2	3.4	8.98
7	8th Plate		Not Applicable		
8	65x65x6	485	1	5.8	2.784
9	65x65x6	850	2	5.8	9.86
10	65x65x6	485	1	5.8	2.784
11	45x45x5	1230	2	3.4	8.16
12	45x45x5	1000	2	3.4	6.8
13	65x65x6 with cleat welded on both ends of length 65mm	485	1	5.8	2.9
	Clamps				
	50x8	550	2	3.1	3.41
	50x8	480	2	3.1	2.976
	Bolts & Nuts (various sizes)				
	16x125mm	8			4
	16x50 mm	8			
	16x50 mm	4			

BILL OF MATERIALS-8

SINGLE POLE MOUNTED TRANSFORMER STRUCTURAL MATERIALS ON 9 MTRS. LONG RCC POLE (SQ. SECTION) FOR 100 kVA TC SET.

Part No.	MS Angle size in mm	Length in mm	Quantity	Wt/Mtr	Weight in kg.
1	50x50x6	850	3	4.5	11.475
2	50x50x6	1150	4	4.5	20.7
3	50x50x6	850	2	4.5	7.65
4	45x45x5	900	2	3.4	6.12
5	45x45x5	1500	2	3.4	10.20
6	45x45x5	1321	2	3.4	8.98
7	8th Plate	Not Applicable			
8	65x65x6	485	2	5.8	5.568
9	65x65x6	850	2	5.8	9.86
10	65x65x6	485	2	5.8	5.568
11	45x45x5	1350	2	3.4	9.18
12	45x45x5	1000	2	3.4	6.8
13	65x65x6 with cleat welded on both ends of length 65mm	485	1	5.8	2.9
	Clamps				
	50x8	550	2	3.1	3.41
	50x8	480	2	3.1	2.976
	Bolts & Nuts (various sizes)				
	16x125mm	8			5
	16x50 mm	8			
	16x50 mm	4			

BILL OF MATERIALS – 9

**For OH line (Having Single H Frame with Transformer seating and seating angle support x-arm) for
11mtr Spun Pole for 25KVA Transformer.**

Sl No	Size of the steel section	Length (in mm)	Qty (in Nos)	Kgs/Mtr	Total Wt
	<u>TOP Bracket</u>				
1	100x100x8mm MS Angle	850	3	12.1	30.86
2	75x40x4.8mm MS Channel (MC75/MCP75)	2400	2	7.14	34.27
3	45x45x5mm MS Angle	850	3	3.4	8.67
4	75x40x4.8mm MS Channel (MC75/MCP75)	1040	2	7.14	14.85
5	50x50x6mm MS Angle	1000	2	4.5	9
6	50x50x6mm MS Angle	1000	2	4.5	9
7	65x65x6mm MS Angle	1440	2	5.8	16.7
	<u>Transformer Center</u>				
8	130x130x12mm Angle	1110	1	23.4	25.97
9	100x50x5mm MS Channel (MC100/MCP100)	1200	2	9.56	22.94
10	130x130x12mm MS Angle (with side plate)	1110	2	23.4	51.95
11	75x75x6mm MS Angle	1750	2	6.8	23.8
12	65x65x6mm MS Angle	1260	2	5.8	14.62
13	75x40x4.8mm MS Channel (MC75/MCP75)	1110	2	7.14	15.85
	<u>GOS Mounting Structure (Ladder)</u>				
14	45x45x5mm MS Angle	1640	2	3.4	11.15
15	45x45x5mm MS Angle (Cleat)	60	6	3.4	1.22
16	40x40x5mm MS Angle	335	2	3	2.01
17	Round clamps of different sizes made out of MS flats suitable for fixing the above structural materials to the pole.				
	a) 75x6 MS Flat	1000	6	3.532	21.19
18	MS Hexagonal bolts, nuts and washers of different sizes to sufficient in quantity for fixing clamps		15kgs Approx.		15

Total in Kgs 329.06

Note

- 1. The weights mentioned are subject to tolerance as per IS**
- 2. The weights mentioned are before drilling of holes**

BILL OF MATERIALS - 10

For UG Cable network (Having 3 Nos H Frame with Transformer seating and seating angle support x-

Sl No	Size of the steel section	Length (in mm)	Qty (in Nos)	Kgs/Mtr	Total Wt
TOP Bracket					
1	100x100x8mm MS Angle	850	5	12.1	51.43
2	75x40x4.8mm MS Channel (MC75/MCP75)	2400	4	7.14	68.54
3	45x45x5mm MS Angle	850	5	3.4	14.45
4	75x40x4.8mm MS Channel (MC75/MCP75)	1040	2	7.14	14.85
5	50x50x6mm MS Angle	2000	2	4.5	18
6	50x50x6mm MS Angle	1000	2	4.5	9
7	65x65x6mm MS Angle	1440	2	5.8	16.7
Transformer Center					
8	130x130x12mm Angle	1110	1	23.4	25.97
9	100x50x5mm MS Channel (MC100/MCP100)	1200	2	9.56	22.94
10	130x130x12mm MS Angle (with side plate)	1110	2	23.4	51.95
11	75x75x6mm MS Angle	1750	2	6.8	23.8
12	65x65x6mm MS Angle	1260	2	5.8	14.62
13	75x40x4.8mm MS Channel (MC75/MCP75)	1110	2	7.14	15.85
GOS Mounting Structure (Ladder)					
14	45x45x5mm MS Angle	1640	6	3.4	33.46
15	45x45x5mm MS Angle (Cleat)	60	18	3.4	3.67
16	40x40x5mm MS Angle	335	6	3	6.03
	Round clamps of different sizes made out of MS flats suitable for fixing the above structural materials to the pole.				
17	a) 75x10 MS Flat	1000	2	5.89	11.77
	b) 75x6 MS Flat	1000	8	3.53	28.26
18	MS Hexagonal bolts, nuts and washers of different sizes to sufficient in quantity for fixing clamps		17kgs		
			Approx.		17
				Total in Kgs	448.3

Note

1. The weights mentioned are subject to tolerance as per IS
2. The weights mentioned are before drilling of holes

BILL OF MATERIALS – 11

For OH line (Having Single H Frame without Transformer seating and seating angle support x-arm)

Sl No	Size of the steel section	Length (in mm)	Qty (in Nos)	Kgs/Mtr	Total Wt
	<u>TOP Bracket</u>				
1	100x100x8mm MS Angle	850	3	12.1	30.86
2	75x40x4.8mm MS Channel (MC75/MCP75)	2400	2	7.14	34.27
3	45x45x5mm MS Angle	850	3	3.4	8.67
4	75x40x4.8mm MS Channel (MC75/MCP75)	1040	2	7.14	14.85
5	50x50x6mm MS Angle	1000	2	4.5	9
6	50x50x6mm MS Angle	1000	2	4.5	9
7	65x65x6mm MS Angle	1440	2	5.8	16.7
	<u>GOS Mounting Structure (Ladder)</u>				
8	45x45x5mm MS Angle	1640	2	3.4	11.15
9	45x45x5mm MS Angle (Cleat)	60	6	3.4	1.22
10	40x40x5mm MS Angle	335	2	3.002	2.01
	Round clamps of different sizes made out of MS flats suitable for fixing the above structural materials to the pole.				
11	a) 75x6 MS Flat	1000	6	3.532	21.19
12	MS Hexagonal bolts, nuts and washers of different sizes to sufficient in quantity for fixing clamps		10kgs Approx.		10
				Total in Kgs	168.93

Note

- 1. The weights mentioned are subject to tolerance as per IS**
- 2. The weights mentioned are before drilling of holes**

BILL OF MATERIALS – 12

For UG Cable network (Having 3 Nos H Frame without Transformer seating and seating angle support x-arm) for 11 mtr Spun Pole for 63/100/250/500 KVA Transformer.

Sl No	Size of the steel section	Length (in mm)	Qty (in Nos)	Kgs/Mtr	Total Wt
	<u>TOP Bracket</u>				
1	100x100x8mm MS Angle	850	5	12.1	51.43
2	75x40x4.8mm MS Channel (MC75/MCP75)	2400	4	7.14	68.54
3	45x45x5mm MS Angle	850	5	3.4	14.45
4	75x40x4.8mm MS Channel (MC75/MCP75)	1040	2	7.14	14.85
5	50x50x6mm MS Angle	2000	2	4.5	18
6	50x50x6mm MS Angle	1000	2	4.5	9
7	65x65x6mm MS Angle	1440	2	5.8	16.7
	<u>GOS Mounting Structure (Ladder)</u>				
8	45x45x5mm MS Angle	1640	6	3.4	33.46
9	45x45x5mm MS Angle (Cleat)	60	18	3.4	3.67
10	40x40x5mm MS Angle	335	6	3	6.03
11	Round clamps of different sizes made out of MS flats suitable for fixing the above structural materials to the pole				
	a) 75x6 MS Flat	1000	8	3.53	28.26
12	MS Hexagonal bolts, nuts and washers of different sizes to sufficient in quantity for fixing clamps		10kgs Approx		10
				Total in Kgs	274.39

Note

- 1. The weights mentioned are subject to tolerance as per IS**
- 2. The weights mentioned are before drilling of holes**