South Central Railway

Service with commitment - Progress with pride

कर्षण वितरण
Traction Distribution



दर अनुसूची
Schedule of Rates - 2025

SOUTH CENTRAL RAILWAY

TRACTION DISTRIBUTION

SCHEDULE OF RATES (SOR)

MAY 2025 (Revised)

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Brij Mohan Meena

सत्यमेव जयते

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FOREWORD

Dear All TRD Stakeholders,

It is with great pride and a sense of accomplishment that I present the **Schedule of Rates (SOR) for Traction Distribution – 2025** of South Central Railway. This edition has been meticulously developed first time in Indian Railways following a comprehensive review of the existing SOR, including a detailed redrafting of item descriptions and explanatory notes.

The document has undergone thorough examination by the designated committee, critical scrutiny by the Accounts department, and final validation by the Chief Electrical Distribution Engineer (CEDE) Mr. K. Thourya before its approval. I am confident that the revised item descriptions with clearly defined specifications and corresponding drawings will eliminate the ambiguities that existed in the previous SOR and prevent misinterpretation.

The unit rates included herein has been determined based on the latest Accepted Rates and detailed rate analyses. This will instill confidence among all stakeholders be it during estimate preparation, tender invitation, rate quoting, evaluation by tender committees, or final acceptance. The greater clarity provided in work descriptions and technical requirements is expected to significantly streamline the tendering process, accelerate project execution, and enhance the overall quality, safety, and reliability of TRD works with minimal post-commissioning issues.

I sincerely acknowledge the dedicated efforts of the TRD and Accounts teams, as well as the valuable contributions from Senior Section Engineers and other field experts, in bringing out this well-structured, transparent, and practical SOR-2025.

I am confident that this document will serve as a vital reference tool to educate and support all stakeholders railway officers, supervisors, and contractor personnel alike in ensuring timely and quality execution of TRD installations. Constructive feedback and suggestions for further refinement of this SOR-2025 are most welcome.

14.05.2025

09th May 2025
Secunderabad

Brij Mohan Meena

Acknowledgement

I take this opportunity to express my sincere gratitude to **Shri Brij Mohan Meena, PCEE/SCR**, for his overall leadership, support, and encouragement.

I am profoundly thankful to **Shri K. Thourya, CEDE/SCR**, for placing his trust in me and assigning the responsibility of convening the Schedule of Rates (SOR) for Electrical Traction Distribution (TRD). His belief and support were instrumental in the successful completion of this document.

My heartfelt thanks are extended to **Shri J. Sekhar Babu, Secretary/PG/GM,** for his significant role in shaping the structure and content of the SOR. His insightful contributions have greatly enhanced the overall quality and precision of this document.

I am deeply grateful to **Shri G. Hrushikesh, Dy.CEE/Proj./II/SC**, for his technical inputs and consistent support, which greatly aided the development of the SOR.

I also express my sincere appreciation to **Shri G. Sridhar, Dy.FA&CAO/C-I/SC**, for his expert supervision and meticulous oversight of the rate structuring, which was vital in framing the financial backbone of the new SOR.

I extend special thanks to Shri P. Sharath Kumar, JE/DRG/TRD/GTL, for his dedicated contribution in translating conceptual inputs into a well-structured document. His meticulous research, thorough compilation of last accepted rates, referencing of purchase orders, and comprehensive rate analysis were instrumental in enhancing the depth and completeness of the SOR.

I gratefully acknowledge the technical inputs and field-based insights provided by the Senior Section Engineers (SSEs) of all divisions, whose practical experience and knowledge have been invaluable in shaping this document.

K Sudarsan Reddy
Sr.DEE/Tr./GTL
(Convener)

Preface

The **Schedule of Rates (SOR)** for **Overhead Equipment (OHE)** and **Power Supply Installations (PSI)** in **Electrical Traction Distribution (TRD)** serves as a vital reference document for planning, estimating, and for executing various works related to railway electrification, OHE & PSI modifications and replacement of over-aged assets of OHE & PSI.

The Electrical TRD Department is currently following the Schedule of Rates (SOR) formulated in the year 2000. Since then, no revisions have been carried out. As a result of this long-standing stagnation, various divisions under SCR have resorted to applying ad-hoc percentage escalations to the outdated SOR rates while preparing cost estimates. These escalated estimates are then vetted and used for tender execution. However, the inconsistent application of different ad-hoc escalation percentages across divisions has led to significant difficulties in rate comparison during tender committee proceedings.

In view of above, it has become important to carry out periodic revision of these rates duly considering newly evolving standards, market dynamics i.e., fluctuations in material costs, labour wages including taxes and duties etc. To review, standardize, and update the SOR accordingly, **PCEE/SCR has constituted a committee comprising Electrical Officers (Sr.DEE/TR/GTL, Dy.CEE/Projects/II/SC, and Secretary/PG) and one Finance Officer (Dy. FA&CAO/C-I/SC).**

The committee has undertaken a comprehensive and systematic review of the Schedule of Rates (SOR), covering both supply and erection components, along with their explanatory notes. This review was carried out in a realistic and transparent manner, with the following key aspects:

- Detailed review of material components listed under the supply portion of each SOR item.
- Rate analysis based on current market trends for supply items.
- Rate references from purchase orders and Last accepted rates from recently awarded tenders.
- Rate analysis for Erection portion based on Manpower requirement
- Introduction of new items aligned with field requirements on realistic basis.
- Detailed update of explanatory notes, incorporating practical insights and feedback from experienced field officers & supervisors.

Final SOR Report (comprising of Revised rates for existing SOR items, New SOR items and revised explanatory notes) is submitted to **CEDE/SCR** for further review and to obtain approval of PCEE/SCR. Subsequently, approval from PCEE/SCR has been obtained for the adoption of the **New Schedule of Rates for Overhead Equipment (OHE) and Power Supply Installations (PSI)** in Electrical Traction Distribution (TRD) across South Central Railway.

The revised SOR provides a comprehensive listing of supply & erection rates for a wide range of OHE & PSI items with explanatory notes. This updated SOR is expected to bring uniformity in estimates preparation, improve financial predictability and supports the efficient execution of TRD works over South Central Railway. Users are advised to refer to the Explanatory Notes in conjunction with each item description in the SOR.

We extend our deepest gratitude to everyone who contributed in revision and finalization of Schedule of Rates for their expertise, commitment and their valuable suggestions.

K Sudarsan Reddy Sr.DEE/Tr./GTL (Convener)	J Sekhar Babu Secretary/PG/GM (Member)	G Hrushikesh Dy.CEE/Proj./II/SC (Member)

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S. No.	Item No.	Description	Unit	Rate
	SCHEDULE A1: OHE & PSI ITEMS			
1	1(a)	Preparation of Design & Drawings for Overhead Equipment	TKM	20066
2	1(b)	Preparation of Design & Drawings for Switching Station (SP/SSP)	Each	40828
3	1(c)	Preparation of Traction Working Rule Diagram along with Working Instructions	Each	11869
4	1(d)	Supply and Installation of Traction Working Rule Diagram Boards	Sq. ft	1271
5	1(e)	Preparation of Design & Drawings for Traction Substation (TSS).	Each	88273
6	1(f)	Preparation and Designing of Sectioning Diagram.	Each Station	14212
7	1(g)	Design and Preparation of Structure Erected Drawing (SED).	Each	668
8	3(a)	Erection of Traction Masts, Feeder Masts, AT Mast and Main Masts of Switching Stations.	MT	3465
9	3(b)	Erection of TTCs, Portals and Small Parts Steel (SPS)	MT	15267
10	3(e)	Supply and Erection of Guy Rod Assembly		
		Supply	Each	9331
		Erection	Each	1120
11	3(g)	Supply of Steel Reinforcement for RCC Work	MT	71717
12	4(a)(i)	Supply (without Insulators) and Erection of Single Cantilever Assembly for Conventional OHE		
		Supply	Each	12114
		Erection	Each	1080
13	4(a)(ii)	Erection of Two Cantilever Assemblies on same structure or support for Conventional OHE	Each	1619
14	4(a)(iii)	Erection of Three Cantilever Assemblies on same structure or support for Conventional OHE	Each	1859

S. No.	Item No.	Description	Unit	Rate
15	4(a)(iv)	Supply (without Insulators) and Erection of Single Cantilever Assembly for Tramway OHE		
		Supply	Each	8430
		Erection	Each	1080
16	4(a)(v)	Erection of Two Cantilever Assemblies on same structure or support for Tramway OHE	Each	1619
17	4(a)(vi)	Erection of Three Cantilever Assemblies on same structure or support for Tramway OHE	Each	1859
18	4(b)(i)	Supply (without Insulators) and Erection of a Pull Off arrangement for Conventional OHE		
		Supply	Each	10693
		Erection	Each	785
19	4(b)(ii)	Supply (without Insulators) and Erection of a Pull Off arrangement for Tramway OHE		
		Supply	Each	6078
		Erection	Each	593
20	6(a)	Supply and Erection of Regulated Conventional OHE		
		Supply	TKM	24271
		Erection	TKM	48362
21	6(b)	Erection of Regulated Contact Wire Only	TKM	29647
22	6(c)	Supply and Erection of Regulated Contact Wire (Regulated with Briddle Wire)		
		Supply	TKM	19908
		Erection	TKM	31421
23	7(a)	Erection/Stringing of Along Feeder (either All Aluminium 25 kV Feeder (single spider) or Copper Feeder wire)	KM	12004
24	7(b)	Erection of Copper Cross Feeder Wire	Each	2354
25	7(c)	Erection of Large Span Wire (130 Sq. mm)	Meter	207

S. No.	Item No.	Description	Unit	Rate
26	8(a)(iv)	Supply of Regulating Equipment Without Counter-Weight Assembly		
		Supply	Each	21221
27	8(a)(v)	Supply and Erection of Regulating Equipment With Counter-Weight assembly for Conventional OHE		
		Supply	Each	70583
		Erection	Each	4000
28	8(a)(vi)	Supply and Erection of Regulating Equipment With Counter-Weight assembly for Tramway Type OHE		
		Supply	Each	53568
		Erection	Each	4000
29	8(a)(xii)	Marking/Painting of temperature and 'Y' - Measurement on OHE Structures at BWA locations.	Each	185
30	8(b)(i)	Supply (without Insulator) and Erection of materials for Termination single conductor of OHE or terminating wire		
		Supply	Each	4444
		Erection	Each	956
31	8(b)(ii)	Supply (without Insulator) and Erection of Materials for Termination of Conventional OHE		
		Supply	Each	8201
		Erection	Each	1120
32	8(b)(iii)	Supply (without Insulator) and Erection of Materials for Termination of Along Feeder (Aluminium/Copper)		
		Supply	Each	5192
		Erection	Each	1000
33	8(b)(vi)	Supply (without Insulator) and Erection of Materials for Termination of Tramway OHE		
		Supply	Each	4508
		Erection	Each	1000

S. No.	Item No.	Description	Unit	Rate
34	8(b)(ix)	Supply (without Insulators) and Erection of Materials for Termination of Copper Cross Feeder		
		Supply	Set	8293
		Erection	Set	1000
35	9(a)	Supply (without Insulators) and Erection of Anti-creep with galvanized steel wire for Conventional OHE		
		Supply	Each	22000
		Erection	Each	3372
36	9(b)	Supply (without Insulators) and Erection of Anti-creep with galvanised steel wire for regulated Tramway OHE		
		Supply	Each	21137
		Erection	Each	3372
37	9(c)	Supply (without Insulators) and Erection of Anti-creep with cadmium copper catenary wire for Conventional OHE in polluted area (excluding supply of cadmium copper catenary wire)		
		Supply	Each	5877
		Erection	Each	3372
38	9(d)	Supply (without Insulators) and Erection of Anti-creep with cadmium copper catenary wire for Tramway OHE in polluted area (excluding supply of cadmium copper catenary wire)		
		Supply	Each	4204
		Erection	Each	3372
39	10(a)	Extra on item 6(a) or 6(c) for Supply and Erection of additional fittings required at a turnout, cross-over or over-lap		
		Supply	Each	5733
		Erection	Each	1250

S. No.	Item No.	Description	Unit	Rate
40	11(a)(i)	Supply (without Insulator) and Erection of 25 kV Solid Core Cut-in Insulator.		
		Supply	Each	1859
		Erection	Each	711
41	11(a)(ii)	Supply (without Insulator) and Erection of 25 kV Solid Core Suspension Insulator.		
		Supply	Each	2022
		Erection	Each	494
42	11(b)	Supply (without Insulator) and Erection of 25 kV Post Insulator		
		Supply	Each	850
		Erection	Each	336
43	12(a)	Supply (without Insulators) and Erection of 25 kV Section Insulator Assembly for Conventional OHE		
		Supply	Each	51930
		Erection	Each	3117
44	12(b)	Supply (without Insulators) and Erection of 25 kV Section Insulator Assembly for Tramway OHE		
		Supply	Each	49350
		Erection	Each	3557
45	12(c)	Erection of Light Weight Section Insulator	Each	4300
46	13(a)	Supply (without Insulators) and Erection of 25 kV Single Pole Isolator without earth contact assembly		
		Supply	Each	40128
		Erection	Each	2891
47	13(b)	Supply (without Insulators) and Erection of 25 kV Double Pole Isolator without earth contact assembly.		
		Supply	Each	67227
		Erection	Each	4188

S. No.	Item No.	Description	Unit	Rate
48	13(c)	Supply and Erection of Earth Contact Assembly for an Isolator		
		Supply	Each	13357
		Erection	Each	412
49	13(d)	Supply and Erection of an Interlocking device		
		Supply	Each	4610
		Erection	Each	294
50	13(e)	Supply (without Insulators) and Erection of 132 kV Double Pole Isolator without earth contact assembly		
		Supply	Each	147437
		Erection	Each	5084
51	13(f)	Supply (without Insulators) and Erection of 25 kV Single Pole Isolator (1600 A) without earth contact assembly		
		Supply	Each	42973
		Erection	Each	5340
52	13(g)	Supply (without Insulators) and Erection of 25 kV Double Pole Isolator (1600 A) without earth contact assembly.		
		Supply	Each	74874
		Erection	Each	5340
53	14(a)	Erection of PTFE Neutral Section Assembly	Each	8376
54	15(a)	Supply and Erection of 50 sq.mm Copper Jumper (C-Jumper, F-Jumper, Anti-Theft Jumper) (excludes copper jumper supply)		
		Supply	Each	756
		Erection	Each	356
55	15(b)	Supply and Erection of 160 or 105 sq.mm Copper Jumper (Isolator Jumper, G-Jumper) (excludes copper jumper supply)		
		Supply	Each	2126
		Erection	Each	680

S. No.	Item No.	Description	Unit	Rate
56	15(c)	Supply and Erection of 160 sq. mm Large copper jumper between Aluminium Bus and Cross-feeder (excludes copper jumper supply)		
		Supply	Each	5008
		Erection	Each	612
57	15(d)	Supply and Erection of 160 sq. mm Large copper jumper between Cross-feeder and OHE (excludes copper jumper supply)		
		Supply	Each	3345
		Erection	Each	612
58	15(e)	Supply and Erection of Aluminium Jumper		
		Supply	Each	3654
		Erection	Each	342
59	16(a)	Supply and Erection of Structure Bond		
		Supply	Each	833
		Erection	Each	304
60	16(b)	Supply and Erection of Longitudinal Bond		
		Supply	Each	604
		Erection	Each	274
61	16(c)	Supply and Erection of Transverse & Special Bond		
		Supply	Each	951
		Erection	Each	326
62	16(aa)	Drilling of Holes on Rails	Each	107
63	16(d)	Supply and Erection of Structure Bond on Platform Area		
		Supply	Each	1618
		Erection	Each	2369

S. No.	Item No.	Description	Unit	Rate
64	17(a)	Supply and Erection of Single Earth Electrode at COP/FOB/PTFE/Steel Girder etc.		
		Supply	Each	3511
		Erection	Each	1347
65	17(b)	Supply and Erection of Earth Bus		
		Supply	Meter	183
		Erection	Meter	80
66	17(c)	Supply and Erection of Single Earth Electrode TSS/SP/SSP/AT		
		Supply	Each	4142
		Erection	Each	1905
67	17(d)	Supply and Erection of Copper Strips (25 mm x 3 mm) for Equipment Earthing		
		Supply	Meter	959
		Erection	Meter	85
68	17(e)	Supply and Erection of Earth leads 75 mm x 8 mm mild steel laid in the ground.		
		Supply	Meter	379
		Erection	Meter	103
69	17(f)	Supply and Erection of Earth leads 75 mm x 8 mm mild steel laid exposed		
		Supply	Meter	379
		Erection	Meter	76
70	17(g)	Supply and Erection of Earth leads 50 mm x 6 mm mild steel laid in the ground.		
		Supply	Meter	184
		Erection	Meter	76

S. No.	Item No.	Description	Unit	Rate
71	17(h)	Supply and Erection of Earth leads 50 mm x 6 mm mild steel laid exposed		
		Supply	Meter	184
		Erection	Meter	65
72	17(i)	Supply and Erection of Mild steel rod 32 mm dia for Earth Mat		
		Supply	Meter	1056
		Erection	Meter	69
73	17(j)	Supply and Erection of 8 SWG G.I wire for earthing		
		Supply	Meter	33
		Erection	Meter	25
74	17(k)	Supply and Erection of Earth Screen Wire		
		Supply	Meter	465
		Erection	Meter	30
75	18(a)	Erection of 25 kV Vacuum Interrupter (BM)	Each	5596
76	18(b)	Erection of 25 kV Vacuum Circuit Breaker (CB)	Each	5596
77	18(c)	Erection of 132/220 kV Double Pole Circuit Breaker of SF-6 type	Each	10525
78	19(a)	Erection of 25 kV Type-I Potential Transformer (PT)	Each	1340
79	19(b)	Erection of 25 kV Type-II Potential Transformer (PT)	Each	1340
80	20(a)	Erection of 42 kV Lightning Arrester	Each	847
81	20(b)	Erection of 120 kV Lightning Arrester	Each	1880
82	20(c)	Erection of 198 kV Lightning Arrester	Each	2354
83	21	Supply and Erection of Terminal Boards in control cubicles		
		Supply	Each	21460
		Erection	Each	522

S. No.	Item No.	Description	Unit	Rate
84	22(a)	Supply and Erection of an Iron Clad 110 V DC Fuse Box		
		Supply	Each	3738
		Erection	Each	110
85	22(b)	Supply and Erection of an Iron Clad 230 V AC Fuse Box		
		Supply	Each	4135
		Erection	Each	110
86	22(c)	Supply and Erection of 110 V Distribution Boards		
		Supply	Each	34692
		Erection	Each	771
87	23(a)	Erection of 110 V, 40 Ah Lead Acid Battery	Each	8496
88	23(b)	Erection of Battery charger for 110 V, 40 Ah Lead Acid Battery	Each	1274
89	24(a)	Erection of 110 V, 200 Ah Lead Acid Battery	Each	8496
90	24(b)	Erection of Battery charger for 110 V, 200 Ah Lead Acid Battery.	Each	1911
91	25(a)	Supply and Erection of cable for Control and Indication (10 or 7 core, 2.5 sq. mm)		
		Supply	Meter	1118
		Erection	Meter	21
92	25(b)	Supply and Erection of cable for Heater Supply (2 core, 4 sq. mm)		
		Supply	Meter	421
		Erection	Meter	21
93	25(c)	Supply and Erection of cable for Catenary Indication (2 core, 2.5 sq. mm)		
		Supply	Meter	289
		Erection	Meter	21

S. No.	Item No.	Description	Unit	Rate
94	25(d)	Supply and Erection of cable for 110 V DC Power supply (2 core. 4 sq. mm)		
		Supply	Meter	421
		Erection	Meter	26
95	25(e)(i)	Supply and Laying of 2 core, 70 sq mm XLPE Aluminium cable		
		Supply	Meter	212
		Erection	Meter	26
96	25(e)(ii)	Supply and Laying of 2 core, 150 or 185 sq mm XLPE Aluminium cable		
		Supply	Meter	401
		Erection	Meter	39
97	26(a)(i)	Supply and Erection of Aluminium Bus Bar 36 mm x 28 mm		
		Supply	Meter	612
		Erection	Meter	72
98	26(a)(ii)	Supply and Erection of 18 mm Copper Bus Bar		
		Supply	Meter	2250
		Erection	Meter	146
99	26(b)(i)	Supply and Erection of Aluminium Bus Terminal (6480)		
		Supply	Each	1215
		Erection	Each	47
100	26(b)(ii)	Supply and Erection of Aluminium Bus Splice (6490)		
		Supply	Each	1162
		Erection	Each	47
101	26(b)(iii)	Supply and Erection of Aluminium Bus TEE connector (6500)		
		Supply	Each	1593
		Erection	Each	42

S. No.	Item No.	Description	Unit	Rate
102	26(b)(iv)	Supply and Erection of Aluminium Bus Bar Terminal connector 36/20 mm (6530)		
		Supply	Each	1062
		Erection	Each	42
103	26(b)(v)	Supply and Erection of Aluminium Bus Bar Tap connector (6520)		
		Supply	Each	1800
		Erection	Each	47
104	26(b)(vi)	Supply and Erection of Aluminium Flexible Bus Splice (6550)		
		Supply	Each	3092
		Erection	Each	47
105	26(b)(vii)	Supply and Erection of Aluminium Bus Terminal connector bolted type (6830-1)		
		Supply	Each	677
		Erection	Each	42
106	26(c)(i)	Supply and Erection of Solid Copper Busbar Connector - 18 mm Bus Terminal (6310-1)		
		Supply	Each	1231
		Erection	Each	47
107	26(c)(ii)	Supply and Erection of Solid Copper Busbar Connector - 18 mm Bus Splice (6320)		
		Supply	Each	1416
		Erection	Each	47
108	26(c)(iii)	Supply and Erection of Solid Copper Busbar Connector - 18 mm Bus TEE Joint (6330)		
		Supply	Each	2110
		Erection	Each	47

S. No.	Item No.	Description	Unit	Rate
109	26(c)(iv)	Supply and Erection of Solid Copper Busbar Connector - 18 mm Bus Terminating TEE (6350)		
		Supply	Each	2056
		Erection	Each	47
110	26(c)(v)	Supply and Erection of Aluminium Bus Bar 50 mm x 39 mm		
		Supply	Meter	1181
		Erection	Meter	75
111	26(c)(vi)	Supply and Erection of ACSR conductor (Zebra 61/3.18 mm)		
		Supply	Meter	189
		Erection	Meter	27
112	26(c)(vii)	Supply and Erection of Rigid type Bi-metallic Terminal connector suitable for 50 mm dia AL Tubular Bus Bar to Terminal Pad of 25 kV Isolator/CT (ID no 11090)		
		Supply	Each	1416
		Erection	Each	43
113	26(c)(viii)	Supply and Erection of Expansion Type Terminal connector to suit 50 mm dia AL Tubular Bus Bar to Terminal Pad of 25 kV C.T/Isolator/ C.B & Interrupter (ID no 11060)		
		Supply	Each	3894
		Erection	Each	43
114	26(c)(ix)	Supply and Erection of 25 kV System Rigid Bus Splice connector to suit 50 mm O/D AL Tube on Both ways. (ID no 11180)		
		Supply	Each	1558
		Erection	Each	43

S. No.	Item No.	Description	Unit	Rate
115	26(c)(x)	Supply and Erection of 25 kV System TEE connector to suit 50 mm O/D AL Tubular Bus Bar to 50 mm O/D AL Bus Bar (ID no 11150)		
		Supply	Each	1564
		Erection	Each	43
116	26(c)(xi)	Supply and Erection of Rigid Through connector to suit 50 mm dia AL Tubular Bus Bar and Spider AAC Conductor for 25 kV PT Type-II (ID no 11110)		
		Supply	Each	1682
		Erection	Each	43
117	26(c)(xii)	Supply and Erection of 25 kV System TEE connector to suit 50 mm O/D AL Tube and Spider AAC Conductor (ID no 11140)		
		Supply	Each	1475
		Erection	Each	43
118	26(c)(xiii)	Supply and Erection of TEE connector to Suit Zebra (28.58 dia) ACSR Conductor on Both ways for 220 kV System (ID no 11040)		
		Supply	Each	2006
		Erection	Each	43
119	26(c)(xiv)	Supply and Erection of 220 kV System Bi-metallic Terminal Connector to suit ZEBRA (28.62 dia) ACSR Conductor and Al/Cu Pad Isolator/CT/BT (ID no 11120/11030)		
		Supply	Each	1534
		Erection	Each	43
120	26(c)(xv)	Supply and Erection of Rigid type connector on S.I. to suit 50 O/D AL Bus Bar for 25 kV System (ID no 11200)		
		Supply	Each	885
		Erection	Each	43

S. No.	Item No.	Description	Unit	Rate
121	26(c)(xvi)	Supply and Erection of 25 kV System TEE Connector to suit 36 mm O/D AL Bus Bar to 50 mm O/D AL Bus Bar (11240)		
		Supply	Each	2708
		Erection	Each	49
122	26(c)(xvii)	Supply and Erection of Siding clamp for 50 mm AL Busbar (11190)		
		Supply	Each	1480
		Erection	Each	49
123	26(c)(xviii)	Supply and Erection of 220 kV System Rigid connector on SI to suit ZEBRA (28.58 mm dia) ACSR Conductor (ID no 11050)		
		Supply	Each	1450
		Erection	Each	49
124	26(c)(xix)	Supply and Erection of Rigid type Bi-metallic connector for 50 mm AL Busbar (ID no 11070)		
		Supply	Each	1534
		Erection	Each	49
125	26(c)(xx)	Supply and Erection of 25 kV Expansion Bus Coupler to suit 50 mm AL Busbar (ID no 11210)		
		Supply	Each	4767
		Erection	Each	49
126	27(a)	Erection of 25 kV/240 V, 5/10/25/50 KVA Auxiliary Transformer	Each	7234
127	27(b)	Supply and Erection of 240 V L.T. Distribution Board in the control room for L.T supply transformer with changeover switch		
		Supply	Each	70000
		Erection	Each	1033

S. No.	Item No.	Description	Unit	Rate
128	28	Supply (without Insulators) and Erection of 25 kV Drop Out Fuse switch for all oil type Auxiliary Transformer of all capacities		
		Supply	Each	10219
		Erection	Each	563
129	30(a)(i)	Supply and Erection of Fencing Panel at SP/SSP/TSS		
		Supply	Meter	3770
		Erection	Meter	208
130	30(a)(ii)	Supply and Erection of Fencing Upright at SP/SSP/TSS		
		Supply	MT	115050
		Erection	MT	4825
131	30(a)(iii)	Supply and Erection of Gates		
		Supply	Meter	5280
		Erection	Meter	376
132	30(b)(i)	Supply and Erection of Anti-climbing device at TSS/SP/SSP		
		Supply	Meter	426
		Erection	Meter	11
133	30(b)(ii)	Supply and Erection of Anti-climbing device for Auxiliary Transformer		
		Supply	Each	1795
		Erection	Each	383
134	31(a)	Transfer of Overhead Equipment from one Mast or Support to another, including removal of Cantilever Assembly from old Mast or Support	Each	1870
135	31(b)	Provision of additional bracket assembly/assemblies on a mast or support	Each	2316
136	31(c)	Dismantling of Overhead Equipment	TKM	13957

S. No.	Item No.	Description	Unit	Rate
137	31(d)	Dismantling of Along Feeder Wire (Aluminium or Copper)	KM	6028
138	31(e)	Splicing and Extension of Anchored OHE	Set	2558
139	31(f)	Dismantling of Section Insulator	Each	2622
140	31(g)	Slewing and Putting back of OHE in original position	Span	2286
141	31(h)	Dismantling of an Isolator	Each	1780
142	31(i)	Dismantling of Post Insulator	Each	336
143	31(j)(i)	Dismantling of Suspension Insulator	Each	494
144	31(j)(ii)	Dismantling of Cut-in Insulator	Each	589
145	31(k)(i)	Dismantlement of OHE Mast or structure by cutting	Each	3062
146	31(k)(ii)	Dismantlement of Upright of TTC/Portal by cutting	Each	4376
147	31(l)(i)	Retrieval of Traction Masts, Main Masts of Switching Station, TTC Uprights etc	Each	11520
148	31(l)(ii)	Removal of OHE Masts on Bridges	Each	4248
149	31(m)	Releasing of Pole mounted LT supply transformer	Each	3617
150	31(n)	Dismantling of Guy Rod	Each	524
151	31(o)	Releasing of Multiple Cantilever Crossarm cantilever assemblies where single cantilever assembly is leftover	Each	524
152	31(p)	Dismantling of Drop Arms/Booms/ Temporary Masts	MT	5359
153	31(q)	Splicing and Extension of Feeder conductor	Each	2986
154	31(r)	Dismantling of Cantilever Assembly including Insulators	Each	480
155	31(s)	Dismantling of Fabricated Steel or Small Parts Steel (SPS)	MT	709
156	31(t)(i)	Dismantling of a Regulating Equipment (Three-pulley type) with counter weight assembly for Conventional OHE	Each	2542

S. No.	Item No.	Description	Unit	Rate
157	31(t)(ii)	Dismantling of a Regulating Equipment (Three-pulley type) with counter weight assembly for Tramway OHE	Each	1874
158	31(t)(iii)	Dismantling of Anti-creep with galvanized steel wire or cadmium catenary wire	Each	1480
159	31(t)(iv)	Dismantling of all types of Copper Jumpers	Each	140
160	31(t)(v)	Dismantling of Termination for Conventional type Overhead Equipment	Each	515
161	31(t)(vi)	Dismantling of Termination for Tramway type Overhead Equipment	Each	515
162	31(t)(vii)	Dismantlement of Termination for Along Feeder (Aluminium or Copper)	Each	506
163	31(t)(viii)	Transfer of Feeder Wire from one Mast or Support to another Mast or Support	Each	2411
164	31(t)(ix)	Re-adjustment of OHE Spans, including droppers	Span	4376
165	31(t)(x)	Dismantling of Structure Bond / Longitudinal Bond / Transverse and Special Bond	Each	145
166	31(u)(i)	Dismantling of 25 kV Potential Transformer (Type I, II)	Each	636
167	31(u)(ii)	Dismantling of 25 kV Current Transformer	Each	636
168	31(u)(iii)	Dismantling of 132 kV Current Transformer	Each	1484
169	31(u)(iv)	Dismantling of 42 kV Lightning Arrester	Each	478
170	31(u)(v)	Dismantling of 120 or 198 kV Lightning Arrester	Each	1068
171	31(u)(vi)	Dismantling of 132 kV Double Pole Isolator	Each	2542
172	31(u)(vii)	Dismantling of 25 kV Single Pole Isolator 1600 A	Each	2986
173	31(u)(viii)	Dismantling of 25 kV Double Pole Isolator 1600 A	Each	3301
174	31(u)(ix)	Dismantling of 132 kV CB Oil type	Each	6602
175	31(u)(x)	Dismantling of 25 kV CB Oil type	Each	4453
	32	**100% Extra Rate for Erection Under Power**		

S. No.	Item No.	Description	Unit	Rate
		Block		
176	34(a)	Construction of Switching Station Building (Super Structure Portion including Plinth Beam)	Each	347079
177	34(c)	RCC work for foundation and plinth in ratio 1:2:4	cum	6802
178	34(d)	Brick work for foundation plinth	cum	5195
179	34(e)	Construction of retaining wall with stone masonry	cum	3768
180	34(f)	Excavation of Earth, filling including compaction in all kinds of soil	cum	298
181	34(h)	Excavation of Pile of 100 mm to 200 mm dia upto 3.5 m	Meter	197
182	34(i)	Plastering of Retaining wall with 1:4 cement mortar	sq. m	130
183	34(j)	Providing and Laying Pitching with Stone Boulders	cum	6659
184	34(k)	Supply and Spreading of 20 mm ballast at TSS/SSP/SP yards	cum	1915
185	35	Internal and External Lighting of Switching (SP/SSP) station building	Each	37716
186	36(a)	Unloading of all types of Steel Structures	MT	140
187	36(b)	Loading of all types of Steel Structures	MT	240
188	37(a)	Unloading of all types of Copper & Aluminium conductors	MT	120
189	37(b)	Loading of all types of Copper & Aluminium conductors	MT	120
190	38	Transportation of OHE structures / Materials / Equipments	MT-KM	116
191	39(a)	Erection of Released Guy Rod	Each	1120
192	39(b)	Erection of Released Cantilever Assembly	Each	1186
193	39(c)	Erection of Released Regulating Equipment	Each	5596
194	39(d)	Erection of Released Termination	Each	1120

S. No.	Item No.	Description	Unit	Rate
195	39(f)	Erection of Released 25 kV Post Insulator	Each	371
196	39(g)	Erection of Released Section Insulator	Each	4453
197	39(h)	Erection of Released 25 kV Single Pole Isolator	Each	4078
198	39(i)	Erection of Released Copper Jumper	Each	340
199	39(j)	Erection of Released Anti-creep	Each	3745
200	40(a)	Supply and Erection of Number Plate (Enamel Type)		
		Supply	Each	516
		Erection	Each	100
201	40(b)	Supply and Erection of Number Plate (Retro-Reflective Type)		
		Supply	Each	1049
		Erection	Each	149
202	41(a)	Supply and Erection of Retro-Reflective type DJ ON (CLOSE)/DJ OFF (OPEN)/ 500 m/250 m/Train-18/MEMU Neutral Section Boards		
		Supply	Each	1865
		Erection	Each	179
203	41(b)	Supply and Erection of Enamel type Public Caution board		
		Supply	Each	2166
		Erection	Each	179
204	41(c)	Supply and Erection of Enamel type Staff Caution board		
		Supply	Each	1384
		Erection	Each	179
205	41(d)	Supply and Erection of Retro-Reflective Type Electric Engine Stop Board/Caution Unwired Turnout Board		
		Supply	Each	3410
		Erection	Each	179

S. No.	Item No.	Description	Unit	Rate
206	41(e)	Supply and Erection of Retro-Reflective Type Power Block Working Limit Board		
		Supply	Each	1284
		Erection	Each	179
207	41(f)	Supply and Erection of Enamel type Caution Clearance to OHE nearby Restricted Board		
		Supply	Each	823
		Erection	Each	179
208	41(g)	Supply and Erection of Retro-Reflective type Danger Board for Height Gauge		
		Supply	Each	2562
		Erection	Each	179
209	41(h)	Supply and Erection of Vitreous Enamelled 25 kV Danger Board with skull & bones for Overline Structure (OLS) and Auxiliary Transformer		
		Supply	Each	352
		Erection	Each	179
210	41(i)	Supply and Erection of Enamel Protected Area Board		
		Supply	Each	1475
		Erection	Each	179
211	41(j)	Supply and Erection of Retro-Reflective Sigma Board		
		Supply	Each	690
		Erection	Each	179
212	41(k)	Supply and Erection of Vitreous Enamelled TSS/SP/SSP Name Board		
		Supply	Each	5588
		Erection	Each	179

S. No.	Item No.	Description	Unit	Rate
213	41(l)	Supply and erection of set of Isolator operation OPEN/CLOSE boards		
		Supply	Set	1540
		Erection	Set	179
214	42	Supply and Erection of Shock Treatment Chart		
		Supply	Each	2862
		Erection	Each	204
215	43	Supply and Erection of Protective Screens at/on ROB/FOBs		
		Supply and Erection	Set	26100
216	45(a)	Erection of 25 KV Current Transformer	Each	1911
217	45(b)	Erection of 132 KV Outdoor Oil filled Current Transformer	Each	2670

S. No.	Item No.	Description	Unit	Rate
	SCHEDULE A2: FOUNDATION ITEMS (incl. Supply & Erection)			
218	2(a)(i)	Concrete for foundations and plinth in Hard Soil	cum	10004
219	2(a)(ii)	Concrete for foundations and plinth in Rocky Soil	cum	10259
220	2(b)	Concrete for foundations and plinth in other than Hard and Rock Soil	cum	9230
221	2(c)(i)	Reinforced Concrete for foundation, plinth and trench	cum	10179
222	2(c)(ii)	Reinforced Concrete for Cable Trench covers	sq. m	2893
223	2(d)(i)	Reinforcement of Brick Work	cum	6336
224	2(d)(ii)	Plastering of Brick Work	sq. m	142
225	2(e)	Extra for supply & sinking of concrete shells (M15 grade)	cum	7590
226	2(f)	Casting of foundations using mechanized Augur (M15 grade)	cum	8747
227	2(g)	Casting of single under reamed pile foundation (M15 grade)	cum	8818
228	2(h)(i)	Reinforcement cement concrete, ratio 1:2:4 in columns with 20 mm and downgraded stone aggregate and coarse sand.	cum	12691
229	2(h)(ii)	Reinforcement cement concrete, ratio 1:3:6 in pile caps with 20 mm and downgraded stone aggregate and coarse sand.	cum	11679
230	2(h)(iii)	Mass concrete (PCC), ratio 1:4:8 stone with nominal size stone aggregate 40 mm gauge and ordinary sand in mud mat.	cum	4472
231	2(i)	Breaking of foundation up to 200 mm below track formation and drain / PF surface etc	cum	2952

S. No.	Item No.	Description	Unit	Rate
	SCHEDULE B1: STEEL SUPPLY			
232	3(as)	Supply of Rolled or Fabricated and Galvanized Traction Masts, Switching Station Masts, AT masts, Feeder masts etc	MT	132174
233	3(bs)	Supply of Fabricated and Galvanized structures such as TTCs, Portals, other than masts	MT	135370
234	3(cs)	Supply of Fabricated and Galvanized Small Parts Steel (SPS) other than Masts, TTCs and Portals.	MT	147256

S. No.	Item No.	Description	Unit	Rate
	SCHEDULE B2: COPPER SUPPLY			
235	6(cs)	Supply of 7 mm dia Hard Drawn Round Copper Dropper Wire	KG	1350
236	6(ds)	Supply of 5 mm dia Hard Drawn Round Copper Dropper Wire	KG	1250
237	6(es)	Supply of Cadmium Copper Bridle Wire (7/2.1 mm)	KG	1483
238	7(bs)	Supply of 150 sq.mm Hard Drawn Stranded Copper Cross Feeder Wire	KG	1350
239	7(cs)	Supply of 130 sq.mm Cadmium Copper Large Span Wire	KG	1400
240	15(as)	Supply of 50 sq.mm Annealed Stranded Copper Jumper Wire	KG	1261
241	15(bs)	Supply of 160 sq.mm Annealed Stranded Copper Jumper Wire	KG	1355
242	15(cs)	Supply of 105 sq.mm Annealed Stranded Copper Jumper Wire	KG	1349

S. No.	Item No.	Description	Unit	Rate
	SCHEDULE B3: INSULATOR SUPPLY			
243	4(ax)	Supply of Porcelain Stay and Bracket Insulators for Item No. 4(a)(i) / 4(a)(iv)	Set	6255
244	4(ax)(i)	Supply of Porcelain Stay Insulator for Item No. 4(a)(i) / 4(a)(iv)	Each	3093
245	4(ax)(ii)	Supply of Porcelain Bracket Insulator for Item No. 4(a)(i) / 4(a)(iv)	Each	3162
246	4(axx)	Supply of Composite Stay and Bracket Insulators for Item No. 4(a)(i) / 4(a)(iv)	Set	3823
247	4(axx)(i)	Supply of Composite Stay Insulator for Item No. 4(a)(i) / 4(a)(iv)	Each	1938
248	4(axx)(ii)	Supply of Composite Bracket Insulator for Item No. 4(a)(i) / 4(a)(iv)	Each	1885
249	4(bx)	Supply of Porcelain Insulator Item no. 4(b)(i)/ 4(b)(ii)	Each	4145
250	4(bxx)	Supply of Composite Insulator Item no. 4(b)(i)/ 4(b)(ii)	Each	1920
251	8(bx)	Supply of Porcelain 9-ton Insulator for item no. 8(b)(ii)/8(b)(iii)/8(b)(vi)/8(b)(ix)/9(a)/9(b)/9(c) /9(d)/11(a)(i)/11(a)(ii)	Each	4145
252	8(bxx)	Supply of Composite 9-ton Insulator for item no. 8(b)(ii)/8(b)(iii)/8(b)(vi)/8(b)(ix)/9(a)/9(b)/9(c) /9(d)/11(a)(i)/11(a)(ii)	Each	1920
253	11(bx)	Supply of Post Insulator for Item no. 11(b)	Each	5558
254	12(ax)	Supply of Sectioning and 9-ton Insulators for Item no. 12(a)	Set	10718
255	12(bx)	Supply of Sectioning Insulator for Item no. 12(b)	Set	6573
256	13(ax)	Supply of Post and Operating Rod Insulators for Item no. 13(a)	Set	14236
257	13(bx)	Supply of Post and Operating Rod Insulators for Item no. 13(b)	Set	28472
258	28(x)	Supply of Post Insulators for Item No. 28	Set	11116

S. No.	Item No.	Description	Unit	Rate
	SCHEDULE B4: GENERAL SUPPLY			
259	7(as)	Supply of All Aluminium 25 kV Feeder conductor (Single Spider 19/3.99 mm).	KM	229628
260	12(cs)	Supply of Light Weight Section Insulator	Each	415151
261	14(as)	Supply of PTFE Short Neutral Section Assembly	Each	1434674
262	18(as)	Supply of 25 kV Vacuum Interrupter (BM)	Each	303614
263	18(bs)	Supply of 25 kV Vacuum Circuit Breaker (CB)	Each	453474
264	18(cs)	Supply of 132 kV Double Pole SF-6 Circuit Breaker	Each	699669
265	19(as)	Supply of 25 kV Type-I Potential Transformer (PT)	Each	49939
266	19(bs)	Supply of 25 kV Type-II Potential Transformer (PT)	Each	44398
267	20(as)	Supply of 42 kV, 10 kA Metal oxide Gapless type Lightning Arrester	Each	47456
268	20(bs)	Supply of 120 kV, 10 kA Metal oxide Gapless type Lightning Arrester	Each	49420
269	20(cs)	Supply of 198 kV, 10 kA Metal oxide Gapless type Lightning Arrester	Each	76720
270	23(as)	Supply of 110 V, 40 Ah Low Maintenance Lead Acid Battery	Each	129604
271	23(bs)	Supply of Battery Charger for 110 V, 40 Ah lead acid battery.	Each	87763
272	24(as)	Supply of 110 V, 200 Ah Low Maintenance Lead Acid Battery.	Each	390141
273	24(bs)	Supply of Battery Charger for 110 V, 200 Ah lead acid battery	Each	224113
274	27(as)	Supply of 5 KVA, 25 kV/ 240 V Oil filled Auxiliary Transformer	Each	64467
275	27(bs)	Supply of 10 KVA, 25 kV/ 240 V Oil filled Auxiliary Transformer	Each	82225
276	27(cs)	Supply of 25 KVA, 25 kV/ 240 V Oil filled Auxiliary Transformer	Each	132455

277	28(s)	Supply of 25 kV Operating Rod For Drop Out Fuse Switch	Each	4161
278	45(as)	Supply of 25 kV Current Transformer CT Ratio 1500-750/5A	Each	54959
279	45(bs)	Supply of 132 kV Oil filled Current Transformer of ratio 400-200/5A	Each	159866
280	45(cs)	Supply of 220 kV Oil filled Current Transformer of ratio 200-100/1-1 A	Each	310930

S. No.	Item No.	Description	Unit	Rate
	SCHEDULE C: GENERAL ITEMS			
281	3(z)	Portal Boom Splicing and Extension for Each Portal	Each	38000
282	4(z)(i)	Replacement of Stay Insulator under Power Block	Each	1235
283	4(z)(ii)	Replacement of Bracket Insulator under Power Block	Each	1173
284	4(z)(iii)	Replacement of 9-ton Insulator under Power Block	Each	1116
285	6(z)(i)	Re-rolling of Contact wire 107/150 sq. mm into Drums	Meter	18
286	6(z)(ii)	Re-rolling of Catenary wire 65 sq. mm into Drums	Meter	18
287	6(z)(iii)	Supply of Reinforced Wooden Drum for Re-rolling of Catenary & Contact wire	Each	21746
288	16(z)	Disconnection & Reconnection of any type of bond	Each	160
289	17(z)(i)	Transportation & Erection of 13 m long 52/60 KG Released Rail from nominated place to work site	Number	5249
290	17(z)(ii)	Supply & Erection of Galvanised Iron Flat 75 x 8 mm	Meter	952
291	17(z)(iii)	Supply & Erection of High Productivity Fasteners (Rail Contact System) for fixing of Traction Bonds at Buried Rail Earthing Station. One Set comprises of M-12/20 Stainless Steel Nuts, Bolts & Washers etc.	Set	5444
292	17(z)(iv)	Excavation & Refilling of Soil for Buried Rail	cum	1049
293	18(z)(i)	Supply of Paint and Stenciling/Painting of mast location, RL, MRL, EC socket symbols and implantations on OHE masts/portals	Each	284
294	18(z)(ii)	Supply of Paint and Painting of ATD Counter Weight including Temperature Marking of 'Y' value for 15°C, 35°C & 45°C	Each	203
295	18(z)(iii)	Supply of Paint and Painting of any type of Bond	Each	112
296	18(z)(iv)	White Washing for copping of mast/portal foundations	Each	75
297	18(z)(v)	Supply of Paint and Painting of Fencing Panels	sq. m	63
298	18(z)(vi)	Supply of Paint and Painting of PSI Equipments	sq. m	94
299	19(z)	Trimming/Cutting of Tree Branches including disposal of branches/Bushes outside yard (Note: Girth of more than 20 cm will only be considered as tree branch)	Each	170

S. No.	Item No.	Description	Unit	Rate
	SCHEDULE D: 2X25 kV ITEMS			
300	7(c)	Supply and Erection of Aerial Earth Conductor (AEC) with necessary accessories, fittings and fasteners on OHE mast/Portals.		
		Supply	KM	103343
		Erection	KM	19750
301	7(d)	Supply and Erection of of Buried Earth Conductor (BEC) with necessary accessories fittings and fasteners		
		Supply	KM	132774
		Erection	KM	35471
302	7(d)(i)	Supply and Erection of TEE connector for BEC end and lug for connection		
		Supply	Each	1503
		Erection	Each	82
303	8(a)(i)	Supply and Erection of 3:1 type Modified ATD with counter weight assembly for Conventional OHE (regulated) 2400 kgf		
		Supply	Each	84876
		Erection	Each	10794
304	13(h)	Supply and Erection of DP Isolator complete with SPS, insulators and jumpering arrangement etc suitable for 2x25 kV system.		
		Supply	Each	178078
		Erection	Each	10569

EXPLANATORY NOTES

SCHEDULE A1: OHE & PSI Items

Item 1(a) - Preparation of Design & Drawings for Overhead Equipment

The price shall cover per TKM basis for site survey, design and preparation of complete layout plan of each station/section (i.e. including existing unmodified portion) and all related drawings for overhead equipment. The OHE is to be designed as per RDSO/CORE standards.

In case of modification works in existing electrified area, soil classification as per nearby locations may be adopted. The preparation of Layout plans (LOPs) and other designs are to be finalized by the contractor in consultation & in close coordination with Railway Engineer In-charge. The price shall include the following scope.

Layout Plan (LOP):

After site survey and based on the engineering scale plan, contractor will submit proposed OHE layout plan for approval. After approval of proposed layout plan, the work is to be started. The contractor may be asked to prepare the layout plans based on the site details if the Railway Engineer In-charge is not able to supply the Engineering scale plan (ESP).

Feeder will also be applicable independently in case of feeders running on independent structures (not supporting OHE) along or across tracks.

Note: As advised by Railway Engineer In-charge, Part LOP may be submitted for planning to start the work at site apart from Full LOP. In case of big yards, showing complete LOP in zero size sheet is not feasible to check at site. Hence, Part LOPs may be submitted as advised by Railway Engineer In-charge.

Cross Section Drawing (CSD):

The price shall cover design and preparation of complete cross section drawings (CSDs) of each location as per RDSO/CORE standards. The contractor shall submit CSDs for approval. In-so-far as yards between outer most points and crossings are concerned, cross section drawings for each structure shall indicate guy rods, if any, the cross section of the formation, height and nature of the bank, whether new or old, nature of soil, type of foundation block, structure proposed, reverse deflection of the structure and all necessary particulars for erection of the foundation and the structures.

Note: (i) In open line sections, cross-sections drawings (CSDs) shall be submitted in the proforma, separately for each Railway line. (ii) For special foundation, drawings with all necessary details shall be submitted to the Purchaser. (iii) In case of side bearing foundation with extra depth, formation details as such location and necessary details for anchor foundation will be submitted. (iv) Prior to CSD preparation, a soil test should be conducted as per requirements to determine the exact soil-bearing capacity and soil type

Structure Erection Drawing (SED):

The Contractor shall submit structure erection drawings for each location for approval incorporating all the details included in the cross section drawing for the structure and the details of the bracket assembly, mast extensions, isolator mounting frame and anchorage of overhead equipment, feeder return conductors proposed for each structure together with all particulars necessary for the correct erection of overhead equipment at the structure. For structures with isolators, the details of electrical connections shall also

be incorporated. In open line section, the contractor shall submit structure erection particulars in the 'SED' proforma separately for each main line track in addition to particular details as indicated in the proforma for cross-section drawings.

The price shall also include the following, if required:

i) Preparation of long section drawings of overhead equipment including detailed study of over line structures such as foot over bridges, road over bridges etc. for maintaining the specified height of contact wire and requisite clearances. Contractor has to submit four (04) hard copy sets and soft copy (Auto Cad) to the purchaser.

ii) Preparation of Bonding plan drawings and supply of 4 hard copy sets as well as soft copy. Contractor has to submit four (04) hard copy sets and soft copy (Auto Cad) to the purchaser.

Approved Drawings:

Contractor has to prepare above mentioned /or all relevant in-principle drawings and submit 01 set of check paper print for verification from railway. Contractor has to make suitable corrections/ modifications raised on check prints, and submit 02 sets for approval.

As Erected Drawings:

After completion of work at site, contractor has to prepare **'as erected drawings'** of proposed works as per site in one (01) set check paper print for verification from railway. After incorporation of remarks on check print, contractor have to submit five (05) hard copy sets along with one tracing print and soft copy (Auto Cad) to the purchaser.

Notes For Measurements: For the purpose of payment against this item, the length of track shall be measured as under:

1. General: By the difference in the chainages of the length under consideration, as incorporated in the layout plans.
2. Turnouts: The track taking off shall be deemed as starting from the toe of the switch of the Turnout.
3. Cross-overs: The length of track shall be taken as the difference in the chainages of the toes of switches of the two turnouts constituting the crossover.
4. Diamond crossing with or without slips: The two tracks crossing each other shall be measured independently as per note 1 above as though there were no crossing. No extra shall be provided for slip points.
5. Dead ends and tops of loops: The lengths for payment under this item shall be up to the chainage of anchor mast of the terminating OHE.

The length of line to be considered for purpose of item 1(a) shall be measured

i) by the distance between the center line of the two structures to which the feeders/return feeders/conductors are anchored, in case of feeders running along the track if such feeder/return feeders/conductors are running completely on independent structures or

ii) by the distance between the center of the two structures supporting the OHE on either side of the first and last independent structure in case of feeders/return feeders/conductors running along the track supporting OHE.

Item 1(b) - Preparation of Design & Drawings for Switching Station (SP/SSP)

The price shall include the cost of preparation of design and drawing of switching station (SP/SSP) as per latest RDSO drawings & specifications. Also, it includes the necessary additions/alterations required for addition of an interrupter along with other equipment in existing SP/SSP.

The price shall cover supply of detailed drawings as mentioned below:

a) Schematic Diagram
b) Location Plan
c) General Arrangement Drawing (GAD)
d) Foundation Layout Drawing.
e) Fencing Layout Drawing
f) Earth mat Layout
g) Cable trench Drawing.
h) Cable Run Drawing
i) Structure Assembly Drawing
j) Any other essential drawings required in connection with SP/SSP.

Approved Drawings:

Contractor has to prepare above mentioned /or all relevant in-principle drawings of proposed work and submit one (01) set check paper print for verification from railway. Contractor have to make suitable corrections/ modifications raised on check prints, and submit two (02) sets of drawings for approval.

As Erected Drawings:

After completion of work at site, contractor has to prepare '**as erected drawing'** of proposed works per site submerged in existing portion of SP/SSP in one (01) set check paper print for verification from railway. After incorporation of remarks on check print, contractor have to submit five (05) hard copy sets along with one tracing print and soft copy (Auto Cad) to the purchaser.

Item 1(c) - Preparation of Traction Working Rule Diagram along with Working Instructions [Appendix-G]

The price shall include the preparation of the Traction Working Rule diagram (SWR Drawing) and the development of station working instructions for incorporation in Appendix-G of SWR Book at station. Traction working rule diagram is to be prepared based on Approved Layout plan and approved SIP duly incorporating signals and all elementary sections clearly. SWR (Appendix-G) should contain all instructions in connection with power block working section wise, sub section wise and protections to be taken etc.

Contractor has to prepare the SWR drawing in AutoCAD format and the instructions in MS Word format for Railway approval and submit one (01) set check paper print for verification from railway. Contractor has to make suitable corrections/ modifications raised on check prints, and submit 02 hard copy set of drawings for approval of competent authority. Upon approval, the Contractor shall supply six (06) hard copy sets of the drawings along with one soft copy, complete with coloring, operational rules, and a proper cover. The work shall be carried out in accordance with the ACTM and G&SR guidelines.

Note: (1) SWR drawings are to be printed in A3 Paper along with lamination.
(2) SWR Instructions are to be printed in A4 Paper.

Item 1(d) - Supply & Installation of Traction Working Rule Diagram Boards

The price shall include the supply and installation of fabricated Traction Working Rule Diagram (SWRD)/Sectioning/Schematic Diagram Boards of various sizes at designated locations, including Stations/Junction cabins, TPC cubicles, OHE/PSI depot, etc. The boards must be fabricated using 3 mm thick ACP (Aluminium Composite Panels) sheets, supported by iron framing, and finished with aluminium beading for durability and a professional appearance. The SWRD drawings shall be printed on adhesive vinyl, with elementary sections distinctly marked in different colours for clarity. Installation of the boards shall be carried out in accordance with the requirements and directions of the Railway Engineer In-charge at station, cabins, Depot and TPC.

Note: Dimensions of Traction working rule diagram boards are to be decided in consultation with Railway Engineer In-charge.

Item 1(e) - Preparation of Design & Drawings for Traction Substation (TSS)

The price shall include the cost of preparation of design and drawing of Traction Substation (TSS). The design & drawings for TSS should be prepared as per latest RDSO drawings & specifications. The price shall also include duly incorporating the necessary additions/alterations required for addition of an interrupter along with other equipment or addition of extra bay.

The price shall cover supply of detailed drawings as mentioned below:

a) Schematic Diagram
b) Location Plan
c) General Arrangement Drawing (GAD)
d) Foundation Layout Drawing.
e) Fencing Layout Drawing
f) Earth mat Layout
g) Cable trench Drawing.
h) Cable Run Drawing
i) Structure Assembly Drawing
j) Control Room Building Drawing
k) Baffle Wall Drawing
l) Any other essential drawings required in connection with TSS.

Approved Drawings:

Contractor has to prepare above mentioned /or all relevant drawings of proposed work and submit 01 set check paper prints for verification from railway. Contractor has to make suitable corrections/ modifications raised on check prints, and submit 02 sets of drawings for approval.

As Erected Drawings:

After completion of work at site, contractor has to prepare **'as erected drawing'** of proposed works per site submerged in existing portion of TSS in 01 set check paper print for verification from railway. After incorporation of remarks on check print, contractor have to submit five (05) hard copy sets along with one tracing print and soft copy (Auto Cad) to the purchaser.

Item 1(f) - Preparation and Designing of Sectioning diagram.

The price shall include the preparation of Sectioning diagram for each station. If required for the sectioning diagram, the Contractor shall develop it based on the approved Signal Interlocking Plan (SIP) and Engineering Scale Plan (ESP), copies of which will be provided by the Railways at no cost. If required, wiring drawing is also to be submitted by contractor.

Contractor has to prepare drawings of proposed work and submit one (01) set check paper print for verification from railway. Contractor has to make suitable corrections/ modifications raised on check prints, and submit 02 hard copy sets and PDF version of drawings for approval. Upon approval, five (05) hard copy sets of the drawings, along with one tracing print and a soft copy in AutoCAD format, shall be supplied to the purchaser. The work shall be carried out in accordance with ACTM and G&SR standards.

Item 1(g) - Design and Preparation of Structure Erected Drawing (SED)

The price shall cover for site survey, design and preparation of complete SED of each location based on existing LOP. This item will be operated for single / isolated locations or for AT Stations. The design is to be prepared as per RDSO/CORE standards. The price shall also cover soil investigation and testing in an approved manner, for new sidings and branch lines. In case of modification works in existing electrified area, soil classification as per nearby locations may be adopted. The price shall include the following scope.

Cross Section Drawings:

The price shall cover design and preparation of complete cross section drawings of each location as per RDSO/CORE standards (i.e. including existing unmodified portion). The contractor shall submit two sets of blue print for approval. In-so-far as yards between outer most points and crossings are concerned, cross section drawings for each structure, shall indicate (a) guy rods, if any, (b) the cross section of the formation, (c) height and nature of the bank, whether new or old, (d) nature of soil, (e) type of foundation block, (f) structure proposed, (g) reverse deflection of the structure and all necessary particulars for erection of the foundation and the structures.

Note: (i) In open line sections, cross-sections drawings shall be submitted in the proforma, separately for each Railway line. (ii) For special foundation, drawings with all necessary details shall be submitted to the Purchaser. (iii) In case of side bearing foundation with extra depth, formation details as such location and necessary details for anchor foundation will be submitted. (iv) Prior to CSD preparation, a soil test should be conducted as per requirements to determine the exact soil-bearing capacity and soil type

Structure Erection Drawings:

The Contractor shall submit structure erection drawings for each location for approval incorporating all the details included in the cross section drawing for the structure and the details of the bracket assembly, mast extensions, isolator mounting frame and anchorage of overhead equipment, feeder return conductors proposed for each structure together with all particulars necessary for the correct erection of overhead equipment at the structure.

For structures with isolators, the details of electrical connections shall also be incorporated. In open line section, the contractor shall submit structure erection particulars in the 'SED' proforma separately for each main line track in addition to particular details as indicated in the proforma for cross-section drawings.

Approved Drawings:

Contractor has to prepare above mentioned /or all relevant drawings and submit 01 set of check paper print for verification from railway. Contractor has to make suitable corrections/ modifications raised on check prints, and submit 02 sets for approval.

As Erected Drawings:

After completion of work at site, contractor has to prepare '**as erected drawings'** of proposed works as per site in one (01) set check paper print for verification from railway. After incorporation of remarks on check print, contractor has to submit five (05) hard copy sets and soft copy (Auto Cad) to the purchaser.

Item 3(a) - Erection of Traction Masts, Feeder Masts, AT Mast and Main Masts of Switching Stations

The price shall include the cost for erection (either manually or by crane), alignment and setting before grouting of individual traction masts, main masts of switching post, booster transformer stations, masts for LT supply transformer station, dwarf masts whether rolled or fabricated

Note: For the purpose of payment, the weight of individual traction mast shall be determined for each type on the basis of the payable weights per meter length shown below for standard types. For special type masts, the payable weight per meter length will be indicated by the Purchaser at the time of approval of designs.

Sl. No	Type of Mast	Weight in kg per meter including galvanization.
1	BFB 6"x6"	38.30
2	RSJ 8"x6"	53.30
3	B 150	39.07
4	B 175	44.61
5	B 200	50.76
6	B 225	61.50
7	B 250	70.72
8	K 150	38.18
9	K 175	43.72
10	K 200	49.87
11	K 225	37.50
12	K 250	66.72
13	S 1	53.39
14	S 3	76.40
15	S 4	53.39
16	S 5	111.53
17	S 6	53.39
18	S 7	76.40

19	S 8	111.53
20	S100	23.72
21	S101	19.98
22	T150	38.18
23	Dwarf mast	--

Item 3(b) - Erection of TTCs, Portals and Small Parts Steel (SPS)

The price shall include the cost of erection (either manually or by crane), alignment and setting before grouting, wherever required, of portals, gantries, two/three tracks cantilever (TTC) structures and tower/steel work for feeders for traction sub-station, drop arms, standard super masts, suspension brackets for feeders and return conductors, complete with anchor plates drilled and welded in position, multiple cantilever cross arm, chairs, adaptors for bracket assemblies and all other small part steel works, the erection of which is carried out by the Contractor irrespective of whether they are supplied by the Purchaser or the Contractor. The prices shall also include erection of galvanized bolts, nuts washers etc. wherever required as per approved designs and drawings.

Note for Item 3(b):

i) For the purpose of payment against items 3(b) weight of structures or fabricated steel work will be calculated based on gross weight including galvanization. There will be no addition for increased weight due to painting (or) weld material or reduction for holes or skew cuts.

ii) The rates against item 3(b) shall be applicable to the erection of small part steel work, which are not covered under the various other items of work. Unless specifically indicated none of the other items of work shall include the cost of erection of small part steel work, which will invariably be paid for under item 3(b) as applicable.

iii) All required galvanized bolts, nuts and washers are to be claimed under item 3(cs) of Schedule-B1, wherever not provided. Quantity requirement is to be decided as per site condition.

Note for Item 3(a), 3(b):

- The price shall also include the straightening of masts/portal uprights bent during transit and cutting of masts/portal uprights to suit the site conditions.
- The mast/structures cut to suit site condition, proportionate weight will only be paid under item 3(a)/3(b).
- The quantity schedule for item no 3(a) & 3(b) are prepared based on certain drawings given during preparation of schedule and as per site requirements.

Item 3(e) - Supply and Erection of Guy Rod Assembly

The price shall include the supply and erection of guy rod assemblies of various lengths for traction masts, portals, TTCs, feeder masts, or supports as per RDSO Drg No. ETI/OHE/P/5000 (Rev.B) or its latest revision & RDSO Drg No. ETI/OHE/01403/SH.1&2 or its latest revision. All necessary parts shall be grouted into the anchor block complete with bolts, nuts, and other required fittings. The price shall exclude supply and erection of small parts steel, if any.

The supply materials include the following components:

RI No.	Description of components	Qty per unit for Normal Anchor	Qty per unit for Dwarf Mast Anchor
5001/5001 -1/5001-3	Anchor bolts (complete with Nuts, Locknuts and Split pins)	-	2
5002	Guy rod Stirrup	1	1
5004/5005 /5006-1/ 9070/ 9071	Guy Rod (complete with Nuts, Locknuts, Washer and Split pins)	1	1
5007-1	Anchor 'V' bolt (complete with Nuts, Locknuts, Punched Washer and Split pins)	1	-
5008	Anchor Loop	1	-
5220	Guy Rod Double Strap Assembly complete with bolt, nut, washers and pins.	1 or 2	1

Item 3(g) - Supply of Steel Reinforcement for RCC Work

The price shall include the supply of tested quality of steel for reinforcement of appropriate size and for reinforcement steel above 8mm (or) suitable dia. shall be High strength deformed steel bars conforming to IS:1786/1985.

The cost towards cutting straightening hooking, bending, erecting and placing and keeping in position including all lead and lift and including cost of binding wire shall be inclusive in item 2(h)(i), 2(h)(ii) or under appropriate item respectively.

Test certificates for steel will be furnished by the contractor at his own cost from a laboratory approved by the Engineer-in-Charge. Nothing extra will be paid for unauthorized overlaps and wastage of steel involved in cutting the bars to their required sizes.

Item 4(a)(i) - Supply (without Insulators) and Erection of Single Cantilever Assembly for Conventional OHE

Supply: The price shall include the supply of a single cantilever assembly mounted on a traction mast, support or drop arm. The price includes the cost of all components complete with fasteners excluding stay & bracket insulators, dropper wires, and small parts steel if any. The supply of cantilever assembly shall conform to RDSO Drg No. ETI/OHE/G/02106 (Rev. C) (SH. 1 & 3) or its latest revisions & RDSO Drg No. ETI/OHE/G/02104 (Mod. C) (SH. 1) or its latest revisions.

The supply materials include the following components:

Rly. ID No.	Description of components	Qty for IR Cantilever	Qty for OR Cantilever
3021	Mast Fitting for Hook Insulator with two nos. GI Bolt.	1 Set	1 Set
2400	Tubular Stay Arm Assembly (2401 – 25 mm Stay Tube – 1 No (2.5meters) , 2402-1 – Tubular Stay Adjuster (large) 16 hole – 1 No, 2403-1 – Tubular Stay Sleeve – 1 No, 2402 – Stud Bolt 10 mm with Lock Nut – 2 No)	1 Set	1 Set
2110-1/2130-1/ 2380	Standard/Large Catenary Suspension Bracket with U Bolt – 2Nos, Nut – 4Nos, Spring Washers – 4 Nos	1 Set	1 Set
1160/1170	Suspension Clamp with U Bolt – 2 Nos, Pin – 1 No, Lock Plate – 2Nos, Nut – 4Nos, Split Pin – 1 No, Punched Washers – 1 No **OR** Double Suspension Clamp with U Bolt – 2 Nos, Pin – 1 No, Lock Plate – 1 Nos, Nut – 4 Nos, Split Pin – 1 No, Punched Washers – 1 No **for anti-creep location**	1 Set	1 Set
3070-1/3070-2	Mast Bracket Fitting Assembly (150/200) with two nos. GI Bolt.	1 Set	1 Set
2080/2040	Large Bracket Tube (3.8 m length) with Tube Cap (2104-1) or Standard Bracket Tube (Suitable length) with Tube Cap	1Set	1Set
2150-1 or 2160-1	Register Arm Hook assembly complete with bolts, nuts and lock nuts.	1 Set	-
2422-2	Register Arm Eye Piece 25 mm	1	-
2421/2420-1	Register Arm Tube (3.8m length) with Tube Cap (2423-1)	1 Set	-
2431	Raised Register Arm Tube (25mm dia) (3.5 m length) with dropper clip (2423-1)	-	1 Set
2360	25 mm Drop Bracket Assembly complete with bolt, locknut	1 Set	-
2550-1/2	Standard Anti-Wind Clamp complete with Strap, Bolt, Nut, Spring Washer, Snap Head Rivet	1 Set	-

2390/2540/2520	BFB Steady Arm Assembly (2390/2540/2520 - BFB Steady arm – 1 No, 2391- BFB Steady arm Hook – 1 No, 2392 - BFB Steady Arm Swivel – 1 No, AL Rivets – 4 Nos) **Or** Bent Steady Arm assembly (if required)	1 Set	-
1174	Packing Saddle	1 No	1 No
1220	Contact wire swivel clip (1221) and pin (1222)	1 Set	1 Set
2270-4/2270-5/ 2460style-2	49 mm Register Arm Dropper Assembly (2270-5) for Pull-off CL Excluding dropper wire (2277– Dropper Clip (49 mm) – 1 No, 2461-1 – Dropper Clip (34 mm) – 1 No, 2 Nos – Bolt, Lock Nut, Spring Washer, Spilt Pin) **OR** 38mm Register Arm Dropper Assembly (2270-4) Pull-off CL Excluding dropper wire (2274-1 –Dropper Clip (38 mm) – 1 No, 2461-1 – Dropper Clip (34 mm) – 1 No, 2 Nos – Bolt, LockNut, Spring Washer, Spilt Pin) **OR** 25 mm Register Arm Dropper Assembly (2460) for Push-off CL Excluding dropper wire (2461 – Dropper Clip (25 mm) – 1 No or 2461-1 – Dropper Clip (34 mm) – 1 No, 2 Nos – Bolt, LockNut, Spring Washer, Spilt Pin)	1 Set	-
2470 style-02	25 mm Raised Register Arm Dropper Assembly (2470) Excluding dropper wire (2471-1 – Dropper Clip (25 mm) – 1 No, 2 Nos – Bolt, LockNut, Spring Washer, Spilt Pin)	-	1 Set
	Stay Fasteners (Bolt, Nut, LockNut, Washer)	1 Set	1 Set
	Bracket Fasteners (U-Bolt, Nut, Lock Nut, Washer)	1 Set	1 Set
1371-3	Raised Register Arm Clamp	-	1 Set
2432	RRA Adjuster	-	1 Set

Erection: The price shall include fabrication and erection of a single cantilever assembly mounted on a traction mast, support or drop arm. This includes installations on high- or low-level platforms, at turnouts, over bridges, at overlaps, and at locations with reduced encumbrance or at termination locations. It includes the erection of all components, including stay & bracket insulators and dropper wires, fasteners. But, excludes small parts steel if any.

The erection of cantilever assembly shall conform to RDSO Drg No. ETI/OHE/G/02106 (Rev. C) (SH .1 & 3) or its latest revisions & RDSO Drg No. ETI/OHE/G/02104 (Mod. C) (SH .1) or its latest revisions.

Note: Any additional material required for erection of cantilever assembly, the contractor has to supply at his own cost.

Item 4(a)(ii) - Erection of Two Cantilever Assemblies on same structure or support for Conventional OHE

The price shall cover erection of Two Cantilever Assemblies at overlap/turnout/crossover on same structure or support.

Unit 'Each' represents Two Cantilevers.

Item 4(a)(iii) - Erection of Three Cantilever Assemblies on same structure or support for Conventional OHE

The price shall cover erection of Three Cantilever Assemblies at overlap/turnout/crossover on same structure or support.

Unit 'Each' represents Three Cantilevers.

Note: (1) Any fasteners which are required, but not covered under above item are to be supplied under item no. 3(cs) of schedule B1.

(2) The erection of a single cantilever assembly falls under item no. 4(a)(i) of Sch-A1. For structures or supports requiring two or three cantilevers, the corresponding operations should be carried out under item nos. 4(a)(ii) and 4(a)(iii) of Sch-A1 respectively.

Item 4(a)(iv) - Supply (without Insulators) and Erection of Single Cantilever Assembly for Tramway OHE

Supply: The price shall include the supply of a single cantilever assembly mounted on a traction mast, support, or drop arm. The price includes the cost all components complete with fasteners except for solid core insulators, dropper wires, and small steel parts. The supply of cantilever assembly shall conform to RDSO Drg No. ETI/OHE/G/04204 (Rev. B) or its latest revisions.

The supply materials include the following components:

Rly. ID No.	Description of components	Qty per unit
3021	Mast Fitting for Hook Insulator with two nos. GI Bolt.	1
2400	Tubular Stay Arm Assembly (2401 – 25 mm Stay Tube – 1 No, 2402/2402-1 – Tubular Stay Adjuster – 1 No, 2403-1 – Tubular Stay Sleeve – 1 No, 2402 – Stud Bolt 10 mm with Lock Nut – 2 No)	1 Set

2380	Hook Bracket with U Bolt – 2 Nos, Nut – 4 Nos, Spring Washers – 4 Nos	1 Set
2140	Large Catenary Direct Clamp	1 Set
2160-1	Register Arm Hook assembly complete with bolts, nuts and lock nuts.	1 Set
2080	Large Bracket Tube (Suitable length) with Tube Cap (2104-1)	1 Set
3070-1/3070-2	Mast Bracket Fitting Assembly (150/200) with two nos. GI Bolt.	1 Set
2540-1	BFB Steady Arm Assembly (2540 – BFB Steady arm – 1 No, 2391- BFB Steady arm Hook – 1 No, 2392 - BFB Steady Arm Swivel – 1 No, AL Rivets – 4 Nos)	1 Set
2550-3	Anti wind clamp for Tramway	1 set
1220	Contact wire swivel clip	1 set
	Stay Fasteners (Bolt, Nut, LockNut, Washer)	1 Set
	Bracket Fasteners (U-Bolt, Nut, LockNut, Washer)	1 Set

Erection: The price shall include the fabrication and erection of a single cantilever assembly mounted on a traction mast, support, or drop arm. This includes installations on high or low platforms, in the vicinity of turnouts, over bridges, at overlaps, and at locations with reduced encumbrance or terminating wires. It includes the erection of all components, including solid core insulators and dropper wires, but excludes small steel parts. The erection of cantilever assembly shall conform to RDSO Drg No. ETI/OHE/G/04204 (Rev. B) or its latest revisions.

Item 4(a)(v) - Erection of Two Cantilever Assemblies on same structure or support for Tramway OHE

The price shall cover erection of Two Cantilever Assemblies at overlap/turnout/crossover on same structure or support.

Unit 'Each' represents Erection of Two Cantilevers.

Item 4(a)(vi) - Erection of Three Cantilever Assemblies on same structure or support for Tramway OHE

The price shall cover erection of Three Cantilever Assemblies at overlap/turnout/crossover on same structure or support.

Unit 'Each' represents Erection of Three Cantilevers.

Note: (1) Any fasteners which are required, but not covered under above item are to be supplied under item no. 3(cs) of schedule B1.

(2) The erection of a single cantilever assembly falls under item no. 4(a)(iv). For structures or supports requiring two or three cantilevers, the corresponding operations should be carried out under item nos. 4(a)(v) and 4(a)(vi), respectively.

Item 4(b)(i) - Supply (without Insulators) and Erection of a Pull Off arrangement for Conventional OHE

Supply: The price shall include the supply of all components required for a pull-off arrangement to pull one equipment only excluding SPS, solid core insulators, conductor, small jumper (50 sq.mm). The supply of cantilever assembly shall conform to RDSO Drg No. ETI/OHE/G/03301 or its latest revisions.

The supply materials include the following components

Rly. ID No.	Description of components	Qty per unit
5040	18 mm Single Clevis Assembly complete with pin, split pin and punched washer	2
5030	Anchor Double Strap Assembly with Snap Head Pin, Punched Washer, Split Pin	2
1350	Thimble (Packing saddle)	4
1320	U Clamp	8
1192	Catenary Dropper Clip complete with bolt, nut, spring washer and split pin	4
2340	(Low speed) Steady Arm Assembly	1
1220	Contact Wire Swivel Clip & pin	1
1160	Suspension clamp complete with U-bolt – 2 Nos, pin – 1 No., Nut – 4 Nos, suspension clamp lock plate – 2 Nos, split pin – 1 No., Punched Washer A-12 – 1 No.	1
5190-2	Equalising Plate Assembly complete with snap head pin, punched washer and spilt pin	1
1330	U Clamp	2
1311	Pull off clamp distance piece	1

Erection: The price shall include the erection of all components including solid core insulators, small jumper wire and conductors excluding SPS. The erection of cantilever assembly shall conform to RDSO Drg No. ETI/OHE/G/03301 or its latest revisions.

Item 4(b)(ii) - Supply (without Insulators) and Erection of a Pull Off arrangement for Tramway OHE

Supply: The price shall include the supply of all components required for a pull-off arrangement to pull one equipment only excluding SPS, solid core insulator (RI No.6020) and conductor.

Erection: The price shall include the erection of all components including solid core insulators, small jumpers and conductors excluding SPS.

Item 6(a) - Supply and Erection of Regulated Conventional OHE

Supply: The price shall include the supply of all components, such as dropper clips, parallel clamps for jumpering, complete with bolts and nuts, if any. However, it shall exclude supply of contact wire, catenary, dropper wire, jumper wire, terminating wire(s), and small parts steel works.

The supply materials include the following components

Rly. ID No.	Description of components	Qty. per unit
1040-2	Contact wire parallel clamp small complete with bolt, nut and spring washer	12
1030-3/1030-2	PG Clamps complete with bolt, nut and spring washer	8
1180	Contact wire dropper clip (107/150) with locking wire	133
1192	Catenary dropper clip complete with bolt, nut, spring washer and Split Pin	133

Erection: The price shall include the erection of all components, including wires and conductors such as contact wire, catenary, droppers, jumpers, and galvanized steel or terminating wires, if any, but shall exclude small parts steel work, if applicable. The price shall cover adjustment of OHE height & stagger at the specified rail level as per track.

Note: The termination of conductors is not included in this item. Terminations are to be operated under item no. 8(b)(ii) OF Sch-A1 separately.

Item 6(b) - Erection of Regulated Contact Wire Only

Erection: The price shall cover the erection of all components, including wires and conductors such as contact wire, catenary, droppers, jumpers, and galvanized steel or terminating wires, if any, but shall exclude small parts steel work, if applicable. The price shall cover adjustment of OHE height & stagger at the specified rail level as per track.

Note: The termination of conductors is not included in this item and Terminations are to be operated under item no. 8(b)(ii)/8(b)(vi) of Sch-A1 separately.

Item 6(c) - Supply and Erection of Regulated Contact Wire (Regulated with Bridle Wire)

Supply: The price shall include the supply of all components including bridle wire clamps, dropper clips, parallel clamps for jumpering, complete with bolts and nuts etc, if any, but excluding contact wire, dropper wire, jumper wire and terminating wire/s and small parts steel works.

The supply materials include the following components:

Rly. ID No.	Description of components	Qty. per unit
1070-1	Bridle Wire Clamp Small complete with 2 Nos of bolt, nut, spring washer & punched washer	40 Set
1030-3/1030-2	PG Clamps complete with 1 No. of bolt, nut and spring washer	8 Set
1180	Contact wire dropper clip (107) with locking wire	40 Set
1194	Bridle wire dropper clip complete with 1 No. of bolt, nut, spring washer and split pin	40 Set

Erection: The price shall cover the erection of all components, including wires and conductors such as contact wire, bridle wire, droppers, jumpers, and galvanized steel or terminating wires, if any, but shall exclude small parts steel work, if applicable. The price shall cover adjustment of OHE height & stagger at the specified rail level as per track.

Note: The termination of conductors is not included in this item. Terminations are to be operated under item no. 8(b)(vi) separately.

Note for Measurement:

1. For the purpose of payment against item 6(a), 6(b) and 6(c), the length of over head equipment, which shall include terminating wires and galvanized steel wire, shall be measured from the centre lines of the traction masts/structures at which the two ends of each tension length of over head equipment are anchored.
2. The length shall be the difference between the actual chainages of the two traction masts/structures at which the ends of each tension length are anchored or by the sum of the actual spans between the same two points whichever is higher as included in the "as erected" layout plans. For purpose of progress payment reference to layout plans as approved shall be made. The price under items 6(a), 6(b) & 6(c) does not cover the cost of supply and erection of cut-in insulators, the supply and erection of which shall be paid for under item 11(a), (b), (c).
3. In the case of splicing and extension of anchored OHE, the actual length of wire used at site from ending clamp/splice to the splice/ending clamp will be reckoned for measurement purpose under item No. 6(a), 6(b) and 6(c).

Item 7(a) - Erection/Stringing of Along Feeder (either All Aluminium 25 kV Feeder conductor (single spider) or Copper Feeder wire)

Erection: The price shall include the erection and stringing of Along Feeder either 25 kV All Aluminium Feeder conductor (single spider) or Copper Feeder conductor.

Note: The price does not include the erection of suspension assembly, termination and small part steel work, complete with bolts and nuts etc., if any.

Item 7(b) - Erection of Copper Cross Feeder Wire

Erection: The price shall include the erection of 25 kV feeder wire across the track at the location of SP/SSP/FP/TSS etc.

Unit 'Each' represents length of cross feeder upto 40 m.

Note: The termination of cross feeder is not included in this item, will be paid under item 8(b)(ix) of Sch-A1.

Item 7(c) - Erection of Large span wire (130 Sq. mm)

Erection: The price shall include the erection of 130 sq. mm cadmium copper large span wire.

Note: The price shall not include termination and large span wire ending clamps, will be paid under relevant items (8(b)(i)/8(b)(ii)) of Sch-A1.

Item 8(a)(iv) - Supply of Regulating Equipment Without Counter-Weight Assembly

Supply: The price shall include only supply of 3 pulley type (3:1) regulating equipment without counter-weight assembly for conventional type OHE. The supply of ATD shall conform to RDSO Drg No. ETI/OHE/P/5500 or its latest revisions, ETI/OHE/G/00195 (Rev.A) or its latest revision & RDSO specification no. TI/SPC/OHE/ATD/0060 or its latest revision.

The supply materials include the following components

Rly. ID No.	Description of components	Qty. per unit
5500	Regulating Equipment Three-Pulley type modified pulley groove (3:1 ratio) complete with Anti-falling Rods (Tie rods), clevis & eye (forged), Arms, Spacers, All Fasteners	1 Set
	SS Wire Rope (8 m)	1
5341	SS Wire Rope Ending Clamp with Wedge RI No. 5321	2
5183	Double Eye Distance Rod	1
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2
5030	Anchor Double Strap Assembly with Snap Head Pin, Punched Washer, Split Pin	3

Note: (1) The mast anchor fittings along with fasteners required for erection of regulating equipment will be paid separately under item 3(cs) of Sch - B1. Only forged fittings are to be used.

(2) The price shall not include supply of termination, which will be paid for under item 8(b)(ii)/8(b)(vi) of Sch-A1.

(3) The erection component shall be executed under item 8(a)(v) of Sch-A1, as the erection will be carried out using counterweights supplied by the Railways.

Item 8(a)(v) - Supply and Erection of Regulating Equipment With Counter-Weight assembly for Conventional OHE

Supply: The price shall include the supply of 3 pulley type (3:1) regulating equipment with counter-weight assembly for conventional type OHE including SS wire rope with ending clamp, 9 tonne adjuster with double strap assembly and anti-theft guide tube assembly. The price shall cover cost of all components required for Regulated Equipment along with fasteners.

The supply of ATD shall conform to RDSO Drg No. ETI/OHE/P/5500 or its latest revisions, ETI/OHE/P/5090 or its latest revisions, ETI/OHE/G/00195 (Rev.A) or its latest revision & RDSO specification no. TI/SPC/OHE/ATD/0060 or its latest revision.

The supply materials include the following components

Rly. ID No.	Description of components	Qty. per unit
5500	Regulating Equipment Three-Pulley type modified pulley groove (3:1 ratio) complete with Anti-falling Rods (Tie rods), clevis & eye (forged), Arms, Spacers, All Fasteners	1 Set
5091	40 KG Cast Iron Base Weight	1
5092	40 KG Cast Iron Counter Weight	15
5093	20 KG Cast Iron Counter Weight	1
5098	5 KG Cast Iron Counter Weight	1
5099	Counter Weight Eye Rod with split pin, nut, punched washer	1 Set
5060-2	Counter Weight Guide Tube (5.6 m) with All Fasteners	1 Set
	SS Wire Rope (8 m)	1
5341	SS Wire Rope Ending Clamp with Wedge RI No. 5321	2
5183	Double Eye Distance Rod	1
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2
5030	Anchor Double Strap Assembly with Snap Head Pin, Punched Washer, Split Pin	3

Note: (1) The mast anchor fittings along with fasteners required for erection of regulating equipment will be paid separately under item 3(cs) of Sch - B1. Only forged fittings are to be used.

(2) The price shall not include supply of termination, which will be paid for under item 8(b)(ii) of Sch-A1.

Erection: The price shall include the erection of 3 pulley type (3:1) regulating equipment (ATD) with counter-weight assembly for conventional type OHE including SS wire rope with ending clamp, 9 tonne adjuster with double strap assembly and anti-theft guide tube assembly conform to RDSO Drg No. ETI/OHE/P/5500 or its latest revisions, ETI/OHE/P/5090 or its latest revisions, ETI/OHE/G/00195 (Rev.A) or its latest revision & RDSO specification no. TI/SPC/OHE/ATD/0060 or its latest revision.

The price shall also cover adjustment of the entire regulating equipment and includes the erection of provision of anti-falling arrangement as per RDSO Drawing No. – TI/DRG/OHE/ATD /RDSO/00001/99/2 (Latest) & + (Latest).

Note: The price shall not include erection of termination and SPS, which will be paid for under item 8(b)(ii) and 3(b) of Sch-A1 respectively.

Item 8(a)(vi) - Supply and Erection of Regulating Equipment With Counter-Weight assembly for Tramway Type OHE

Supply: The price shall include the supply of 3 pulley type (3:1) regulating equipment with counter-weight assembly for tramway type OHE including SS wire rope with

ending clamp, 9 tonne adjuster with double strap assembly and anti-theft guide tube assembly. The price shall cover cost of all components required for Regulated Equipment along with fasteners.

The supply of ATD shall conform to RDSO Drg No. ETI/OHE/P/5500 or its latest revisions, ETI/OHE/P/5090 or its latest revisions, ETI/OHE/G/00195 (Rev.A) or its latest revision & RDSO specification no. TI/SPC/OHE/ATD/0060 or its latest revision.

The supply materials include the following components

Rly. ID No.	Description of components	Qty. per unit
5500	Regulating Equipment Three-Pulley type modified pulley groove (3:1 ratio) complete with Anti-falling Rods (Tie rods), clevis & eye (forged), Arms, Spacers, All Fasteners	1 Set
5091	40 KG Cast Iron Base Weight	1
5092	40 KG Cast Iron Counter Weight	9
5098	5 KG Cast Iron Counter Weight	3
5099	Counter Weight Eye Rod with Split Pin, Nut, Punched Washer	1 Set
5060-2	Counter Weight Guide Tube (5.6 m) with All Fasteners	1 Set
	SS Wire Rope (8 m)	1
5341	SS Wire Rope Ending Clamp with Wedge RI No. 5321	2
5183	Double Eye Distance Rod	1
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	3

Note: (1) The mast anchor fittings along with fasteners required for erection of regulating equipment will be paid separately under item 3(cs) of Sch - B1. Only forged fittings are to be used.

(2) The price shall not include supply of termination, which will be paid for under item 8(b)(vi) of Sch-A1.

Erection: The price shall include the erection of 3 pulley type (3:1) regulating equipment (ATD) with counter-weight assembly for conventional type OHE including SS wire rope with ending clamp, 9 tonne adjuster with double strap assembly and anti-theft guide tube assembly confirming to RDSO Drg No. ETI/OHE/P/5500 or its latest revisions, ETI/OHE/P/5090 or its latest revisions, ETI/OHE/G/00195 (Rev.A) or its latest revision & RDSO specification no. TI/SPC/OHE/ATD/0060 or its latest revision.

The price shall also cover adjustment of the entire regulating equipment and includes the erection of provision of anti-falling arrangement as per RDSO Drawing No. – TI/DRG/OHE/ATD /RDSO/00001/99/2 (Latest) & + (Latest).

Note: The price shall not include erection of termination and SPS, which will be paid for under item 8(b)(ii) and 3(b) respectively.

Item 8(a)(xii) - Marking/Painting of temperature and 'Y' - Measurement on OHE Structures at BWA locations.

The price shall include marking/painting of temperature and 'Y' measurement scale on OHE masts at [ATD] BWA locations. The price shall also include the cost of paint.

Item 8(b)(i) - Supply (without Insulator) and Erection of material for termination of single conductor of OHE or terminating wire

Supply: The price shall include the supply of all materials necessary for the termination of single conductor (contact wire / catenary wire / anti-creep wire termination on one side / large span wire) on a traction mast or structure **but excluding 9 ton insulator assembly and terminating wire, if any**.

The supply materials include the following components

Rly. ID. No.	Description of Components	Qty per unit for Cont wire Termination	Qty per unit for Cat wire Termination	Qty per unit for AC wire for one side termination	Qty per unit for LS wire termination
5040	18 mm Single Clevis Assembly complete with pin, split pin and punched washer	1 No	1 No	1 No	---
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	2 Nos	2 Nos	2 Nos	2Nos
1110-2	Contact wire ending clamp complete with pin, split pin and punched washer	1 No	---	---	---
1120/ 1120-1	Catenary Wire Ending clamp complete with pin, split pin and punched washer	----	1 No	---	---
1140	Large span wire ending clamp complete with snap head pin, split pin and punched washer	----	----	----	2 Nos
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	1 No	1No	1 No	1 No
1360/1120	Steel wire ending clamp or Catenary wire ending clamp	--	---	1 No	---

Erection: The price shall include the erection of all materials including the 9 ton insulator assembly for termination of single conductor (contact wire / catenary wire / anti-creep wire termination on one side / large span wire).

Note: 1) In case of "V" type anchorage is adopted for terminating a single conductor such an arrangement would be counted as two off under item 8(b)(i), for the purpose of payments.

2) The price shall not include the supply and erection of large span wire, which can be claimed under Sch-B2 item no. 7(cs) for supply and Sch-A1 item no 7(c) for erection.

Item 8(b)(ii) - Supply (without Insulator) and Erection of materials for Termination of Conventional OHE

Supply: The price shall include the supply of all materials necessary for the termination of double conductors of overhead equipment on a traction mast or structure but excluding 9 tonne insulators, mast anchor fittings and terminating wire.

The supply materials include the following components

Rly. ID. No.	Description of Components	Qty. per unit
5040	18 mm Single Clevis Assembly complete with pin, split pin and punched washer	1 No
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	4 Nos
5190-1/5190-2/ 5191-1-2/ 5192/5192-1-2/ 5194-1/5195-2	Equalizing Plate/Compensating Plate with snap head pin, split pin and punched washer	1 No
1110-2	Contact wire ending clamp complete with pin, split pin and punched washer	1 No
1120/1120-1	Catenary Wire Ending clamp complete with pin, split pin and punched washer	1 No
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	3 Nos
1140	Large span wire ending clamp complete with snap head pin, split pin and punched washer	2 Nos (As Required)

Erection: The price shall include the erection of all materials for OHE termination including the 9-tonne insulator assembly.

Note: The price shall also include supply and erection of large span wire ending clamps, if required for any termination.

Item 8(b)(iii) - Supply (without Insulators) and Erection of materials for Termination of Along Feeder (Aluminium/Copper)

Supply: The price shall include the supply of all materials required for the termination of an all-aluminium (spider) / copper feeder but excluding the cost of 9 tonne insulators, mast anchor fittings adjuster. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/05145-1 (Rev.A) or its latest revisions.

The supply materials include the following components

Rly. ID. No.	Description of Components	Qty per unit for AL Feeder	Qty per unit for Cu Feeder
5040	18 mm Single Clevis Assembly complete with pin, split pin and punched washer	1 No	1 No
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	2 No	2 No
1600	20 mm Strain Clamp complete with U-bolt – 3 Nos, Nut – 6 Nos, Punched Washer A-14 – 6 Nos, snap head pin – 1 No., punched washer A-18 – 1 No., split pin – 1 No.	1 No	-
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	1 No	1 No
1130	Feeder wire ending clamp complete with snap head pin, split pin and punched washer	-	1 No

Erection: The price shall include the erection of all materials including the 9-tonne insulator assembly. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/05145-1 (Rev.A) or its latest revisions.

Item 8(b)(vi) - Supply (without Insulators) and Erection of Materials for Termination of Tramway OHE

Supply: The price shall include the supply of all materials necessary for the termination of overhead equipment conductor on a traction mast or structure **but excluding 9 tonne insulator assembly, mast anchor fittings and terminating wire**. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/04212 or its latest revisions.

The supply materials include the following components

Rly. ID. No.	Description of Components	Qty. per unit
5040	18 mm Single Clevis Assembly complete with pin, split pin and punched washer	1 No
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	2 Nos
1110-2	Contact wire ending clamp complete with pin, split pin and punched washer	1 No
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	1 No

Erection: The price shall include the erection of all materials for OHE termination including the 9-tonne insulator assembly. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/04212 or its latest revisions.

Item 8(b)(ix) - Supply (without Insulators) and Erection of Materials for Termination for Copper Cross Feeder

Supply: The Price shall include the supply of all materials required for termination of copper cross feeder wire (37/2.25mm HDBC) **but excluding 9-Ton insulator assembly**, mast anchor fitting. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/05121 or its latest revisions.

The supply materials include the following components.

Rly. ID. No.	Description of Components	Qty. per unit
5040	18 mm Single Clevis Assembly complete with pin, split pin and punched washer	2 Nos
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	4 Nos
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2 Nos
1130	Feeder wire ending clamp complete with snap head pin, split pin and punched washer	2 Nos

Erection: The price shall include the erection of all materials including 9-ton insulator and termination of cross feeder at both ends with gantries. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/05121 or its latest revisions.

Note: Fittings required for termination of one cross feeder at both ends constitute one set.

Notes to item 8(b)(i), 8(b)(ii), 8(b)(iii), 8(b)(vi) & 8(b)(ix):

1) The price shall not include SPS items, wherever required will be paid under item 3(cs) of Sch-B1 w.r.t supply and under item 3(b) of Sch-A1 w.r.t erection.
2) The prices shall not include the cost of jumper connection (i) between feeders and (ii) or feeders to a bus-bar, overhead equipment or isolator switch which will be paid for under item 15(a) to 15(e) of Sch-A1.

Item 9(a) - Supply (without Insulators) and Erection of Anti-creep with galvanised steel wire for Conventional OHE

Supply: The price shall include the supply of all materials for anti-creep including adjusters, galvanized steel wire at its terminations on either side on structures, ending clamps and fittings but excluding the cost of 9-ton insulator assembly and small parts steel work, if any. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions.

The supply materials include the following components

Rly.ID No.	Description of components	Qty. per unit
-	Galvanised steel wire (19/2.50 mm)	As required
1360	Steel wire ending clamp	2 Nos
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2 Nos

5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	4 Nos
3010/5040	Clevis assembly complete with pin/snap head pin, split pin and punched washer	2 Nos
1170	Double suspension clamp complete with U-bolt – 2 Nos, Packing saddle – 1 No., Nut – 4 Nos, suspension clamp lock plate – 2 Nos, PIN – 1 No., split pin – 1 No., Punched Washer A-12 – 1 No.	1 No
1040-3	PG Clamps with bolt, nut and spring washer	2 Nos

Erection: The price shall include the erection of all materials including 9-ton insulator assembly but excluding small parts steel work, if any. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions.

Note: In case, the anti-creep extends beyond one span on either side of anti creep centre, payment for the supply and erection of extra length shall be paid additionally at the rate of 20% of the rate for 9(a) for each extra span.

Item 9(b) - Supply (without Insulators) and Erection of Anti-creep with galvanised steel wire for regulated Tramway OHE

Supply: The price shall include the supply of all materials for anti-creep for the tramway type OHE. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions. The supply materials include the following components but excluding the cost of 9-ton insulator assembly and small parts steel work, if any.

Rly.ID No.	Description of components	Qty. per unit
-	Galvanised steel wire (19/2.50 mm)	As required
1360	Steel wire ending clamp	2 Nos
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2 No
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	4 Nos
3010/5040	Clevis assembly complete with pin/snap head pin, split pin and punched washer	2 No
2140	Large catenary direct clamp	1 No

Erection: The price shall include the erection of all materials of anti-creep arrangement for the tramway type OHE. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions.

Note: In case, the anti-creep extends beyond one span on either side of anti creep centre, payment for the supply and erection of extra length shall be paid additionally at the rate of 20% of the rate for 9(a) for each extra span.

Item 9(c) – Supply (without Insulators) and Erection of Anti-creep with cadmium copper catenary wire for Conventional OHE in polluted area (excluding supply of cadmium copper catenary wire)

Supply: The price shall include the supply of all materials for anti-creep including, adjusters, as its terminations on either side of structure, ending clamps and fittings but excluding cadmium copper catenary wire, mast anchor fittings and 9-ton insulator assembly for polluted zone and small parts steel, if any. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions.

The supply materials include the following components

Rly.ID No.	Description of components	Qty. per unit
1123/1120/1122	Catenary ending clamp	2 Nos
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2 Nos
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	4 Nos
3010/5040	Clevis assembly complete with pin/snap head pin, split pin and punched washer	2 Nos
1170	Suspension clamp complete with U-bolt – 2 Nos, Packing saddle – 1 No., Nut – 4 Nos, suspension clamp lock plate – 2 Nos, PIN – 1 No., split pin – 1 No., Punched Washer A-12 – 1 No.	1 No
1040-3	PG Clamps with bolt, nut and spring washer	2 Nos

Erection: The price shall include the erection of all materials including cadmium copper catenary wire, 9-ton insulators assembly but excluding small parts steel work, if any. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions.

Note: In case, the anti-creep extends beyond one span on either side of anti creep centre, payment for the supply and erection of extra length shall be paid additionally at the rate of 20% of the rate for 9(a) for each extra span.

Item 9(d) - Supply (without Insulators) and Erection of Anti-creep with cadmium copper catenary wire for Tramway OHE in polluted area (excluding supply of cadmium copper catenary wire)

Supply: The price shall include the supply of all materials for anti-creep including, adjusters, as its terminations on either side of structure, ending clamps and fittings but excluding cadmium copper catenary wire, mast anchor fittings and 9-ton insulator assembly for polluted zone and small parts steel work, if any for tramway type OHE. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions.

The supply materials include the following components

Rly.ID No.	Description of components	Qty. per unit
1123/1120/1122	Catenary ending clamp	2 Nos
5020	9-ton Adjuster (Double Eye) complete with bolt, nut and split pin	2 Nos
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	4 Nos
3010/5040	Clevis assembly complete with pin/snap head pin, split pin and punched washer	2 Nos
2140	Large catenary direct clamp	1 No
1170	Suspension clamp complete with U-bolt – 2 Nos, Packing saddle – 1 No., Nut – 4 Nos, suspension clamp lock plate – 2 Nos, PIN – 1 No., split pin – 1 No., Punched Washer A-12 – 1 No.	1 No

Erection:. The price shall include the erection of all materials including cadmium copper catenary wire, 9-ton insulators assembly but excluding small parts steel work, if any for tramway type OHE. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/02111 or its latest revisions.

Note: In case, the anti-creep extends beyond one span on either side of anti creep centre, payment for the supply and erection of extra length shall be paid additionally at the rate of 20% of the rate for 9(a) for each extra span.

Note for item 9(a) to 9(d):

The price shall not include the cost of any additional cut-in or suspension insulator which will be paid for under item no. 11(a)(i)/11(a)(ii) w.r.to erection

Item 10(a) - Extra on item 6(a) or 6(c) for Supply and Erection of additional fittings required at a turnout, cross-over or over-lap

Supply: The price shall include the supply of additional components and fittings required at turnouts, crossings or over-laps (insulated or un-insulated) including overlaps, knuckle or crossing equipment at a turnout, or a diamond crossing and parallel clamps for jumper connections between two sets of overhead equipment conductor at a turnout, diamond crossings, overlaps or neutral section, but excluding jumper wire.

The supply materials include the following components

Rly. ID No.	Description of components	Qty. per unit
1030-3/ 1030-2	PG Clamps, Bolt with Nut and Spring Washer	6
1040-2	PG Clamps, Bolt with Nut and Spring Washer	4

1180	Contact wire dropper clip (107Sqmm)	6
1192	Catenary dropper clip, Bolt with Nut, Spring Washer and Split Pin	6
1110-2	Contact wire ending clamp, Snap Head Pin, Split Pin and Punched Washer	1
1120 or 1120-1	Catenary ending clamp, Snap Head Pin, Split Pin and Punched Washer	1
1140	Large span wire ending clamp (130) , Snap Head Pin, Split Pin and Punched Washer	2

Erection: The price shall include the erection of all materials including jumper wire, and all adjustments required at turnouts, crossings, overlaps and neutral sections.

Item 11(a)(i) - Supply (without Insulator) and Erection of 25 kV Solid Core Cut-in Insulator.

Supply: The price is applicable to the provision of an additional 9 tonne cut-in-insulator on a flat rate basis such as in a head span, cross span or in span wire or an overhead equipment conductor at an insulated overlap, anti-creep not provided for in other items. The price shall cover supply of all components required for the cut-in-insulator assembly, including appropriate terminal fittings for the conductor **but excluding 9-tonne insulator**.

The supply materials include the following components

Rly.ID No.	Description of components	Qty. per unit
1110-2/1120-1/1140	Contact wire ending clamp (1110-2)/ Catenary ending clamp (1120-1)/Large Span Wire ending clamp (130) (1140) / Steel wire ending clamps complete with all fasteners	2

Erection: This price shall cover erection of all components including 9-tonne insulator but excluding small parts steel work, if any.

Item 11(a)(ii) – Supply (without Insulator) and Erection of 25 kV Solid Core Suspension Insulator.

Supply: The price is applicable to the provision of a 9-tonne suspension insulator assembly for suspension of an all-aluminium 25 KV feeder (single or double SPIDER), 150 sq. mm copper feeder wire, 130 sq.mm Large span wire or 65 sq.mm cadmium catenary wire (or) any other similar type of suspension.

The price shall cover supply of all components, required for the suspension assembly including the appropriate suspension clamp **but excluding 9 tonne insulator and small parts steel work** if any. The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/05143 (Rev. B) or its latest revisions.

The supply materials include the following components

Rly.ID No.	Description of components	Qty. per unit for Al feeder	Qty. per unit for Cu feeder	Qty per unit for LS wire/Steel wire/Cu catenary wire
5040	18 mm Single Clevis Assembly complete with pin, split pin and punched washer	1 No	1 No	1 No
5030	Anchor Double Strap Assembly complete with pin, split pin and punched washer	1 No	1 No	1 No
1580/1160	Suspension clamp complete with U-bolt – 2 Nos, Nut – 4 Nos, spring washer – 4 Nos, Punched Washer A-14 – 4 Nos, pin – 1 No., punched washer A-18 – 1 No., split pin – 1 No. **OR** Suspension clamp complete with U-bolt – 2 Nos, Nut – 4 Nos, suspension clamp lock plate – 2 Nos, PIN – 1 No., split pin – 1 No., Punched Washer A-12 – 1 No.	1 No	1 No	1 No
	Flat Armour Tape with Ferrules 2 Nos	1 set	-	-
1272	18 mm brass suspension clevis with snap head pin, split pin and punched washer	-	1 No	1 No

Note: Any additional fasteners required in connection with this item are to be supplied under item 3(cs) of Schedule B1 and erection under item 3(b) of Schedule A1

Erection: The price shall cover erection of all components including the 9-tonne insulator assembly but excluding small parts steel work, if any. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/05143 (Rev. B) or its latest revisions.

Item 11(b) - Supply (without Insulators) and Erection of 25 kV Post Insulator

Supply: The price is applicable to the provision of a 25 kV post insulator to support copper or aluminium jumper / busbars. The price shall cover supply of all components and fittings/angle iron (outrigger) to support the jumpers including fasteners and saddles but excluding supply of post insulators and small parts steel works if any. The price shall also include supply of stud bolts.

Erection: The price shall include the erection of all components required for the assembly including the post insulator, fasteners but excluding small parts steel work if any.

Item 12(a) - Supply (without Insulators) and Erection of 25 kV Section Insulator Assembly for Conventional OHE

Supply: The price shall include the supply of all components required for a section insulator assembly but excluding supply cost of sectioning core insulators, 9-tonne insulator and dropper wires. The supply of materials shall conform to RDSO Drg No. RE/33/G/05181 or its latest revisions, ETI/OHE/P/6140 or its latest revisions,

ETI/OHE/P/6120 or its latest revisions, ETI/OHE/P/6181-1 or its latest revisions, ETI/OHE/P/6180-2 or its latest revisions, ETI/OHE/P/6170 or its latest revisions.

The supply materials include the following components

Rly.ID No.	Description of components	Qty. per unit
1120	Catenary ending clamp complete with snap head pin, punched washer, split pin	2 sets
1192	Catenary dropper clip assembly along with bolt, nut, spring washer and spilt pin	4 sets
6170	Parallel clamp for double contact wire complete with bolt, nut and spring washer	12 sets
6181-1	Section Insulator Double Strap Assembly (Double Strap (6181-1 – 2 Nos, Pivot Pin (6182) – 2 Nos, Punched washers – 2 Nos, Split pins – 2 Nos,	4 sets
6120	Contact Wire End Link Assembly (Contact wire end link (RI – 6121) – 1 No, Pin ⌀ 16x60 (6122) – 2 Nos, Pin ⌀ 18x75 (6123) – 1 No, Bolt M12x50/50 with Lock Nut – 1 No, Bolt M16x55/45 with Lock Nut – 1 No, Split cotter pin 4x36 – 1 No, Split cotter pin 4x40 – 2 Nos, Washer A-20 – 2 Nos, Washers A-18 – 1 No	1 set
6130	Cross Beam Assembly (Cross Beam (RI – 6131) – 1 No, Saddle Pin ⌀ 12x45 (6132) – 2 Nos, Pin ⌀ 18x75 (6123) – 1 No, Bolt M16x55/45 with Lock Nut – 1 No, Bolt M10x30/30 with Lock Nut – 4 Nos, Split cotter pin 4x36 – 2 Nos, Split cotter pin 3.2x28 – 2 Nos	1 set
6140	Runner Assembly (Runner Bracket (RI - 6141) – 2 Nos, Runner Left (RI – 6142) – 1 No, Runner Right (RI – 6143) – 1 No, special stud M12 with Nut (RI – 6144) – 2 Nos, Bolt M14x100/45 – 2 Nos, Spring Washer – 2 Nos, Split Pin – 2 Nos)	1 set

Erection: The price shall include the erection and adjustment of all components including sectioning & 9-ton insulator assembly, droppers etc. The erection of materials shall conform to RDSO Drg No. RE/33/G/05181 or its latest revisions, ETI/OHE/P/6140 or its latest revisions, ETI/OHE/P/6120 or its latest revisions, ETI/OHE/P/6181-1 or its latest revisions, ETI/OHE/P/6180-2 or its latest revisions, ETI/OHE/P/6170 or its latest revisions.

Item 12(b) - Supply (without Insulators) and Erection of 25 kV Section Insulator Assembly for Tramway OHE

Supply: The price shall cover supply of all components required for a standard section insulator assembly including special arrangements for supporting the equipment and terminal fittings **but excluding supply of section insulator (core insulator) as required**.

The supply of materials shall conform to RDSO Drg No. ETI/OHE/G/04207 or its latest revisions.

Erection: The price shall include the erection and adjustment of all components such as sectioning & 9-ton insulator assembly, droppers etc. The erection of materials shall conform to RDSO Drg No. ETI/OHE/G/04207 or its latest revisions.

Item 12(c) - Erection of Light Weight Section Insulator

Erection: The price shall include the erection of Light Weight Section Insulator Assembly covering the entire assembly as per RDSO Specification No. TI/SPC/OHE/LWTSI/0060 (Rev.1) with A&C Slip No.1 or latest with all accessories, fittings and fasteners.

Item 13(a) - Supply (without Insulators) and Erection of 25 kV Single Pole Isolator without earth contact assembly

Supply: The price shall include the supply of a 25 kV single pole isolator (1250 A) (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision, RDSO Drg No. ETI/OHE/G/05513 or its latest revisions, ETI/OHE/G/05516 or its latest revisions. The price shall exclude the supply of post & operating rod insulators.

The supply materials include the following components

RI No.	Component	Qty
-	Single Pole Isolator Assembly with all accessories including Arcing Horn, Operating Rod, Operating Rod Guides, Padlock with two keys etc with all Fasteners (Nut, Bolt, Washer)	1 set
1009	19 mm Terminal Connector Assembly with Fasteners (Nut, Bolt, Flat & Spring Washers)	2 or more as per requirement.
-	Integral Lock	2

Erection: The price shall include the erection of a 25 kV single pole isolator (1250 A) (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision, ETI/OHE/G/05513 or its latest revisions, ETI/OHE/G/05516 or its latest revisions. It includes the erection of the post and operating rod insulators also.

Note: 1. The price does not include the supply and erection of SPS complete with bolts, nuts, and other fasteners required for supporting the isolators and operating rods on gantries or masts.

2. Also, it excludes the supply and erection of insulators for jumper support and the corresponding jumper connectors. This item is to be operated under 11(b)

3. 18 mm copper bus bar or 36 mm Aluminium bus bar with associated connectors for provision of isolator on TTCs/Portals shall be claimed separately under item no. 26 of Schedule A1.

Item 13(b) - Supply (without Insulators) and Erection of 25 kV Double Pole Isolator without earth contact assembly.

Supply: The price shall include the supply of a 25 kV double pole isolator (1250 A) (excluding the earth contact assembly) in accordance with RDSO Specification No.

TI/SPC/PSI/ISOLTR/0210 or its latest revision. The price shall exclude the supply of post & operating rod insulators.

The supply materials include the following components.

RI No.	Component	Qty
-	Double Pole Isolator Assembly with all accessories including Arcing Horn, Operating Rod, Operating Rod Guides, Padlock with two keys etc with all Fasteners (Nut, Bolt, Washer)	1 set
1009	19 mm Terminal Connector Assembly with Fasteners (Nut, Bolt, Flat & Spring Washers)	3 or more As per Requirement
-	Integral Lock	2

Erection: The price shall include the erection of a 25 kV double pole isolator (1250 A) (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision. However, the price will only include the erection of the post and operating rod insulators.

Note: 1. The price does not include the supply and erection of SPS complete with bolts, nuts, and other fasteners required for supporting the isolators and operating rods on gantries or masts.

2. Also, it excludes the supply and erection of insulators for jumper support and the corresponding jumper connectors. This item is to be operated under 11(b)

3. 18 mm copper bus bar or 36 mm Aluminium bus bar with associated connectors for provision of isolator on TTCs/Portals shall be claimed separately under item no. 26 of Schedule A1.

Item 13(c) - Supply and Erection of Earth Contact Assembly for an Isolator

Supply & Erection: The price shall include the supply and erection of Earth Contact Assembly for an Isolator as per specification no. TI/SPC/PSI/ISOLTR/0210 or latest.

Item 13(d) - Supply and Erection of an Interlocking device

Supply & Erection: The price shall include the supply and erection of Interlocking device for an Isolator as per specification no. TI/SPC/PSI/ISOLTR/0210 or latest.

Item 13(e) - Supply (without Insulators) and Erection of 132 kV Double Pole Isolator without earth contact assembly

Supply: The price shall include the supply of a 132 kV double pole isolator (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision.

The price shall exclude the supply of post & operating rod insulators.

The supply materials include the following components.

RI No.	Component	Qty
-	132 kV Double Pole Isolator Assembly with all accessories including Arcing Horn, Operating Rod, Operating Rod Guides, Padlock with two keys etc with all Fasteners (Nut, Bolt, Washer) with suitable Terminal Connectors	1 set
-	Integral lock/Inter Lock	As Required

Erection: The price shall include the erection of a 132 kV double pole isolator (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision. However, the price will only include the erection of the post and operating rod insulators.

Note: 1. The price does not include the supply and erection of SPS complete with bolts, nuts, and other fasteners required for supporting the isolators and operating rods on gantries or masts.

2. Also, it excludes the supply and erection of insulators for jumper support and the corresponding jumper connectors. This item is to be operated under 11(b)

3. 18 mm copper bus bar or 36 mm Aluminium bus bar with associated connectors for provision of isolator on TTCs/Portals shall be claimed separately under item no. 26 of Schedule A1.

Item 13(f) - Supply (without Insulators) and Erection of 25 kV Single Pole Isolator (1600 A) without earth contact assembly

Supply: The price shall include the supply of a 25 kV single pole isolator (1600 A) (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision. The price shall exclude the supply of post & operating rod insulators.

The supply materials include the following components

RI No.	Component	Qty
-	25 kV Single Pole Isolator Assembly (1600 A) with all accessories including Arcing Horn, Operating Rod, Operating Rod Guides, Padlock with two keys etc with all Fasteners (Nut, Bolt, Washer) with suitable Terminal Connectors	1 set
-	Integral lock / Inter Lock	As Required

Erection: The price shall include the erection of a 25 kV single pole isolator (1600 A) (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision. However, the price will only include the erection of the post and operating rod insulators.

Note: 1. The price does not include the supply and erection of SPS complete with bolts, nuts, and other fasteners required for supporting the isolators and operating rods on gantries or masts.

2. Also, it excludes the supply and erection of insulators for jumper support and the corresponding jumper connectors. This item is to be operated under 11(b)
3. 18 mm copper bus bar or 36 mm Aluminium bus bar with associated connectors for provision of isolator on TTCs/Portals shall be claimed separately under item no. 26 of Schedule A1.

Item 13(g) - Supply (without Insulators) and Erection of 25 kV Double Pole Isolator (1600 A) without earth contact assembly.

Supply: The price shall include the supply of a 25 kV double pole isolator (1600 A) (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision. The price shall exclude the supply of post & operating rod insulators.

The supply materials include the following components

RI No.	Component	Qty
-	25 kV Double Pole Isolator Assembly (1600 A) with all accessories including Arcing Horn, Operating Rod, Operating Rod Guides, Padlock with two keys etc with all Fasteners (Nut, Bolt, Washer) with suitable Terminal Connectors	1 set
-	Integral lock/Inter Lock	As Required

Erection: The price shall include the erection of a 25 kV double pole isolator (1600 A) (excluding the earth contact assembly) in accordance with RDSO Specification No. TI/SPC/PSI/ISOLTR/0210 or its latest revision. However, the price will only include the erection of the post and operating rod insulators.

Note: 1. The price does not include the supply and erection of SPS complete with bolts, nuts, and other fasteners required for supporting the isolators and operating rods on gantries or masts.

2. Also, it excludes the supply and erection of insulators for jumper support and the corresponding jumper connectors. This item is to be operated under 11(b)
3. 18 mm copper bus bar or 36 mm Aluminium bus bar with associated connectors for provision of isolator on TTCs/Portals shall be claimed separately under item no. 26 of Schedule A1.

Item 14(a) - Erection of PTFE Neutral Section Assembly

The price shall include the erection, testing and commissioning of PTFE short neutral section assembly as per RDSO Spec No. TI/SPC/OHE/SNS/0000 REV-1 or latest if any, with all accessories.

Item 15(a) – Supply and Erection of 50 sq.mm Copper Jumper (C-Jumper, F-Jumper, Anti-Theft Jumper) (excludes copper jumper supply)

Supply: The price shall include the supply of PG Clamps with Bolt M16x50/38 & Nut, Spring Washer as per RDSO Drg No. ETI/OHE/P/1040-2 (Rev-E) or latest, Drg No. ETI/OHE/P/1040-3 (Rev-B) or latest and Specification No. TI / SPC / OHE / Fittings / 0130 (10/13), Rev-1 or latest, RDSO Drg No. ETI/OHE/G/05107 or its latest revision.

The supply materials include the following components

RI No.	Component	Qty
1040-2 /1040-3	PG Clamps with bolt, nut and spring washer for C-Jumper / F-Jumper / Anti-Theft Jumper	2 Nos for C-Jumper/ 3 Nos for F-Jumper/ 4 Nos for Anti-Theft Jumper

Erection: The price shall include erection of complete 50 sq.mm jumper assembly (C-Jumper/F-Jumper/Anti-Theft Jumper) including Jumper Wire & PG Clamp with bolt, nut and spring washer.

Note: The supply cost for 50 sq.mm Jumper wire is excluded and will be paid under item no. 15(as) of Sch-B2.

Item 15(b) - Supply and Erection of 160 or 105 sq.mm Copper Jumper (Isolator Jumper, G-Jumper) (excludes copper jumper supply)

The price shall include the supply of PG Clamps with Bolt M16x50/38 & Nut, Spring Washer as per DRG No. ETI/OHE/P/1030-2 (Mod-D) or latest, DRG No. ETI/OHE/P/1030-3 (Rev-A) or latest and Specification No. TI/SPC/OHE/Fittings/0130(10/13), Rev-1 or latest.

The supply materials include the following components

RI No.	Component	Qty
1030-2 /1030-3	PG Clamps with bolt, nut and spring washer for 160 sq. mm jumper / 105 sq. mm jumper	8 Nos

Erection: The price shall also include erection of complete 160/105 sq.mm jumper assembly (Isolator Jumper, G-Jumper) including Jumper Wire & PG Clamp with bolt, nut and spring washer.

Note: The supply cost for 105/160 sq.mm Jumper wire is excluded and will be paid under item no. 15(bs)/15(cs) of Sch-B2.

Item 15(c) - Supply and Erection of Large copper jumper wire 160 sq. mm between Aluminium Bus and Cross-feeder (excludes copper jumper supply)

Supply: This jumper shall be provided between Aluminium bus and the copper cross feeder at SP/SSP/FP locations.

The supply materials include the following components

RI No.	Component	Qty
1050-3	PG Clamps with bolt, nut and spring washer	6 Nos
1009	19 mm Terminal connector	1 No
6480	AL Bus Terminal connector (6480) with Bi-metallic strip	1 No

Erection: The price covers the erection of the complete jumper assembly including Y Jumper as per site requirement.

Note: The supply cost for 160 sq.mm Jumper wire is excluded and will be paid under item no. 15(bs) of Sch-B2.

Item 15(d) - Supply and Erection of Large copper jumper wire 160 sq. mm between Cross-feeder and OHE (excludes copper jumper supply)

Supply: This jumper shall be provided between copper cross feeders and OHE. The supply materials include the following components

RI No.	Component	Qty
1050-3	PG Clamps with bolt, nut and spring washer	6 Nos
1030-3	PG Clamps with bolt, nut and spring washer	4 Nos

Erection: The price covers the erection of the complete jumper assembly including Y Jumper as per site requirement.

Note: The supply cost for 160 sq.mm Jumper wire is excluded and will be paid under item no. 15(bs) of Sch-B2.

Item 15(e) - Supply and Erection of Aluminium Jumper

Supply & Erection: The price shall cover on a flat rate basis the supply and erection of an aluminium jumper of size 19/7/1.4mm bare 3/4H generally confirming to IS:8130 complete with all components and fittings required for providing jumper connection, including parallel clamps, bimetallic ALCU strips wherever required, and terminal or tee clamps at either end.

The price shall be applicable for any aluminium jumper/connections in any combination between feeders, return conductors, overhead equipment, and isolators and outgoing bus bars or switching stations and booster stations.

Item 16(a) - Supply and Erection of Structure Bond

Supply & Erection: The price includes the complete supply and installation of the structure bond between the structure and rail, in accordance with RDSO Drawing No. ETI/OHE/P/7000 (Rev.F) or the latest version, and Code No. ETI/OHE/71(11/90)-REV 1 or its latest revision.
The price includes the supply of all required materials such as **MS Flat 40 x 6 mm** (in suitable lengths), **GI Bolt M16x50/38**, along with corresponding nuts, spring washers, and punched washers. Additionally, it covers the provision of a heat-shrinkable PVC sleeve for structure bonding on track-circuited rails, for providing proper insulation and protection.

The price also covers all necessary preparation work such as shaping and drilling the bond, ensuring precise fitting and secure erection of all materials.

Moreover, the price includes painting of the bond with **primary coat of red oxide and secondary coat of black bituminous paint** grade 85/25 (Fully Blown) as per **IS: 702 – 1961** after fabrication of bond.

Item 16(b) - Supply and Erection of Longitudinal Bond

Supply & Erection: The price includes the complete supply and installation of the longitudinal bond between the two rails, in accordance with RDSO Drawing No. ETI/OHE/P/7030 (Rev.F) or the latest version, and Code No. ETI/OHE/71(11/90)-REV 1 or its latest revision.

The price includes the supply of all required materials such as **MS Flat 40 x 6 mm** (in suitable lengths), **GI Bolt M16x65/38**, along with corresponding nuts, spring washers, and punched washers.

The price also covers all necessary preparation work such as shaping and drilling the bond, ensuring precise fitting and secure erection of all materials.

Moreover, the price includes painting of the bond with **primary coat of red oxide and secondary coat of black bituminous paint** after fabrication of bond.

Item 16(c) - Supply and Erection of Transverse & Special Bond

Supply & Erection: The price includes the complete supply and installation of the longitudinal bond between the two rails, in accordance with RDSO Drawing No. ETI/OHE/P/05251 (Rev.A) or the latest version, and Code No. ETI/OHE/71(11/90)-REV 1 or its latest revision.

The price includes the supply of all required materials such as **MS Flat 40 x 6 mm** (in suitable lengths), **GI Bolt M16x65/38**, along with corresponding nuts, spring washers, and punched washers. Additionally, it covers the provision of a heat-shrinkable PVC sleeve for bonding on track-circuited rails, providing proper insulation and protection.

The price also covers all necessary preparation work such as shaping and drilling the bond, ensuring precise fitting and secure erection of all materials.

Moreover, the price includes painting of the bond with **two coats of black bituminous paint**, after fabrication of bond.

Item 16(aa) - Drilling of Holes on Rails

The price covers drilling of holes on rails for provision of all types of bonds with suitable template approved by purchaser. The price shall also cover chamfering of the holes after drilling.

Note: Rail hole drilling is to be done with magnetic core drilling machine.

Item 16(d) - Supply and Erection of Structure Bond on Platform Area

Supply & Erection: The price shall include the supply and erection of the structure bond in the platform area as per RDSO Drawing No. ETI/OHE/P/7000 (Rev. F) or the latest version, and Code No. ETI/OHE/71(11/90)-REV 1 or its latest revision.

The bonds shall be securely embedded by cutting the concrete to a minimum depth of 15 cm and covering them with concrete to ensure stability, preventing any exposure or lifting at the ends. The width of the bond groove on the platform shall be a minimum of 10 cm, allowing for the easy installation of the 40x6 MS flat bond. Any damage to tiles or granite during the process shall be repaired and restored to their original condition.

The price also includes all necessary preparation work, such as shaping and drilling the bond, ensuring precise fitting, and securely erecting all materials. Additionally, the price covers the provision and installation of heat-shrinkable PVC tubing for the structure bond under the track circuit rail.

It also includes the supply and erection of double cleats with fasteners for the platform bond to prevent any projection of the bond. Also, it is to be ensured that the PF bond is not exposed on PF area and coping of PF.

Moreover, the price includes painting of the bond with **two coats of black bituminous paint**, grade 85/25 (Fully Blown) as per **IS: 702 – 1961 after fabrication and before installation** of bond.

Item 17(a) - Supply and Erection of Single Earth Electrode at COP/FOB/PTFE/Steel Girder etc

Supply & Erection: The price shall cover supply and erection of an earth electrode assembly as per RDSO Drawing No. ETI/OHE/P/7020 (mod-B) or latest for COP/FOB/CLS/PTFE/Steel Girder/Single line track circuit area/earthing for isolators/buried rail etc.

The pipe shall be embedded as far as possible vertically into the ground, except when hard rock is encountered, where it may be buried inclined to the vertical, the inclination being limited to 30° from the vertical. The price also includes 3.1 m long mild steel galvanized single perforated pipe of not less than 40 mm nominal bore and 48.4 mm dia, embedded into the ground by driving or otherwise complete with fasteners, protective concrete box with lids and lugs suitable for directly connecting mild steel flats of size 40 mm x 6 mm/ 50 mm x 6 mm as per RDSO specification No. ETI/OHE/71 (11/90)-REV 1 or latest. Price of MS flat will be paid separately under relevant item.

The price shall also include the testing of earth resistance value & painting the same [Background Yellow, Marking with Black] on one side of protection box. The price shall also include the white washing of earth pit box with cover for earthing station. Bentonite powder is as per requirement is to be added till earth resistance is reached within limits. The price also includes provision of charcoal and salt as per site requirement.

Item 17(b) – Supply and Erection of Earth Bus

Supply & Erection: The price shall cover supply of 50 mm x 6 mm MS strip confirming to IS-1731:1971 & Grade –A to IS-2062:1969 (MS flat) required for equipment earthing, connecting traction structures to the nearest non-track circuited rail or earth electrode or existing grid, including all fasteners like bolts(16x50x37), spring washers, flat washers etc at both ends. The price shall also cover erection of MS strip laid in the ground at depth of 60/30 cm / exposed as per requirement / site conditions.
Required fabrication, cutting, bending, welding & drilling is to be carried out by Contractor. The price shall also include painting as per code of practice for earthing.

Note: The payment will be made for the actual MS strip used at site for earthing & not for residual portion of MS strip leftover during fabrication / cutting.

Item 17(c) – Supply and Erection of Single Earth Electrode at TSS/SP/SSP/AT

Supply & Erection: The price shall cover supply and erection of an earth electrode assembly as per RDSO Drawing No. ETI/PSI/222-1 or latest revision, with charcoal & salt, all accessories & fasteners for 4.0 m length earth electrode at TSS/SSP/SP/AT's. The

pipe shall be embedded as far as possible vertically into the ground, except when hard rock is encountered, where it may be buried inclined to the vertical, the inclination being limited to 30˚ from the vertical.

3

The price also includes 4.0 m long mild steel galvanized single perforated pipe of not less than 40 mm nominal bore and 48.4 mm dia, embedded into the ground by driving or otherwise complete with protective concrete box with lids and lugs suitable for directly connecting two mild steel flats of size 50 mm x 6 mm / 75 mm x 8 mm as per RDSO specification No. TI / SPC / PSI / EARTHING / 0210. Salt and river sand to be mixed on the surface as one layer. Alternative layers of charcoal & salt shall be provided 150 mm around the earth pipe for embedded portion and each layer shall be 30 cm. Price of MS flat will be paid separately under relevant item.

The price shall also include the testing of earth resistance value & painting the same [Background Yellow, Marking with Black] on one side of protection box. Bentonite powder is as per requirement is to be added till earth resistance is reached within limits..
The individual resistance value of Earthing Station of a pole mounted LT supply transformer station shall not exceed 10 Ohms. If this value cannot be achieved with one electrode, additional electrodes shall have surrounded earth treated with charcoal and salt filling. For additional earth electrodes separate payment will be made.

Item 17(d) - Supply and Erection of Copper Strips (25 x 3 mm) for Equipment Earthing

Supply & Erection: The price shall cover supply and erection of 25 mm x 3 mm copper strips to connect the earth terminals of equipments like potential transformers, lightning arresters, L.T. supply transformers to the main masts of the gantries on which they are mounted. The price shall cover all fastenings required for fixing the copper strips along any structure member of the gantry.

Item 17(e) - Supply and Erection of Earth leads 75 mm x 8 mm laid in the ground

Supply & Erection: The price shall cover supply and installation per meter length 75 x 8 mm mild steel flat, buried at a depth of 60 cm below ground level. The price shall also cover connections of the mild steel flats to the earth electrodes to constitute the main earth ring and to the earthed terminals of the 132/25 kV Transformers etc. as required.

Note: The price for excavation of earth is excluded and will be paid under item 34(f) of Sch - A1.

Item 17(f) - Supply and Erection of Earth leads 75 mm x 8 mm mild steel laid exposed

Supply & Erection: The price shall cover supply and installation per meter length of 75 x 8 mm mild steel flat, painted all around with two coats of painting to colour grass green shade-218 of IS:5 passing through cable trench or exposed above ground level. The price shall also cover the connections of the steel flats to the earth electrodes, to constitute the main earth ring and to the earthed terminals of the various equipment as required.

Item 17(g) - Supply and Erection of Earth leads 50 mm x 6 mm mild steel laid in the ground.

Supply & Erection: The price shall cover supply and installation per meter length of 50 x 6 mm mild steel flat buried at a depth of 60 cm below ground level. The price shall also cove connections of the steel flats to the main earth ring and to the steel structures and metallic frame work/terminals of various equipment, as required.

Note: The price for excavation of earth is excluded and will be paid under item 34(f) of Sch - A1.

Item 17(h) - Supply and Erection of Earth leads 50 mm x 6 mm mild steel laid exposed

Supply & Erection: The price shall cover supply and installations per meter length of 50 X 6 mm mild steel flat painted all around with two coats of painting to colour grass green shade – 218 of IS:5 passing through cable trench or exposed above ground level. The price shall also cover the connections of the steel flats to the main earth ring and to the steel structures and metallic frame work/ terminals of various outdoor equipment as required.

Item 17(i) - Supply and Erection of Mild steel rod 32 mm dia for Earth Mat

Supply & Erection: The price shall cover supply and installation per meter length of bare mild steel rod of dia 32 mm, to be buried at a depth of 60 cm below the ground level to form the earthing grid and connected to earth electrodes. The price shall also cover jointing of the M.S. rods to form earthing grid and connection to M.S. flats for system earthing.

Note: The price for excavation of earth is excluded and will be paid under item 34(f) of Sch - A1.

Item 17(j) - Supply and Erection of 8 SWG G.I wire for earthing

Supply & Erection: The price shall cover supply and erection of 8 SWG G.I wire per meter, used for earthing of remote-control cubicles, fencing panels, control panels DB's etc.

Item 17(k) - Supply and Erection of Earth Screen Wire

Supply & Erection: The price shall cover supply and stringing per meter length of 19/2.5 mm [70kg/mm] galvanized steel stranded wire. It shall include the supply and erection of suitable terminations using strain clamps adjuster [on one side only] etc. It shall also include connecting by means of suitable terminal spades the end of the earth screen wire to the main members of the columns of portals gantries across which these wires are strung or to 50 x 6 mm MS flat earth leads. For purpose of payment, the clear span between the structures on which earth wire is run shall be adopted.

Item 18(a) - Erection of 25 kV Vacuum Interrupter (BM)

Erection: The price shall cover erection, testing & commissioning of Vacuum Type Interrupters complete with supporting frame-work, terminal connectors, accessories, operating mechanism, and all fittings etc for their efficient and trouble-free operation. The price for erection shall include alignment and grouting of the Interrupter on its foundation block and mounting of accessories, if any, in their respective positions.

The price also covers grouting, modifications, if any to the existing supporting steel structure/frame, positioning the mechanism box on foundation block and also the other accessories in their respective positions. In case of modification/alteration required for the existing foundation/structure, the contractor shall submit the designs/drawings for the modification/alteration with supporting explanatory notes, calculation etc. to the Purchaser/railways for approval. Concrete for modification/alteration to the foundation shall paid under item no. 2 of Sch-A2.

All the tools & plant, equipment/instruments required for testing and commissioning of the interrupter shall be arranged by the Contractor.

Item 18(b) - Erection of 25 kV Vacuum Circuit Breaker (CB)

Erection: The price shall cover erection, testing & commissioning of 25 kV Vacuum Type Circuit Breaker complete with supporting frame work and terminal connectors for their efficient and trouble-free operation. The price for erection shall include alignment & grouting of the Circuit breaker on its foundation block and mounting of accessories, if any, in their respective positions.

The price also covers grouting, modifications, if any to the existing supporting steel structure/frame, positioning the mechanism box on foundation block and the other accessories in their respective positions. In case of modification/alteration required for the existing foundation/structure, the contractor shall submit the designs/drawings for the modification/alteration with supporting explanatory notes, calculation etc. to the Purchaser/railways for approval. Concrete for modification/alteration to the foundation shall paid under item no. 2 of Sch-A2.

All necessary tools, equipment, instruments including power supply required for carrying out necessary checks, tests and commissioning shall be arranged by the contractor.

Item 18(c) - Erection of 132/220 kV Double Pole Circuit Breaker of SF-6 type

Erection: The price shall cover erection, testing & commissioning of 132 or 220 kV SF-6 Type Circuit Breaker complete with supporting frame work and terminal connectors for their efficient and trouble-free operation. The price for erection shall include alignment & grouting of the Circuit breaker on its foundation block and mounting of accessories, if any, in their respective positions.

The price also covers grouting, modifications, if any to the existing supporting steel structure/frame, positioning the mechanism box on foundation block and also the other accessories in their respective positions. In case of modification/alteration required for the existing foundation/structure, the contractor shall submit the designs/drawings for the modification/alteration with supporting explanatory notes, calculation etc. to the Purchaser/railways for approval. Concrete for modification/alteration to the foundation shall paid under item no. 2 of Sch-A2.

All necessary tools, equipment, instruments including power supply required for carrying out necessary checks, tests and commissioning shall be arranged by the contractor

Item 19(a) - Erection of 25 kV Type-I Potential Transformer (PT)

Erection: The price shall cover erection of a 25 kV Potential Transformer Type-I (Indication) complete with all fittings and accessories as per relevant specifications, including terminal connectors and fixing bolts. The price for erection shall include proper alignment of the potential transformer in position.

Note: The price shall not include the cost of any small parts steel work and jumper.

Item 19(b) - Erection of 25 kV Type-II Potential Transformers (PT)

Erection: The price shall cover supply and erection of a 25 kV Potential Transformer Type-II (Protection) complete with all fittings and accessories as per relevant

specifications, including terminal connectors and fixing bolts. The price for erection shall include proper alignment of the transformer in position. The price shall also cover the erection of an enamelled number plate and fixing bolts.

Note: The price shall not include the cost of any small parts steel work and jumper.

Item 20(a) – Erection of 42 kV Lightning Arrester

Erection: The price shall cover erection of 42 kV, Metal Oxide Gapless Lightning Arrester complete with all fittings & accessories as per relevant specifications including terminal connectors and fasteners etc. The cost of erection shall include proper alignment of the lightning arrester in position. Erection should also comply to TI/MI/0048 Rev-1 dated 27/07/2021. Any Base modification for fixing of Lightning arrester as per Specification TI/SPC/PSI/MOGTLA/0101 (2/15)

Note: The price shall not include the cost of any small parts steel work and jumper.

Item 20(b) – Erection of 120 kV Lightning Arrester

Erection: The price shall cover erection of 120 kV, Metal Oxide Gapless Lightning Arrester (suitable for 132 kV TSS) lightning arrester complete with all fittings and accessories. The cost of erection shall include proper alignment of the LA in position.

Note: The price shall not include the cost of any small parts steel work and jumper.

Item 20(c) –Erection of 198 kV Lightning Arrester

Erection: The price shall cover erection of 198, kV Metal Oxide Gapless Lightning Arrester (suitable for 220 kV TSS) lightning arrester complete with all fittings and accessories. The cost of erection shall include proper alignment of the LA in position.

Note: The price shall not include the cost of any small parts steel work and jumper.

Item 21 - Supply and Erection of Terminal Boards in control cubicles

Supply & Erection: The price shall cover supply and erection of Terminal Board consisting of six terminal strips for connecting the cables as per RDSO drawing ETI/PSI/501 (latest). Terminal Board shall be mounted on the wall of remote-control cubicle building at a height of 1 m above the floor level.

The price also includes proper numbering of Terminal strips for Interrupter and potential transformer to indicate the equipment to which it is connected. Numbers shall be engraved on mounting plate with colour contrasting with the colour of Bakelite. The price shall also include terminal board cover of foam lining.

Item 22(a) - Supply and Erection of an Iron Clad 110 V DC Fuse Box

Supply & Erection: The price shall cover supply and erection of a 15A, 110V Iron clad or latest two way fuse box on the wall inside the remote control cubicle. The fuse box shall be complete with two fuse carriers and bases.

Item 22(b) - Supply and Erection of an Iron Clad 230 V AC Fuse Box

Supply & Erection: The price shall cover supply and erection of a 15A, 230V AC. Iron clad or latest 4-way fuse box on the wall inside the remote control cubicle, for heater supply of Interrupters. The fuse box shall contain four fuse carriers and bases.

Item 22(c) - Supply and Erection 110 V Distribution Boards

Supply & Erection: The price shall cover supply and erection of a 110 V Distribution Boards as per latest RDSO spec. The price shall include the grouting of the frame work of the distribution board in position or mounting it on the wall and necessary connections.

Item 23(a) - Erection of 110 V, 40 Ah Lead Acid Battery

Erection: The price shall cover erection of 110V, 40 Ah lead acid battery complete with stand, accessories, and a tool board. The price for erection shall include installation and connecting of the battery, but exclude the cost of connecting cables, the supply and erection of which will be paid for under appropriate Item. The price for erection shall include installation, connecting, initial charging at site if required and commissioning of the battery.

Item 23(b) - Erection of Battery charger for 110 V, 40 Ah Lead Acid Battery

Erection: The price shall include the erection of battery charger for a 110 V, 40 Ah lead acid batteries complete with connecting lead and plug for connection to 230 V AC supply. The price for erection shall include mounting of the charger in position and connecting it up to the 230V AC. distribution board in the control cubicles. The price shall not include supply and erection of any cable for connecting the charger to the 110V battery which shall be paid for under appropriate item.

Item 24(a) - Erection of 110 V, 200 Ah Lead Acid Battery

Erection: The price shall cover erection of 110 V, 200 Ah lead acid battery complete with stand, accessories, and a tool board. The price for erection shall include installation and connecting of the battery, but exclude the cost of connecting cables, the supply and erection of which will be paid for under Item 25. The price for erection shall include installation, connecting, charging at site if required and commissioning of the battery.

Item 24(b) - Erection of Battery charger for 110 V, 200 Ah Lead Acid Battery.

Erection: The price shall cover erection of battery charger for a 110 V, 200 Ah lead acid battery complete with connecting lead and plug for connection to 230 V A.C. supply. The price for erection shall include mounting of the charger in position and connecting it up to the 230V A.C. distribution board in the control cubicles. The price shall not include supply and erection of any cable for connecting the charger to the 110V battery which shall be paid for under appropriate item.

Item 25(a) - Supply and Erection of cable for Control and Indication (10 or 7 core, 2.5 sq. mm)

Supply & Erection: The price shall include the supply and installation, measured per meter, of a 1100V grade PVC insulated and sheathed armoured (heavy-duty) cable, in compliance with IS:1554 (Part-I)-1988. The cable will be 7/10 core, 2.5 sq.mm copper conductor, running from each circuit breaker or interrupter to the Control and Relay Board. The price also shall include supply and installation of terminal connectors at both ends, if necessary, as well as any conduits required for protection or routing.

Item 25(b) - Supply and Erection of cable for Heater Supply (2 core, 4 sq. mm)

Supply & Erection: The price shall include the supply and installation, measured per meter, of a 1100V grade PVC insulated and sheathed armoured (heavy-duty) cable, in compliance with IS:1554 (Part-I)-1988. The cable will be 2 core, 4 sq.mm copper conductor, running from (i) each interrupter to interrupter (ii) from interrupter to 230 V AC Fuse box (iii) From Fuse box to LT distribution board.

The price also shall include supply and installation of terminal connectors at both ends, if necessary, as well as any conduits required for protection or routing.

Item 25(c) - Supply and Erection of cable for Catenary Indication (2 core, 2.5 sq. mm)

Supply & Erection: The price shall include the supply and installation, measured per meter, of a 1100V grade PVC insulated and sheathed armoured (heavy-duty) cable, in compliance with IS:1554 (Part-I)-1988. The cable will be 2 core, 2.5 sq.mm copper conductor, running from line indication type potential transformer to terminal board and from 240V AC LT distribution board to terminal board.

The price also shall include supply and installation of terminal connectors at both ends, if necessary, as well as any conduits required for protection or routing, to be embedded between the steel work based and the cable trench and shall include all fastenings on masts and structural members to support them.

Item 25(d) - Supply and Erection of cable for 110 V DC Power supply (2 core, 4 sq. mm)

Supply & Erection: The price shall cover supply and installation per meter length of PVC 1100V grade, 4 sq.mm (copper conductor) 2 core and sheathed armoured (heavy-duty) cable, from each current transformer to the control and relay board, from 110V DC distribution board to the control and Relay Board and from 240V AC. LT distribution board to Battery Chargers.

The price also shall include supply and installation of terminal connectors at both ends, if necessary, as well as any conduits required for protection or routing.

Item 25(e)(i) - Supply and Laying of 2 core, 70 sq. mm XLPE Aluminium cable

The price shall include the supply and laying of 2 core, 70 sq.mm XLPE insulated, PVC Sheathed, 1100 V, armoured Aluminium conductor.

Item 25(e)(ii) - Supply and Laying of 2 core, 185 / 150 sq. mm XLPE Aluminium cable

The price shall include the supply and laying of 2 core, 185 / 150 sq.mm XLPE insulated, PVC Sheathed, 1100 V, armoured Aluminium conductor.

Note for Item 25(a) to 25(e)(ii):

1. The length of cables shall be the actual distance measured along the lengths of the cable between the starting and terminating points of each cable.
2. For purpose of payment fraction of a meter in the total length of cable of each type used at a switching station, shall be rounded off to the next higher meter.
3. Price under item 25 do not include cost of concrete cable trenches which will be paid for under appropriate item.
4. The price shall also include releasing existing cables. All released cables and connectors shall be handed over to the concerned TRD depot.
5. The price for erection of cables shall include cable boxes, metallic glands, identification labels, terminal connectors, copper lugs and leading inducts or pipes as required.
6. The price for erection shall include connecting up of the cable at either end. It shall also include clamping of the cable on steel supports, fixing in the trenches, on the structures, on the framework of the equipment or on the wall of the control room as required.

Item 26(a)(i) - Supply and Erection of Aluminium Bus Bar 36 mm x 28 mm

Supply & Erection: The price shall cover supply and erection of aluminium bus bar 36 mm x 28 mm including bending and shaping.

Item 26(a)(ii) - Supply and Erection of 18 mm Copper Bus Bar

Supply & Erection: The price shall cover supply and erection of copper bus bar 18 mm including bending and shaping.

Item 26(b)(i) - Supply and Erection of Aluminium Bus Terminal (6480)

Supply & Erection: The price shall include the supply and erection of Aluminium Bus Terminal (6480) for 25 kV Isolator including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6480 or latest. The price shall also include the supply and erection of ALCU strip if required to be provided at junction.

Item 26(b)(ii) - Supply and Erection of Aluminium Bus Splice (6490)

Supply & Erection: The price shall include the supply and erection of Aluminium Bus Splice (6490) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6490 or latest.

Item 26(b)(iii) - Supply and Erection of Aluminium Bus TEE connector (6500)

Supply & Erection: The price shall include the supply and erection of Aluminium Bus TEE connector (6500) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6500 or latest.

Item 26(b)(iv) - Supply and Erection of Aluminium Bus Bar Terminal connector 36/20 mm(6530)

Supply & Erection: The price shall include the supply and erection of Aluminium Bus Bar Terminal connector (6530) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6500 or latest for connecting the 20 mm spider conductor to the 36 mm Aluminium Bus Bar at Traction Substation.

Item 26(b)(v) - Supply and Erection of Aluminium Bus Bar Tap connector (6520)

Supply & Erection: The price shall include the supply and erection of Aluminium Bus Bar Tap connector (6520) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6520 or latest for cadmium catenary tapped from 36 mm O/D Aluminium Bus Bar for Drop Out switch in switching station.

The price shall also include the supply and erection of ALCU strip if required to be provided at junction.

Item 26(b)(vi) - Supply and Erection of Aluminium Flexible Bus Splice (6550)

Supply & Erection: The price shall include the supply and erection of Aluminium Flexible Bus Splice (6550) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6550 or latest for making expansion joints in long 36 mm Aluminium Bus Bar.

The price shall also include the supply and erection of ALCU strip if required to be provided.

Item 26(b)(vii) - Supply and Erection of Aluminium Bus Terminal connector bolted type (6830-1)

Supply & Erection: The price shall include the supply and erection of Aluminium Bus Terminal connector bolted type (6830-1) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6550 or latest for making expansion joints in long 36 mm Aluminium Bus Bar.

Item 26(c)(i) - Supply and Erection of Solid Copper Busbar Connector - 18 mm Bus Terminal (6310-1)

Supply & Erection: The price shall include the supply and erection of 18 mm Bus Terminal (6310-1) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6310-1 or latest.

Item 26(c)(ii) - Supply and Erection of Solid Copper Busbar Connector - 18 mm Bus Splice (6320)

Supply & Erection: The price shall include the supply and erection of 18 mm Bus Splice (6320) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/6320 or latest.

Item 26(c)(iii) - Supply and Erection of Solid Copper Busbar Connector- 18 mm Bus TEE Joint (6330)

Supply & Erection: The price shall include the supply and erection of 18 mm Bus TEE Joint (6330) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. RE/33/P/6330 or latest.

Item 26(c)(iv) - Supply and Erection of Solid Copper Busbar Connector - 18 mm Bus Terminating TEE (6350)

Supply & Erection: The price shall include the supply and erection of 18 mm Bus Terminating TEE (6350) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. RE/33/P/6350 or latest.

Item 26(c)(v) - Supply and Erection of Aluminium Bus Bar 50 mm x 39 mm

Supply & Erection: The price shall include the supply and erection, measured per meter, of 50 mm x 39 mm dia. aluminium tube to serve as bus-bar or equipment to equipment bus bar connection in the traction sub-station, wherever required. The price shall include straightening, shaping and connecting/clamping of the conductor to the equipment terminals/bus bar supports as required

Item 26(c)(vi) - Supply and Erection of ACSR conductor (Zebra 61/3.18 mm)

Supply & Erection: The price shall include the supply and erection per meter length of 61/3.18 mm (ZEEBRA ACSR) conductor to serve as bus bar or equipment to equipment/bus bar connection in the traction substation, wherever required. The price shall include strengthening, shaping and connecting/clamping of the conductor to the equipment terminals/bus bar supports as required.

Item 26(c)(vii) - Supply and Erection of Rigid type Bi-metallic Terminal connector suitable for 50 mm dia AL Tubular Bus Bar to Terminal Pad of 25 kV Isolator/CT (ID no 11090)

Supply & Erection: The price shall include the supply and erection of Rigid type Bi-metallic Terminal connector suitable for 50 mm dia AL Tubular Bus Bar to Terminal Pad of 25 kV Isolator/CT (ID no 11090) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11090 or latest. The price shall also include the supply and erection of ALCU strip if required to be provided.

Item 26(c)(viii) - Supply and Erection of Expansion Type Terminal connector to suit 50 mm dia AL Tubular Bus Bar to Terminal Pad of 25 kV C.T/Isolator/ C.B & Interrupter (ID no 11060)

Supply & Erection: The price shall include the supply and erection of Expansion Type Terminal connector to suit 50 mm dia AL Tubular Bus Bar to Terminal Pad of 25 kV C.T/Isolator/ C.B & Interrupter (ID no 11060) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11060 or latest. The price shall also include the supply and erection of AL-CU strip if required to be provided. The copper flexible connector (80 x 80 mm) suitable for 50 mm dia AL busbar shall be supplied as advised by Railway Engineer In-charge.

Item 26(c)(ix) - Supply and Erection of 25 kV System Rigid Bus Splice connector to suit 50 mm O/D AL Tube on Both ways. (ID no 11180)

Supply & Erection: The price shall include the supply and erection of 25 kV System Rigid Bus Splice connector to suit 50 mm O/D AL Tube on Both ways. (ID no 11180) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11180 or latest.

Item 26(c)(x) - Supply and Erection of 25 kV System TEE connector to suit 50 mm O/D AL Tubular Bus Bar to 50 mm O/D AL Bus Bar (ID no 11150)

Supply & Erection: The price shall include the supply and erection of 25 kV System TEE connector to suit 50 mm O/D AL Tubular Bus Bar to 50 mm O/D AL Bus Bar (ID no 11150) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11150 or latest.

Item 26(c)(xi) - Supply and Erection of Rigid Through connector to suit 50 mm dia AL Tubular Bus Bar and Spider AAC Conductor for 25 kV PT Type-II (ID no 11110)

Supply & Erection: The price shall include the supply and erection of Rigid Through connector to suit 50 mm dia AL Tubular Bus Bar and Spider AAC Conductor for 25 kV PT Type-II (ID no 11110)including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11110 or latest.

Item 26(c)(xii) - Supply and Erection of 25 kV System TEE connector to suit 50 mm O/D AL Tube and Spider AAC Conductor (ID no 11140)

Supply & Erection: The price shall include the supply and erection of 25 kV System TEE connector to suit 50 mm O/D AL Tube and Spider AAC Conductor (ID no 11140) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11140 or latest.

Item 26(c)(xiii) - Supply and Erection of TEE connector to Suit Zebra (28.58 DIA) ACSR Conductor on Both ways for 220 kV System (ID no 11040)

Supply & Erection: The price shall include the supply and erection of TEE connector to Suit Zebra (28.58 DIA) ACSR Conductor on Both ways for 220 kV System (ID no 11040) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11040 or latest.

Item 26(c)(xiv) - Supply and Erection of 220 kV System Bi-metallic Terminal Connector to suit ZEBRA (28.62 DIA) ACSR Conductor and Al/Cu Pad Isolator/CT/BT (ID no 11120/11030)

Supply & Erection: The price shall include the supply and erection of 220 kV System Bi-metallic Terminal Connector to suit ZEBRA (28.62 DIA) ACSR Conductor and Al/Cu Pad Isolator/CT/BT (ID no 11120/11030)including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11120 or latest (**or)** ETI/PSI/P/11030 or latest. The price shall also include the supply and erection of AL-CU strip if required to be provided at junction.

Item 26(c)(xv) - Supply and Erection of Rigid type connector on S.I. to suit 50 O/D AL Bus Bar for 25 kV System (ID no 11200)

Supply & Erection: The price shall include the supply and erection of Rigid type connector on S.I. to suit 50 O/D AL Bus Bar for 25 kV System (ID no 11200) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11200 or latest.

Item 26(c)(xvi) - Supply and Erection of 25 kV System TEE Connector to suit 36 mm O/D AL Bus Bar to 50 mm O/D AL Bus Bar (11240)

Supply & Erection: The price shall include the supply and erection of 25 kV System TEE Connector to suit 36 mm O/D AL Bus Bar to 50 mm O/D AL Bus Bar (11240) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11240 or latest.

Item 26(c)(xvii) - Supply and Erection of Siding clamp for 50 mm AL Busbar (11190)

Supply & Erection: The price shall include the supply and erection of Siding clamp for 50 mm AL Busbar (11190) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11190 or latest.

Item 26(c)(xviii) - Supply and Erection of 220 kV system Rigid connector on SI to suit ZEBRA (28.58 mm dia) ACSR Conductor (ID no 11050)

Supply & Erection: The price shall include the supply and erection of 220 kV system Rigid connector on SI to suit ZEBRA (28.58 mm dia) ACSR Conductor (ID no 11050) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11050 or latest.

Item 26(c)(xix) - Supply and Erection of Rigid type Bi-metallic connector for 50 mm AL Busbar (ID no 11070)

Supply & Erection: The price shall include the supply and erection of Rigid type Bi-metallic Terminal connector suitable for 50 mm dia AL Tubular Bus Bar to 30 dia Cu Stud of 25 kV Current Transformer (ID no 11070) including Fasteners (GI Nut, Bolt & Washer

etc.) as per RDSO Drawing No. ETI/PSI/P/11090 or latest. The price shall also include the supply and erection of ALCU strip if required to be provided.

Item 26(c)(xx) - Supply and Erection of 25 KV Expansion Bus Coupler to suit 50 mm AL Busbar (ID no 11210)

Supply & Erection: The price shall include the supply and erection of 25 KV Expansion Bus Coupler to suit 50 mm AL Busbar (ID no 11210) including Fasteners (GI Nut, Bolt & Washer etc.) as per RDSO Drawing No. ETI/PSI/P/11210 or latest.

Item 27(a) -Erection of 25 kV/240 V 5/10/25/50/100 kVA Auxiliary Transformer

Erection: The price shall include erection of 25kV/240V LT supply transformer of capacity 5/10/25/50/100kVA, at site, as per the RDSO's latest specification complete with terminal connectors on a mast or gantry. The price shall be applicable for transformers mounted on steel pedestals at switching stations also. The price shall also cover oil filtration and pre commissioning tests confirming to IS 1866 and as approved by the Employers or Engineer. The contractor shall make his own arrangement for oil filtration equipment, as well as power supply required for the same, all necessary tools, equipment, instruments required for carrying out oil filtration/checks/tests and the contractor shall arrange for commissioning.

Note: Contractor at his own cost shall do the replenishment of the transformer oil on account of testing and leakages during the warranty period.

Item 27(b) - Supply and Erection of 240 V L.T. Distribution Board in the control room for L.T supply transformer with changeover switch

Supply & Erection: The price shall include the supply and erection of 240 V L.T. Distribution Board in the control room for L.T supply transformer with changeover switch.

Item 28 - Supply (without Insulators) and Erection of 25 kV Drop Out Fuse switch for Auxiliary Transformer of all capacities and for Type-I PTs

Supply & Erection: The price shall include the supply and erection of 25 kV DO fuse switch complete with all mounting accessories and terminal connectors as required excluding the supply of 25 kV solid core insulator as per RDSO Drg No. ETI/PSI/038 or its latest revision.

The price shall not include erection of small parts steel work. The actual quantity will be decided by Railway Engineer In-charge. The provision of DO fuse switch for Type-I PTs shall also be claimed under this item.

Item 30(a)(i) - Supply and Erection of Fencing Panel at SP/SSP/TSS

Supply & Erection: The price shall include the supply and erection of fencing panel as per RDSO Specification No. ETI/C/0186 SH-1 for SP/SSP & ETI/PSI/121 for TSS or latest revision. The price also shall include two coats of red oxide zinc chromate primer confirming to IS: 2074 and finished with two coats of aluminium paint.

The prices shall not include supply and erection of fencing up-rights, anti-climbing devices. **B**ut, shall include the cost of fasteners and the price shall be for a meter length of the panels, 2.4 m for SP/SSP or 2.5 m for TSS height measured in the plan view of the appropriate approved drawings. However dimensions of fencing panels are to be done as approved by Railway Engineer In-charge.

Item 30(a)(ii) - Supply and Erection of Fencing Upright at SP/SSP/TSS

Supply & Erection: The price shall include the supply and erection of fencing upright as per RDSO specification No. ETI/C/0186 SH-2 for SP/SSP & ETI/PSI/121 for TSS or latest revision. The price also shall include two coats of red oxide zinc chromate primer to IS: 2074 and finished with two coats of aluminium paint.

The price shall be on the basis of black weight of the steel with no deduction for holes or skew cut or no increase for weld materials.

Note: The cost of foundation of uprights will be paid under appropriate item.

Item 30(a)(iii) - Supply and Erection of Gates

Supply & Erection: The price shall include the supply and erection of Gates for SP/SSP/TSS as per RDSO Drg. No. ETI/C/0186 (SH 1&2) or its latest revision (or) the dimensions of Gate may be decided as per site condition by Railway Engineer In-charge. As per drawing approved by Railway Engineer In-charge, may be executed.

The price shall also include two coats of red oxide zinc chromate primer to IS: 2074 and finished with two coats of aluminium paint.

Item 30(b)(i) - Supply and Erection of Anti-climbing device at TSS/SP/SSP

Supply & Erection: The price shall cover supply and erection of an anti-climbing device consisting of galvanized steel fixtures and barbed wire mounted on the fencing panels as per RDSO Drg. No. ETI/PSI/121 or its latest revision, ETI/PSI/104 or its latest revision & ETI/C/0186 (SH 1&2) or its latest revision.

The price shall be per meter length of the panel.

The price shall also include painting of the fixtures with two coats of red oxide zinc chromate primer and finished with two coats of Aluminium paint as per IS 2074.

Item 30(b)(ii) - Supply and Erection of Anti-climbing device for Auxiliary Transformer.

Supply & Erection: The price shall include the supply and erection of anti-climbing device consisting of galvanized steel fixtures and barbed wire mounted on the AT mast as per RDSO Drg No. ETI/OHE/SK/106 or its latest revision.

The price shall be for each mast provided with the devices.

The price shall also include painting of the fixtures with two coats of red oxide zinc chromate primer and finished with two coats of Aluminium paint as per IS 2074.

Item 31(a) - Transfer of Overhead Equipment from one Mast or Support to another, including removal of Cantilever Assembly from old Mast or Support.

The price shall include the transfer of overhead equipment to a cantilever assembly on a new mast or support. The price shall also include **dismantling of the existing bracket assembly/assemblies** including **SPS** from the old mast or support.

The dismantled cantilever assembly shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

The foundation, steel work and bracket assembly for the new mast or structure will be paid under appropriate items.

Note: Dismantling of cantilevers (item no. 31(r) of Sch-A1) should not be operated, when this item is operated

Item 31(b) - Erection of additional bracket assemblies on a same mast or support

The price shall include the dismantling of existing bracket assemblies including SPS. The price shall also include the provision of a multiple cantilever cross arm and erection of bracket assembly/assemblies on the multiple cantilever cross arm.

Note: 1. This item is to be operated when conversion of single cantilever to multi cantilevers is planned.

2. The price shall not include the supply cost of multiple cantilever cross arm, which will be paid under item no. 3(cs) of Sch-B1

3. This price shall not include the price for supply of new cantilever assembly/assemblies, which will be paid for under item no. 4(a)(i) of Sch-A1.

Item 31(c) - Dismantling of Overhead Equipment

The price shall include the dismantling of overhead equipment which includes contact wire, catenary wire, jumpers and droppers.

The dismantled materials shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Note: Dismantling of Terminations are to be covered under 31(t)(v) of Sch-A1 for conventional OHE and 31(t)(vi) of Sch-A1 for Tramway OHE.

Item 31(d) - Dismantling of Along Feeder wire (Aluminium or copper feeder wire)

The price shall include the dismantling of Aluminium or Copper Feeder wire.
The dismantled feeder wire shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(e) - Splicing and Extension of Anchored OHE

The price shall include the splicing of terminated overhead equipment for extension, along with the necessary adjustments to the affected equipment. The splicing of contact and catenary wire after dismantling of section insulator shall also be claimed under this item.

The cost of dismantling the overhead equipment will be covered separately under Item 31(c). The extended overhead equipment shall be measured and paid from the center line of the splice to the newly extended section under Item 6(a), 6(b), or 6(c).

If only the catenary or contact wire is spliced and extended, half the rate shall be paid. In the case of anti creep wire splicing and extension is done, half the rate shall also apply. When splicing a catenary wire with a contact wire or an insulated catenary wire using an ending clamp/splice under a Road Over Bridge (ROB), payment shall be made under this item at half the rate per splice.

The dismantled equipment must be properly stacked and transported to the nearest TRD depot, as instructed by the Railway Engineer In-charge.

Note: The price does not include supply of splices and any additional wire pieces (contact and catenary).

Item 31(f) - Dismantling of Section Insulator

The price shall include the dismantling of Section Insulator assembly along with sectioning and 9-ton insulators. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(g) - Slewing and Putting back of OHE in original position

The price shall include the temporary slewing or lowering of OHE to ground for carrying out special works, at the request of the Railway Engineer In-charge and restoration & readjustment of the OHE after completion of special work.

Slewing of OHE shall be paid for the OHE slewed in terms of span and putting back of OHE to normal condition after completion of special works. It is paid in terms of spans and slewing is done including anchoring spans. This is inclusive of and RC wire / earth wire if any in case of 2x25 kV AT system.

Additional components or materials used during such restoration of OHE shall be paid separately under appropriate items.

Item 31(h) - Dismantling of an Isolator

The price shall cover cost of dismantling of single or double pole isolator including post insulators, operating rod insulators, operating rod, earthing heel arrangement and associated small parts steel (SPS) work in isolated cases. The price shall also include the dismantling of busbars.

The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Note: The dismantling of isolator jumpers shall be claimed under item no. 31(t)(iv) of Sch-A1.

Item 31(i) - Dismantling of Post Insulator

The price shall include the complete dismantling of post insulators, along with their associated fittings, that are not covered under any other specified items. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(j)(i) - Dismantling of Suspension Insulator

The price shall include the complete dismantling of suspension insulators, along with their associated fittings, that are not covered under any other specified items. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(j)(ii) - Dismantling of Cut-in Insulator

The price shall include the complete dismantling of cut-in insulators, along with their associated fittings, that are not covered under any other specified items. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(k)(i) - Dismantlement of OHE Mast or structure by cutting

The price shall include the dismantling of existing OHE mast /PSI mast/ structure by cutting just above the foundation level by breaking the muff, if required, without causing

any damage to the mast or any adjacent structure. The dismantled OHE mast shall be properly stacked.

Note: The transportation of OHE mast to nearest TRD depot as advised by Railway Engineer In-charge can be claimed under item no. 38 of Sch-A1.

Item 31(k)(ii) – Dismantlement of Upright of TTC/Portal by cutting

The price shall include the dismantling of existing traction Portals/TTC uprights by cutting just above the foundation level by breaking the muff, if required, without causing any damage to the masts/ Portals/ TTC uprights or any adjacent structure. The dismantled OHE Portals/TTC shall be properly stacked.

Note: The transportation of OHE Portals/TTC to nearest TRD depot as advised by Railway Engineer In-charge can be claimed under item no. 38 of Sch-A1.

Item 31(l)(i) - Retrieval of Traction Masts, Main Masts of Switching Station, TTC Uprights etc

The price shall include the excavation of surrounding earth of the existing foundation to the required depth, breaking of foundation block and extracting of mast in full length. The price shall also cover refilling of excavation pit with surrounding soil and stacking of retrieved mast. No explosives shall be used for this work.

Note: The transportation of retrieved mast to nearest TRD depot as advised by Railway Engineer In-charge can be claimed under item no. 38 of Sch-A1.

Item 31(l)(ii) - Removal of OHE Masts on Bridges

The price covers removal of OHE Masts on bridges by removing the nuts by spanners or by cutting if rusted.

Note: (1) In view of safety involved and site constraints, UTV machine is to be used for removal of OHE Masts on Bridges. In case of UTV machine utilization, proportional deduction of UTV machine utilization charges are to be deducted while paying.

(2) The transportation of retrieved mast to nearest TRD depot as advised by Railway Engineer In-charge can be claimed under item no. 38 of Sch-A1.

Item 31(m) - Releasing of pole mounted LT supply transformer

The price shall include the releasing of pole mounted LT supply transformer including D.O. fuse switch, insulators, jumpers, anti-climbing device, fencing panels, LAs and associated small parts steel work.

The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(n) - Dismantling of Guy Rod

The price is applicable to dismantling/cutting of guy rod assembly not provided for in other items. The price shall cover dismantling of guy rod assembly and associated small parts steel work (excluding components embedded in concrete).

Note: In case of buried anchor loop, cutting of guy rods can be done if dismantling is not possible.

Item 31(o) - Releasing of Multiple Cantilever Cross arm cantilever assemblies where single cantilever assembly is leftover.

The price shall cover dismantling of existing single bracket assembly leftover on multiple cantilevers cross arm assembly, dismantling of multiple cantilever cross arm assemblies, erection of bracket adaptor assemblies if required and erection of dismantled bracket assembly.

Note:

1) The price shall not include any consequential adjustment to traction overhead equipment such as re-spacing of droppers, levelling, etc.
2) The price shall not include supply of small parts of steel which will be paid for under item 3(cs).
3) Bracket adaptor erection should not be claimed under 3(b) and MCC dismantling should not be claimed under 31(s).

Item 31(p) - Dismantling of Drop Arms / TTB / Portal Booms/ Temporary Masts

The price shall include the dismantling of drop arms, TTB, Portal booms and temporary masts etc. The dismantled equipment shall be properly stacked.

Note: The transportation of drop arms/booms/temporary masts to nearest TRD depot as advised by Railway Engineer In-charge can be claimed under item no. 38.

Item 31(q) – Splicing and Extension of Feeder conductor

The price shall include the splicing of terminated all aluminium (spider) / copper feeder conductor for extension.

The cost of dismantling of feeder conductor would be paid for under item no. 31(d) for the whole length of the anchoring span irrespective of the physical position of the splices.

The extended feeder conductor (single spider) shall be deemed as starting from the centre line of the structure preceding the old terminating structure and the extended feeder conductor (single spider) shall be paid under item no. 7(a).

The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Note: The price does not include the supply of splices.

Item 31(r) - Dismantling of cantilever assemblies including insulators

The price shall include the dismantling of cantilever assemblies, not provided for in other items. The price includes the dismantling of cantilever assemblies including stay & bracket insulators, excluding small parts steel work. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(s) - Dismantling of Fabricated steel or SPS

The price shall include the dismantling of fabricated steel work or small parts steel (SPS), not provided for in other items. The dismantled equipment is to transported to nearest TRD Depot and to be properly stacked.

Item 31(t)(i) - Dismantling of a regulating equipment (Three pulley type) with counter weight assembly for conventional OHE

The price shall include the dismantling of regulating equipment (3 pulley type) with counter weight assembly for Conventional OHE, excluding small parts steel work. The dismantled equipment shall be transported to nearest TRD depot and properly stacked as advised by Railway Engineer In-charge.

Item 31(t)(ii) - Dismantling of a regulating equipment (three pulley type) with counter weight assembly for Tramway OHE

The price shall include the dismantling of regulating equipment (3 pulley type) with counter weight assembly for tramway OHE, excluding small parts steel work. The dismantled equipment shall be transported to nearest TRD depot and properly stacked as advised by Railway Engineer In-charge.

Item 31(t)(iii) - Dismantling of anti-creep with galvanized Steel wire or copper catenary wire

The price shall include the dismantling of anti-creep galvanized steel wire or copper catenary wire not provided for in other items. The price shall cover cost of dismantling of anti-creep including terminations, excluding small parts steel work (excluding components embedded in concrete). The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(t)(iv) – Dismantling of copper jumper

The price shall include the dismantling of all types of jumpers not accounted for in other items. The price shall cover the cost of dismantling jumpers, along with associated clamps, connectors, and other fittings. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(t)(v) - Dismantling of termination for conventional over head equipment conductor

The price shall include the dismantling of termination of conventional overhead equipment conductors for ATD & FTA, not accounted for in other items. The price shall cover cost of dismantling of termination of double overhead equipment conductors, excluding small parts steel work. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(t)(vi) - Dismantling of termination for tramway type OHE or single conductor of overhead equipment

The price shall include the dismantling of termination of tramway OHE for ATD & FTA, not accounted for in other items. The price shall cover cost of dismantling of termination of tramway OHE, excluding small parts steel work.

The price for dismantling of termination on one side of anti-creep can be claimed under this item.

The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(t)(vii) - Dismantling of Termination for Along Feeder (Aluminium or Copper)

The price shall include the dismantling of termination of all aluminium or copper 25 kV feeder conductors not accounted for in other items. The price shall cover cost of dismantling of termination of feeder, excluding small parts steel work.

The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(t)(viii) - Transfer of feeder wire from one mast to another

The price shall include the transfer of feeder to a suspension insulator on a new mast or support, and dismantling of the erected suspension insulator from the old mast or support, excluding the small parts steel work.

The foundation and steel work for the new mast or structure will be paid under appropriate items. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(t)(ix) - Re-adjustment of OHE spans including droppers

The price shall include the readjustment of OHE spans including droppers in a span, setting stagger, associated section insulator droppers and jumpers in a span. The price also includes the dismantling and re-erection of droppers, if required. The dismantled equipment shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Note: Half of the rate to be paid, if less than or equal to 4 droppers adjusted in any span.

Item 31(t)(x) – Dismantling of Structure Bond/Longitudinal Bond/Transverse & Special Bond / Platform Bond

The price shall include the dismantling of structure bond / longitudinal bond / transverse & special bond / platform bond. The dismantled bond shall be properly stacked and transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(i) - Dismantling of 25 kV Potential Transformer (Type I, II)

The price shall include the dismantling of 25 kV Potential Transformer complete with all fittings and accessories including terminal connectors. The process should ensure that no damage occurs to the potential transformer, associated equipment, or surrounding infrastructure. The price shall exclude the small parts steel (SPS).

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(ii) - Dismantling of 25 kV Current Transformer

The price shall include the dismantling of 25 kV Current Transformer complete with all fittings and accessories including terminal connectors. The process should ensure that no damage occurs to the current transformer, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(iii) - Dismantling of 132 kV Current Transformer

The price shall include the dismantling of 132 kV Current Transformer complete with all fittings and accessories including terminal connectors. The process should ensure that no damage occurs to the current transformer, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(iv) - Dismantling of 42 kV Lightning Arrester

The price shall include the dismantling of 42 kV Lightning Arrester complete with all fittings and accessories including terminal connectors. The process should ensure that no damage occurs to the Lightning Arrester, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(v) - Dismantling of 120/198kV Lightning Arrester

The price shall include the dismantling of 120 kV or 198 kV Lightning Arrester complete with all fittings and accessories including terminal connectors. The process should ensure that no damage occurs to the Lightning Arrester, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(vi) - Dismantling of 132 kV Double Pole Isolator

The price shall include the safe dismantling of 132 kV double pole isolators. The price also shall include the disconnection of all electrical connections, removal of mounting hardware, and any associated components. The process should ensure that no damage occurs to the isolator, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot or as advised by Railway Engineer In-charge.

Item 31(u)(vii) - Dismantling of 25 kV Single Pole Isolator 1600 A

The price shall include the safe dismantling of 132 kV/25 kV isolators. The price also shall include the disconnection of all electrical connections, removal of mounting hardware, and any associated components. The process should ensure that no damage occurs to the isolator, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(viii) - Dismantling of 25 kV Double Pole Isolator 1600 A

The price shall include the safe dismantling of 25 kV Double Pole Isolator (1600 A). The price also shall include the disconnection of all electrical connections, removal of mounting hardware, and any associated components. The process should ensure that no damage occurs to the isolator, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(ix) - Dismantling of 132/220 kV CB SF-6 type

The price shall include the safe dismantling of 132/220 kV SF-6 type CB. The price also shall include the disconnection of all electrical connections, removal of mounting hardware, and any associated components. The process should ensure that no damage occurs to the CB, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 31(u)(x) – Dismantling of 25 kV CB Vacuum/SF-6 type

The price shall include the safe dismantling of 25 kV CB. The price also shall include the disconnection of all electrical connections, removal of mounting hardware, and any associated components. The process should ensure that no damage occurs to the CB, associated equipment, or surrounding infrastructure.

The dismantled equipment shall be properly stacked at substation and/or shall be transported to nearest TRD depot as advised by Railway Engineer In-charge.

Item 32 - Extra Rate for Erection Under Power Block

The price under this item includes extra charges over and above erection rates of SOR items, for erection of equipment in the vicinity of energized overhead equipment and feeders or erection of equipment with joints equipment already energized or on energized equipment which calls for a power block (shut off of traction power).

The price payable under this item shall be **100% extra on the erection rates** of the item referred against each item, provided such work is not called for on account of non-compliance with specifications, approved drawings and instructions given by the purchaser from time to time.

Where the prices under this item are applicable, the contractor shall finalize the quantities of various items of work to be done under a power block, jointly with the Railway Engineer In-charge prior to taking the work in hand.

Item 34(a) - Construction of switching station building (super structure portion including plinth beam)

Supply & Erection: The price shall cover the construction of Control room of SP/SSP building above plinth and will include labour and material cost for the following works:

(i) RCC work in plinth, lintels, chajja, Roof slab.
(ii) Pre-cast RCC slab, RCC jail.
(iii) Cement concrete in flooring.
(iv) Brick masonry in walls.
(v) Plastering works.
(vi) For control room and battery room, Doors, windows grills, water pipeline ventilators and painting are to be provided.
(vii) For control room, tiles to be provided and for battery room acid resistant tiles to be provided along with acid proof painting for walls in battery room.
(viii) White washing and colour washing.
(ix) Spreading of stone metal (ballast).
(x) Provision of RCC pipe etc.

(xi) Any other Item of work required to complete the work which has not been mentioned/included above shall also be done by the contractor and nothing extra shall be paid the same.

(xii) Room size to be decided as per joint inspection at site suitably.

Construction of switching station shall be done strictly as per RDSO's drawing No.ETI/C/0067C (Mod-A) or latest.

The price shall cover the provision of all shuttering, frame works, arrangement of water, all tools and plants are required for the work, consumable materials etc. The materials used for the work such as brick, sand, stone aggregates, steel for door frame, grill, RCC pipe shall be of best quality in accordance with Railways specification.

The price shall also cover the provision of vent suitably on the wall, for installation of Exhaust fan in the battery room as well as control room.

Item 34(c) - RCC work for foundation and plinth in ratio 1:2:4

Supply & Erection: The price shall cover the price of reinforcement concrete work for construction of column including supply of cement, concrete, structuring arrangements and dismantling thereto but excluding cost of steel required for reinforcement which has been covered under appropriate item. The price shall cover cutting, bending and laying of reinforcement in column. The concrete mixture shall also be of 1:2:4 ratio before casting the same in accordance with IS: 456/1978

Item 34(d) – Brick work for foundation plinth

Supply & Erection: The price shall cover all labour and materials including cement and brick. The price covers supply, fixing, erecting, and removal of scaffolding, timber or steel frame work, shuttering, centering etc. The price covers arrangement of water at site, mixing of mortar, soaking bricks and all watering during the work and prescribed period of curing afterwards. The price shall cover the arrangement of all tools and plants required for work. The price shall cover all consumable materials e.g. fuel, oil, string, rope, wedges etc.

Item 34(e) - Construction of retaining wall with stone masonry

Supply & Erection: The price shall include all labour and materials including cement for Construction of retaining wall with Random rubble/stone masonry in cement & sand 1:4. The price shall cover supplying, fixing, erecting, and removal of scaffolding, timber or steel frame work, shuttering, centering etc. The price shall also include watering during the work.

Item 34(f) - Excavation of Earth, filling including compaction in all kinds of soil

The price shall cover the excavation of earth and earth filling at SP/SSP/TSS/OHE foundations. The price covers all labour and materials required including arrangement of necessary tools and plants required for the work. This price includes the transportation cost of earth in case, earth is not available for filling up the nearby area. The price covers the watering and ramming of levelled / filled earth either manually or by mechanical means. The price shall cover arrangement of necessary water required for the work.

The price also includes the disposal of excavated earth/leveling etc. for foundations, drainage etc

Item 34(h) - Excavation of Pile of 100 mm to 200 mm dia upto 3.5 m

The price shall cover the cost of all labour tools and plants required at site during making of a 100 to 200 mm dia bore hole along-with single under ream up to a depth of 3.50 metre. The excavated earth from the bore hole shall be disposed off and leveled all around. The price shall also cover the cost of all consumable materials and water is required at site during execution of work.

Item 34(i) - Plastering of Retaining wall with 1:4 cement mortar

Supply & Erection: The price shall cover the supply of all materials and labour cost including cement for plastering of Retaining wall either constructed by Rubble masonry work or Brick work. Plastering work shall be done by cement mortar in 1:4 (1 cement and 4 sand). The price shall also cover the cost of arrangement of necessary water is required for the work. The price shall cover the cost of necessary tools and plants required for the work and necessary consumable Items. Nothing extra shall be paid to the contractor for any rehandling of materials from the place of delivery to place of work. The price shall cover the cost of cleaning and wetting the surface of the work. The price shall also cover the cost of curing of the plastered surface as per extent practice.

Item 34(j) - Providing and Laying Pitching with Stone Boulders

Supply & Erection: Providing and laying Pitching with Stone Boulders, weighing approximately 25 kg each with voids filled with cement sand mortar 1:4 on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per Technical Specification. Rate is including the cost of cement.

Item 34(k) - Supply and spreading of 20 mm ballast at TSS/SSP/SP yards

Supply & Erection: The price shall include supply and spreading of uniformly graded 20 mm Ballast stone size in the TSS/SSP/SP yards, duly levelling the area. The Ballast stone shall be of good quality and free from any dust/dirt/muck. Prior approval shall be obtained from the Railway Engineer In-charge for the ballast stone sample. The ballast stones shall be spread out uniformly to a depth of 10 cm to 20 cm as directed by Railway Engineer In-charge.

Item 35 - Internal and External Lighting of Switching (SP/SSP) station building

Supply & Erection: The price shall cover all cost of labour and materials required for the work. Wiring work shall be done in accordance with IE rules, IS-732. The price shall also cover the cost of testing and commissioning of the installations. The various activities involved in the work are as follows:

- Fixing of MS conduits on wall and drawing of wires for circuit and point wiring.
- Provision of C.I. Switch boxes of appropriate size concealed in wall at appropriate height with phenolic laminated (Hylum) sheet for fixing of switches, plugs etc.
- Provision of Main Board and Distribution Boards and connection thereof.
- Provision of LED light fittings, Exhaust fan, Outdoor LED Light fittings complete with tubes and bulbs respectively as per requirement.
- Provision of Earthing station and connection between earthing station to Main Board with the help of 8 SWG GI wire. Earthing work shall be done in accordance with IS: 3043/1987.

- Materials such as energy efficient (LED) light fittings, Exhaust fan, switches sockets, Ceiling Rose, Socket outlets all shall be with ISI mark.
- Provision of Switches, sockets outlets, Ceiling Roses on respective switch boards and points in appropriate numbers and connection thereof.
- Provision of LED Street light fitting (80 Watt or above as per requirement) complete in all respect on the wall of the building facing towards switchyard.

After completion of wiring work necessary testing of wiring and Earthing station shall be done and results submitted to the site-in-charge duly signed by representatives of both the contractor and purchaser.

Item 36(a) – Unloading of all types of Steel Structures

The price shall cover unloading charges for all type of steel structures (BFB/RSJ, B-series, Special structures, N, O, R type structures, SPS etc.) from trailer/truck.

Item 36(b) – Loading of all types of Steel Structures

The price shall cover loading charges for all type of steel structures (BFB/RSJ, B-series, Special structures, N, O, R type structures, SPS etc.) from trailer/truck.

Item 37(a) – Unloading of all types of Copper and Aluminium Conductors

The price shall cover unloading charges for all type copper conductors (contact wire, catenary wire, Dropper wire, Bridle wire, Jumpers, etc.) and Aluminium conductors (spider conductor etc.) from trailer/truck.

Item 37(b) – Loading of all types of Copper and Aluminium Conductors

The price shall cover loading charges for all type copper conductors (contact wire, catenary wire, Dropper wire, Bridle wire, Jumpers, etc.) and Aluminium conductors (spider conductor etc.) from trailer/truck

Item 38 – Transportation of OHE structures / Materials / Equipments

The price shall include the transportation of new or released OHE structures / Materials / Equipments which are not covered in other items.

Item 39 – Erection of Released Equipment

The price for items 39(a), (b), (c), (d), (f), (g), (h), (i) and (j) shall include the erection of respective dismantled equipment under item no. 31 and taken into account by the Contractor as deemed to be supplied by the Purchaser. The payment for SPS in connection with erection of these items will be as per item no. 3(b) as per procedure as applicable to item 1 to 31.

If dismantled equipment is common to conventional and tramway OHE, same will be erected either for conventional or tramway OHE depending on requirement.

The price against these items shall include transportation of dismantled equipment, which are fit for erection as decided mutually by the Purchaser and the Contractor. The price shall also cover transport of released material (unused) to handover at nearest Purchaser's depot or any depot nominated by the purchaser.

Item 40(a) – Supply and Erection of Number Plates (Enamel Type)

Supply & Erection: The price shall include the supply and erection of one enamel number plate along with clamps & Fasteners (Bolt, Nut, Locknut, Spring Washer, Lead Washer etc.) on OHE structures (Masts/Portals/Drop Arms etc). The supply and erection of number plate shall conform to Drg No. RE/33/P/7501 (Rev. F) or latest, clamps shall be as per RDSO drawing no. ETI-OHE-G-01701 & ETI-OHE-P-3300 or latest and specification no. ETI/OHE/33 (8/85) or latest.

Item 40(b) – Supply and Erection of Number Plates (Retro-Reflective Type)

Supply & Erection: The price shall include the supply and erection of one retro-reflective number plate along with clamps, Fasteners (Bolt, Nut, Locknut, Spring Washer, Lead Washer etc.) on OHE structures (Masts/Portals/Drop Arms etc). The supply and erection of retro-reflective number plate shall conform to RDSO Drg No. ETI/OHE/P/7503 or latest, clamps shall be as per RDSO drawing no. ETI-OHE-G-01702 & ETI-OHE-P-3330 or latest and specification no. ETI/OHE/33A (12/97) Rev.8 or latest.

Item 41(a) – Supply and Erection of Retro-reflective type DJ ON (CLOSE)/DJ OFF (OPEN)/ 500 m/250 m/Train-18/MEMU Neutral Section Boards

Supply & Erection: The price shall include the supply and erection of Retro- Reflective type 500 m / 250 m warning board for neutral section of size 750 x 450 x 2 mm and DJ ON (Close)/ DJ OFF (Open)/Train-18/MEMU Neutral section boards of size 800 x 400 x 2 mm as per RDSO Specification No. ETI/OHE/33A (12/97) REV-8 or latest. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(b) – Supply and Erection of Enamel type Public Caution board Board with skull and bones symbol

Supply & Erection: The price shall include the supply and erection of Enamel type Public Caution Board / Staff Caution Board along with **skull and bones symbol** (3 Language - Hindi, English, Regional language) of size 700 mm x 400 mm x 2mm as per RDSO Specification No. ETI/OHE/33A (12/97) Rev-8 or latest and similar as per RDSO Drg No.RE/33/P/7551. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(c) – Supply and Erection of Enamel type Staff Caution Board

Supply & Erection: The price shall include the supply and erection of Retro-reflective type Public Caution Board / Staff Caution Board along with **skull and bones symbol** (3 Language - Hindi, English, Regional language) of size 500 mm x 400 mm x 2 mm as per RDSO Specification No. ETI/OHE/33A (12/97) Rev-8 or latest and similar as per RDSO Drg No.RE/33/P/7551. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(d) – Supply and Erection of Retro reflective Type Electric Engine Stop Board/ Caution Unwired Turnout Board

Supply & Erection: The price shall include the supply and erection of Retro-reflective Electric Engine Stop Board/Caution Unwired Turnout Board of size 900 mm x 600 mm x 2mm as per RDSO Specification No. ETI/OHE/33A (12/97) Rev-8 or latest and similar as per RDSO Drg No.RE/33/P/7572 Rev. B or latest. The price shall also include the supply

and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(e) – Supply and Erection of Retro-Reflective Type Power Block working limit Board

Supply & Erection: The price shall include the supply and erection of Retro-Reflective type Power Block Working Limit Board of size 450 x 450 x 2 mm as per RDSO Specification No. ETI/OHE/33A (12/97) REV-8 or latest and RDSO Drg no. ETI/OHE/P7574 Rev B or latest. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(f) - Supply and Erection of Enamel Caution Clearance to OHE nearby Restricted Board

Supply & Erection: The price shall include the supply and erection of Retro-reflective type Caution board 25 KV (OHE Nearby) of size 400 mm x 270 mm x 2 mm as per RDSO specification No. ETI/OHE/33A (12/97) Rev-8 (latest) and RDSO Drg. no.RE/33/436. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(g) - Supply and Erection of Retro-reflective type Danger Board with skull and bones for Height gauges

Supply & Erection: The price shall include the supply and erection of Retro-reflective type 25 KV Danger board with skull and bones for Height gauge at Level Crossing gate of size 1400 mm x 300mm x 2mm as per RDSO specification No. ETI/OHE/33A (12/97) Rev-8 or latest and RDSO Drg. No. ETI/C/0069 Mod-D (latest). The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(h) - Supply and Erection of Vitreous Enameled 25 kV Danger Board with skull & bones for Over-line Structure (OLS), Auxiliary Transformer

Supply & Erection: The price shall include the supply and erection of 25 kV Danger Board Vitreous Enameled with Skull &Bones of size 250 mm x 200 mm x 1.6 mm for AT & OLS protective screen(3 Language- Hindi, English, Regional language) as per RDSO Specification No. ETI/OHE/33A (12/97) Rev.8 or latest and RDSO Drg. No. ETI/OHE/SK/104 or latest. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(i) - Supply and Erection of Enamel Protected Area Board

Supply & Erection: The price shall include the supply and erection of Protected area-No Admission board with skull and bones(3 Language- Hindi, English, Regional language) of size 1200 mm x 450 mm x 2mm as per RDSO Specification No. ETI/OHE/33A (12/97) Rev.8 or latest. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(j) - Supply and Erection of Retro-Reflective Sigma Board

Supply & Erection: The price shall include the supply and erection of Retro-Reflective sigma sign board of size 450 mm x600 mm x2 mm as per RDSO specification No. ETI/OHE/33A/12/97) Rev.8 or latest and RDSO Drg. No. TI/DRG/OHE/PLTBRD/RDSO/0036/12/0 or latest. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(k) - Supply and Erection of Vitreous Enamelled TSS/SP/SSP Name Board

Supply & Erection: The price shall cover supply of TSS/SP/SSP name boards vitreous enamelled (Trilingual: Hindi, English, Telugu) of size 450 mm x 1200 mm x 2mm. Erection of name board at SP/SSP/TSS for provision on fencing panel. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 41(l) - Supply and erection of set of Isolator operation OPEN/CLOSE boards

Supply & Erection: The price shall cover supply of set of isolator operation open/close boards of size 600mmX900mm with thickness 5mm made of colour photo paper printed with chemical lamination. These boards are to be provided at Dy.SS rooms, SP's, SSP's, TSS's and depots. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

Item 42 - Supply and Erection of Shock Treatment Chart

Supply & Erection: The price shall include the supply and erection of shock treatment chart of size 900mmx 600mmx 8mm made of colour photo paper printed with chemical lamination as per relevant specification duly written instruction in English, Hindi and local language with all columns filled in. The price shall also include the supply of the required fixture/ fasteners for mounting on wall at the control cubicle/ station wherever required as directed by the Railway Engineer In-charge of the work. The price shall also include the supply and erection of clamping material (fixing arrangement with anti-corrosive paint) along with Fasteners (GI Bolt, Nut, Washers etc.)

43 – Supply and Erection of Protective Screens at/on ROB/FOBs

Supply & Erection: The price shall include on per track basis on both sides of ROB/FOB, the cost of all material required for fabrication of protective screen including angle, Tee, expanded metal (Jali), GI sheet, paints etc.

The price shall also include the labour cost for fabrication, erection and painting at various locations. The fabrication and erection work shall be done as per RDSO Drg. No. ETI/C/0068 Mod. I or latest. The price shall also include the filling of gap between gangway floor and protective screen with cement to avoid escape of water from floor of FOB while cleaning and fall on OHE to avoid continuous path to fault current.

Item 45(a) – Erection of 25 kV Current Transformer

Erection: The price shall include erection, testing, commissioning, and connecting of a 25 kV Current Transformer of all ratings complete with all fittings and accessories including terminal connectors. It shall also include mounting of the transformer in position.

Item 45(b) - Erection of 132 kV or 220 kV Outdoor Current Transformer

Erection: The price shall include erection, testing, commissioning, and connecting of a 132 kV or 220 kV Current Transformer of all ratings complete with all fittings and accessories including terminal connectors. It shall also include mounting of the transformer in position.

SCHEDULE A2: FOUNDATION ITEMS (SUPPLY & ERECTION)

Item 2(a)(i) - Concrete for foundations and plinth in Hard Soil &

Item 2(a)(ii) - Concrete for foundations and plinth in Rocky Soil

Supply & Erection: The price shall cover excavation, supply & handling of all materials, accessories, temporary arrangements for excavation in hard soil and in concrete/masonry drains/walls requiring use of chisel and hammer under item 2(a)(i) or requiring blasting under item 2(a)(ii), Shoring wherever necessary, casting concrete including frame work wherever necessary, tamping of concrete, grouting of masts and finishing the top of concrete foundation or anchor blocks. The price also includes dismantling of all connected temporary arrangements, back filling with earth and compacting the same to the required height and width as per drawing to ensure safety of foundation, confining the exposed height of foundation block to within 10 cm and removal of soil.

The Purchaser's Engineer shall certify where use of chisel and hammer or blasting has been necessary. The contractor shall arrange for supply of explosives and all tools & plants for blasting operations at his own cost. If half or more of the depth or width of excavation is in hard soil/concrete/masonry drains/walls or in rock, the entire foundations shall be paid for under item 2(a) (i) or 2 (a) (ii) as the case may be. If half of the depth or width of the excavation is in hard soil/concrete/masonry drains/walls and the other half is in rock, the entire foundation shall be paid under item 2 (a) (ii). The price shall include the cost of cement. Proper curing of foundation is to be ensured.

Notes for measurement for items 2(a)(i) and (ii)

1. The payable volume of the foundations under item 2(a)(i) and (ii) shall be the designed one as shown in the drawings for which the hole has been blasted, irrespective of the actual configuration assumed by the latter due to the blasting.
2. The depth of the excavation shall be measured from the formation level to the maximum excavated point.

Item 2(b) - Concrete for foundations and plinth in other than Hard and Rock Soil

Supply & Erection: The price shall include all works mentioned in item 2(a)(i) & 2(a)(ii) in all classes of soil except hard soil, masonry drains, walls and rock. Proper curing of foundation is to be ensured. The price shall also include foundations for AT/BT masts.

Note for item 2(a)(i), 2(a)(ii) & 2(b):

(a) In coastal area, M15 for foundation and M20 for grouting may be followed
(b) For remaining areas, M10 for foundation and M15 for grouting may be followed.

Item 2(c)(i) - Reinforced Concrete for foundation, plinth and trench

Supply & Erection: The price shall cover excavation and all reinforced concrete work for foundations including supply of steel for reinforcement & other materials including bending, binding, laying of the reinforcement, shoring wherever necessary, casting concrete including framework wherever necessary, grouting and finishing the tops of foundation blocks. The price shall also include dismantling of all connected temporary arrangements, back filling as required and removal of soil.

The price shall also cover all concrete work for foundation (including that of Height gauge) or anchor blocks on bridge piers, irrespective of whether they are actually

reinforced or not, those for cast-in-situ piles foundation and counter weight foundations. Rails and fasteners required for counter weight foundations shall be supplied by the Purchaser free at the Contractor's depot or work spot according to convenience of the Purchaser. The volume of cast-in-situ piles shall be added to the volume of foundation block for the purpose of payment. Dowel bars as may be required for bond with bridge structures shall be supplied and erected free of cost by the Purchaser. Dowel bars will not be considered as reinforcement for the purpose of this item. The price shall also include the cost of cement. Proper curing of foundation is to be ensured.

Item 2(c)(ii) - Reinforced concrete for Cable Trench covers

Supply & Erection: The price shall cover casting of cable trench covers in reinforced concrete as per RDSO Drg. No. ETI/C/0038 MOD-E and SCR/HQ/Elcet/SSP&SP/CABLE TRENCH or as per site requirement with superior quality. The price shall include the supply of steel for reinforcement angle iron for the frame and fabrication of angle iron frame etc. The price shall include positioning and dressing up of trench covers, if required. The price shall include the cost of cement also. Cement will not be supplied by Railways. Proper curing is to be ensured.

Note: Nominal reinforcement will be necessary in black cotton soil foundations. Such nominally reinforced foundations in black cotton soil will be payable under item 2(b) and not under item 2(c). The steel for nominal reinforcement will be arranged by the Contractor and the concrete mixture, in such a case shall be as for normal foundations 1:3:6.

Item 2(d)(i) - Reinforcement of Brick Work

Supply & Erection: The price shall cover excavation and construction of reinforced brick work laid in cement mortar 1:3 mix for the baffle wall. The price shall include supply of steel for reinforcement and other materials. The price shall also include bending/binding and laying of reinforcement, shoring, shuttering and scaffolding arrangement, required for the construction of brick wall and its curing.

The price shall also include dismantling of all connected temporary arrangements, back filling required and removal of spoil. The price shall also include the cost of cement. Proper curing is to be ensured.

Item 2(d)(ii) - Plastering of Brick Work

Supply & Erection: The price shall cover supply and handling of all materials, scaffolding arrangements, raking out joints, curing and finishing of plaster (12 mm. thicknesses with cement mortar 1:4 mix.) on the Baffle wall.

The price shall also include dismantling of all connected temporary arrangements and removal of spoil. The price shall also include the cost of cement. Proper curing of is to be ensured.

Item 2(e) - Extra for supply & sinking of concrete shells (M15 grade)

Supply & Erection: The price shall cover on items 2(a), (b) and (c) for supply and sinking of a concrete shell before casting of concrete for traction structure foundations or anchor blocks including pumping of water wherever necessary. Purchaser's Engineer shall decide whether sinking of concrete shells is necessary. Proper curing of is to be ensured.

Item 2(f) - Casting of foundations using mechanised Augur (M15 grade)

Supply & Erection: The price shall cover excavation, supply and handling of all materials including supply and erection of steel for reinforcement, accessories/temporary arrangements and all associated operations for casting of foundations by mechanized Augur in all type of soils except rocks. All machines, tools and equipment needed for the above shall be supplied by the Contractor at his own cost. The price shall include the cost of cement.

NOTE:

1. The payable volume of the foundation shall be the designed one as shown in the drawings for which the pit has been excavated irrespective of the actual configuration assumed by the latter after auguring.
2. The depth of the excavation shall be measured from the formation level to the maximum excavated point.

Item 2(g) - Casting of single under reamed pile foundation (M15 grade)

Supply & Erection: The price shall cover boring of hole for under reamed pile as per RDSO Drg. No.ETI/C/0062 which is having dia. of 300 mm or if any sizes as approved by Purchaser required for cast-in-situ pile foundation including difficult location like low lying areas near river, ponds or at any other location of which foundation is not covered under item No. 2(a) to 2 (f). The price shall also cover the charges of pumping set required for draining of water encountered while boring the holes, cost of compressor or any other machine required for breaking of brick apron or any other hard strata if it is coming in way of boring of holes. The price shall also cover the casting of concreting of ratio 1:2:4 mix 20mm graded stone or downgraded and cost of shuttering and its removal and cost of any other item which is encountering during course of boring and casting of pile. Proper curing of is to be ensured.

The price shall also cover the cost of cutting, bending and laying of reinforcement but excluding the cost of steel required for reinforcement which has been covered under appropriate item. The price shall also cover the cost of all other materials including cement required for the work.

The work shall be executed strictly in accordance with IS-456/2000.The price shall also cover the cost of transportation (to and fro) of all materials, tools and plants required for the work. The price shall cover the cost of compactness the concrete with the help of Electrical/Mechanical vibrator.

The price shall also cover the screening and washing of concrete. The price shall also cover the cost of consumable like fuel, oil, wedges, string rope etc., required for the finishing the work.

The cost of full volume of RCC pile cap and RCC column upto Rail level height more than one meter on top of piles shall be covered under item 2(g)(i), however for heights, less than one meter the rates of item 2(c) shall be applicable.

Item 2(h)(i) - Reinforcement cement concrete, ratio 1:2:4 in columns with 20 mm and downgraded stone aggregate and coarse sand.

Supply & Erection: The price shall cover the cost of reinforcement cement concrete work for construction of column including supply of cement, concreting, shuttering arrangements and dismantling thereto but excluding cost of steel required for

reinforcement which has been covered under item 3(g). The price shall cover cutting, bending and lying of reinforcement in column. The concrete mixture shall be of 1:2:4 ratio and casting of the same to be done in accordance with IS: 456/2000.

The item shall cover any requirement of concreting in the special foundation design which has not been covered under item 2(c) or where foundations are required to be projected above ground level to the extent of more than 1 meter, and shall be operated for the work of foundation or OHE supports only. Proper curing of is to be ensured.

Item 2(h)(ii) - Reinforcement cement concrete, ratio 1:3:6 in pile caps with 20 mm and downgraded stone aggregate and coarse sand.

Supply & Erection: The price shall cover the cost of reinforcement concrete work for construction of pile caps including supply of cement, concreting, shuttering arrangements and dismantling thereto but excluding cost of steel required for reinforcement which has been covered under appropriate item. The price shall cover cutting, bending and laying of reinforcement in column. The concrete mixture shall be of 1:3:6 ratio and casting of the same to be done in accordance with IS:456/1978. Proper curing of is to be ensured.

Item 2(h)(iii) - Mass concrete (PCC), ratio 1:4:8 stone with nominal size stone aggregate 40 mm gauge and ordinary sand in mud mat.

Supply & Erection: The price shall cover the cost of all materials e.g. 40mm graded stone aggregate, sand, cement, arrangement of water and necessary tools and plants. The price shall be inclusive of shuttering arrangement, cutting, levelling, finishing etc. The price shall cover the cost of transportation (to and fro) of all materials, tool and plants etc., and handling/re-handling of materials at the site. The price shall cover the screening and washing of concrete. The price shall also cover the cost of consumable materials like fuel, oil, wedges, string rope etc. required for the work. Proper curing of is to be ensured.

Item 2(i) - Breaking of foundation up to 200 mm below track formation and drain / PF surface etc

Supply & Erection: The price shall include breaking of concrete of OHE foundation / Drain / PF etc up to 200 mm below the formation / ground level using required hand operated electrical / pneumatic hammer / tools and plant including cutting of embedded metallic parts to facilitate the casting of OHE foundations and the installation of earth pits on platforms. It also covers the disposal of debris beyond the station yard limits. After the foundations are cast/earth pits are installed, the flooring must be neatly restored to its original condition. The work shall be carried out as per the instructions of Railway Engineer In-charge.

SCHEDULE B1: STEEL SUPPLY

Item 3(as) – Supply of Rolled or Fabricated and Galvanized Traction Masts, Switching Station Masts, AT Mast, Feeder Mast etc as per latest RDSO and IS Specifications.

Supply: The price shall include the supply of traction masts and main masts including B, K, and S series masts, as well as masts for switching stations, ATs (Auxiliary Transformers), and FPs (Feeder Posts), in accordance with the latest RDSO drawings and IS specifications.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also include the weighing of the aforementioned steel components prior to handing them over to the purchaser for execution of the work.

Item 3(bs) – Supply of Fabricated and Galvanized structures other than masts such as TTC, Portals, as per latest RDSO and IS Specifications.

Supply: The price shall include the supply of fabricated steel structures, excluding masts, such as TTCs and portal sets as required for the work, in accordance with the latest RDSO drawings and relevant IS specifications.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also include the weighing of the aforementioned steel components prior to handing them over to the purchaser for execution of the work.

Item 3(cs) – Supply of Fabricated and Galvanized Small Parts Steel (SPS) other than masts, TTC and Portal as per latest RDSO and IS Specifications.

Supply: The price shall include the supply of all fabricated steel work, including fasteners.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also include the weighing of the aforementioned steel components prior to handing them over to the purchaser for execution of the work.

The cost of erection for this steel work, if undertaken by the contractor, will be paid separately under item 3(b) of Schedule A.

For standard fabricated steelwork for which RDSO's approved drawings are available, the weights of steelwork as specified in RDSO's drawings shall be considered for payment. However, in case the unit sectional weight of any member indicated in RDSO's drawings is not in conformity with the unit sectional weight as per the latest I.S. specification, the weight of the fabricated steel work shall be calculated on the basis of latest I.S. specification and the same will be considered for payment.

For the non-standard fabricated steelwork (like base frame for interrupters/ CB's, plate for boom splicing etc., the calculated weight to be considered for payment under this shall be included in the relevant drawing based on, latest I.S. sectional weight at the time of submitting the designs for approval of the purchaser.

All fabricated steel work shall be galvanized with hot dip galvanization.

Note for 3(cs): For the purpose of payment against 3(cs) weight of structures of fabricated steel work will be calculated according to the weight of black steel given in section books for the lengths of various members shown in the approved drawings. There will be no addition for increased weight due to galvanizing or painting or weld materials or reduction for holes or skew cuts.

SCHEDULE B2: COPPER SUPPLY

Item 6(cs) - Supply of 7 mm dia Solid Round Hard Drawn Copper Dropper Wire

Supply: The price shall include the supply of 7 mm dia. Solid Round Hard Drawn Copper Dropper Wire as per IS: 282-1982 Specification with latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper dropper wire before its handover to the purchaser for execution of the work.

Item 6(ds) - Supply of 5 mm dia Solid Round Hard Drawn Copper Dropper Wire

Supply: The price shall include the supply of 5 mm dia. Solid Round Hard Drawn Copper Dropper Wire, as per IS: 282-1982 Specification with latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper dropper wire before its handover to the purchaser for execution of the work.

Item 6(es) - Supply of Cadmium Copper Bridle Wire (7/2.1 mm)

Supply: The price shall include the supply of 20 sq mm cadmium copper bridle wire (7/2.1 mm) as per RDSO Specification TI/SPC/OHE/CAT/Cu-Cd/0971 or latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper bridle wire before its handover to the purchaser for execution of the work.

Item 7(bs) - Supply of 150 sq.mm Hard Drawn Stranded Copper Cross Feeder Wire

Supply: The price shall include the supply of 150 sq. mm hard drawn bare copper cross feeder wire (37/2.25 mm) as per RDSO Specification TI/SPC/OHE/HDCSCF/0031 or latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper cross feeder wire before its handover to the purchaser for execution of the work.

Item 7(cs) - Supply of 130 sq.mm Cadmium Copper Large Span Wire

Supply: The price shall include the supply of 37/2.10 mm cadmium copper large span wire (130 sq.mm), required for the work, as per RDSO's Specification No. ETI/OHE/50(6/97) with latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper large span wire before its handover to the purchaser for execution of the work.

Item 15(as) - Supply of 50 sq.mm Annealed Stranded Copper Jumper Wire

Supply: The price shall include the supply of 50 sq. mm annealed stranded copper conductors (19/1.8) – jumper wire (unit weight of 0.438 kg/m) as per RDSO Specification TI/SPC/OHE/JMP/0941 or latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper jumper wire before its handover to the purchaser for execution of the work.

Item 15(bs) - Supply of 160 sq.mm Annealed Stranded Copper Jumper Wire

Supply: The price shall include the supply of 160 sq. mm annealed stranded copper conductors (19/7/1.25) – jumper wire (unit weight of 1.504 kg/m) as per RDSO Specification TI/SPC/OHE/JMP/0941 or latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper jumper wire before its handover to the purchaser for execution of the work.

Item 15(cs) - Supply of 105 sq.mm Annealed Stranded Copper Jumper Wire

Supply: The price shall include the supply of 105 sq. mm annealed stranded copper conductors (19/7/1.25) – jumper wire (unit weight of 0.9936 kg/m) as per RDSO Specification TI/SPC/OHE/JMP/0941 or latest revision.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover the weighing of the copper jumper wire before its handover to the purchaser for execution of the work.

SCHEDULE B3: INSULATOR SUPPPLY

Item 4(ax) – Supply of Porcelain Stay and Bracket Insulators for item no. 4(a)(i) / 4(a)(iv).

Supply: The price shall include the supply of one Porcelain Stay Arm Insulator (RI 6000-2) (1050 mm CD) and one Porcelain Bracket Insulator (RI 6030-1) (1050 mm CD) as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or Latest for cantilever assembly covered under item no. 4(a)(i) / 4(a)(iv).

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 4(ax)(i) – Supply of Porcelain Stay Insulator for item no. 4(a)(i) / 4(a)(iv).

Supply: The price shall include the supply of one Porcelain Stay Arm Insulator (RI 6000-2) (1050 mm CD) as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or Latest for cantilever assembly covered under item no. 4(a)(i) / 4(a)(iv).

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 4(ax)(ii) – Supply of Porcelain Bracket Insulators for item no. 4(a)(i) / 4(a)(iv).

Supply: The price shall include the supply of one Porcelain Bracket Insulator (RI 6030-1) (1050 mm CD) as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or Latest for cantilever assembly covered under item no. 4(a)(i)/ 4(a)(iv).

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 4(axx) - Supply of Composite Stay and Bracket Insulators for item no. 4(a)(i) / 4(a)(iv).

Supply: The price shall include the supply of one Composite Stay Arm Insulator (1600 mm CD) and one Bracket Composite Insulator (1600 mm CD) as per RDSO specification TI/SPC/OHE/INSCOM/1072 or Latest for cantilever assembly covered under item no. 4(a)(i)/ 4(a)(iv).

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 4(axx)(i) - Supply of Composite Stay Insulator for item no. 4(a)(i) / 4(a)(iv).

Supply: The price shall include the supply of one Composite Stay Arm Insulator (1600 mm CD) as per RDSO specification TI/SPC/OHE/INSCOM/1072 or Latest for cantilever assembly covered under item no. 4(a)(i) / 4(a)(iv).

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the

price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 4(axx)(ii) - Supply of Composite Bracket Insulator for item no. 4(a)(i) / 4(a)(iv).

Supply: The price shall include the supply of one Composite Bracket Insulator (1600 mm CD) as per RDSO specification TI/SPC/OHE/INSCOM/1072 or Latest for cantilever assembly covered under item no. 4(a)(i) / 4(a)(iv).

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 4(bx) - Supply of Porcelain Insulator for item no. 4(b)(i) / 4(b)(ii)

Supply: The price shall include the supply of one Porcelain 9-ton insulator (RI 6020-1) (1050 mm CD) as per RDSO specification TI/SPC/OHE/INS/0071(04/2022) or Latest for pull-off arrangement.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 4(bxx) - Supply of Composite Insulator for item no. 4(b)(i) / 4(b)(ii)

Supply: The price shall include the supply of one Composite 9-ton insulator (1600 mm CD) as per RDSO specification TI/SPC/OHE/INSCOM/1072 or latest for pull-off arrangement.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 8(bx) - Supply of Porcelain 9-ton Insulator for item no. 8(b)(i) / 8(b)(ii) / 8(b)(iii) / 8(b)(vi) / 8(b)(ix), 9(a) / 9(b) / 9(c) / 9(d) and 11(a)(i) / 11(a)(ii)

Supply: The price shall include the supply of one Porcelain 9-ton insulator (RI 6020-1) (1050 mm CD) as per RDSO specification TI/SPC/OHE/INS/0071(04/2022) or Latest for termination / anti-creep arrangement / cut-in insulator / suspension insulator etc.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 8(bxx) - Supply of Composite 9-ton Insulator for item no. 8(b)(i) / 8(b)(ii) / 8(b)(iii) / 8(b)(vi) / 8(b)(ix), 9(a) / 9(b) / 9(c) / 9(d) and 11(a)(i) / 11(a)(ii)

Supply: The price shall include the supply of one Composite 9-ton insulator (1600 mm CD) as per RDSO specification TI/SPC/OHE/INSCOM/1072 or latest for termination / anti-creep arrangement / cut-in insulator / suspension insulator etc.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the

price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 11(bx) – Supply of Post Insulator for item no. 11(b)

Supply: The price shall include the supply of one Post Insulator for 25 kV Isolator and Bus bar Assembly (RI No. 6090), as per RDSO specification No. TI/SPC/OHE/INS/0071 and Drawing No. ETI/OHE/P/6090-1 or Latest covered under item no. 11(b) of Sch-A1.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 12(ax) - Supply of Sectioning and 9-ton Insulators for item no. 12 (a)

Supply: The price shall include the supply of one 25 kV Sectioning (Core) Insulator (RI No. 6110) (CD 850 mm) and one Porcelain 9-ton insulator (RI 6020-1) (1050 MM CD) as per RDSO specification TI/SPC/OHE/INS/0071(04/2022) or Latest covered under for item no. 12(a) of Sch-A1.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 12(bx) - Supply of Sectioning Insulator for item no. 12(b)

Supply: The price shall include the supply of one 25 kV Sectioning (Core) Insulator (RI No. 6110) (CD 850 mm) as per RDSO specification TI/SPC/OHE/INS/0071(04/2022) or Latest covered under item no. 12(b) of Sch-A1.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 13(ax) - Supply of Post and Operating Insulators for item no. 13(a)

Supply: The price shall include the supply of two Post Insulators (RI No. 6090) and one Operating Rod Insulator (RI No. 6260) (CD 850 mm) as per RDSO Specification No. TI/SPC/OHE/INS/0071 or Latest covered under item no. 13(a) of Sch-A1.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 13(bx) - Supply of Post and Operating Insulators for item no. 13(b)

Supply: The price shall include the supply of four Post Insulators(RI No. 6090) and two Operating Rod Insulator (RI No. 6260) (CD 850 mm) as per RDSO Specification No. TI/SPC/OHE/INS/0071 or Latest covered under item no. 13(b) of Sch-A1.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the

price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

Item 28(x) – Supply of Post Insulators for item 28

Supply: The price shall include the supply of two Post Insulators as per RDSO specification No. TI/SPC/OHE/INS/0071 and Drawing No. ETI/OHE/P/6090-1 or Latest covered under item no. 28 of Sch-A1.

Delivery shall be made to the OHE depot and subsequently transported to the designated worksite location or as directed by the Railway Engineer In-charge. Additionally, the price shall also cover testing of insulator before installation as per RDSO Specification TI/SPC/OHE/INS/0071(04/2022) or its latest revision.

SCHEDULE B4: GENERAL SUPPLY

Item 7(as) - Supply of All Aluminium 25 kV Feeder conductor (Single Spider 19/3.99 mm)

Supply: The price include supply of 25 kV Aluminium feeder conductor made of all aluminium bare, hard drawn conductor 19/3.99 mm (Single Spider) as per IS:398 (Part-I) 1996 or latest or RDSO latest specification.

Item 12(cs) - Supply of Light Weight Section Insulator

Supply: The price shall include the supply of Light Weight Section Insulator as per RDSO Specification No. TI/SPC/OHE/LWTSI/0060(Rev.1) with A & C Slip no. 1 or its latest revision.

Item 14(as) – Supply of PTFE Short Neutral Section Assembly

Supply: The price shall include supply of PTFE Short Neutral Section Assembly Complete (Phase Break) suitable for 107 Sq mm Grooved Copper Contact Wire and 65 Sq mm Cadmium Copper Wire as per RDSO Specification No. TI/SPC/OHE/SNS/0000 Rev-1 with A & C Slip No. 1 or latest revision.

Item 18(as) – Supply of 25 kV Vacuum Interrupter (BM)

Supply: The price shall include supply of 25 kV Single Pole Vacuum Interrupter complete with all necessary fittings, terminal connectors, accessories, fasteners etc., as per RDSO Spec. No. TI/SPC/PSI/LVCBIN/0121 (05/23) or latest revision. This is to ensure efficient and trouble-free operation at the designated site of work or the depot nominated by the Railways.

Item 18(bs) – Supply of 25 kV Vacuum Circuit Breaker (CB)

Supply: The price shall include supply of 25 kV Single Pole Circuit Breaker (CB) complete with all necessary fittings, terminal connectors, accessories, fasteners etc., as per RDSO Spec. No. TI/SPC/PSI/LVCBIN/0121 (05/23) or latest revision. This is to ensure efficient and trouble-free operation at the designated site of work or the depot nominated by the Railways.

Item 18(cs) - Supply of 132kV Double Pole SF-6 Circuit Breaker

Supply: The price shall include supply of 132 kV Double Pole SF-6 Gas Circuit Breaker, complete with all necessary fittings, terminal connectors, accessories, fasteners etc., as per RDSO Spec. No. TI/SPC/PSI/HVCB/0121 with A&C slip no.1 or latest revision. This is to ensure efficient and trouble-free operation at the designated site of work or the depot nominated by the Railways.

The price shall also cover supply of terminal connectors, supporting frame and SF6 gas for first filling for commissioning of the Circuit Breaker. The price shall also include interlocking arrangement with the adjacent isolators.

Item 19(as) - Supply of 25 kV Type-I Potential Transformer (PT)

Supply: The price shall include the supply of a 25 kV Potential Transformer Type-I (Indication/Measuring), complete with all necessary fittings, terminal connectors, accessories, fasteners etc., in accordance with RDSO Specification No. TI/SPC/PSI/PT/0120 (06/2021) or the latest revision. This is to ensure efficient and

trouble-free operation at the designated site of work or the depot nominated by the Railways. However, the price shall exclude the cost of any small parts or steelwork.

Item 19(bs) - Supply of 25 kV Type-II Potential Transformer (PT)

Supply: The price shall include the supply of a 25 kV Potential Transformer Type-II (Protection), complete with all necessary fittings, terminal connectors, accessories, fasteners etc., in accordance with RDSO Specification No. TI/SPC/PSI/PT/0120 (06/2021) or the latest revision. This is to ensure efficient and trouble-free operation at the designated site of work or the depot nominated by the Railways. However, the price shall exclude the cost of any small parts or steelwork.

Item 20(as) - Supply of 42 kV, 10 kA Metal oxide Gapless type lightning arrester

Supply: The price shall include supply of 42 kV, 10 kA rating Metal Oxide Gapless Lightning arrester complete with all necessary fittings, terminal connectors, accessories, fasteners etc., as per TI/SPC/PSI/MOGTLA/0101 (02/2015) at the work-site or at the depot nominated by Railways. However, the price shall exclude the cost of jumper wire and any small parts steel work.

Item 20(bs) - Supply of 120 kV, 10 kA Metal oxide Gapless type lightning arrester

Supply: The price shall include supply of 120 kV, 10 kA rating Metal Oxide Gapless Lightning arrester with surge counters complete with all necessary fittings, terminal connectors, accessories, fasteners etc., as per TI/SPC/PSI/MOGTLA/0101 (02/2015) at the work-site or at the depot nominated by Railways. However, the price shall exclude the cost of jumper wire and any small parts steel work.

Item 20(cs) - Supply of 198 kV, 10 kA Metal oxide Gapless type lightning arrester

Supply: The price shall include supply of 198 kV, 10 kA rating Metal Oxide Gapless Lightning arrester with surge counters complete with all necessary fittings, terminal connectors, accessories, fasteners etc., as per TI/SPC/PSI/MOGTLA/0101 (02/2015) at the work-site or at the depot nominated by Railways. However, the price shall exclude the cost of jumper wire and any small parts steel work.

Item 23(as) - Supply of 110 V, 40 Ah Low Maintenance Lead Acid Battery

Supply: The price shall cover supply of 110V, 40 Ah low maintenance lead acid battery complete with stand, accessories and a tool board as per RDSO Specification No. RDSO/PE/SPEC/TL/0040(Rev-2)/2021 or latest revision at the site of work or at the depot nominated by railways. The price excludes the cost of connecting cables, the supply and erection of which will be paid for under appropriate Item.

Item 23(bs) - Supply of Battery Charger for 110 V, 40 Ah lead acid battery.

Supply: The price shall cover supply of battery charger for a 110V, 40 Ah lead acid battery complete with connecting lead and plug for connection to 230 V A.C. supply as per RDSO specification No. TI/SPC/PSI/40-150 CHGR/1210 or latest revision at the site of work or at the depot nominated by railways. The price shall not include supply of any cable for connecting the charger to the 110V battery which shall be paid for under appropriate Item.

Item 24(as) - Supply of 110 V, 200 Ah Low Maintenance Lead Acid Battery.

Supply: The price shall cover supply of 110V, 200 Ah low maintenance lead acid battery complete with stand, accessories, and a tool board as per RDSO Specification No. RDSO/PE/SPEC/TL/0040(Rev-2)/2021 or latest revision at the site of work or at the depot nominated by railways. The price excludes the cost of connecting cables, the supply and erection of which will be paid for under appropriate item.

NOTE: One set containing **55 nos. of 2 V, 200 Ah Lead Acid battery**.

Item 24(bs) - Supply of Battery Charger for 110 V, 200 Ah lead acid battery

Supply: The price shall cover supply of battery charger for a 110V, 200 Ah lead acid battery complete with connecting lead and plug for connection to 230 V A.C. supply as per RDSO specification No. TI/SPC/PSI/200-250CHGR/0210 or latest revision at the site of work or at the depot nominated by railways. The price shall not include supply and erection of any cable for connecting the charger to the 110V battery which shall be paid for under appropriate item.

Item 27(as) – Supply of 5 kVA, 25 kV/ 240 V Oil filled Auxiliary Transformer

Supply: The price shall cover supply of Auxiliary Transformer 5 kVA, 25 kV/240V, Oil type as per RDSO specification No. ETI/PSI/15(11/92) or latest revision, complete with terminal connectors at the work site or at the depot nominated of railways.

Item 27(bs) - Supply of 10 kVA, 25 kV/ 240 V Oil filled Auxiliary Transformer

Supply: The price shall cover supply of Auxiliary Transformer 10 kVA, 25 kV/240V, Oil type as per RDSO specification No. ETI/PSI/15(11/92) or latest revision, complete with terminal connectors at the work site or at the depot nominated of railways.

Item 27(cs) - Supply of 25 kVA, 25 kV/ 240 V Oil filled Auxiliary Transformer

Supply: The price shall cover supply of Auxiliary Transformer 25 kVA, 25 kV/240V, Oil type as per RDSO specification No. ETI/PSI/15(11/92) or latest revision, complete with terminal connectors at the work site or at the depot nominated of railways.

Item 28(s) - Supply of 25 kV Operating Rod for Drop Out Fuse Switch

Supply: The price shall include the supply of 25 kV operating pole / rod for 25 kV drop out switch as per RDSO specification No. ETI/PSI/14(1/86) with A&C slip No. 1 or latest revision.

Item 45(as) - Supply of 25 kV Current Transformer CT Ratio 1500-750/5A

Supply: The price shall include the supply of a 25 kV Current Transformer CT Ratio 1500-750/5A complete with all necessary fittings, terminal connectors, accessories, fasteners etc., in accordance with RDSO Specification No. TI/SPC/PSI/CT/0210(07/2021) or the latest revision. This is to ensure efficient and trouble-free operation at the designated site of work or the depot nominated by the Railways. However, the price shall exclude the cost of any small parts or steel work.

Item 45(bs) - Supply of 132 kV oil filled current transformer of ratio 400-200/5A

Supply: The price shall include the supply of a 132 kV Oil filled Current Transformer CT Ratio 400-200/5A complete with all necessary fittings, terminal connectors, accessories, fasteners etc., in accordance with RDSO Specification No. TI/SPC/PSI/CT/0210

(07/2021) or the latest revision. This is to ensure efficient and trouble-free operation at the designated site of work or the depot nominated by the Railways. However, the price shall exclude the cost of any small parts or steel work.

Item 45(cs) - Supply of 220 kV oil filled current transformer of ratio 200-100/1-1 A

Supply: The price shall include the supply of a 220 kV oil filled current transformer of ratio 200-100/1-1 A complete with all necessary fittings, terminal connectors, accessories, fasteners etc., in accordance with RDSO Specification No. TI/SPC/PSI/CT/0210(07/2021) or the latest revision. This is to ensure efficient and trouble-free operation at the designated site of work or the depot nominated by the Railways. However, the price shall exclude the cost of any small parts or steel work.

SCHEDULE C: GENERAL ITEMS

Item 3(z) – Portal Boom Splicing and Extension

Splicing & Extension: The price is applicable to splicing of all types of portal booms for extension of clear span. The price shall cover modification of two end pieces (one existing at one end of boom and the other to be erected) involving cutting, drilling, welding, cold galvanization etc. to suit clear span as per site condition. The price shall also cover erection of modified end piece, splicing including supply and erection of bolts, nuts, washers required for splicing of boom.

The price shall exclude dismantling of upright and supply of end piece, small part steel required for modification of end pieces including splice/covering angle, etc. which will be paid for under items 31(k)(ii) of Sch-A1 & 3(cs) of Sch-B1.

Note: Splicing plates shall be supplied suitably as per requirement. Splicing plates are different for N, O and R type portals

Item 4(z)(i) - Replacement of Stay Insulator under Power Block

Replacement: The Price shall include Dismantling of existing Stay Insulator (Porcelain/Composite) and Erection of new Stay Insulator (Porcelain/Composite) at same location with adjustment of OHE parameters (height, stagger etc.) as per standards/instructions of Railway Engineer In-charge.

The price shall also cover erection of all the associated components/fittings and necessary modification or fabrication required in Stay Tube etc. (New Stay Tube will be provided by Railway if required)

The price shall also cover testing of stay insulator as per RDSO specification TI/SPC/OHE/INSTEST/0091 or latest revision.

Dismantled insulators without any fracture/damage in existing condition along with other dismantled material shall be handed over to the Railway Engineer In-charge. The price shall include the transportation of dismantled material to the nearest depot as per the instructions of Railway Engineer In-charge.

Note: (1) Supply of Stay insulators is not included in this item.

(2) In case of operation of above item under Non Power blocks, half the rate is to be paid

Item 4(z)(ii) - Replacement of Bracket Insulator under Power Block

Replacement: The Price shall include Dismantling of existing Bracket Insulator (Porcelain/Composite) and Erection of new Bracket Insulator (Porcelain/Composite) at same location with adjustment of OHE parameters (height, stagger etc.) as per standards/instructions of Railway Engineer In-charge.

The price shall also cover erection of all the associated components/fittings and necessary modification or fabrication required in Bracket Tube etc. (New Bracket Tube will be provided by Railway if required)

The price shall also cover testing of Bracket insulator as per RDSO specification TI/SPC/OHE/INSTEST/0091 or latest revision.

Dismantled insulators without any fracture/damage in existing condition along with other dismantled material shall be handed over to the Railway Engineer In-charge. The

price shall include the transportation of dismantled material to the nearest depot as per the instructions of Railway Engineer In-charge.

Note: (1) Supply of Bracket insulators is not included in this item.

(2) In case of operation of above item under Non Power block, half the rate is to be paid

Item 4(z)(iii) - Replacement of 9-tonne Insulator under Power Block

Replacement: The Price shall include Dismantling of existing 9-tonne Insulator (Porcelain/Composite) and Erection of new 9-tonne Insulator (Porcelain/Composite) at same location with adjustment of OHE parameters (height, stagger etc.) as per standards/instructions of Railway Engineer In-charge.

The price shall also cover erection of all the associated components/fittings and necessary modification or fabrication required in 9-tonne Tube etc. (New 9-tonne Tube will be provided by Railway if required)

The price shall also cover testing of 9-tonne insulator as per RDSO specification TI/SPC/OHE/INSTEST/0091 or latest revision.

Dismantled insulators without any fracture/damage in existing condition along with other dismantled material shall be handed over to the Railway Engineer In-charge. The price shall include the transportation of dismantled material to the nearest depot as per the instructions of Railway Engineer In-charge.

Note: (1) Supply of 9-ton insulators is not included in this item.

(2) In case of operation of above item under Non Power blocks, half the rate is to be paid

Item 6(z)(i) - Re-rolling of Contact wire 107 / 150 sq.mm into Drums

Re-rolling: The 107 or 150 sq. mm Contact wire shall be wound on the drum provided by Railway and Paper shall be provided between each layer of conductor while winding on the drum and during course of winding the conductor should not deform, bulge or damage in any manner.

Item 6(z)(ii) - Re-rolling of Catenary wire 65 sq.mm into Drums

Re-rolling: The 65 sq. mm catenary wire shall be wound on the drum provided by Railway and Paper shall be provided between each layer of conductor while winding on the drum and during course of winding the conductor should not deform, bulge or damage in any manner.

Item 6(z)(iii) - Supply of reinforced Wooden Drums as per specification for re-rolling of Catenary & Contact wire

Supply: The price shall cover supply of reinforced Wooden Drums shall conform to specification IS: 1778-1980 for re-rolling of contact & catenary wire.

Item 16(z) - Disconnection & Reconnection of any type of bond

The price shall cover disconnection and reconnection of Structure Bond/Longitudinal Bond/Transverse & Special Bond as per the instructions of the Railway Engineer In-charge of work or authorized representative. Necessary tools and tackles required shall be arranged by contractor only. It is also ensured that no damage to TRD bonds during Engineering Track Renewal works.

The rate will be per bond. For dismantlement of existing bond alone half the rate will be paid.

Item 17(z)(i) – Transportation & Erection of 9 m / 13 m long 52 / 60 KG Released Rail from nominated place to work site

The price shall cover loading, unloading & transportation of released rail of 9 meters or 13 meters (Railway Supplied) from nearest available location (up to 200 km) to work site for execution. The price shall also cover arrangement of vehicle, manpower, tools & tackles for loading, unloading & transportation of released rails. The price shall cover erection of 13m long 52/60 kg buried rail. The buried rail erection will be followed as requirements vide Drg. No. ETI/PSI/0212-1 or latest and SMI 0032 (Rev-2).

Note: Earth electrodes are to be operated under item 17(a) of Schedule-A1

Item 17(z)(ii) – Supply & Erection of Galvanised Iron Flat 75 x 8 mm

Supply & Erection: The price shall cover supply and erection per meter length of 75x8mm size Galvanized Iron flat (Buried rail to each pit) buried at a depth of 60 cm below the ground level. The price shall also cover connections of the Galvanized Iron flats to the earth electrodes to constitute the main earth ring and to the earthed terminals at SSP/SP as per the site requirement decided by the Railway Engineer In-charge.

The price shall cover supply and installation per meter length of 75 x 8 mm size (Buried rail to track) Galvanized Iron flat, painted all around with two coats of paints to colour grass green shade-218 of IS:5 passing through cable trench of exposed above ground level. The price shall also cover connections of the Galvanized Iron flats to the earth electrodes to constitute the main earth ring and to the earthed terminals of the various equipment at SSP/SP as per the site requirement decided by the Railway Engineer In-charge.

Item 17(z)(iii) – Supply & Erection of High Productivity Fasteners (Rail Contact System) for fixing of Traction Bonds at Buried Rail Earthing Station.

Supply & Erection: The price shall cover supply, erection and installation of RDSO approved high productivity fasteners as per SMI No. TI/SMI/0032 Rev-2, to provide separate earthing stations at TSS/SP/SSPs. The work shall be executed including all fasteners for each buried rail in accordance with RDSO SMI No. TI/SMI/0032 Rev-2 and letter No. TI/PSI/Earthing/Policy/14DT: 26-02-20 or latest revision

Item 17(z)(iv) - Excavation & Refilling of Soil for Buried Rail

The price shall cover excavation to a depth of 1 m, width of 0.6m and length of 15 m for providing buried rail for earthing system and refilling of the same. The soil around buried rail will be treated by providing charcoal & salt. The work shall be executed in accordance with SMI No. TI/SMI/0032 Ref-1.

Item 18(z)(i) – Supply of Paint and Stencilling/Painting of mast location, RL, MRL, EC socket symbols, and implantations on OHE masts / portals using Enamel paint with a Yellow Background and Black Font.

Supply & Erection: The price shall be inclusive of the cost of yellow and black paint conforming to relevant IS standard. The price shall cover stencilling of location number, implantation, rail level, and EMC socket direction etc on OHE structures as per the instructions of the Railway Engineer In-charge of work or his authorised representative.

The existing painted portion on OHE structures earmarked for stencilling the parameters on OHE shall be cleaned with good quality sand paper before applying fresh paint. Two coats of yellow enamel paint shall be applied as background and the various parameters shall be stencilled using black enamel paint. ISI marked good quality enamel paint shall be used.

The font size of the various parameters to be stencilled on various types of OHE structures shall be approved by the Railway Engineer In-charge of work before commencing the work in a section. In this connection, a sample to be stencilled and approved by the Railway Engineer In-charge of work.

Item 18(z)(ii) - Supply of Paint and Painting of ATD Counter Weight including Temperature Marking of 'Y' value.

Supply & Erection: The price shall cover cost for Painting of Counter Weight of ATD including marking of 'Y' Value in terms of 10°C, 35°C & 55°C, Half Tension (HTL) length in meters over counter weight. Two coats of aluminium paint are to be painted on that as required by the Railway Engineer In-charge. Paint to be supplied by contractor. ISI marked good quality enamel paint shall be used. It also includes painting of bottom two pieces of counter weight with yellow colour paint.

The cost includes all material, tool & tackles, manpower etc. required for painting of counter weight of ATD with aluminium/yellow paint.

Item 18(z)(iii) - Supply of Paint and Painting of any type of Bond

Supply & Erection: The Price shall include the supply of ISI marked good quality black enamel paint and primary coat of red oxide for painting of Bonds i.e. Structure/ Longitudinal/Transverse & Special bond. Price shall also include the opening and re-fixing of bonds, cleaning / wiping of all the oil, corrosion, dust or dirt if any, a coat of primer i.e. red oxide shall also be applied. The primer coat or first coat of paint when dried, then only the 2nd finishing coat of black bituminous paint shall be applied.

Cost of Materials required for painting work such as brush, Stencil, Kerosene etc. to be incurred in contractor's scope.

Item 18(z)(iv) - White Washing for copping of mast / portal foundations

Supply & Erection: The price shall include cleaning of area around muff of OHE mast/portal by removing the vegetation and condition of structure muff are to be checked and recasting of damaged muff with 2 coats of white wash. The price also includes supply of white wash. Cost of Materials required for painting work such as brush, Stencil, Kerosene etc. to be incurred in contractor's scope.

Item 18(z)(v) - Supply of Paint and Painting of Fencing Panels

Supply & Erection: The price shall cover the cost of supply and painting of PSI assets i.e., fencing panels, fencing uprights, anti-climbing devices of ATs, barbed wire of TSS/SP/SSPs, tubular poles at TSS/SP/SSPs with aluminium paint from any of RDSO approved aluminium paint confirming to IS 2339 or latest.

Item 18(z)(vi) - Supply of Paint and Painting of PSI Equipments

Supply & Erection: The price shall cover the cost of supply &painting of PSI equipment like traction power transformers, CBs, PTs, ATs, & BMs etc., with water proof grey enamel paint from any of RDSO approved paint confirming to IS: 2932 or latest.

Item 19(z) - Trimming/Cutting of Tree Branches including disposal of branches / bushes outside yard (Note: Girth of more than 20 cm will only be considered as tree branch)

The price shall cover cost for trimming/cutting of tree branches of circumference more than 20 cm (Per tree basis). The tree branches / tree in the vicinity of 06 metres shall be cleared off. Necessary men, tools and tackles required shall be arranged by contractor only. Power Block will be arranged by Railway during trimming/cutting of critical tree/tree branches near to OHE / likely to fall near OHE.

SCHEDULE D – 2 x 25 kV Items

Item 7(c) – Supply and Erection of Aerial Earth Conductor (AEC) with necessary accessories, fittings and fasteners on OHE mast / Portals.

Supply & Erection: The price shall cover supply of Arial Earth Conductor (AEC) with necessary accessories, fittings and fasteners on mast/ portals. The AEC scheme should be as per RDSO Technical Instruction No. TI/IN/0042 or any latest guidelines issued by Railway Board/RDSO for High Speed.

The price shall cover cost of supply and erection of 12.24 mm dia ACSR Raccoon with mast fitting as per RDSO Drg. No. TI/DRG/OHE/ ERBOND/ RDSO/00001/11/0. AEC of 12.24 mm dia. ACSR Raccoon conductor should be erected on the back side of the OHE masts/Portals. The cost for connecting the ACSR on back side of OHE/feeder mast is also included in this item. SPS required for ACSR will be paid under separate item.

The price of ACSR conductor jointing, if any, shall be covered under this item, but the anchoring/ termination arrangement as and where required shall be covered under separate item.

Item 7(d) - Supply and Erection of Buried Earth Conductor (BEC) with necessary accessories fittings and fasteners

Supply & Erection: The price shall cover cost of Supply and erection of 20 mm dia galvanized steel conductor as per RDSO drawing. BEC of 20 mm dia (cross section 238.64 sq mm), galvanized steel conductor should be laid underground along the UP and DN track separately, 300 mm below ground surface and approximately one meter away (or asper site conditions) from the OHE foundation towards opposite direction of track.

The BEC will be connected to each OHE mast/Portal and Feeder mast by same conductor having Tee Connector & Lug Connector as per Drawing No: TI / DRG / OHE / TC / RDSO / 00001 /20 /0 & TI / DRG / OHE / SC / RDSO / 00001 /20/0 for BEC end and Lug for connection with mast/portal. The cross bonding of the UP BEC – UP Mast / Portal - UP Traction Rail - DN Traction Rail-DN mast/Portal –DN BEC should be done by 50X6 mm GS flat (Galvanization shall be done as per RDSO specification ETI/OHE/13) at every 450 m. The details of the AEC/BEC and cross bonding scheme are given in drawing No: TI/DRG/OHE/EARTHING/RDSO/00001/20/0.

At stations, BEC conductor should be laid underground for Loop lines & platform also. BEC can be run on the sidewall of Platform (platform coping) with suitable clamp & bolt grouted in the coping. BEC should be connected to Earth Pit as per Drawing No. ETI/OHE/P/7020 Rev. B or latest at every 450 m wherever it is exposed above the ground. At Bridges/Platform coping laying arrangement of BEC should be as per RDSO drawing. For three line and four line section, separate BEC should be provided for each line. The above recommendation is as per prevalent practice used in 2 x 25 kV system with 12 kA fault current adopted by other projects in country. However, the adequacy and efficacy of this earthing and bonding system should be verified by the simulation studies/measurements of the touch and step potential of the rail in normal load and short circuit condition for compliance with EN 50122-1 and IEC 62128-1 (2013).

The cost of erection of steel conductor below ground surface, at platform and bridges are inclusive in this item. The cost of supply and erection of suitable clamps and bolts for clamp BEC at Platform and bridges are payable under this item.

Item 7(d)(i) - Supply and Erection of Tee connector for BEC end and lug for connection

Supply & Erection: The price shall cover cost of Supply and Erection of Tee connector for BEC end and lug for connection. The BEC will be connected to each OHE mast/Portal and Feeder mast by same conductor having Tee Connector & Lug Connector as per Drawing No. TI / DRG / OHE / TC / RDSO / 00001 / 20 / 0 & TI / DRG / OHE / SC / RDSO / 00001 /20/0 for BEC end and Lug for connection with mast/portal. The cross bonding of the UP BEC –UP Mast/Portal-UP Traction Rail-DN Traction Rail-DN mast/Portal –DN BEC should be done by 50 x 6 mm GS flat at every 450 m. The details of the AEC/BEC and cross bonding scheme are given in drawing no TI/DRG/OHE/EARTHING/RDSO/00001/20/0

Item 8(a)(i) - Supply and Erection of 3:1 type Modified ATD with counter weight assembly for Conventional OHE (regulated) 2400 kgf

Supply & Erection: The price shall cover Supply and Erection of Regulating equipment three-pulley as per RDSO specification no. TI/SPC/OHE/3PHTATD/0150 with A&C Slip No. 1 or latest with small parts steel work for 2400 kgf tension. The material to be procured from the RDSO/CORE approved sources. The price shall also cover supply all type of fasteners and fittings.

Item 13(h) – Supply and Erection of DP Isolator complete with SPS, insulators and jumpering arrangement etc suitable for 2x25 kV system.

Supply & Erection: The price shall cover supply and erection of complete 55/66 kV Double pole Isolator type II including insulators, SPS, connectors, Jumpers, bus bars, Integral locks and fasteners etc for its smooth & trouble-free operation. Double pole Isolator should be provided at Insulated Overlap of 1250 Amp rating as per Specification No. ETI/PSI/133. Mounting Arrangement should be as per Drawing No. ETI/OHE & FEEDER/G/06005 Sh-2 & ETI/OHE & FEEDER/G/06008 for mast and portals respectively. The price shall also include supply & erect the pad lock with three keys to protect the opening by miscreants and keys shall be handed over to depot in-charge or his authorized representative.

In the double pole isolator work, one pole will be for 25 kV OHE and another pole shall be connected with feeder wire. The connection work between feeder and double pole isolator work shall be done by Construction department and connectors, 9 tonne Insulators, jumpers, PG clamps etc. shall be arranged by the Construction department. The connectors supplied along with the double pole isolators for feeder portion terminal shall be supplied to Railway. Double pole isolators are to be erected on separate mast if required after approval of by Sr.DEE/TRD. However, in case, if there is shortage of space, Double pole isolators shall be erected on TTC/Portals after prior approval of Sr.DEE/TRD.

भारत-सरकार/Government of India
रेलमंत्रालय/Ministry of Railways
दक्षिणमध्यरेलवे/South Central Railway

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No. E.252/Tr.D/Policy /Vol.VII

dt: 19.05.2025

CEE/Con/SCR, CEE/Projects/SCR,
CPM/GS/E/SCR
Sr.DEE/TrD/SC, BZA, GTL & HYB
Sr.DEE/Tr/GNT, DEE/TrD/NED

Sub: Approved copy of the Revised Schedule of Rates (SOR) for Traction distribution items of Electrical department SCR - reg.

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The Revised Schedule of Rates (SOR) for Traction distribution items of Electrical department submitted by the JAG officers Committee concurred by Dy.FA&CAO/SCR, has been approved by the PCEE for adoption over the South Central Railway.

Divisions / Executing agencies are advised to adopt the Schedule of Rates (SOR) over SCR with immediate effect.

Encl: SOR – 2025 Booklet.

19/05/2025

(के.थौर्या/K.Thourya)
मु.वि.वि.इंजी/दमरे/एससी/CEDE/SCR/SC