EXPLANATORY NOTES FOR SCHEDULE OF RATES
OHE PARTICULAR
Schedule-1, Section-1 to 5

Item No.1 (a): Preparation of designs and drawings for overhead equipment and verification of Purchaser's pegging plans.

The price shall cover verification of Purchaser's overhead equipment pegging plans indicating location of structures which will be furnished by the purchaser, in stages, and preparation of all drawings and designs required to be finalised by the Contractor. The price shall include the following:-

(i) Making minor modifications with the approval of the Purchaser to the layout of the structures and overhead equipment, if necessary, and submission of overhead equipment layout plans, including stagger, location of cut in insulators etc.

(ii) Preparation of cross section drawings and structure erection drawings for each structure location [see para 2.5.6.1(f) and 2.5.6.1(h) respectively].

(iii) Choice of type and size of foundations to suit soil and loading conditions, except for the ones which are considered as "Works under other Agencies" (see para 1.2.37).

(iv) Preparation of long section drawings of overhead equipment where such drawings are required including detailed study of overline structures such as foot over bridges, road over bridges etc. for maintaining the specified height of contact wire and requisite clearances.

(v) Preparation of other designs and drawings including drawings of small parts steel work (other than those for which RDSO standard drawings are available) and detailed designs for booster transformer stations and LT. Supply Transformer stations (see para 1.2.23).

(vi) Supply of requisite no. of copies of all drawings, including completion drawings specified in part -II, Chapter V to the Purchaser.

(vii) Preparation, design, development of Bonding Plans based of Track Circuit plans supplied by the purchaser, clearly specifying the location of various bonds, +ve, -ve rails and other relevant details as required for bonding plan and supply of requisite number of copies of Bonding Plans drawings.

In case preparation of the overhead equipment pegging plans by the Purchaser for any part of the section is delayed, the Contractor may be asked to prepare pegging plans for the section. No extra payment will be made for the preparation of such pegging plans. The total length of track for which the Contractor may be asked to prepare such pegging plans will not exceed 2% of the final total quantity against this Item. This price shall also cover soil investigation and testing in an approved manner.

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.

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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 upto the chainage of anchor mast of the terminating OHE.*

6. Feeders and return feeders from grid sub-station to feeding station

This Item will also be applicable independently in case of feeders/return feeders/ conductors from grid substation to overhead equipment feeding stations or in a case of feeders/conductors running on independent structures (not supporting OHE) along or across tracks.

In such a case the length of line to be considered for purpose of Item (a) shall be measured by the distance between the center of gantries of the grid sub-station and feeding stations in case of feeder/return feeders/conductors line from grid sub-station, or 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 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 No.1 (b): Preparation of designs and drawings for switching stations (FP/SP/SSP)

The price shall cover on a flat rate basis per switching station, survey, investigation of soil bearing pressure, preparation of cross section drawings, preparation of general arrangement drawings, detailed layout of equipment, bus-bar connections and insulators, layout of earthing system and earth connections, cable run layout, detailed designs and drawings for steel work and structural support, excluding the ones for which supply is made by the Purchaser, suitable concrete plinths for equipment and drawings for equipments, components, fitting and materials supplied by the Contractor. The price shall include supply of requisite number of copies of all drawings, including completion drawings as specified in Part -II, Chapter-V to the Purchaser (see para 1.2.23).

Item No. 2 (a): (i) Concrete for foundation and plinth in hard soil.
(ii) Concrete for foundation and plinth in rocky soil.
(For concrete mix of M 10 and M 15 Grade in Foundation)

The price shall cover excavation, supply and handling of all materials and accessories, temporary arrangements for excavation in hard soil and concrete/masonry drains/walls requiring use of chisel and hammer 2(a)(i) or requiring blasting 2(a)(ii), Shoring where necessary, casting concrete including frame work where 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 spoil.

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 and 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.

Notes for measurement for Items 2 (a) (i) and (ii):-

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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 No. 2 (az): (i) Concrete for foundation and plinth in hard soil.
(ii) Concrete for foundation and plinth in rocky soil.
(for concrete mix of M 15 and M 20 Grade in Foundation)

Same as 2(a)(i) and 2(a)(ii) above.

Item No. 2 (b): Concrete for foundation and plinth in other than hard soil and rock.
(for concrete mix of M 10 and M 15 Grade in Foundation)

The price shall include all works mentioned in Item 2(a) in all classes of soil except hard soil, concrete or masonry drains and walls and rock.

Item No. 2 (bz): Concrete for foundation and plinth in other than hard soil and rock.
(for concrete mix of M 15 and M 20 Grade in Foundation)

Same as 2(b) above.

Item No. 2 (c): Reinforced concrete for foundation and plinth in other than hard soil and rock (Grade M-15)

The price shall cover excavation and all reinforced concrete work for foundations excluding supply of steel for reinforcement {which will be paid separately under Item 3(g)} and including other materials shoring where necessary, casting concrete including frame work where 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 spoil. 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, 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. 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 include the cost of cement.

Item No. 2 (cz): Reinforced concrete for foundation and plinth in other than hard soil and rock (Grade M-20)

Same as for Item 2(c) above except the concrete mix shall be M-20.

Cost of steel for reinforcement if any, shall be payable under Item 3(g).

Item No. 2 (czz): Reinforced cement concrete grade M-25 for foundation and plinth in other than hard soil & rock.

This Item is exclusively applicable for casting foundation with Reinforced cement concrete of Grade M-25 suitable for special portal structures at stations and yards. Foundation shall be cast as per drawing no. CERC-6575-RC-CE-DC-001 applicable for special portal structures. The prices includes following activities-

[i] Excavation of a pit of appropriate size.
[ii] Provision of PCC in grade M-10.
[iii] Casting of RCC in M-25 grade concrete.
[iv] Provision of 36 mm dia foundation bolts.

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[v] Provision of Reinforcement.
[vi] Re-filling, compaction, ramming of pit after casting of foundation.

The price shall cover excavation, supply and handling of all materials and accessories, temporary arrangements for excavation in concrete/ masonry drains/ walls requiring use of chisel and hammer, shoring wherever necessary, casting concrete, finishing the top of foundation after erection of portal structures. The price also includes dismantling of all connected temporary arrangements and removal of spoil after completion of casting work.

Note: [i] 75 mm thick PCC ratio 1:3:6 (M-10) required for foundation bed shall be paid under Item 34 (b).

[ii] Cost of supply of steel Reinforcement shall be payable against Item 3(g) including cutting, straightening, hooking, bending, binding, erecting and placing and keeping in position including all lead and lift and including cost of binding wire.

[iii] Cost of supply of 36 mm dia Bolts, nuts, washers etc. shall be payable against Item 3(m), however, erection price is inclusive in this Item.

[iv] Price is inclusive of re-fillings, compaction, ramming of pit after casting of foundation.

Item No. 2 (d): **-Deleted-**

Notes for Items 2 (a) to (c):

1. The prices under Item 2 shall be the same for any shape or size of concrete blocks. In calculating the individual volume of concrete, fraction of a cubic metre beyond the third decimal shall be rounded off to the next nearest third decimal.

2. The prices under Items 2(a), (b) and (c) shall apply for concreting of all foundations for mast, gantries, portals, anchor blocks for guy rods, and fencing uprights.

3. For purposes of computation of volume of concrete under Item 2, the volume of steel work embedded in the foundation block shall be ignored.

4. Cost of all concrete will be paid for only under Item 2 and the prices of other Items shall not include cost of concrete except for Item-17.

5. For the purpose of computation of volume of concrete under Item-2. The volume of concrete shall include the volume of sand and bitumen in sand cored foundation. However, for the purpose of computation of the quantity of cement utilised in sand core foundations, the volume of the sand and bitumen used in the core hole should be deducted from the total volume of the foundation.

6. For purposes of computation of volume of concrete, the volume of each muff for all masts shall be taken as 0.02 cum except for masts with balance weights and for each column of portal, each headspan mast, 2 or 3 track cantilever masts, and special fabricated masts for which the volume of muff shall be taken as 0.08 cu.m. irrespective of the size and shape of muff, on a flat basis.7. The prices under Items 2 (a), (b) and (c) shall also include the cost of concrete cable trenches and trench covers at the switching stations as well as embodiment of drain pipes, where required.

8. The prices under Items 2 (a),(b) and (c) shall also cover the cost of diversion of masonry/earth drain wherever necessary for casting of foundations.

9. Concrete mix for foundation and grouting/muffing under Item 2(a),(b) and (c) will be as per para 2.2.4.

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10. In case Ready Mix concrete is used, no extra payment shall be payable to the contractor. Payment shall be done at the rates given in the contract irrespective of whether the concrete is nominal or Ready Mix.

Item No. 2 (e): Extra for supply & sinking of concrete shells

The price shall cover extra 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 where necessary. Purchaser's Engineer shall decide whether sinking of concrete shells is necessary.

NOTE: The above price shall be per concrete shell of standard size specified in para 2.2.7. If more than one concrete shell is used in a foundation, the price shall be proportionately augmented.

Item No.2 (f): - DELETED -

Item No. 2(h)(i) : -DELETED-

Item 2(j): Concrete for Cylindrical type side bearing foundations (M-15 and M-20) (SBC - 11000 kgf/sqm)

Cylindrical type foundation for side bearing and side gravity locations for 11000 kgf/sqm safe bearing capacity (SBC) as an alternative to Conventional Side Bearing type foundation for conventional and High Rise OHE as per RDSO's drawing Nos.

(i) TI/DRG/CIV/FND/RDSO/00002/17/0 Rev-0 for Conventional OHE.
(ii) TI/DRG/CIV/FND/RDSO/00004/17/0 Rev-0 for Conventional OHE.
(iii) TI/DRG/CIV/FND/RDSO/00003/17/0 Rev-0 for High Rise OHE.
(iv) TI/DRG/CIV/FND/RDSO/00005/17/0 Rev-0 for High Rise OHE.

The price shall cover excavation of pits with the help of mechanized augar, supply and handling of all materials and accessories including re- enforcement steel (epoxy coated) conforming to IS: 432 Part -1. The price shall include cutting, bending and binding of re-enforcement bars.

Price shall include shoring if required, concrete grouting of mast and finishing the top of foundation of mast. The price shall also include dismantling of all temporary arrangements and removal of spoil. Machinery/Plant and Augur required for digging of pit shall be arranged by contractor at their own cost.

Item No. 3(a)(i): Supply and Erection of traction masts fabricated from Rolled mild steel beam (BFB) of size 152mm x 152mm x 37.1 Kg/m and galvanised in length 9.5 m or 8.5 m long.

The price shall cover the cost of supply of finished traction mast fabricated from Rolled mild steel beam (BFB) 152mm x 152mm x 37.1 Kg/m designated SC-150, table 3.1of IS-808/1989 duly drilled as per RDSO's Drawing No. ETI/OHE/G/00144,Sh.No.3 Mod-C, with latest mod. and galvanised as per Specification No. ETI/OHE/13 (4/84) with A&C Slip No.1 to 4 with latest spec. The length of the mast will be 9.5 or 8.5 meter as required. The steel shall be conforming to IS-2062/2011 (or latest) Grade - E250, Quality-A, Zinc conforming to IS-209/1992 (or latest).

The price shall cover the cost of erection, alignment and setting before grouting of individual traction masts. The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast at platforms.

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Item No. 3(a)(ii): Supply and Erection of traction masts, main mast of Switching stations and Booster transformer stations fabricated from Rolled mild steel Joist (RSJ) of size 203 mm x 152 mm x 52.0 kg/m and galvanised in various lengths.

The price shall cover the cost of supply of traction mast, main mast of Switching stations and Booster transformer stations fabricated from Rolled mild steel joist (RSJ) 203mm x 152mm x 52.0 Kg/m designation WB-200, table 2.2 of IS-808/1989 duly drilled as per RDSO's Drawings given below for various types of masts and galvanised as per Specification No. ETI/OHE/13 (4/84) with A&C Slip No.1 to 4, with latest spec. The steel shall be conforming to IS-2062/2011 (or latest) Grade - E250, Quality-A, Zinc conforming to IS-209/1992 (or latest).

Drg No. (i) ETI/OHE/G/00144, Sh.No.3 latest Mod	9.5 M long
(ii) ETI/C/0030 latest Mod	11.4 m (S1)
(iii) ETI/C/0031 latest Mod	11.4 m (S2)
(iv) ETI/C/0036 latest Mod	8.0 m (S4)
(v) ETI/C/0181 latest Mod	12.4 m (S6)
(vi) ETI/C/0184 latest Mod	9.4 m (S9)

The price shall also cover the cost of supply of any other structures fabricated out of RSJ beam.

The price shall cover cost of erection, alignment and setting before grouting of individual traction masts and main masts of Switching and Booster Transformers stations including those for head spans. The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast at platforms.

Item No. 3(b)(i) :Supply and erection of fabricated and galvanized structures (O,N&R type portals) with necessary components other than masts.

The price shall cover the cost of supply of O, N and R type portals with components as per RDSO's Drg. No. :

(i) ETI/C/0008 Sheet No.1 latest Mod for 'N' type
(ii) ETI/C/0017 Sheet No.1 latest Mod for 'O' type
(iii) ETI/C/0011 Sheet No.1 latest Mod for 'R' type

The structures shall be fabricated from steel conforming to IS-2062/2011 (or latest) Grade - E250, Quality-A, IS-808/1989 and galvanised as per RDSO's specification No.ETI/OHE/13 (4/84) with A&C slip Nos 1 to 4 (or latest).

The price shall cover, cost of erection, alignment and setting before grouting, wherever required, of portals assembly of boom components and erection of the same. The prices shall also include supply and erection of galvanised bolts, nuts washers etc. wherever required as per approved designs and drawings. The price shall cover assembling, adjustment and erection of all types of booms including TTC booms and any special structures across the track, not covered under Item 3(b)(iii). The price shall also include the cost of repairing platform shelters in case the shelter is dismantled/ removed/damaged during the course of erection of a portal at platforms.

Item No. 3(b)(ii) : Supply and erection of structural steel (traction mast) fabricated and galvanized, of all type B-Series Mast.

The price shall cover the cost of supply of B-Series traction mast 9.5 m and/or 11.4 m long i.e. B-Series Mast fabricated and galvanized as per RDSO Drg No. ETI/C/0071 (Mod-E), TI/DRG/CIV/B-Mast/00001/ 13/0 with latest mod and specification No. ETI/OHE/13 (4/84) with A&C slip Nos 1 to 4 (or latest).

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Steel shall be conforming to IS-2062/2011 (or latest) Grade - E250, Quality-A, and Zinc conforming to IS-209 (or latest).

The price shall also cover the supply of all size of B-Series mast required which has not been mentioned.

The price shall cover the cost of erection, alignment and setting before grouting of individual traction masts and main masts of Switching and Booster Transformers stations including those for head spans. The price shall also include the cost of repairing platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast at platforms.

Note: 11.4 m long masts shall have provision for erection of Brackets (Cantilevers) for conventional as well as for High Rise OHE.

Item No. 3(b)(iii): Supply and erection of special fabricated & galvanised steel structure other than portals and traction masts not covered under Item 3(b)(i) & 3(b)(ii).

The price shall cover the cost of supply and erection of special fabricated & galvanised steel structures (other than BFB/RSJ/B-Series masts and portals) for conventional and High Rise OHE. The structure to be supplied under this Item shall be TTC, G-type, BFB type portals, Bridge masts, emergency masts and double/fabricated "S" series masts such as S3, S5, S7, S8, S-100, S-101, T-150, Dwarf Masts etc. Any other similar structure required during the execution of work shall also be supplied under this Item.

The price shall include the cost of steel, fabrication, galvanisation, and supply at site for erection. Steel shall be conforming to IS-2062/2011 (or latest) Grade - E250, Quality-A, Zinc conforming to IS- 209/1997 (or latest) and galvanization to RDSO's specification No. ETI/OHE/13(4/84) with A&C slip No.1 to 4, with latest spec. The various structures covered under this Item are:-

SN	Description	Drg No.	Mod
1	TTC with 5.5/8.0m boom	ETI/C/0009 sheet 1	Latest
2	G-type portal upright & end pieces	ETI/C/0056	Latest
3	BFB portal	ETI/C/0026 Sh.1	Latest
4	S-7,12.4m	ETI/C/0182	Latest
5	S-8,12.4m	ETI/C/0183	Latest
6	S-100, for LT, transformer at SWS	ETI/C/0043	Latest
7	S-101, for Isolators inside SWS	ETI/C/0044	Latest
8	S-3,11.4m	ETI/C/0180	Latest
9	S-5,11.4m	ETI/C/0042	Latest
10	T-150, for LT supply transformer	ETI/PSI/037	Latest
11	Dwarf Mast	ETI/OHE/G/1402	Latest
12	Special BFB Portal for 5 tracks (General Arrangement) for High Rise OHE	TI/DRG/CIV/BFB-POTAL/00001/13/0 Sh. No. 1	Latest
13	G-Type Portal Special Upright and End Piece for High Rise OHE	TI/DRG/CIV/G-PORTAL/00001/13/0	Latest
14	Two Track Cantilever Structure (TTC) General Arrangement for High Rise OHE	TI/DRG/CIV/TTC/ 00001/13/0 Sh.-1	Latest

The price shall cover, cost of erection, alignment and setting before grouting , wherever required, gantries, including tower/ steel tower/steel work for feeders for traction sub-station, drop arms, standard super masts and suspension brackets for feeders and return conductors,

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dwarf masts or stub masts for anchoring, complete with anchor plates drilled and welded in position, multiple cantilever cross arm, chairs, adopters 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 supply and erection of galvanised bolts, nuts washers etc. wherever required as per approved designs and drawings. The prices shall also include the cost of repairing of platform shelters in case the shelter is dismantled/ removed/damaged during the course of erection of a mast/portal at platforms.

Note for Item 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii) & 3(b)(iii) :

(i) The price for the Items 3(a)(i), 3(a)(ii) and 3(b)(i), 3(b)(ii) , 3(b)(iii) shall also include the cost of stenciling of location number on masts/portal uprights in the manner as directed by the Purchaser. The price shall also include straightening of masts/portals uprights wherever approved by the purchaser and cutting of mast/portals/upright to suit the site condition.

(ii) For the purpose of payment for supply and/or erection, the black weights as per respective RDSO drawing for individual traction masts (RSJ, BFB & B series, S-1, S4, S-6 & S-9), head span, Portal structures (O, N & R type), special steel structures (TTC, BFB, G & P type portal, Dwarf masts, S3, S5, S8, S100, S101, T-150 etc) shall be payable to the contractor.

(iii) For the purpose of payment for supply and/or erection, of bridge mast or any other structures which are not covered in RDSO's drawings, if any, the black weights of such structures including all components as shown in respective approved drawing, shall be payable to the contractor by purchaser.

(iv) No payment is permissible for increased weight of any structure or their components on account of galvanization.

(v) The payment shall be made on the basis of the final lengths/weight of the structures, in case the same are cut or modified as indicated above before erection.

(vi) In case of any dispute in unit weights mentioned in drawings, the matter will be decided by the Engineer incharge of the project/Purchaser and the decision taken in the matter will be final and binding on to the contractor.

Standard weights of Galvanized structures
(RDSO latest drawings and specifications will prevail over following data)

S. No.	Structure Type	Standard Length in Meters	Black Wt. (kg) as per Drawing	Weight of finished Galvanized (Wt. of galvanization 610 g/sqm) Structure (kg)
A	B	C	D	E
1	RSJ	9.50	494.00	499.77
2	BFB	9.50	352.45	357.64
3	B-150	9.50	369.69	378.67
4	B-175	9.50	422.89	432.40
5	B-200	9.50	474.19	483.95
6	B-250	9.50	659.27	672.34

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S. No.	Structure Type	Standard Length in Meters	Black Wt. (kg) as per Drawing	Weight of finished Galvanized (Wt. of galvanization 610 g/sqm) Structure (kg)
7	NU	10.445	365.26	385.30
8	NE1	5.38	183.88	193.63
9	NE2	5.88	199.18	209.80
10	NB 1.5	1.5	68.83	70.33
11	NB 3.0	3.0	110.99	113.69
12	NB 4.5	4.5	160.58	164.47
13	NB 6.0	6.0	210.20	215.14
14	NB 7.5	7.5	252.36	258.50
15	NB 9.0	9.0	301.95	309.28
19	RU	10.58	627.48	651.87
20	RE-1	11.6	634.33	662.13
21	RE-2	12.1	660.56	689.75
22	RB 7.5	7.5	432.58	440.78
23	RB 9.0	9.0	507.71	517.15
24	RB 10.5	10.5	586.49	597.65
25	RB 12.0	12.0	665.26	677.78
26	RB 13.0	13.0	717.88	731.60
Note: The tolerance of (+/-) 2.5% of the weight of finished galvanized structures as per column-E above will be the limit.				

***Note:** This list is only indicative in nature and weight of finished galvanized structures or weight of galvanisation in structures shall be governed by latest guidelines issued by RDSO in this regard.*

Item 3(b) (iv): Design, Supply, Fabrication, Erection & Painting of Height Gauge at level crossings (for clear span up to 7.3m and / or above 7.3m upto 12.2m)

The price shall cover supply of Height Gauges duly fabricated and painted complete in all respects. However, provision of a particular type of Height Gauge at various level crossings shall be decided and advised by the purchaser during execution of work. The contractor shall procure the structures/Steel required for the work accordingly. Following RDSO/ CORE drawings are applicable for different types of Height Gauges.

SN	Description	RDSO/CORE Drg. No.
1	Standard Plan, Details of Height Gauge for span 7.3 m to 10.0 m, Details of structure and foundation.	CORE Drawing No. RE/CIVIL/S/148-2011 Mod-1 & 2 OR TI/DRG/CIV/HGAUGE/RDSO/00001/14/0 Mod-A
2	Standard Plan, Height Gauge for level crossing (For clear span up to 7.3 m) Details of structures and foundation.	TI/DRG/CIV/HGAUGE/RDSO/00001/05/0

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SN	Description	RDSO/CORE Drg. No.
3	Standard plan, Height Gauge for level crossing (For clear span above 7.3 m up to 12.2 m) Details of structures and foundations.	TI/DRG/CIV/HGAUGE/RDSO/00002/05/0

Price shall cover supply of various steel sections conforming to IS-2062/2011 (or latest) Grade - E250, Quality-A, IS 808/1989, Fabrication at site or supply duly fabricated from CORE/IS approved sources for structures & SPS. Price shall cover supply of bolts, nuts & washers etc necessary for fastening the components of Height Gauge.

Price shall cover the cost of painting of Booms & upright with Red Oxide / Zinc Chromate to IS: 2074 as first coat and 2nd coat with enamel paint to IS: 2933-1975 Black and white colour alternatively 300 mm wide band.

Crash Barrier and Rail Barricading shall be provided as required and as per provision in drawings.

The price shall cover the cost of erection, alignment and setting while grouting of upright and side supports. The price shall cover labour charges required for welding / fabrication of side supports / uprights and other components at site.

Note:-

(i) For the purpose of payment against Item 3(b)(iv) for all the components (upright, boom, side supports, crash barrier / Barricading etc.), weight of structures/ fabricated steel works will be calculated according to standard unit weight of respective sections for required quantity. Contractor will be required to submit Bill of materials for each type of Height Gauge along with Black weight thereof for approval by the purchaser before claiming the payment.

(ii) In case of any dispute in unit weights, the matter will be decided by the Engineer incharge of the project/Purchaser and decisions taken in the matter will be final and binding on to the contractor.

(iii) No crane / tools & Plants will be provided by the purchaser for fabrication, erection or transportation of Height Gauge or black steel required for the work.

(iv) Prices for foundation works (CC & RCC) shall be admissible under Item 34(b) and 2(cz) respectively.

Item No. 3(b)(v): Supply and Erection of special type portal structures including uprights, Booms and components.

The price shall cover the cost of supply of special type portal structure with components as per Drawing to be supplied by the purchaser.

The structure shall be fabricated from steel confirming to IS - 2062/ 2011 No. E - 250 (Fe 410 W) quality- A, IS - 808 / 1989 and galvanised as per RDSO specification No. ETI/OHE/13 (4/84) with A&C slips Nos 1 to 4 (or latest).

The price shall cover, cost of erection, alignment and setting before grouting, wherever required of portal assembly of boom components and erection of the same. The prices shall also include supply and erection of galvanised bolt, nuts, washers etc wherever required as per approved designs and drawings. The price shall cover assembling, adjustment and erection of booms. The price shall also include the cost of repairing platform shelters in case the shelter is dismantled/ removed/ damaged/ during the course of erection of a portal at platform.

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The Price shall also cover the cost of stenciling of location number on the portal upright in the manner as directed by the purchaser. The price shall include the cost of straightening of uprights/Booms if required.

Item No. 3 (c): **Supply only of fabricated steel work other than mast**

The price shall cover the cost of supply only of all fabricated steel work excluding fasteners which are required to be supplied by the Contractor. The cost of erection for such steel work, if carried out by the Contractor shall be paid for under Item 3(b)(iii).

For standard fabricated steel work for which RDSO'S approved drawings are available, the weight of steel work as specified in RDSO'S drawing shall be considered for payment. However, in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification, the weight of the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment. For the non-standard fabricated steel work, the calculated weight to be considered for payment under this Item shall be included in the relevant drawing based on, latest IS sectional weight at the time of submitting the designs for approval of the Purchaser.

The price shall include the cost of supply of bracket top and bottom mast fittings suitable for PSC masts.

Item No. 3(d) **- DELETED-**

Notes for Items 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii), 3(b)(iii) & 3(c) -

1. For the purpose of payment against Items 3(a)(i), 3(a)(ii), 3(b)(i), 3(b)(ii), 3(b)(iii) & 3(c), weight of structures or 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 material or reduction for holes or skew cuts.

2. The rates against Item 3(b)(iii) 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 supply and/or erection of small part steel work, which will invariably be paid for under Item 3(b)(iii) or and 3(c) as applicable.

Item No. 3(e)(i) : Supply and erection of a Guy Rod Assembly

The price shall cover supply and erection of Guy Rod Assembly, for both conventional and High Rise OHE, of various lengths for traction masts, feeder line towers or supports complete with mast guy rod fittings, guy rod with adjustments and part/s be grouted in the anchor block. The price shall not include the cost of supply and erection of a dwarf or stub mast with anchor plates drilled and welded in position, where required, for anchorage, and small parts steel work, complete with bolts and nuts etc., if any for attaching the mast guy rod fittings to the mast/structure which shall be paid for separately under the relevant Item. Prices indicated against all other Items should be exclusive of the price of supply and erection of guy rod, if any which will be paid for under this Item.

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COMPONENTS REQUIREMENT

Rly. Id. No.	Description of components	Qty. per unit
3232	Mast guy rod fitting (welded) complete with 4 short bolts, nuts, lock nuts and washers for attachment to mast/S.P.S including appropriate fittings.	1 off
5001/ 5001-1/ 5001-3	Anchor bolts (complete with nuts lock nuts and split pins)	1 Set
5002	Guy rod stirrup	1 off
5004 or 5005 or 5005-2 or 5006-1 or 9070 or 9071 or 5006-2	Guy rod with nut, lock nut, washer and split pin	1 off
5007-1	Anchor 'v' bolt	2 off
5008	Anchor	2 off
5220	Guy rod double strap assembly	1 off or 2 off (as required)

NOTE: 1. In case the Contractor desires to adopt a different design for guy rod assembly, the same shall be indicated by him in the Tender and the components required should be clearly listed under this Item as deviation.

2. Supply and erection of guy rod assembly at anticreep portals will also be paid for under this Item.

Item No. 3(e)(ii): Supply and erection of Anchoring Arrangement of traction mast with Galvanised steel stranded wire

The price shall cover supply and erection of Anchoring Arrangement with Galvanised steel stranded wire of required length for traction masts, feeder line towers or supports complete with mast guy rod fittings, Galvanised steel stranded wire of 9.3 or 9.7 m and part/s be grouted in the anchor block as per RDSO's drawing No. TI/DRG/OHE/GSSW/0002/09/0. The price shall not include the cost of supply and erection of a dwarf or stub mast with anchor plates drilled and welded in position, where required, for anchorage, and small parts steel work, complete with bolts and nuts etc., if any for attaching the mast guy rod fittings to the mast/structure which shall be paid for separately under the relevant Item. Prices indicated against all other Items should be exclusive of the price of supply and erection of guy rod, if any which will be paid for under this Item.

COMPONENTS REQUIREMENT

Rly.Id.No.	Description of components	Qty. per unit
3232	Mast guy rod fitting (welded) complete with 4 short bolts, nuts, lock nuts and washers for attachment to mast/S.P.S including appropriate fittings	1 of
5023-1	Eye Bolt (complete with M24 nut, Lock nut Plain washer, thimble and split pins 5x40	1 Set
5002	Guy rod stirrup	1 off
5004-1or 5005-1	Galvanised Steel Stranded Wire 12.5 mm dia	1 off
5007-1	Anchor 'v' bolt	2 off
5008	Anchor loop	2 off

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5220	Guy rod double strap assembly	1 off or 2 off (as required)

Item No.3(f) : **– DELETED -**

Item No.3(g): Supply of steel reinforcement for RCC work including cost of cutting, straightening, bending , biding, erecting and placing & keeping in position including all lead & lift & including cost of binding wire

The Item covers the price of supply of tested quality of steel for reinforcement of appropriate size and for reinforcement steel above 8 mm or suitable dia shall be High strength deformed steel bars conforming to IS:1786/1985 and below 8 mm dia shall be mild steel and medium tensile steel bars conforming to IS:432(Pt.I)/ 1982.

Price shall cover the cost towards cutting, straightening hooking, bending, binding, erecting and placing and keeping in position including all lead and lift and including cost of binding wire.

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 No.3(h)(i): -DELETED-

Item No. 3(h)(ii): -DELETED-

Item No.3(i) : **Supply and Erection of 25 kV Caution Boards/Plates**

The price shall cover price of material including Caution Boards, SPS Items, nuts, bolts etc. as required and erection charges Caution Boards shall be of two types.

(i) General Caution Notice at entrance to Railway station (Hindi & English). No. ETI/OHE/G/7551 Mod-C (or latest).
(ii) Caution Plate 25000 V. No. ETI/OHE/G/7531 Mod-C (or latest)

Price shall be inclusive of Sales tax, Excise duty, Freight etc. Boards shall required to be installed on a steel structure/Rail post/wall of a building therefore mode of erection shall be as per requirement of the site.

Item No. 3(j) : Supply and erection of protective screen on ROBs/FOBs

The price shall cover 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).

Item No. 3(k): Supply and erection of Danger Plate on a Height Gauge

The price shall cover supply of Danger Board (as per RDSO drawing No. ETI/C/0069 Rev-C) including necessary Bolts, Nuts, Washers etc and erection thereof on the boom of each Height Gauge

Item No. 4(a)(i): Supply without Insulator and erection of a single bracket assembly

The price shall cover on a flat rate basis any bracket assembly on a traction mast or support on drop arm and shall include those on high/low level platform, in the vicinity of turnouts, over bridges or and at locations with reduced encumbrance or terminating wires. The price shall

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include the cost of supply of all components including galvanised steel tube, dropper wires, bolts and nuts etc. but excluding small parts steel work and solid core insulators. Cost of insulators will be paid in Schedule-1, Section-5 and cost of SPS will be paid under Item 3(c) of Schedule-1, Section-3. The price shall cover erection of all components including insulators, small parts steel work and dropper wires. However, this does not include the anticreep arrangement at masts/structures. The price shall include:

Rly. Id No.	Description of components	Qty. per unit
3021-1	Mast fitting for hook insulator (Forged)with 2 off bolts, nuts, lock nuts and washers of 16 dia.	1 set
2400	Tubular stay arm assembly (including galvanized steel tube).	1 set
2110/ 2130/ 2380	Catenary suspension bracket assembly or hook bracket	1 off
1160)	Suspension clamp	1 off
2120, 2140, 2040, 2080	Bracket tube assembly complete with tube cap and sleeve where required (including galvanized steel tube).	1 set
3070-1/2)	Mast bracket fitting assembly including 2 off bolts, nuts, lock nuts and washers of 16 m for attachment to structure or to small part steel work.	1 set
2151-2, 2152-2, 2161-2, 2162-2	Register arm hook Top & Bottom complete (Forged) with bolts, nuts and lock nuts.	1 off
2420 or 2430, 2270-4 or 5	Register arm assembly or raised register arm assembly (including galvanised steel tube).	1 set
2460 Style 02 or 2470Style 02	Register arm dropper assembly including dropper wire complete with bolts, nuts etc.	1 set
2391-1, 2540/2520	Steady arm hook (BFB) (Forged) or bent steady arm (where required)	As required
2361-1, 2491-2, 2492-2	25 mm drop bracket (Forged) with bolts & locknuts. 25 mm Steady arm clamp (Forged) with bolts & locknuts.	-do-
1220/1370/-1	Contact wire swivel clip or raised register arm clamp	1 off
2550-1/2	Antiwind clamp	As required

Item No. 4(a)(ii): Extra on 4(a) (i) for supply and erection of additional fittings on a single bracket assembly for supporting two OHEs

The price is applicable as an extra to Item 4(a) (i) or 4(a) (v) for the provision of additional fittings required to support an additional OHE on a single bracket assembly payable under Item 4(a)(i) or 4(a)(v). The price shall include supply of all extra fittings excluding the double contact wire swivel clip. The price shall include erection of all extra fittings, including the double contact wire swivel clip.

Item No. 4(a)(iii): Supply without insulator and erection of a single bracket assembly suitable for tramway type overhead equipment (regulated).

The price shall cover on a flat rate basis any bracket assembly, on a traction mast or support on drop arm, and shall include those on high level platform, in the vicinity of turnouts, over bridges or over-laps and at locations with reduced encumbrance or terminating wires. The price shall include the cost of supply of all components including galvanised steel tubes, dropper wires, bolts and nuts etc. but excluding small parts steel work and solid core insulators (Cost of insulators will be paid in Schedule-1, Section-5). Cost of SPS will be paid under Item 3(c)

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of Schedule-1, Section-3. The price shall cover erection of all components including insulators, small part steel work and dropper wires. However, this does not include the anticreep arrangement at masts/structures. The price shall include:

Rly. Id. No	Description of Component.	Qty. per Unit.
3021-1	Mast fitting for hook insulator (Forged) with 2 off bolts, nuts, lock-nuts & washers of 16 mm dia.	set 1
2400	Tubular stay arm (including galvanized steel tube).	set 1
2403-1, 2402	Tubular stay sleeve with Adjuster.	set 1
2380	Hook bracket	set 1
2140	Large catenary direct clamp	set 1
2160-1	Large register arm hook	set 1
2080	Large bracket tube assembly (49 mm) (including galvanised steel tube).	set 1
3070-1/2	Mast bracket fitting assembly including 2 off, bolts, nuts, lock-nuts and washers 16 mm.	set 1
2540-1	BFB steady arm assembly	set 1
2550-3	Standard anti-wind clamp	set 1
1220	Contact wire swivel clip	set 1

Item No.4(a)(iv): **Extra on Item 4(a)(iii) for supporting two tramway type OHE (Regulated).**

The price is applicable as an extra to Item 4(a)(iii) for the provision of additional fittings required to support an additional OHE on complete bracket assembly payable under Item 4(a)(iii). The price shall include supply of all extra fittings, excluding the double contact wire swivel clip.

Item No.4(a)(v): -DELETED-

Item No.4 (ax): Supply of Insulators for Item Nos.4 (a)(i) & 4 (a) (iii).

The price shall cover only supply of the following Insulators mentioned against each Items required for execution of work covered under Items 4(a)(i) & 4(a)(iii). Erection cost of insulators are inclusive in Items 4(a)(i) & 4(a)(iii) respectively.

Item No.	Insulator
4(ax)(i)	Stay Arm Porcelain (CD-1050 mm)
4(ax)(iv)	Bracket Porcelain (CD-1050 mm)
4(ax)(ii)	Stay Arm Composite (CD-1050 mm)
4(ax)(v)	Bracket Composite (CD-1050 mm)
4(ax)(iii)	Stay Arm Composite (CD-1600 mm)
4(ax)(vi)	Bracket Composite (CD-1600 mm)

Item No. 4(b)(i) : **Supply without insulator and erection of pull-off arrangement for one OHE**

The price shall cover supply of all components required for a pull-off arrangement to pull one equipment only including supply of copper conductors, small jumper(50) wire, head-span mast fittings complete with M.S. angle, equalising plate assembly, steady-arm, catenary dropper clip, contact wire swivel clip and fittings excluding solid core insulators (Cost of insulator will be paid in Schedule-1, Section-5). The price shall cover erection of all components including solid core insulators, small jumper wire and conductors.

NOTE : (i) For composite OHE' a catenary dropper clip with necessary bimetallic strip/ washer to be used in place of catenary dropper clip (Id. No.1192).

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(ii) 5 mm diameter Hard drawn Copper wire shall be used for Register Arm Dropper for all locations except for those on long Girder Bridges, where wear rate is high for which 7 mm diameter Hard drawn Copper wire shall be used for Register Arm Dropper.

Item No. 4(b)(ii): Extra for each additional equipment pulled.

The price shall cover as an extra to Item 4(b)(i) supply and erection of all additional fittings required including the supply of required conductors/ jumper wires, in case the pull off pulls more than one equipment the prices applicable for each extra equipment pulled.

Item No. 4(b)(iii) Supply without insulator and erection of a pull-off arrangement for regulated Tramway type OHE.

The price shall cover supply of all components including conductors required for a pull off arrangement to pull one equipment only, complete with steady arm, contact wire swivel clip and fittings, including solid core insulator (Cost of insulator will be paid in Schedule-1, Section-5), . The price shall cover erection of all components including solid core insulators, small jumpers.

Item No. 4(b)(iv) : - DELETED -

Item No. 4 (bx): Supply of Insulators for Item Nos. 4 (b)(i) & 4 (b)(iii)

The price shall cover only supply of following Insulators mentioned against each Item required for execution of work covered under Items 4(b) (i) & 4(b) (iii). Erection cost of insulators are inclusive in Items 4 (b) (i) & 4 (b) (iii) respectively.

Item No.	Insulator
4(bx)(i)	Porcelain 9 Tonne (CD-1050 mm)
4(bx)(ii)	Composite 9 Tonne (CD-1050 mm)
4(bx)(iii)	Composite 9 Tonne (CD-1600 mm)

Item No. 5(a)(i): Supply without Insulator and erection of mounting arrangement for span wire.

The price shall cover supply of all components including adjusters, terminal fittings and mast attachments required to attach a span wire or a head-span wire or a cross span wire or a steady span wire or a support span wire for supporting contact wire only, at both ends, to traction masts/structures or special brackets. The price shall exclude the cost of solid core insulators (Cost of insulator will be paid in Schedule-1, Section-5), and small parts steel work, if any. The price shall cover erection of all components including mounting arrangements for span wire and solid core insulators but excluding small parts steel work, if any.

Item No. 5(a)(ii): - DELETED -

<u>Item No. 5(az)(ii):</u> Supply and erection of a span wire

The price shall cover supply and erection of a large span wire (130) per meter. The payable length in case of head span wires shall be the horizontal distance between the inner faces of all traction masts/structure on which the mast attachments are mounted, and in case of Large Span Wire, the actual length shall be measured at the time of erection. No extra payment shall be made on account of the sag. Erections of a meter beyond the first decimal shall be rounded off to the nearest first decimal.

NOTE *:* The quantity for which the payment is made for the supply and erection of large span wire under this Item shall be deducted from the corresponding length in the span for which payment is made under Item 6(a).

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Item No. 5(b): **Supply without insulator and erection of suspension of one conventional OHE/ composite OHE from head span**

The price shall cover supply of a suspension assembly to carry complete all copper OHE/ Composite OHE on head spans inclusive of all dropper assemblies (exclusive of dropper wire) and from head-span, cross-span steady wire attachment, steady arm/rod, catenary suspension clamps and other fittings required to make complete suspension arrangements for copper OHE/Composite OHE on head span. The price shall cover the erection of all components, fittings, and droppers for suspension of OHE from head span.

Item No. 5(c): **Supply of without insulator and erection of Suspension /registration of contact wire only**

The price shall cover supply dropper wire and supply and erection of all fittings required for suspension/ registration of a contact wire only whether under head spans carrying other types of OHE or not or on any bracket for carrying contact wire only. The price shall include the followings:-

(i) Vee clamp or double vee clamp with adjuster, or steady arm with steady wire clamp.
(ii) Contact wire swivel clip.

Item No.5 (ax): Supply of Insulators for Item 5(a)(i), 5(b) and 5(c)

The price shall cover only supply of any of the following Insulators mentioned against each Item required for execution of Item covered under Items 5(a)(i), 5(b) and 5(c). Erection cost of insulators are inclusive in Items 5(a)(i), 5(b) and 5(c) respectively.

Item No.	Insulator
5(ax)(i)	Porcelain 9 Tonne (CD-1050 mm)
5(ax)(ii)	Composite 9 Tonne (CD-1050 mm)
5(ax)(iii)	Composite 9 Tonne (CD-1600 mm)

Item No. 6 (a): - DELETED -

Item No. 6 (az) : Supply and erection of overhead equipment only

The price shall cover the supply of all copper conductors including dropper wire (5 mm), jumper wire (50 sq.mm, 19/1.80 mm) as per the specifications indicated under para 2.4.9 of the tender paper. The price shall be excluding the cost of **supply of contact wire (107 sq.mm HDGCC), catenary (65 sq.mm 19/2.10 mm, to be supplied by the purchaser.**

The price shall cover supply of all components including dropper clips, parallel clamps for jumpering and splices (where their use is approved) and small parts steel works complete with bolts and nuts etc. for attachment of number plates to mast/structure, if any. The price shall cover erection of all components and wires and conductors including contact wire, catenary wire, droppers, jumpers and terminating wires, if any, but excluding small parts steel work, if any. The price shall be excluding the cost of erection of large span wire, which will be paid under Item 5(az)(ii).

The price shall include provision of Retro reflective number plates on traction masts or structures. The prices shall exclude supply of small parts steel work for fixing of retro reflective number plate (like as Clamps & plates) will be paid under Item no.3(c). The price shall include bolts and nuts for attachment of Retro reflective number plates to masts/ structures. The price shall also include the

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cost of painting the setting distance and rail level on masts/structures, stenciling of symbol for direction of emergency telephone socket. The price shall not include termination of conductors which will be paid for under Item 8.

Rly. Ident No.	Description of components	Qty. for unit
1040-2 or SK-534/1 & SK-575/2 or SK- 576/1 & SK-535/2 or 1041-3.	Contact wire parallel clamp small	As required
1180/SK572/1 &SK-572/2	Contact wire dropper clip (107)	-do-
1192	Catenary dropper clip complete with bolts, nuts etc	-do-
7501/7503	Enameled/ Retro reflective number plates complete with 2 Galv. MS. bolts m 10x35/30, nuts and lead washer for m 10 bolts but excluding SPS for attachment of number plate to masts/structures.	-do-
1110-2	Contact wire ending clamp	-do-
1120	Catenary ending clamp	-do-
1140	Large span wire clamp (130)	-do-
5020-1/5020-2	9-T, Adjuster (Forged)	-do-
5030	Anchor double strap assembly	-do-
5191/5192	Compensating plate/equalizing plate	-do-

Item No. 6(b) : **- DELETED -**

Item No. 6(bz) : **Supply and Erection of contact wire only**

The price shall cover erection of contact wire only. The price shall exclude termination which will be paid for under Item 8. The price shall include provision of Retro-reflective and enameled number plates on traction masts/structures and painting of setting distance structures and rail levels on masts/structures. The price shall exclude the supply of small part steel works complete with bolts and nuts for attachment of enameled number plates to masts/ structures. Contact wire required for the work shall be supplied by the purchaser.

Description	Qty. for unit	Supplied by
Contact wire (107 Sq mm)	As required	Contractor
Retro-reflective	As required	Contractor

Item No. 6(c) : **– DELETED -**

Item No. 6(cz) : **Supply and Erection of contact wire only (regulated with bridle wire)**

The price shall cover the supply of dropper wire (5mm), 7/2.10, 20 sq.mm Briddle wire as per the specifications indicated under para 2.4.9 of the tender paper, erection and provision of briddle wires with clamps and two droppers including clips, Retro-reflective and enameled number plates on traction masts/structures, painting of setting distance and rail levels on masts/ structures, stenciling of symbol for direction of emergency telephone socket if required. The price shall exclude supply of required small part steel works complete with bolts and nuts for attachment of enameled number plates to masts/ structures. The price shall exclude termination which will be paid for under Item 8. Contact wire required for the work shall be supplied by the purchaser.

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Item No. 6(d) : **DELETED**

Note: All bolts and nuts below 14mm dia on current carrying parts of OHE shall be stainless steel.

Note for Measurement:

1. For the purpose of payment against Item 6(a), (b), (c), & (d) the length of over head equipment, which shall include terminating wires, shall be measured from the center 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. No extra payment will be made on account of either due to sag in these wires/conductors or scraps generated. The price under Items 6(az), 6(bz), 6(cz) & 6(d) 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.
3. For the purpose of progress payment reference to layout plans "As Approved" shall be made. However, the price under this Item shall be adjusted according to the final length of OHE indicated in the "As Erected" layout plan.

Note for Number Plates:

(i) Retro-reflective OHE number plates should be provided generally at all locations. (Reference-Railway Board's letter No. 2001/Elect(G)/170/1 Dated 22/23.12.2016)

(ii) Sigma Board in fog prone area only, for identification of all signals shall be provided two masts prior to all signal locations for easy identification during foggy weather. (Reference-Railway Board's letter No. 2001/Elect(G)/170/1 Pt. Dated 07.05.2012)

Item No. 7(a): Supply and Erection of all Aluminum 25 KV feeder/return conductor (Single Spider)

The price shall cover supply and erection of Hard-drawn stranded All Aluminium conductor conforming to IS-398(Pt.I) with ammendment-1 and of size 19/3.99mm (240 Sq.mm) feeder/return conductor (along or across the tracks). The price shall not include the cost of suspension assembly (which will be paid for under Item-11) and termination (which will be paid for under Item-8.) and small part steel work, complete with bolts and nuts etc, if any. The price shall also cover on a flat rate basis, the cost of supply of splices to the extent required.

Item No. 7(b): -DELETED -

Item No. 7(c): **Supply and erection of earth wire**

The price shall cover supply and erection of earth wire made of 7/4.09 mm steel reinforced aluminium conductor (RACCOON) excluding termination which will be paid for under Item 8 and shall include cost of fittings on structures for supporting the earthwire including bonding of the earth wire to the structure and the structure to earth electrodes or a non-track circuited running rail or impedance bond which will be provided by the Purchaser. The price shall include disc insulators, cut-in-insulator to isolate sections of earth wire which will be paid for under Item 11(c) and the cost of small part steel works complete with bolts and nuts to attach the earth wire mast clamp to masts/structures, if any.

Note for Measurement:

1. The prices under Items 7(a) and 7(b) shall not include termination which will be paid for under Item 8. The connection (a) between feeders, or return conductors and (b) of feeders, or return

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conductors to a bus bar, overhead equipment or isolator switch which will be paid for under Item 15, & cut-in-insulators and suspension insulators which shall be paid for under Item 11.

2. For the purpose of payment against Item 7 (a) and 7(b) the length of feeders, return conductors or earth wire shall be measured from the center lines of the mast/structure at which the two ends of each length of feeder or conductor run are anchored, by adding actual spans. In case of feeders/return conductors crossing a track, the length shall be measured between the faces of traction masts/structures at which the two ends of the cross feeder or return conductors are anchored, as indicated in the as erected structure erection drawings for traction masts/structures. No payment will be made for the extra length of the conductor/s on account of sag or scrap.

3. For purposes of progress payment reference to "As Approved" drawings shall be made. However, the price under this Item shall be adjusted according to the final length of OHE indicated in the "As Erected" layout plan/drawings

Item No.7(d): Supply and Manual Erection of All Aluminium 25 kV Feeder/Return (Single Spider).

Same as Item 7 (a) but the work is to be executed manually instead of with wiring train.

Item: 7(e): Supply and Erection of Copper cross feeder wires (37/2.25 mm HDBC) across the track at SP/SSP/FP/BT locations.

The price shall cover the supply and erection of 25 kV feeder wire across/along the track at the location of SP/SSP/FP/BT/Gantries stations. Feeder wire shall be made of hard drawn bare copper conductor of size 37/2.25 mm. The price shall be inclusive of cost of feeder wire but exclusive of termination (which will be paid under Item 8(b)(ix) and small parts steel work complete with bolts, nuts etc if any.

Item No. 8(a)(i) : -DELETED-

Item No. 8(a)(ii) : -DELETED-

Item No. 8(a)(iii) : -DELETED-

Item No. 8(a)(iv) : -DELETED-

Item No. 8(a)(v) : Supply and erection of regulating equipment (3 pulley type) with Counter weight assembly for conventional/composite OHE.

The price shall cover supply and erection of counter weight assembly (for both conventional and High Rise OHE) including 5 ton adjuster with double strap assembly and normal/anti-theft guide tube assembly, the supply of regulating equipment and stainless steel wire rope (of various length as required) required for the regulating equipment and small part steel work, if any. The price shall also cover adjustment of the entire regulating equipment. The price shall not include supply and erection of termination, which will be paid for under Item No. 8(b).

Item No. 8(a)(vi): Supply and erection of a regulating equipment (3 Pulley type) with counter weight assembly for Tram Way Type OHE (Regulated)

Same as 8(a)(v) above but with counter weight assembly conforming to style – 01 of the relevant termination arrangement drawing No.: ETI/OHE/G/04212, with latest mod.

Item No.8(a)(vii) : -DELETED-
Item No. 8(a)(viii) : -DELETED-
Item No.8(a)(ix) : -DELETED-

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Item No. 8(a)(x) : **Supply without SS Wire Rope and erection of a regulating equipment (3 Pulley type) with counter weight assembly for conventional/ composite OHE**

Same as Item 8(a)(v) but excluding stainless steel wire rope required for the regulating equipment. For shorter tension lengths OHE (like Emergency x-overs) GI Sleeve of 20 mm dia to be inserted in the hexagonal tie rod of ATD of cross-over OHE in accordance with RDSO's SMI No.TI/MI/0035 (Rev-O).

Item No. 8(a)(xi) : **Supply without SS Wire Rope and erection of a regulating equipment (3 pulley type) with counter weight assembly for tramway type OHE (Regulated)**

Same as Item 8(a)(vi) but excluding stainless steel wire rope required for the regulating equipment. For shorter tension lengths OHE (like Emergency x-overs) GI Sleeve of 20 mm dia to be inserted in the hexagonal tie rod of ATD of cross-over OHE in accordance with RDSO's SMI No. TI/MI/0035 (Rev-O).

Item No. 8(a)(xii): **Marking/Painting of temperature & 'Y' measurement of OHE mast at BWA locations**

The price shall cover marking/ painting of temperature and 'Y' measurement on OHE masts at BWA locations including cost of paint.

Item No. 8(b)(i) : **Supply without Insulator and erection of materials for termination of single conductor of overhead equipment or a terminating wire.**

The price shall cover supply of all material necessary for the termination of single conductor of overhead equipment or terminating wire on a traction mast or structure, including appropriate mast anchor fittings, clevis assembly, adjuster, anchor double straps, ending clamp for the catenary or contact wire or terminating wire and fittings including 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly and terminating wire, if any. The price shall cover erection of all materials including the 9 ton insulator assembly and terminating wire, if any.

NOTE : 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 payment.

Item No. 8(b)(ii): **Supply without Insulator and erection of materials for termination of double conductors.**

The price shall cover supply of all materials necessary for the yoked termination of two overhead equipment conductors on a traction mast or structure, including appropriate mast anchoring, clevis assembly, two adjusters, ending clamps for catenary and contact wires, anchor double strap assembly, equalising/ compensating plate and fittings including 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly and terminating wire, if any. However, the price shall cover erection of all materials including the 9 ton insulator assembly.

Item No. 8(b) (iii): **Supply without Insulator and erection of materials for termination of all Aluminum 25 kV feeder/return conductor (single SPIDER).**

The price shall cover supply of all materials required for the termination of an All Aluminium 25 kV feeder/return conductor (SPIDER), including appropriate mast anchor fittings adjuster, strain clamp end fitting including 3 kV cut-in-insulator and 9 ton insulator assembly. However, the price shall cover erection of all materials including the 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5) assembly and 3 KV cut-in-insulator (Cost of insulator will be paid in Schedule-1, Section-5).The price shall be include the cost of 9 ton insulator assembly and erection cost thereof.

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Item No. 8(b)(iv) : **-DELETED-**

Item No. 8(b)(v): **Supply without Insulator and erection of materials for termination of an earth wire.**

The price shall cover supply and erection of all materials required for the termination of an earth wire including appropriate mast anchor fittings, adjuster, terminal clamp and fittings.

Item No. 8(b)(vi): **Supply without Insulator and erection of materials for termination of tramway type OHE (Regulated).**

The price shall cover supply and erection of all materials required for the termination of a single contact wire (regulated) and will exclude the parts covered under Item 8(a)(iii)/(vi).

Item No. 8(b)(vii): **Supply without insulator and erection of materials for termination of double conductors for composite OHE.**

The price shall cover supply of all materials necessary for the yoked termination of two overhead equipment conductors on a traction mast or structure including appropriate mast anchor fittings clevis assembly three adjuster, ending clamps for aluminium Alloy catenary and copper contact wires, anchor double strap assembly, unequal tension compensatory plate and fittings excluding the 9 ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly and terminating wire, if any. The price shall cover erection of all materials including the 9 ton insulator assembly.

Item No. 8(b)(viii): **Supply without insulator and erection of materials for termination of an aluminium conductor of the composite overhead equipment.**

The price shall cover supply of all materials necessary for the termination of single Aluminium conductor of composite OHE or terminating wire on a traction mast or structure, including appropriate mast anchor fittings, clevis assembly, adjuster, anchor double straps, ending clamps for the aluminium catenary or terminating wire and fittings including 9 ton insulator(Cost of insulator will be paid in Schedule-1, Section-5), assembly and termination wire, if any. The price shall cover erection of all materials including the 9 ton insulator assembly and termination wire, if any.

Item No. 8(b)(ix): **Supply without insulators and erection of materials for termination of copper cross feeder with gantries.**

The price shall cover the supply of all materials required for termination of copper cross feeder wire (37/2.25 mm HDBC) including appropriate mast anchor fitting (3231), 18 mm Single clevis (5041-1), 9-Tone adjuster (5020-2), Feeder ending clamp (1130), double clevis (3010) and other components as necessary excluding 9-Ton insulator (Cost of insulator will be paid in Schedule-1, Section-5), assembly. The price shall also cover the erection of all materials including 9-Ton insulator assembly and termination of cross feeder at either ends. Fittings/components required for termination of one cross feeder at both ends constitute one set.

Notes to Item 8 :

(1) Small parts steel work complete with bolts and nuts wherever required, will be paid under Item 3(a) or 3(b) and 3(c) as applicable and shall not be included in this Item.

(2) The prices under Item 8(b)(iii) shall not include the cost of jumper connection (i) between feeders or return conductors and (ii) or feeders or return conductors to a busbar, overhead equipment or isolator switch which will be paid for under Item 15.

(3) The prices under Items 8(b)(i) to 8(b)(viii) shall also include the cost of double eye distance rod (ID no. 5183), if provided for any type of terminations.

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