HARYANA RAIL INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED
(A Joint Venture Govt. of Haryana and Ministry of Railways)
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Telephone: +91 9311478893, E-mail: horc.etendering@gmail.com , Website: www.hridc.co.in

Tender No.: HORC/HRIDC/SYS-1/2023 **Date: 20.07 .2023**

Reference: Specific Procurement Notice dated 29.05.2023.

CORRIGENDUM NO. 2

Name of Work: Contract Package SYS-1: Design, Supply, Installation, Testing & Commissioning of 2x25kV, 50Hz, AC, High Rise Overhead Electrification (OHE), Power Supply System and SCADA in connection with laying of New BG Double Railway Line from Prithla to New Harsana Kalan of Haryana Orbital Rail Corridor (HORC) Project from Km (-)*2.099* to Km 125.98 Including Rigid Overhead Conductor System (ROCS) in Tunnel Portion i.e from km 24.850 to km 29.580 and its connectivity to IR/DFC networks at New Prithla, Patli, Sultanpur, Asaudah and New Harsana Kalan including modifications in New Prithla, Sultanpur, Asaudah and New Harsana Kalan Station Yards (approximately 145 RKM and *315* TKM).

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
1.	Tender Document, Name of Work	Design, Supply, Installation, Testing & Commissioning of 2x25kV, 50Hz, AC, High Rise Overhead Electrification (OHE), Power Supply System and SCADA in connection with laying of New BG Double Railway Line from Prithla to New Harsana Kalan of Haryana Orbital Rail Corridor (HORC) Project from Km (-)2.14 to Km 125.98 Including Rigid Overhead Conductor System (ROCS) in Tunnel Portion i.e from km 24.850 to km 29.580 and its connectivity to IR/DFC networks at New Prithla, Patli, Sultanpur, Asaudah and New Harsana Kalan including modifications in New Prithla, Sultanpur, Asaudah and New	**Name of Work wherever referred to in the Tender Document shall be read as follows:** Design, Supply, Installation, Testing & Commissioning of 2x25kV, 50Hz, AC, High Rise Overhead Electrification (OHE), Power Supply System and SCADA in connection with laying of New BG Double Railway Line from Prithla to New Harsana Kalan of Haryana Orbital Rail Corridor (HORC) Project from Km *(-)2.099* to Km 125.98 Including Rigid Overhead Conductor System (ROCS) in Tunnel Portion i.e from km 24.850 to km 29.580 and its connectivity to IR/DFC networks at

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		Harsana Kalan Station Yards (approximately 145 RKM and 320 TKM).	New Prithla, Patli, Sultanpur, Asaudah and New Harsana Kalan including modifications in New Prithla, Sultanpur, Asaudah and New Harsana Kalan Station Yards (approximately 145 RKM and *315* TKM).
2.	Part 1, Section II, TDS, Sub-Clause ITT 19.1	The Tenderer shall furnish a Tender Security for an amount of **INR 10,000,000.00 (INR Ten Million only) or the equivalent amount in a freely convertible currency.** The rates of exchange for computing INR equivalent shall be the reference rate prevailing twenty-eight (28) days prior to the deadline of Tender submission. Exchange rates shall be taken from the sources specified in Note No. 1 (iii) given under Sub-Clause 3.4.2 (a), Section III, EQC.	The Tenderer shall furnish a Tender Security for an amount of **INR 10,000,000.00 (INR Ten Million only) or the equivalent amount in a freely convertible currency.** The rates of exchange for computing INR equivalent shall be the reference rate prevailing twenty-eight (28) days prior to the deadline of Tender submission. Exchange rates shall be taken from the sources specified in Note No. 1 (iii) given under *Sub-Clause 3.4,* Section III, EQC.
3.	Part 1, Section II, TDS, Sub-Clause ITT 14.7	-	**Replace ITT 14.7 with the following:** All duties (*except Custom Duty*), taxes including *Goods and Services Taxes (GST), royalties, fees, cess* and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of Tenders, shall be included in the rates and prices and the total Tender Price submitted by the Tenderer. *The Tenderer must take note of Sub-Clause 14.1, Part B-Specific Provisions, Section IX: Particular Conditions of Contract (PCC) for quoting rates and prices of their Tender.*
4.	Part 1, Section III, EQC, Sub-Clause 3.4, Experience	Sub-Clause 3.4.2 (a) Specific Construction & Contract Management Experience	The existing Sub-Clause 3.4.2 (a), Specific Construction & Contract Management Experience is replaced and annexed as **"Attachment 1"** of this Corrigendum No. 1.

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
5.	Part 1, Section III, EQC, Sub-Clause 3.4, Experience	-	New Sub-Clause 3.4.2 (b), Specific Construction Experience in Key Activities" is added to Section III, EQC and is annexed as **"Attachment 1"** of this Corrigendum No. 1.
6.	Part 1, Section IV, Tender Dorms, Form EXP-3.4.2(a)	Form EXP-3.4.2(a)- Specific Construction & Contract Management Experience	The existing Form EXP-3.4.2 (a), Specific Construction & Contract Management Experience is replaced and annexed as **"Attachment 2"** of this Corrigendum No. 1.
7.	Part 1, Section IV, Tender Dorms, Form EXP-3.4.2(b)	-	New Form EXP-3.4.2 (b), Specific Construction Experience in Key Activities" is added to Section IV Tender Forms and is annexed as **"Attachment 2"** of this Corrigendum No. 1.
8.	Part 1, Tendering Procedures, Section IV, Tender Forms, Appendix B to Financial Part: Price Schedules, Sub-Clause 5.2, Column No. 4	Total Cost of Cost Centre E1= 0.357x 'E'	Total Cost of Cost Centre E1= *0.0357x* 'E'
9.	Part 1, Section IV Tender Forms, Appendix B to Financial Part: Price Schedules Sub-Clause 5.2.2, Note No. 3	Payment will be made on completion of each Milestone as per weightage given in this Cost Centre.	**Deleted**

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
10.	Part 1, Section IV Tender Forms, Appendix B to Financial Part: Price Schedules Sub-Clause 5.2.2, Note No. 4	Payment will be made on pro rata completion of Track Km Length (TKM) as per weightage (s) given in the Cost Centre.	Payment will be made on pro rata *basis* as per weightage(s) given in the Cost Centre.
11.	Part 1, Section IV Tender Forms, Appendix B to Financial Part: Price Schedules Sub-Clause 5.2.3, Note No. 3	Payment will be made on completion of each Milestone as per weightage given in this Cost Centre.	**Deleted**
12.	Part 1, Section IV Tender Forms, Appendix B to Financial Part: Price Schedules Sub-Clause 5.2.3, Note No. 4	Payment will be made on Pro rata completion of each payment stage as per weightage (s) given in this Cost Centre.	Payment will be made on pro rata *basis* as per weightage(s) given in this Cost Centre.
13.	Part 1, Section IV Tender Forms, Appendix B to Financial Part: Price Schedules Sub-Clause 5.2.4, Note No. 3	Payment will be made on completion of each Milestone as per weightage given in this Cost Centre.	Payment will be made on *pro rata basis* as per weightage(s) given in this Cost Centre.
14.	Part 1, Section IV Tender Forms, Appendix B to Financial Part: Price Schedules Sub-Clause 5.2.5, Note No. 4	Payment will be made on completion of each Milestone as per weightage given in this Cost Centre.	Payment will be made on pro rata *basis* as per weightage(s) given in this Cost Centre.

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>15.</td><td>Part 1, Section IV Tender Forms, Appendix B to Financial Part: Price Schedules Sub-Clause 5.2.7, Note No. 3</td><td>Payment will be made on pro rata completion of each Milestone as per weightage given in this Cost Centre.</td><td>Payment will be made on pro rata basis as per weightage(s) given in this Cost Centre.</td></tr>
<tr><td>16.</td><td>Part 1, Section IV, Tender Forms, Appendix B to Financial Part: Price Schedules, Schedule ‘B’</td><td>Schedule ‘B’</td><td>The existing Schedule ‘B’ is replaced with Schedule ‘B’/R1 and annexed as “Attachment 3” of this Corrigendum No. 2.</td></tr>
<tr><td>17.</td><td>Part 1, Section IV, Tender Forms, Appendix A to Financial Part: Price Schedule, BoQ MS-Excel Sheet</td><td>MS-Excel sheet for quoting price on eProcurement portal</td><td>The existing BoQ MS-Excel sheet for quoting price on eProcurement portal is replaced through this Corrigendum No. 2</td></tr>
<tr><td>18.</td><td>Part 2, Section VII:1, General Specifications (GS), Sub-Clause 1.3.3.</td><td>LEVEL CROSSINGS
There are no Level Crossings in the works.</td><td>LEVEL CROSSINGS
There are no level crossings in the Works. However, if there is any level crossing encountered during execution of the Works, the cost of electrical works required in connection with level crossings shall be paid under Schedule ‘B’.</td></tr>
<tr><td>19.</td><td>Part 2, Section VII – 1, General Specifications, Sub-Clause 1.3.4.</td><td>The salient features of the Track Structure and Formation on Prithla – New Harsana Kalan of HORC are as follows:
<table>
<tr><th>Sr.</th><th>Description</th><th>Details & Particular</th></tr>
<tr><td>1.</td><td>Gauge</td><td>1676 millimeters</td></tr>
</table></td><td>The salient features of the Track Structure and Formation on Prithla – New Harsana Kalan of HORC are as follows:
<table>
<tr><th>Sr.</th><th>Description</th><th>Details & Particular</th></tr>
<tr><td>1.</td><td>Gauge</td><td>1676 mm</td></tr>
</table></td></tr>
</table>

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<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>2.</td><td>Main Line, Loops and Sidings</td><td>60 kg/M Rail, 1 in 12 curved thick web switches with CMS Crossings on Fan shaped PSC Sleepers layout</td></tr>
<tr><td>3.</td><td>Sleepers</td><td>PSC Mono-Block, 60 kg/M</td></tr>
<tr><td>4.</td><td>Formation Width
a) Embankment (Straight Track)

b) Cuttings (Straight Track) excluding side drains</td><td>
For Double line : 13160 mm minimum
For Single line : 7850 mm

For Double line : 13160 mm minimum
For Single line : NA</td></tr>
<tr><td>5.</td><td>Radii of curves</td><td>Shall generally be not less than 700 meters on main lines (2.5 degrees)</td></tr>
<tr><td>6.</td><td>Maximum gradient</td><td>1:200 compensated</td></tr>
<tr><td>7.</td><td>Slope Gradient for Ballast Section</td><td>As per RDSO GE: IRS-0004</td></tr>
</table>
</td><td>
<table>
<tr><td>2.</td><td>Main Line, Loops and Sidings</td><td>60 kg Rail, 1 in 12 thick web and curved switches with CMS Crossings on Fan shaped PSC Sleepers layout</td></tr>
<tr><td>3.</td><td>Sleepers</td><td>PSC Mono-Block</td></tr>
<tr><td>4.</td><td>Formation Width</td><td>For Double line : 13160 mm minimum
For Single line : 7850 mm</td></tr>
<tr><td>5.</td><td>Radii of curves</td><td>Shall generally be not less than 700 meters on HORC main lines (2.5 degrees). Connectivities to IR will have curvatures up to 6 degree.</td></tr>
<tr><td>6.</td><td>Maximum gradient</td><td>1:150 compensated</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>8.</td><td>Cross Slope on top of formation</td><td>1 in 30</td></tr>
<tr><td>9.</td><td>Formation</td><td>As per guidelines and Specifications for design formation for Heavy (32.5 T) Axle Load stipulated by GE: IRS – 0004.</td></tr>
<tr><td>10.</td><td>Ballast Cushion
a) Main Line
b) Loop Line and sidings</td><td>
350 millimeters
250 millimeters</td></tr>
<tr><td>11.</td><td>Bridges</td><td>32.5 T Axle Load</td></tr>
</table>
</td><td></td></tr>
<tr><td>20.</td><td>Part 2, Section –VII – 1, General Specifications (GS), Sub-Clause 2.5.5.</td><td></td><td>Add New Sub-Clause 2.5.6 at the end of Sub-Clause 2.5.5
RDSO Vendor directory along with Standards and Specifications can be accessed at the following URL given below:
https://www.ireps.gov.in/epsn/cvap/admintab/vndrDirectoryAnon.do?activity=displayFirst&approvAgencyCode=-2</td></tr>
<tr><td>21.</td><td>Part 2, Section VII – 1, General Specifications</td><td>The project length, from Prithla – New Harsana Kalan section</td><td>The project length, from Prithla – New Harsana Kalan section</td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td></td><td>(GS), Sub-Clause 2.16.1(1).</td><td>falls along the Tropic of Cancer. The design should consider the lowest and highest temperatures witnessed in the section.</td><td>falls along KMP Expressway. The design should consider the lowest and highest temperatures witnessed in the section.</td></tr>
<tr><td>22.</td><td>Part 2, Section VII – 1, General Specifications (GS), Sub-Clause 8.13.9.</td><td>The testing/inspection of the material shall be done by Engineer’s and/or Employer’s representative and all costs associated with the testing/inspection shall be borne by the Contractor including travel/lodging/boarding charges of Engineer’s and/or Employer’s representative. Any testing/inspection charges to be paid to the Test Laboratories etc. shall also be borne by the Contractor.</td><td>The testing/inspection of the material shall be done by Engineer’s/ Employer’s Representative or RDSO or Third Party as nominated by the Employer and all costs associated with the testing/inspection shall be borne by the Contractor including travel/lodging/boarding charges of Engineer’s and/or Employer’s Representative. Any testing/inspection charges to be paid to the Test Laboratories etc. shall also be borne by the Contractor.</td></tr>
<tr><td>23.</td><td>Part 2, Section VII – 1, General Specifications (GS), Sub-Clause Chapter 15-Appendices, Table in Appendix 14,</td><td></td><td>S. No. 19 is added at the end of S. No. 18 in the Table
<table>
<tr><th>S. No.</th><th>Designation of Project Personnel</th><th>Minimum no. of Project-Personnel required</th><th>Penalty for Non-deployment per month or part thereof per person</th></tr>
<tr><td>19</td><td>Civil Engineer</td><td>1</td><td>RS 2,00,000</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>24.</td><td>Part 2, Section VII – 1, General Specifications (GS), Sub-Clause Chapter 15-Appendices, Table in Appendix 14,</td><td></td><td>S. No. 16 is added at the end of S. No. 15 in the Table

<table>
<tr><th>S. No.</th><th>DESIGNATION</th><th>QUALIFICATION</th><th>EXPERIENCE LEVEL</th></tr>
<tr><td>16</td><td>Civil Engineer</td><td>B.Tech. /Diploma in civil Engineering</td><td>Minimum 5/7 years experience out of which 3/5 years (B.Tech./ Diploma) in infrastructure projects of Railway / Metro/ DFC/ RRTS/ High Speed Rail</td></tr>
</table></td></tr>
<tr><td>25.</td><td>Part 2, Section VII – 1, General Specifications (GS), Sub-Clause Chapter 15-Appendices,</td><td>Appendix -15: Key Dates</td><td>The existing Appendix-15: Key Dates is replaced with Appendix-15: Key Dates/R1 and is annexed as Attachment 4 of this Corrigendum No. 2</td></tr>
<tr><td>26.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Chapter – 1 and 2</td><td>Chapter – 1-Introduction and Objective
Chapter- 2-Overview of the Project</td><td>The existing Chapter-1 and Chapter -2 of Section VII-2: Particular Specifications (PS) is replaced and annexed as Attachment 5 of this Corrigendum No. 2</td></tr>
</table>

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<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>27.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 3.2.5(1)</td><td>(1): Total Freight Traffic in the Horizon years
<table><tr><th>Financial year</th><th>Tonnage in Million Tonnes (MMTPA)</th><th>Trains per day</th></tr><tr><td>2025</td><td>54</td><td>48</td></tr><tr><td>2027</td><td>67</td><td>59</td></tr><tr><td>2032</td><td>81</td><td>72</td></tr><tr><td>2037</td><td>89</td><td>81</td></tr><tr><td>2042</td><td>100</td><td>93</td></tr><tr><td>2047</td><td>115</td><td>108</td></tr><tr><td>2052</td><td>134</td><td>128</td></tr></table></td><td>(1): Total Freight Traffic in the Horizon years
<table><tr><th>Year</th><th>Trains per day</th></tr><tr><td>D</td><td>48</td></tr><tr><td>D+5</td><td>59</td></tr><tr><td>D+10</td><td>72</td></tr><tr><td>D+15</td><td>81</td></tr><tr><td>D+20</td><td>93</td></tr><tr><td>D+25</td><td>108</td></tr><tr><td>D+30</td><td>128</td></tr></table>D- Denotes year of Commissioning of HORC Project</td></tr>
<tr><td>28.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 3.3.1 (3), (iv)</td><td>At 4 junction stations i.e Manesar, New Patli, Badsa & Mandothi and four other stations i.e Prithla, Sohna IMT, Kharkhoda & New Harsana Kalan, 2 nos. 50 kVA auxiliary transformers with ACO Panel at each station shall be provided. At other stations 2 nos. 25 kVA auxiliary transformers at each station shall be provided with ACO panel. At Level Crossing (LC) Gate(s) (if any), 2 nos. 10 kVA auxiliary transformers shall be provided.</td><td>At 4 junction stations i.e Manesar, New Patli, Badsa & Mandothi and eight crossing stations i.e Prithla, Sohna IMT, Dhulawat, Badli, Kharkhoda, Tarakpur, New Harsana Kalan and Sultanpur, 2 nos. 50 kVA auxiliary transformers with ACO Panel at each station shall be provided. At other six stations (Silani, Chandla Dungerwas, Panchagaon, Deverkhana, New Asaudah and Jasur Kheri), 2 Nos. 25 kVA auxiliary transformers at each station shall be provided with ACO panel. At Level Crossing (LC) Gate(s) (if any), 2 Nos. 10 kVA auxiliary transformers shall be provided. At Level Crossing (LC) Gate(s) (if any), 2 nos. 10 kVA auxiliary transformers shall be provided. The scope include provision of auxiliary transformer and its connection to OHE, LT box near</td></tr>
</table>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			auxiliary transformer, laying of copper cable from auxiliary transformer to Auto Change Over (ACO) Panel in at station or S&T installation (RDSO specification no. TI/SPC/PSI/CLS/0020 (amendment-4 or latest) and provision of ACO panel along with earthing wherever required.
29.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 3.3.4 (4).	-	**Add New Sub-Clause 3.3.4 (5) at the end of existing Sub-Clause 3.3.4 (4):** *Simulation study shall be got done by the Contractor through separate specialised agency. Simulation study results and design shall be got validated from an independent Proof Checking & Validation Agency.*
30.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 3.3.5.	-	The existing Sub-Clause 3.3.5 is replaced and annexed as **Attachment 6** of Corrigendum No. 2.
31.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 3.3.6.		The existing Sub-Clause 3.3.6 is replaced and annexed as **Attachment 6** of Corrigendum No. 2.
32.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 3.3.7	Dhulawat station is proposed to be connected to New Taoru station of DFCCIL by single line (approx. 5 TKM) with 2x25 kV high rise OHE system in future. The Contractor shall execute this work (if required) and payment shall be made under schedule-B.	**Deleted**

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>33.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 3.3.8 (i).</td><td>220/132 kV transmission line network. However, gantry at TSS shall be made by the Contractor for termination of 220/132 kV incoming feeders with associated switchgear.</td><td>220 kV transmission line network with transmission line side insulators and conductors. However, gantry at TSS shall be constructed by the Contractor for termination of 220 kV incoming feeders with associated switchgear.</td></tr>
<tr><td>34.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Row No. 8 of Table under Sub-Clause 4.2.</td><td><table><tr><td>Basic wind pressure *</td><td>120 – 200 kgf/m^2, as per wind map based on IS – 875. For long bridges (more than 150m) and within 100m from their abutments on either side and on banks, where the height of the catenary above surrounding mean retarding surface is more than 30 meters, the specified 25% reduction in wind pressure shall not be reckoned for purposes of design.</td></tr></table>*The maximum wind pressure for the specified work area shall be obtained from the wind map as per IS 875 and used for the mechanical designs with the approval of the Engineer. The Thermal withstand capacity shall be considered at 0.5m/sec wind velocity.</td><td><table><tr><td>Basic wind Speed</td><td>50m /sec
Design Wind Force shall be calculated as per IS 875-Part 3</td></tr></table></td></tr>
<tr><td>35.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 4.4.2(8).</td><td>The above CAC criteria shall not be applicable for ROCS items. For ROCS, the items proposed for deployment shall conform to International Standards and RDSO guidelines. The system proposed should be designed for speed</td><td>The above CAC criteria shall not be applicable for ROCS items. For ROCS, the items proposed for deployment shall conform to International Standards and RDSO guidelines. The system proposed should be designed for speed potential</td></tr>
</table>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		potential mentioned in PS clause 8.2.1 and the detailed design report shall be submitted. The validation of design shall be carried by third party design certification.	mentioned in PS clause 8.2.1 and the detailed design report shall be submitted. The validation of design shall be carried by third party design certification *and the cost of the same shall be borne by the Contractor.*
36.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 4.6.2.(5), (a) (xiii).	The ROCS system shall be designed for speed potential mentioned in the Particular Specifications and the detailed design report shall be submitted. The validation of design shall be carried by third party design certification.	*Deleted*
37.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 5.2.	**5. 2 ROLLING STOCK CHARACTERISTICS AND TRAIN OPERATION DATA**	The existing Sub-Clause 5.2 is replaced and annexed as **Attachment 7** of this Corrigendum No. 2
38.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause6.1.3.(2)(j)	Circuit Breakers suitable for 2x25kV AT feeding System	Circuit Breakers suitable for 2x25kV AT feeding System *(2000 A rating minimum)*
39.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.3.(2) (k)	Bridging interrupters suitable for 2x25kV AT feeding system	Interrupters suitable for 2x25kV AT feeding system *(2000 A rating minimum)*
40.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.3.(2) (l)	Double pole isolators, suitable for 2X25 KV AT feeding system.	Double pole isolators, suitable for 2X25 KV AT feeding system *(2000 A rating minimum)*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
41.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.3.(2) (u)	Batteries and Battery Chargers	Batteries and Battery Chargers *(400 AH rating minimum).*
42.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.4.(1)	Double pole circuit breakers for 2X25 AT system with Protection relays as required to automatically isolate fault section/ equipment	Double pole circuit breakers for 2X25 AT system with Protection relays as required to automatically isolate fault section/ equipment *(2000 A rating minimum)*
43.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.4.(2)	Double Pole interrupters for 2X25 AT system	Double Pole interrupters for 2X25 AT system *(2000 A rating minimum)*
44.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.4.(3)	Double pole isolators for 2X25 AT feeding system	Double pole isolators for 2X25 AT feeding system *(2000 A rating minimum)*
45.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.4.(4)	Double Pole isolators (motorised) 2x25 kV for feed extension	Double Pole isolators (motorised) 2x25 kV for feed extension *(2000 A rating minimum)*
46.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.4.(6)	Auxiliary Transformers 10 kVA, 25kV/240V, single phase	Auxiliary Transformers *25 kVA*, 25kV/240V, single phase.
47.	Part 2, Section VII–2, Particular Specifications (PS),	Batteries and Chargers	Batteries and Chargers *(200 AH rating minimum)*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	Sub-Clause 6.1.4.(10)		
48.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5.(1)	Double pole circuit breakers for 2X25 AT system with Protection relays as required to automatically isolate fault section/ equipment	Double pole circuit breakers for 2X25 AT system with Protection relays as required to automatically isolate fault section/ equipment *(2000 A rating minimum)*
49.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5.(2)	Double Pole interrupters for 2X25 AT system	Double Pole interrupters for 2X25 AT system *(2000 A rating minimum)*
50.	Part 2, Section VII–2, Particular Specifications (PS) , Sub-Clause 6.1.5.(3)	Double pole isolators, for 2X25 AT system	Double pole isolators, for 2X25 AT system *(2000 A rating minimum)*
51.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5.(5)	Auxiliary Transformers 10 kVA, 25kV/240V, single phase.	Auxiliary Transformers *25 kVA*, 25kV/240V, single phase
52.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5.(9)	Batteries and Chargers	Batteries and Chargers *(200 AH rating minimum)*
53.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5 Note.	Note: The SP at Sultanpur (for double line) and Asaudah (for single line), as approved by Engineer, shall be of 1x25 kV system and shall have following equipment but not limited to ;	**"Note" shall be renumbered as Sub-Clause 6.1.6** *Sub-Clause 6.1.6* The SP at Sultanpur (for double line) and Asaudah (for single line), as approved by Engineer, shall be of 1x25 kV system and shall have following equipment but not limited to ;

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
54.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5 Note (1)	Single Pole interrupters for 25 kV system;	Sub-Clause 6.1.6 (1) Single Pole interrupters for 25 kV system *(2000 A rating minimum);*
55.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5 Note (2)	Single Pole isolators, for 25 kV system;	Sub-Clause 6.1.6 (2) Single Pole isolators, for 25 kV system *(1600 A rating minimum)*
56.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5 Note (3)	Double Pole isolators for 25 kV system;	Sub-Clause 6.1.6 (3) Double Pole isolators for 25 kV system *(1600 A rating minimum)*
57.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5 Note (6)	Return Current Circuit Cabling;	Sub-Clause 6.1.6 (6) Return Current Circuit *75X8 mm GI flat.*
58.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.1.5 Note (8)	Batteries and Chargers;	Sub-Clause 6.1.6 (8) Battery and Chargers *(40 AH rating minimum).*
59.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause	Harmonics generated at PCC.	**Add the following Note below the existing Table under Sub-Clause 6.7.3** *Note –RDSO Specifications for Power Quality Restorer:*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	6.7.3, Table		*IS/RDSO-TI/0002:2023*
60.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 6.10.(1).	Steel structures for outdoor TSS, SSP, SP, SS and those required for support of overhead equipment, all Small Parts Steel (SPS) works, earthing flats/pipes/rods etc shall be hot dip galvanised as per RDSO's specifications no. ETI/OHE/13 (4/84 or latest) i.e. minimum coating of zinc shall be 610 gm/m2, except for marine and chemically polluted areas. The zinc coating specified in the equipment specification, if any, will also be considered and most stringent zinc coating out of the two will be applicable as approved by the Engineer. The Contractor shall carryout the Pollution Mapping of the entire section as per the relevant standards and RDSO guidelines and shall be submitted for approval of The Engineer. The polluted areas as identified as a result of pollution mapping by the contractor and approved by the Engineer shall be provided with the zinc coating of minimum 1000 gm/ m2 on Steel structures. In case of need to use nonstandard SPS at special locations to be fixed to the steel structure, these shall be with clamps to avoid drilling of galvanized mast sections.	Steel structures for outdoor TSS, SSP, SP, SS and those required for support of overhead equipment, all Small Parts Steel (SPS) works, earthing flats/pipes/rods etc shall be hot dip galvanised as per RDSO's specifications no. ETI/OHE/13 (4/84 or latest) i.e. minimum coating of zinc shall be *1000* gm/m2. The zinc coating specified in the equipment specification, if any, will also be considered and most stringent zinc coating out of the two will be applicable as approved by the Engineer. In case of need to use nonstandard SPS at special locations to be fixed to the steel structure, these shall be with clamps to avoid drilling of galvanized mast sections. *Galvanisation thickness at any point shall not be less than 100 micron.*

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>61.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 7.1.4, Table 7.1.1</td><td>Table 7.1.1 List of Proposed Traction Substations (TSS)
<table><tr><th>S. No</th><th>Installation Name</th><th>Approx. HORC Chainage (inKm)</th><th>Plot Size (sqm) (metre x metre) Approx.</th><th>Voltage level at point ofSupply/ TSS</th></tr><tr><td>1</td><td>Chandla Dungerwas</td><td>43.270</td><td>140 x 85</td><td>220/132 kV</td></tr><tr><td>2</td><td>Mandothi TSS</td><td>90.000</td><td>140 X 85</td><td>220/132 kV</td></tr></table>*Note:
Location and feeding zone TSS in adjoining phases may be considered for simulationstudy input data.</td><td>Table 7.1.1 List of Proposed Traction Substations (TSS)
<table><tr><th>S. No</th><th>Installation Name</th><th>Approx. HORC Chainage (inKm)</th><th>Plot Size (sqm) (metre x metre) Approx.</th><th>Voltage level at point of Supply/TSS</th></tr><tr><td>1</td><td>Chandla Dungerwas</td><td>43.270</td><td>140 x 85</td><td>220kV</td></tr><tr><td>2</td><td>Mandothi TSS</td><td>90.000</td><td>140 X 85</td><td>220 kV</td></tr></table>*Note:
1. Voltage level at point of supply of TSS as given above shall supersede any other values stated anywhere else in Tender Documents.</td></tr>
<tr><td>62.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 7.3</td><td>7.3 220kV/132/2x25kV TRACTION TRANSFORMERS</td><td>The existing Sub-Clause 7.3 is replaced and annexed as Attachment 8 of this Corrigendum No. 2</td></tr>
<tr><td>63.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 7.4</td><td>7.4 AUTO TRANSFORMERS</td><td>The existing Sub-Clause 7.4 is replaced and annexed as Attachment 8 of this Corrigendum No. 2</td></tr>
<tr><td>64.</td><td>Part 2, Section VII–2, Particular</td><td>The indicative layout of the substation, fencing etc. along</td><td>The indicative layout of the substation, fencing etc. along</td></tr>
</table>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	Specifications (PS), Sub-Clause 7.9.14.	with area has been given in the Tender drawings. Contractor shall submit the final layout design for Engineer's approval after taking into consideration the sizes of various equipment etc.	with area has been given in the Tender drawings. *RCC M25 Grade retaining walls shall be provided on all 4 sides of TSS, SP and SSP*. Contractor shall submit the final layout design for Engineer's approval after taking into consideration the sizes of various equipment etc.
65.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.2.1.	**Design Speed** The overhead equipment shall be of simple sagged polygonal type design (ROCS in Tunnels) auto- tensioned in conformance to EN50119 and shall be designed for a maximum permissible speed of 160 kmph.	**Design Speed** (1) The overhead equipment of *HORC main line*s shall be of simple sagged polygonal type design (ROCS in Tunnels) auto- tensioned in *conformity with RDSO* and shall be designed for maximum permissible speed of 160 kmph. (2) *The OHE for loops shall be designed for* maximum permissible *speed of 50 Kmph and connecting lines shall be designed for* maximum permissible *speed of 100 Kmph.* (3) *The testing of OHE shall be done at 10% more than the maximum permissible speed.*
66.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.2.3 (4)	For OHE masts to be erected on bridges and viaducts, the Civil Contractors working in various parts of the Pirthla – Harsana Kalan section shall provide holes for fixing Masts with base plates. The contractor shall interface with Civil Contractor so that masts with base plate are ordered and fabricated at the supplier's works and duly galvanized after welding and drilling holes in the base plate.	For OHE masts to be erected on bridges and viaducts, the Civil Contractors working in various parts of the Pirthla – Harsana Kalan section shall provide b*olts with nuts and washer with template*. The Contractor shall interface with Civil Contractor so that masts with base plate are ordered and fabricated at the supplier's works and duly galvanized after welding and drilling holes in the base plate. *The*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			implantation of OHE mast at viaduct and on composite girder bridges shall be as shown in Tender drawings.
67.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.2.4 (2).	Contact wire gradient and change in the gradient shall be in line with EN 50119.	Contact wire gradient and change in the gradient shall be in line with *RDSO instructions No. TI/IN/0042 and EN 50119 (whichever is more stringent).*
68.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.2.6 (2) (k)	-	**Add New Sub – Clause 8.2.6.2 (l) at the end of existing Sub-Clause 8.2.6.2 (k):** *Pre Sag 0.8mm per meter (maximum).*
69.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.3.6.	-	***Add New Sub – Clause 8.3.7 at the end of existing Sub-Clause 8.3.6*** *HRIDC is providing a single line connectivity with 1x25kV High Rise OHE from MSIL plant at Manesar to Patli station via Manesar yard Line No. 1. Due to restricted space between the two adjoining tracks, only portals will be provided in Manesar yard and its approaches as shown in the Tender drawings.*
70.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.4 (2).	The catenary wire shall be minimum 120 mm² copper alloys conforming to DIN 48201 –Part 1 and Part 2, EN 50119, DIN48200, DIN 48203 or any other equivalent international standard capable of withstanding minimum temperature of 100^0 C.	The catenary wire shall be minimum 120 mm² copper alloys conforming to *RDSO Specifications No. TI/SPC/OHE/CAT/(Cu-Cd)/0971 (latest),* DIN 48201 – Part 1 and Part 2, EN 50119, DIN 48200, DIN 48203 or any other equivalent international standard capable of withstanding minimum temperature of 100^0 C.

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
71.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.4 (4).	Normal height of Contact Wire shall be 7570 mm from rail level. The minimum Contact wire height from rail level shall be 7220 mm or as per IR SSOD-2022 as amended (latest) or the recent guidelines issued by Indian Railways.	*The (minimum)* height of contact wire shall be *7220mm* from rail level as per IRSOD-2022 *as amended (latest) or the recent guidelines issued by Indian Railways.* *The track raise allowance of 275mm shall be kept. The OHE shall be designed in such a way that it shall be possible to raise contact wire height to 7570mm. Contact wire shall be installed at a height ranging from 7220mm to 7570mm from rail level as given in IRSOD including correction slip issued before finalization of design. minimum height of OHE masts shall be 11.6 m.*
72.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.10.1.	The cantilever assembly shall conform to EN 50119. The contractor may adopt the cantilever assembly conforming to RDSO / IR Specifications/ maintenance friendly with modular design proven in any international project, if it meets the functional requirements of the project. In case the contractor offers any new Cantilever Assembly design, the same shall meet the proven design criteria as per clause 4.4.2 of chapter 4 of these Specifications. Cantilever made of fiber shall not be used.	The cantilever assembly shall conform to EN 50119. The contractor may adopt the cantilever assembly conforming to RDSO / IR Specifications/ maintenance friendly with modular design proven in any international project, if it meets the functional requirements of the project. In case the contractor offers any new Cantilever Assembly design, the same shall meet the proven design criteria as per clause 4.4.2 of chapter 4 of these Specifications. Cantilever made of fiber shall not be used..
73.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.12.	The tension in the contact and catenary conductors of the flexible overhead equipment shall be regulated at all temperatures by auto-tensioning devices of proven design at both ends. The Auto Tensioning Device shall conform to EN 50119. The contractor may adopt anchoring of catenary and contact wire on the same mast through regulating	The tension in the contact and catenary conductors of the flexible overhead equipment shall be regulated at all temperatures by auto-tensioning devices of proven design at both ends. The Auto Tensioning Device (ATD) shall conform to *RDSO specification* or EN 50119. The contractor may adopt anchoring of catenary and contact wire on the same mast

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		equipment as per application duty requirement. The breaking strength of the stainless steel wire/rope shall not be less than 2.5 times the maximum computed working load. The use of gas ATD shall be restricted to viaducts and tunnels.	through regulating equipment as per application duty requirement. The breaking strength of the stainless steel wire/rope shall not be less than 2.5 times the maximum computed working load. *Three pulley type ATD shall only be used for regulation of OHE. ATD shall provide a constant tension of 2400 kg (minimum) in the traction over head conductors.*
74.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.14.1.	Overhead equipment structures for the main line tracks shall be mechanically and electrically independent except where specifically approved by the Engineer. In station yards, having 3 or more tracks, generally, portals shall be erected as per yard plan. Portals with larger number of tracks as per yard plan may also be required in station yards. For this purpose, adequate track centers shall be provided by the Contractor. Design for steel structures shall comply with IS 800 - Indian Standard Code of Practice for use of structural steel in General Building Construction. Pre-stressed concrete structures shall not be adopted.	Overhead equipment structures for the main line tracks shall be mechanically and electrically independent except where specifically approved by the Engineer. In station yards, having 3 or more tracks, portals shall be erected as per yard plan. Portals with larger number of tracks as per yard plan may also be required in station yards. *Single mast at stations, platform and yards shall be avoided.* Design for steel structures shall comply with IS 800 - Indian Standard Code of Practice for use of structural steel in General Building Construction. Pre-stressed concrete *mast* shall not be *used*. *On station platforms and in station yards dwarf mast anchors as per RDSO Standards shall be provided at anchoring locations.*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
75.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.14.2.	The structures / uprights shall generally be embedded in PCC / Reinforced concrete. The Concrete for the foundations shall conform to EN50119, BS 8004. In view of the faster installation requirements mechanically augured / excavated, Cast in Situ Cylindrical foundations mechanically augured not less than M-20 grade concrete of suitable size, may be proposed as compared to rectangular foundation design generally used in Indian Railways. For RCC foundations, the reinforcement shall be connected to the Mast for ensuring it as an Earthed structure as per EN 50122-1. Precast prefabricated foundation shall not be used. The formation of track is normally 5 m above the ground level in the open sections.	The structures / uprights shall be embedded in *RCC foundations.* The Concrete for the foundations shall conform to EN50119, BS 8004. In view of the faster installation requirements mechanically augured / excavated, cast in-situ cylindrical foundations not less than M-20 grade concrete of suitable size shall be provided. Rectangular foundation design of Indian railways may be used by the Contractor at specific locations with the approval of the Engineer. For RCC foundations, the reinforcement shall be connected to the mast for ensuring it as an earthed structure as per EN 50122-1. Precast prefabricated foundation shall not be used. *Exposure of foundations shall be as per RDSO Specifications.*
76.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.14.3.	-	***Add the following at the end of existing Sub-Clause 8.14.3*** *The soil bearing capacity as calculated from geo-technical survey or 11000 kgf/sqm, whichever is less, shall be used for design of foundation. The soil investigation shall be carried out at every 500 m (maximum) as per relevant IS Codes.*
77.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.14.4 (2)(a).	**(a) Extra clearance on Curves** The minimum setting of structures on curves shall be increased by the figures for curve allowance being taken from Schedule of Dimensions for HORC.	**(a) Extra clearance on Curves** The minimum setting of structures on curves shall be increased by the figures for curve allowance being taken from *IRSOD (latest).*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
78.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.18.1(1)(b).	The insulators selected shall be Maintenance free with higher Creepage distance and long life and should not require any cleaning.	The insulators selected shall be maintenance free with higher creepage distance and long life and should not require any cleaning. *The minimum creepage distance of insulators for TSS/SP/SSP and OHE/ROCS works shall be 31 mm/ kV.*
79.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.22.2(1).	Supporting steel structure for overhead contact system shall have a safety factor not less than 3 times yield point strength of steel against dynamic operational loads. Grouting shall be designed with a factor of safety as 4 and shall be load tested individually.	Supporting steel structure for overhead contact system shall have a safety factor not less than 3 times the yield strength of steel against dynamic operational loads. *All steel structures of ROCS in Tunnels shall be hot dip galvanized as per RDSO Specifications No- ETI/OHE/13 (4/84), (latest) with minimum galvanisation of 1000 gm/sqm.*
80.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.22.2(2).		**Add the following at the end of existing Sub-Clause 8.22.2 (2)** *Grouting shall be designed with a factor of safety as 4 and shall be load tested at design load for all the anchor bolts.*
81.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.22.1 (3).	**Rolling stock** Maximum height of rolling stock is 6827 mm.	***Rolling stock*** Maximum height of rolling stock shall be *as per IRSOD-2022* .
82.	Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.22.1 (4).	**Height of rigid conductor rail contact wire** Minimum Height of the contact wire shall be 7184 from rail level.	***Height of rigid conductor rail contact wire*** Minimum Height of the contact wire shall be *7220* from rail level.

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>83.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 8.22.6.</td><td>Protection cover for rigid conductor rail

There are possibilities of water leakage through nearest water body in the tunnel. Even though aluminium conductor rail is very robust to withstand climatic conditions, water seepage on the conductor rail cause problems. To avoid this risk, tunnel mouths and local moistures points and water leakage points, conductor rail is provided with a protective cover. Warning Boards shall be provided on the protection cover at 5m intervals. The material shall be Fire Retardant Low Smoke, Zero-Halogen (FRLSOH). Protection cover material & design and warning boards shall be submitted for approval of the Engineer. Contractor shall interface with civil tunnel contractor regarding water leakage areas.</td><td>Protection cover for rigid conductor rail

Conductor rail shall be provided with a protective cover in the entire ROCS length. The material of protection cover shall be Fire Retardant Low Smoke, Zero-Halogen (FRLSZH).</td></tr>
<tr><td>84.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 13.3, Table 13.3.2</td><td>Table 13.3.2: Special Tools -Tower Wagon and Rail-cum-Road Vehicle
<table><tr><th>S. No</th><th>Description</th><th>Quantity in No’s</th></tr><tr><td>1</td><td>8 Wheeler Tower Wagon as per RDSO’s specification no.I/SPC/OHE/8WDEIC/0092(08/15 Rev.2 or latest specification</td><td>1 No.</td></tr></table>Contractor shall place purchase order for 8-Wheeler Tower Wagon within 90 days from the date of issue of LOA.</td><td>Table 13.3.2: Tower Wagon
<table><tr><th>S. No</th><th>Description</th><th>Quantity in No’s</th></tr><tr><td>1</td><td>8 Wheeler Tower Wagon as per RDSO’sspecification no.I/SPC/OHE/8WDEIC/0092(08/15 Rev.2 or latest specification</td><td>1 No.</td></tr></table>Contractor shall place purchase order for 8-Wheeler Tower Wagon within 90 days from Commencement Date.</td></tr>
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<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>85.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 18.4.1, Table 18.4.1, Item No -</td><td>-</td><td>The existing Table 18.4.1 under Sub-Clause 18.4.1 is replaced with Table 18.4.1 (a) & 18.4.1 (b) and annexed as Attachment 9 of Corrigendum No. 2.</td></tr>
<tr><td>86.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Chapter 18, Table 18.4.4</td><td>Table 18.4.4
Indicative Interface with Indian Railways, DFCCIL and Contractor MSIL(OHE) at boundary locations;-</td><td>The existing Table 18.4.4 under Sub-Clause 18.4.4 is replaced and annexed as Attachment 9 of Corrigendum No. 2.</td></tr>
<tr><td>87.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 20.5</td><td>Office and OHE/PSI depot:</td><td>Maintenance Office and OHE/PSI Depot:</td></tr>
<tr><td>88.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Sub-Clause 20.5.1.</td><td>Contractor shall set-up OHE/PSI Depot, corresponding stores, repair shops, which includes furniture, computers, material racks staff cup-boards, tools & Tackles, instruments, material handling instruments, communication instruments, material consumable etc. For proper upkeep of all the installations at least 2 vehicles shall be kept in OHE/PSI depot. In addition at least one vehicle shall be kept at other maintenance locations.</td><td>The Contractor shall set-up maintenance office and OHE/PSI Depot, corresponding stores, repair shops, which includes furniture, computers, material racks staff cup-boards, tools & Tackles, instruments, material handling instruments, communication instruments, material consumable etc. For proper upkeep of all the installations at least 2 vehicles shall be kept in OHE/PSI depot. In addition, at least one vehicle shall be kept at other maintenance locations.</td></tr>
<tr><td>89.</td><td>Part 2, Section VII–2, Particular Specifications (PS), Chapter-19, Appendix 5</td><td></td><td>Add S. No. 97, 98, 99 and 100 after S.N0. 96 in Appendix 5:
<table><tr><td>S.</td><td>Specificati</td><td>Description</td></tr></table></td></tr>
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<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td></td><td>List of RDSO Specifications</td><td></td><td>
<table>
<tr><th>No</th><th>ons No.</th><th></th></tr>
<tr><td>97</td><td>Instruction no. TI/IN/0042</td><td>OHE guidelines for increasing speed potential to 160 kmph in NDLS-HWR & NDLS-BCT routes.</td></tr>
<tr><td>98</td><td>IS/RDSO – TI/0002 :2023</td><td>Indian Railway Standard for Power Quality Restorer (POR) for 25 kV and 2x25 kV Traction Installation in Indian Railways.</td></tr>
<tr><td>99</td><td>TI/SPC/PSI/PROTCT/7101</td><td>Technical Specifications for Control and Relay Panel Including Numerical type protection relays for Scott-connected/V-Connected Single-Phase Traction Transformers, OHE protection, 55 kV AT Protection & Shunt Capacitor Bank Protection for 2x25 kV Traction Sub-station, Sectioning and Paralleling Post, Sub-Sectioning & Paralleling Post and Auto Transformer post.</td></tr>
<tr><td>100</td><td>TI/SPC/OHE/3PHTATD/0150</td><td>Technical Specification for Three Pulley Type Regulating Equipment with 2400 Kgf Tension in Overhead Conductor for 25kV AC Traction.</td></tr>
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S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
90.	Part 2, Section VII–2, Particular Specifications (PS), Chapter-19, Appendix-8		**The existing Appendix-8 of Chapter -19 is replaced with the following:** **Appendix-8** SPECIFICATION FOR 60/84/100 MVA, 220/132 Kv/55 Kv SCOTT-CONNECTED TRACTION POWER TRANSFORMER FOR 2x25 Kv AT FEEDING SYSTEM ***1. Scope*** 1.1. This document applies to 60/84/100 MVA, ONAN/ONAF/OFAF, 220/132/55kV Scott-connected traction power transformers for Auto Transformer (AT) feeding system for installation in HORC. *1.2.The scott-connected traction transformer shall conform to RDSO Specification No. TI/SPC/PSI/TRNPWR/5200 (latest).* *1.3. Spares* *The Contractor shall supply the following spares for 232kV Scott -Connected transformers:* *1.One primary bushing complete with parts, fitting and bushing type currenttransformer.* *2.One secondary bushing complete with parts, fitting and bushing type currenttransformer.* *3.One complete set of gaskets of all sizes required for use in the transformer.* *4.One breather unit with silica gel.*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			5. One piece of radiator. *6. One each of terminal connectors for primary and secondary side bushing terminals* *7. One set of valves* *8. One pressure relief device.* *9. One set of primary, secondary and tapping coil* *10. One complete off circuit motorized tap changer*
91.	Part 2, Section VII–2, Particular Specifications (PS), Chapter-19, Appendix-9		**The existing Appendix -9 of Chapter -19 is replaced with the following:** **Appendix – 9 SPECIFICATION FOR 8 MVA, 55 kV, 50Hz AUTO TRANSFORMER FOR 2 X 25 kV AT FEEDING SYSTEM** **1 SCOPE** **1.1** This document applies to 8 MVA, ONAN, 55/27.5 kV Auto Transformer for Auto Transformer (AT) feeding system for Installation in HORC. **1.2** The auto transformer shall be complete with all parts, fittings and accessories whether specifically mentioned herein or not, necessary for its efficient operation in an unattended traction substation. The auto transformer shall conform to RDSO specification No. TI/SPC/PSI/AUTOTR/1200 (latest).

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			1.3 Spares *The Contractor shall supply the following spares for Auto Transformers:* 1. *Six line bushing complete with parts, fittings and bushing type currenttransformer.* 2. *Six neutral bushing complete with parts, fittings and bushing type currenttransformer.* 3. *Six complete set of gaskets of all sizes required for use in the transformer.* 4. *Six piece of radiator.* 5. *Six terminal connector each for line and neutral side bushing terminals.* 6. *Six set valves.* 7. *Six pressure relief device.* *Note: The Engineer shall distribute the above spares between Auto Transformers of traction sub-Station and Auto Transformers of SP/SSP*
92.	Part 2, Section VII-3:, Tender Drawings	Section VII-3: Tender Drawings	The existing Section VII-3: Tender Drawings is replaced with Section VII-3: Tender Drawings/R1 and Annexed as **Attachment 10** of this Corrigendum No. 2
93.	Part 2, Section VII-4: ESHS Manual	Section VII-4: ESHS Manual	The existing Section VII-4: ESHS Manual is replaced with Section VII-4: ESHS Manual/R1 and Annexed as **Attachment 11** of this Corrigendum No. 2

<table>
<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>94.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Table at the end of Part A Contract Data,</td><td>Table: Time for Access to Site</td><td>Table - 1.0: Time for Access to Site</td></tr>
<tr><td>95.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Part A Contract Data, S. No. 4, Sub-Clause 1.1.76</td><td><table><tr><td>Sections</td><td>1.1.76</td><td>Nil</td></tr></table></td><td><table><tr><td>Sections</td><td>1.1.76</td><td>Refer Table 2 given at the end of Part A-Contract Data, Section IX PCC.</td></tr></table></td></tr>
<tr><td>96.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Part A Contract Data, S. No. 28, Sub-Clause 8.8, Delay Damages payable for each week of delay or part thereof</td><td>0.05% of the Accepted Contract Amount, less Provisional Sum in the currencies and proportions in which the Contract Price is payable for each week or part thereof which shall elapse between the Time for Completion and actual Date of Completion of the Works.
Delay Damages for not achieving Key Dates shall be levied as given in Appendix 15, Section VII-1: General Specifications (GS), Part 2- Employer’s Requirements for each week or part thereof which shall elapse between the relevant Key Date and actual date of achieving Key Date.</td><td>0.05% of the Accepted Contract Amount, less Provisional Sum in the currencies and proportions in which the Contract Price is payable for each week or part thereof which shall elapse between the Time for Completion and actual Date of Completion of the Works.</td></tr>
<tr><td>97.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Part A Contract Data, S. No. 38</td><td>-</td><td>S. No. 38 to S. No. 50 is renumbered as S. No. 39 to S. No. 51 The following is then added as S. No. 38<table><tr><td>Percentage value of a Section</td><td>14.9</td><td>Refer Table 2 given at the end of Part A-Contract Data, Section IX PCC.</td></tr></table></td></tr>
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<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
<tr><td>98.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Table: Time for Access to Site, Item B, S. No. 7, 3rd Column</td><td>
<table>
<tr><th rowspan="2">Civil Contract Package</th><th rowspan="2">Chainage km</th><th colspan="2">Date of Access</th></tr>
<tr><th>Start</th><th>Finish</th></tr>
<tr><td>C-6</td><td>61.50 to 125.98</td><td>D+720</td><td>D+1100</td></tr>
</table>
</td><td>
<table>
<tr><th rowspan="2">Civil Contract Package</th><th rowspan="2">Chainage km</th><th colspan="2">Date of Access</th></tr>
<tr><th>Start</th><th>Finish</th></tr>
<tr><td>C-6</td><td>61.50 to 125.98 and Badsa to Sultanpur connectivity</td><td>D+720</td><td>D+1100</td></tr>
</table>
</td></tr>
<tr><td>99.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Part A-Contract Data, Table: Time for Access to Site,</td><td>-</td><td>“Table 2.0: Sections for Taking Over of the Works” is added at the end of “Table 1.0: Time for Access to Site” in Part A-Contract Data of Section IX PCC and annexed as “Attachment 12” of this Corrigendum No. 2.</td></tr>
<tr><td>100.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Sub-Clause 8.8, Delay Damages,</td><td>Replace the entire Sub-Clause 8.8 with the following:
If the Contractor fails to comply with Sub-Clause 8.2 [Time for Completion], the Contractor shall subject to notice under Sub-Clause 20.1 Claims] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Contract Data, which shall be charged for every week of delay or part thereof which shall elapse between the Time for Completion and actual Date of Completion of the Works. Delay damages for not achieving Key Dates stated in Appendix 15, Section VII-1: General Specifications, Part 2 Employer’s requirements shall be the sum stated in the Contract Data.
However, the total amount due under this Sub-Clause</td><td>Replace the entire Sub-Clause 8.8 with the following:
If the Contractor fails to comply with Sub-Clause 8.2 [Time for Completion], the Contractor shall subject to Notice under Sub-Clause 20.1 [Claims] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Contract Data, which shall be charged for every week of delay or part thereof which shall elapse between the Time for Completion and actual Date of Completion of the Works or Sections.
These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [Termination for Contractor’s Default] prior to completion of the Works or</td></tr>
</table>

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		shall not exceed the maximum amount of delay damages stated in the Contract Data. These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [Termination for Contractor's Default] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract. Delay Damages may be recovered by the Employer from any amount of money due from the Contractor under the Contract. The Delay Damages may also be recovered from the amount of Performance Security Bank Guarantee and in that case the Contractor would be liable to replenish the amount of Performance Security Bank Guarantee. The Delay Damages recovered corresponding to any key date will be provisional and would be refunded by the Employer on achievement of subsequent key date on time.	*Sections.* However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages stated in the Contract Data. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract. Delay Damages may be recovered by the Employer from any amount of money due from the Contractor under the Contract. The Delay Damages may also be recovered from the amount of Performance Security Bank Guarantee and in that case the Contractor would be liable to replenish the amount of Performance Security Bank Guarantee.
101.	Part 3, Section IX Particular Conditions of Contract (PCC), Sub-Clause 13.3.1	-	***Following is added to GC Clause 13.3.1.*** ***Variation in the Accepted Contract Amount & deriving rates of new items*** ***A.*** *Variations in Price Schedule 'A' and Price Schedule 'B' shall be paid as follows:*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			(I) Schedule 'A' *Total Scope of OHE works under Schedule 'A' is 304 TKM. Accepted Contract Amount under Schedule 'A' shall be adjusted for any variation in the total Scope of OHE works on either side (i.e. increase or decrease in OHE TKM). Any increase/decrease per TKM of OHE works shall be paid/recovered at the rate of INR (0.5587xLS) /304.* ***where,*** *LS = Total lump sum accepted cost of Works for Schedule 'A'.* *Measurement of OHE TKM shall be done as per the methodology specified in Drawing No. GC-HRIDC-SYS1-DRW-ELE-008_A1 Section VII-3: Tender Drawings, Part 2-Employer's Requirements.* ***(II) Schedule 'B'*** *The quantities of items shown in Schedule 'B' are approximate, and are liable to vary during actual execution of the work. Some items may have to be added or deleted. The Contractor shall be bound to carry out and complete the Works as instructed by the Engineer, irrespective of the magnitude of variations including additions or deletion in the Schedule 'B'. Variations in Schedule 'B' shall be paid as follows:* *a) At the accepted rates of the Contract for positive variation in quantities of items to the extent of 50%. In case of variation in quantities on minus side, Contract rates will be payable at the accepted rates of the Contract for the executed quantities.* *b) In case the Variation in individual items (except for items*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			under Para c), below) as stipulated above is more than 50% on plus side, the rate for the varied quantity beyond 50% shall be negotiated between the Engineer and the Contractor as per para (d) below. *c) Variation in the quantity of items individually costing upto 1% of Accepted Contract Amount less provisional sum (i.e. total of Schedule 'A' and Schedule 'B') or Rs. 1 crore, whichever is less, shall be payable at the accepted rates of the Contract, till the value of such individual item on account of Variation reaches upto 2% of the Accepted Contract Amount less provisional sum or Rs. 2 crore, whichever is less. Negotiation of rates for such items shall be conducted as per para (d) below only for the exceeded quantity beyond 2% of the Accepted Contract Amount or Rs. 2 crore, whichever is less.* *d)* ***Deriving Rates for New Items / Negotiation*** *In case Engineer introduces an item for which the Contract does not contain any rates or prices applicable to the varied Works, the rate of such items shall be derived, wherever possible, from rate for similar items available in the Price Schedules of the Accepted Contract Amount. If no rates or prices are relevant for the determination of a new rate or price, the Engineer shall proceed to derive the rate Cost Plus Profit for executing the work taking into account the following:* *i) Cost of Materials at current market price, as actually utilized in the final finished Permanent Works, including a reasonable percentage for wastage and transportation.* *ii) Cost of enabling works if any (unless provided for separately) worked out on the above basis but with less stringent quality. Specifications minus salvage value of*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			serviceable material released after completion of Work and cost of material released as scrap. *iii) Cost of labour actually used at the site of Work at rates under Payment of Minimum Wages Act for the area of Work for each category of worker, further enhanced by a percentage of 10% of the aforesaid rates to account for labour not directly utilized at Site and other ancillary and incidental expenses on labour.* *iv) Hire charges for Plant & Machinery, scaffolding, shuttering, forms, etc., required to be used at the site of the work. The tools used by the various trades shall not be counted as Plant & Machinery for this purpose.* *v) An amount of 15% of items d) (i), (ii), (iii) and (iv) above shall be added for taxes, overheads & similar charges and profit. No such percentage shall be applicable to the estimated cost of Materials supplied free of cost to the Contractor.* *vi) In all cases where extra items of works are involved, for which there are no rates in the Accepted Contract Amount, the Contractor shall give a Notice to the Engineer, of at least 7 days before the need for its execution arises.* ***B. Disagreement in Rates for New Items /Negotiation*** *In the event of disagreement of rates of new items/negotiations in respect of items A (II) d) above, the Engineer shall determine*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
			such rates and shall notify the Contractor accordingly, with a copy to the Employer. Until such time as rates or prices are agreed or determined in accordance with Sub-Clause 3.7 [*Agreement or Determination], the Engineer shall fix provisional rates or prices to enable on-account payments to the Contractor. Alternatively, in the event of disagreement, the Contractor shall have no claim to execute extra quantities/new items and the Engineer shall be free to get such additional quantities beyond 50% / new items executed through any other Agency. However, if the Engineer or the Employer so directs, the Contractor shall be bound to carry out any such additional quantities beyond the limits stated above original quantities and/or new items and the disagreement or the difference regarding rates to be paid for the same shall be settled in the manner laid down in the Contract for the settlement of dispute.*
102.	Part 3, Section IX Particular Conditions of Contract (PCC), Sub-Clause 14.1 (b)		**Add the following at the end of Sub-Clause 14.1** ***"****All Goods imported by the Contractor into the Country shall be exempt from customs and other import duties as per the provision of the Notification No. 84/97 dated 11th Nov 1997, as amended from time to time* ***(Copy of Notification is enclosed as Annexure A of PCC Part B-Specific Provisions****). The Employer shall endorse the necessary exemption documents prepared by the Contractor for presentation in order to clear the Goods through Customs.* *If exemption is not granted, the customs duties payable and paid shall be reimbursed by the Employer on submission of documentary evidence by the Contractor.*

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<tr><td></td><td></td><td></td><td>All imported Goods, which are not incorporated in or expended in connection with the Works, shall be exported on completion of the Contract. If not exported, the Goods will be assessed for duties as applicable to the Goods involved in accordance with the Laws of the Country.
However, exemption may not be available for:
(a) Goods which are similar to those locally produced, unless they are not available in sufficient quantities or are of a different standard to that which is necessary for the Works; and
(b) any element of duty or tax inherent in the price of goods or services procured in the Country, which shall be deemed to be included in the Accepted Contract Amount.
Port dues, quay dues and, except as set out above, any element of tax or duty inherent in the price of goods or services shall be deemed to be included in the Accepted Contract Amount."</td></tr>
<tr><td>103.</td><td>Part 3, Section IX Particular Conditions of Contract (PCC), Sub-Clause 14.1 (b)</td><td>-</td><td>Annexure A -Copy of Notification No. 84/97 dated 11th Nov 1997, as amended time to time is added to Section IX: PCC Part B-Specific Provisions, Part 3- Conditions of Contract and is enclosed as Attachment 13 of this Corrigendum No. 2</td></tr>
<tr><td>104.</td><td>Part 2, Section VII – 1, General Specifications (GS), Table of contents, Chapter 3, Project Planning and Management</td><td><table><tr><th>ITEM NO.</th><th>DESCRIPTION</th><th>PAGE NO.</th></tr><tr><td>3.20</td><td>SITE SAFETY PLAN</td><td>46</td></tr><tr><td>3.21</td><td>HEALTH & ENVIRONMENT PLAN</td><td>46</td></tr></table></td><td><table><tr><th>ITEM NO.</th><th>DESCRIPTION</th><th>PAGE NO.</th></tr><tr><td>3.20</td><td>SITE ESHS PLAN</td><td>46</td></tr><tr><td>3.21</td><td>Deleted</td><td>46</td></tr></table></td></tr>
<tr><td>105.</td><td>Part 2, Section VII– 1,</td><td></td><td></td></tr>
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<tr><th>S. No.</th><th>Tender Document Part / Section/ Clause No.</th><th>Description of Existing Clause</th><th>Modified Description of Existing Clause / New Clause</th></tr>
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<tr><td>106.</td><td>Part 2, Section VII – 1, General Specifications (GS), Table of Contents, Chapter-15, APPENDICES</td><td>
<table>
<tr><td>APPENDIX -6</td><td>ENVIRONMENTAL PROTECTION REQUIREMENTS</td><td>208</td></tr>
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<tr><td>APPENDIX -6</td><td>ENVIRONMENT, SOCIAL, HEALTH AND SAFETY REQUIREMENTS</td><td>208</td></tr>
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S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	APPENDIX-6		
107.	Part 2, Section – VII – 1, General Specifications (GS), Sub-Clause 2.2, Abbreviations	SHE – Safety, Health and Environment	*ESHS* – *Environment, Social, Health and Safety*
108.	Part 2, Section – VII – 1, General Specifications (GS), Sub-Clause 3.1.4, Sr. 19,	**Site Safety Plan** – 56 days	**Site Safety Plan** – *As mentioned in ESHS Manual*
109.	Part 2, Section – VII – 1, General Specifications (GS), Sub-Clause 3.1.4, Sr. 20	**Health & Environment Plan** – 56 days	*Deleted*
110.	Part 2, Section – VII – 1, General Specifications (GS), Sub-Clause 3.20	**3.20 SITE SAFETY PLAN** The Contractor shall establish and maintain various provisions of Site Safety Plan as detailed in Chapter-9:- Site Safety Plan of this GS. (1) The Contractor shall submit, as part of his Safety Plan, a Site Management Plan, and also designate a Safety Officer who shall be a person properly qualified to ensure the safety at construction sites. (2) The Contractor shall be fully responsible for the safety of the Works, his personnel, his sub-contractors' personnel, the public, and any persons directly or indirectly associated with the Works, or on or in the vicinity of the Site. The Contractor shall treat safety measures as high priorities in	**3.20 *ESHS* PLAN** The Contractor shall *prepare and submit the site ESHS plan in accordance with Part 2- Employer's Requirements, Section VII-4 ESHS Manual*. (1) The Contractor shall submit, as part of his *ESHS* Plan, a Site Management Plan, and also designate a Safety *Expert* who shall be a person properly qualified to ensure the safety at construction sites. (2) The Contractor shall be fully responsible for the safety of the Works, his personnel, his sub-contractors' personnel, the public, and any persons directly or indirectly associated with the Works, or on or in the vicinity of the Site. The Contractor shall treat safety measures as high priorities in all

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		all his activities throughout the execution of the work. (3) The Contractor shall submit to the Engineer, regular Site Safety Reports, and shall notify immediately the occurrence of an accident involving his staff or that of his sub-Contractors, or to any person within the area of the Site for which the Contractor is responsible.	his activities throughout the execution of the work. (3) The Contractor shall submit to the Engineer, regular Site *ESHS* Reports, and shall notify immediately the occurrence of an accident involving his staff or that of his sub-Contractors, or to any person within the area of the Site for which the Contractor is responsible.
111.	Part 2, Section – VII – 1, General Specifications (GS), Sub-Clause 3.21	**3.21 HEALTH & ENVIRONMENT PLAN** 3.21.1 The Contractor shall submit Health & Environmental Plan illustrating the intended means of compliance with the Employer's Safety, Health, and Environmental Requirements Manual. The Health and Environmental Plan shall contain sufficient information to demonstrate clearly the proposed method of achieving the environmental objectives with particular reference to Noise, Vibration, and EMC/EMI etc. The Contractor shall co-operate in any environmental audit conducted by HRIDC or the Engineer. 3.21.2 Environmental Plans shall include the Contractor's proposed means of complying with his obligations in regard to: a. The Site Environment as found; b. System Environment as described in the Specification; c. policies, procedures, applicable regulations and mitigation measures d. SHE Manual.	***Deleted***

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		3.21.3 Where the Contractor is required to become involved with traffic or footpath management activities, Traffic Management submissions shall be made by the Contractor for Engineer's review 56 days before implementation proving all relevant details and implications.	
112.	Part 2, Section – VII – 1, General Specifications (GS), Sub-Clause 6.2.5	**Safety, Health and Environment Considerations** The design of the Permanent Works shall be according to Indian laws and regulations related to Safety, Health & Environment Requirements. Safety, Health & Environment aspects shall be kept in mind during the Design/Construction/Installation and Testing & Commissioning phases, requirement for which has been specified at appropriate places in the bidding document. It shall be the overall responsibility of the Contractor to ensure compliance of Safety, Health & Environment aspects at all times conforming to the provisions mentioned in this Bidding document.	***Environment, Social, Health and Safety Considerations*** The design of the Permanent Works shall be according to Indian laws and regulations related to *Environment, Social, Health and Safety* Requirements. *Environment, Social, Health and Safety* aspects shall be kept in mind during the Design/Construction/Installation and Testing & Commissioning phases, requirement for which has been specified at appropriate places in the *Tender* document. It shall be the overall responsibility of the Contractor to ensure compliance of *Environment, Social, Health and Safety* aspects at all times conforming to the provisions mentioned in this *Tender* document.
113.	Part 2, Section VII –1, General Specifications (GS), Sub-Clause 6.3.5	6.3.5 The Contractor shall ensure that the system Designs conform to Safety, Health and Environment requirements as specified in this GS, and Project SHE Manual as detailed in this Employer's Requirements.	6.3.5 The Contractor shall ensure that the system Designs conform *Environment, Social, Health and Safety* requirements as specified in *Section VII-4 ESHS Manual, Part 2- Employer's Requirements.*
114.	Part 2, Section VII –1, General Specifications	The updated Method statements shall be prepared to check and monitor the Works in terms of SHE	The updated Method statements shall be prepared to check and monitor the Works in terms of *ESHS* requirements

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	(GS), Sub-Clause 6.15.4 (m)	requirements described in Project SHE Manual and Quality Assurance.	described in Project *ESHS Plans* and Quality Assurance.
115.	Part 2, Section VII – 1, General Specifications (GS), Chapter-9	CHAPTER 9 - SITE SAFETY PLAN.	**Replace entire Chapter 9 - SITE SAFETY PLAN with the following:** **CHAPTER 9 - SITE *ESHS* PLAN** **9.1 General** *Environment, Social, Health and Safety* Manual is attached as *Section VII-4: ESHS Manual in Part 2-Employer's Requirements*. This *ESHS* Manual shall be applicable on the Works being carried out under this Contract.
116.	Part 2, Section VII – 1, General Specifications (GS), Chapter – 15, Appendix - 1. Sub-Clause 1(f) (iv)	iv. Health, Safety and Environment Compliance	iv. *Environment, Social, Health and Safety Compliance*
117.	Part 2, Section VII – 1, General Specifications (GS), Chapter – 15, Appendix - 1. Clause 2	**SAFETY** A review of all safety aspects during the month including reports on all accidents and actions proposed to prevent further occurrence including details of safety training and drive conducted during the period and proposed in coming months.	**ESHS** A review of all *ESHS* aspects during the month including reports on all accidents and actions proposed to prevent further occurrence including details of *ESHS* training and drive conducted during the period and proposed in coming months.
118.	Part 2, Section VII – 1, General Specifications (GS), Chapter – 15, Appendix 5.	c. The discharge points of the temporary drainage / pumping systems shall be as per the consent of the Engineer and shall meet all the requirements as described in Part 2, Section VII-4: HRIDC SHE Manual.	c. The discharge points of the temporary drainage / pumping systems shall be as per the consent of the Engineer and shall meet all the requirements as described in Section VII-4: ESHS Manual, Part 2-Employer's Requirements.

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
	Sub-Clause 3.1 (c)		
119.	Part 2, Section – VII – 1, General Specifications (GS), Chapter – 15, Appendix 5. Sub-Clause 4.2.2	**4.2.2 Trees** Material, including excavated material, shall not be banked around trees. Trees shall be protected from damages at all times by the method(s) consented to by the Engineer. Unless otherwise consented to by the Engineer, trees shall not be trimmed or cut as stated in Part 2, Section VII-4: HRIDC SHE Manual. However, the contractor shall be required to prune the tree leaves coming in proximity of the energized OHE as per the Indian Railways Guidelines before taking over of the OHE assets by the Employer.	**4.2.2 Trees** Material, including excavated material, shall not be banked around trees. Trees shall be protected from damages at all times by the method(s) consented to by the Engineer. Unless otherwise consented to by the Engineer, trees shall not be trimmed or cut as stated in Section VII-4: *ESHS Manual*, *Part 2-Employer's Requirements*. However, the contractor shall be required to prune the tree leaves coming in proximity of the energized OHE as per the Indian Railways Guidelines before taking over of the OHE assets by the Employer.
120.	Part 2, Section – VII – 1, General Specifications, Chapter – 15, Appendix 5. Sub-Clause 4.6.1	**4.6.1 General** The Contractor shall comply with all requirements as detailed in Part 2, Section VII-4: HRIDC SHE Manual of the Bid Document.	**4.6.1 General** The Contractor shall comply with all requirements as detailed in Section VII-4: *ESHS Manual, Part 2-Employer's Requirements.*
121.	Part 2, Section VII – 1, General Specifications (GS), Chapter – 15, Appendix 5. Sub-Clause 4.6.2 (f)	f. The Contractor shall at his own cost, provide First Aid Stations as described in Employer's Requirement, Part 2, Section VII-1, Chapter-9 of this GS and Part 2, Section VII-4: HRIDC SHE Manual.	f. The Contractor shall at his own cost, provide First Aid Stations as described in Section VII-4: *ESHS* Manual, Part 2-Employer's Requirements.
122.	Part 2, Section VII – 1, General Specifications (GS), Chapter – 15, Appendix 5, Sub-Clause 4.7 (h)	h. Periodic health checkups may be conducted. These activities may be provided by the construction contractor in consultation with State Public Health Department. At every camp, first aid facilities with suitable transport must be provided as detailed in Employer's Requirement,	h. Periodic health checkups may be conducted. These activities may be provided by the construction contractor in consultation with State Public Health Department.

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
		Chapter-9 of this GS.	
123.	Part 2, Section VII – 1, General Specifications (GS), Chapter – 15, Appendix 5. Sub-Clause 4.8 (f)	f. The number of common toilet/bath/urinals shall be provided as per the provision in Section VII-4: HRIDC SHE Manual.	f. The number of common toilet/bath/urinals shall be provided as per the provisions given in Section VII-4: *ESHS* Manual, *Part 2-Employer's Requirements*.
124.	Part 2, Section – VII – 1, General Specifications (GS), Chapter – 15, Appendix 5, Sub-Clause 4.11 (c)	c. Provision of the latrines and wash places shall be in accordance with Part 2, Section VII-4: document – HRIDC SHE Manual and as per applicable Codes and Standards. However the layout shall be subject to consent by the Engineer.	c. Provision of the latrines and wash places shall be in accordance with Section VII-4*:ESHS* Manual, *Part 2-Employer's Requirements* and as per applicable Codes and Standards. However, the layout shall be subject to consent by the Engineer.
125.	Part 2, Section – VII – 1, General Specifications (GS), Chapter – 15, Appendix -6.	APPENDIX-6 - ENVIRONMENTAL PROTECTION REQUIREMENTS	**Replace entire APPENDIX-6 ENVIRONMENTAL PROTECTION REQUIREMENTS with the following:** APPENDIX-6 – *ENVIRONMENT, SOCIAL, HEALTH AND SAFETY* REQUIRMENTS *Environment, Social, Health and Safety Requirements shall be as per Section VII-4:ESHS manual, Part 2-Employer's Requirements.*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
126.	Part 2, Section – VII – 1, General Specifications (GS), Chapter–15, Appendix- 9	APPENDIX-9: ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY (ESHS) METRICS FOR PROGRESS REPORTS.	**Replace entire APPENDIX-9 *ENVIRONMENT*, SOCIAL, HEALTH AND SAFETY (ESHS) METRICS FOR PROGRESS REPORTS with the following:** APPENDIX-9: *ENVIRONMENT*, SOCIAL, HEALTH AND SAFETY (ESHS) METRICS FOR PROGRESS REPORTS *The Contractor shall submit the ESHS reports as per the requirements given in Section VII-4: ESHS manual, Part 2- Employer's Requirements.*
127.	Part 2, Section – VII – 2, Particular Specifications (PS), Chapter 20, Sub-Clause 20.2.3		**Add New Sub-Clause 20.2.4 at the end of existing Sub-Clause 20.2.3:** ***240V Single Phase AC Power Supply*** *a) All 25 kV / 0.240 kV Auxiliary Transformers, their connection to OHE, distribution board near Auxiliary Transformers, LT power cable from Auxiliary Transformers to Auto change over panel & Auto change over panel at all 17 main line stations and Sultanpur station.* *b) All 25 kV / 0.240 kV Auxiliary Transformers, their connection to OHE, distribution board near Auxiliary Transformers, LT power cable from Auxiliary Transformers to Auto change over panel & Auto change over panel for Automatic Signalling System power supply from prithla to New Harsana Kalan section and IR connectivity.*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
128.	Part 2, Section – VII – 2, Particular Specifications (PS), Sub-Clause 3.3.3 (3), (b), (xv)	(xv) Pollution mapping for identification of polluted zones warranting use of longer Creepage path insulators;	**(xv)** Pollution mapping for identification of polluted zones warranting use of longer Creepage path insulators. *Minimum nominal creepage distance of insulators shall be 31 mm/kV;*
129.	Part 2, Section – VII – 2, Particular Specifications (PS), Sub-Clause 10.2.1 (6)	(6) Remote monitoring of power supply status of Auxiliary Transformers (ATs) at all stations (17 nos. from Prithla to New Harsana Kalan and Sultanpur & Asaudah) provided enroute through Traction Power SCADA system.	(6) Remote monitoring of power supply status of Auxiliary Transformers at all stations (17 Nos. from Prithla to New Harsana Kalan and Sultanpur & Asaudah) provided enroute through Traction Power SCADA system. *Control and monitoring of motorised isolators of all 17 (Seventeen) main line stations and Sultanpur station.*
130.	Part 2, Section VII – 2, Particular Specifications (PS), Sub-Clause 4.6.2 (5), (a) (xiv)		**Add new Sub-Clause 4.6.2 (5), (a) (xiv) & (xv) at the end of existing Sub-Clause 4.6.2 (5), (a) (xiii)** *(xiv) All Busbars in OHE system shall be of copper material as per relevant specifications.* *(xv) Anti creep wire (galvanised steel wire)*
131.	Part 2, Section VII – 2, Particular Specifications (PS), Sub-Clause 7.9.16		**Add new Sub-Clause 7.9.16 at the end of existing Sub-Clause 7.9.15** *The Contractor shall provide tracks for the entire length inside the Tower Wagon Shed along with all fixtures. The rails shall be provided free of cost by Track Contractor at a nominated depot at Manesar. All the fittings, nut bolts etc. of the track shall be provided the Contractor.*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
132.	Part 2, Section VII – 2, Particular Specifications (PS), Sub-Clause 20.1	Contractor to carry out comprehensive maintenance of entire works under this Particular Specifications for a period of 3 (three) years from the date of taking of works by Employer. The maintenance will start from the day of start of Defect Notification Period (DNP). The maintenance requirement is completely different from DNP requirements and both should not be mixed. The work involves regular maintenance activities of PSI/OHE/SCADA systems from Prithla to Harsana Kalan section and connections to IR at Patli, Sultanpur, Asaudah and Harsana Kalan and connection from Prithla to New Prithla station of DFCCIL (145 RKM and 320 TKM). During the maintenance period Contractor to ensure that system works without any problem. All activities i.e regular, emergent and break down are covered under the scope. In case of damage to infrastructure due to accident by train, the contractor shall attend the restoration and all the cost of material shall be paid to the contractor by Employer as per cost related contract provisions but all manpower shall be arranged by contractor without any additional cost.	Contractor to carry out comprehensive maintenance of entire works under this Particular Specifications for a period of 3 (three) years from the date of taking of works by Employer. The maintenance will start from the day of start of Defect Notification Period (DNP). The maintenance requirement is completely different from DNP requirements and both should not be mixed. The work involves regular maintenance activities of PSI/OHE/SCADA systems from Prithla to Harsana Kalan section and connections to IR at Patli, Sultanpur, Asaudah and Harsana Kalan and connection from Prithla to New Prithla station of DFCCIL (145 RKM and *315* TKM). During the maintenance period Contractor to ensure that system works without any problem. All activities i.e regular, emergent and break down are covered under the scope. In case of damage to infrastructure due to accident by train, the contractor shall attend the restoration and all the cost of material shall be paid to the contractor by Employer as per cost related contract provisions but all manpower shall be arranged by contractor without any additional cost. *The scope includes entire works mentioned in Employer's Requirements except modifications in Harsana Kalan IR SSP with SCADA and two Nos. 1x25kV feeders from Harsana Kalan IR SSP to New Harsana Kalan (HORC) OHE. The broad items of work are given in Sub-Clause 20.2.*

S. No.	Tender Document Part / Section/ Clause No.	Description of Existing Clause	Modified Description of Existing Clause / New Clause
133.	Part 2, Section VII – 1, General Specifications (GS), Chapter 15, Appendix 5, Sub-Clause 1.3.1	The Contractor shall make its own arrangements, at their own cost, subject to the consent of the Engineer, for access required to the Site.	The Contractor shall make its own arrangements, at their own cost for access required to the site of *TSS, SP and SSP*.
134.	Corrigendum No. 1, Item No. 3, SPN, Clause 9, Last Sentence	HRIDC's response to Pre-Tender queries will be uploaded on or before ***18.07.2023.***	HRIDC's response to Pre-Tender queries will be uploaded on ***20.07.2023.***

List of Attachments of Corrigendum No. 2

S. No.	Attachment	Description
1.	Attachment 1	Part 1, Section III – Evaluation and Qualification Criteria 1. Sub Clause – 3.4.2 (a) - Specific Construction & Contract Management Experience/R1 2. New Sub-Clause 3.4.2 (b) - Specific Construction Experience in Key Activities
2.	Attachment 2	Part 1, Section IV – Tender Forms 1. Form EXP-3.4.2 (a)/R1 - Specific Construction & Contract Management Experience 2. New Form EXP-3.4.2 (b), Specific Construction Experience in Key Activities
3.	Attachment 3	Part 1, Section IV – Tender Forms, Appendix B to Financial Part: Price Schedules, Sub-Clause 5.3, Schedule 'B'/R1.
4.	Attachment 4	Part 2, Section VII-1: Employer's Requirements – General Specifications (GS)- 2x25 kV AC Traction electrification and associated work - CHAPTER 15 – APPENDICES, 1. Appendix – 15/R1 – Key Dates
5.	Attachment 5	Part 2, Section VII-2: Employer's Requirements – Particular Specifications (PS) - 2x25 kV AC Traction electrification and associated works - 1. Chapter -1- Introduction and Objective/R1 2. Chapter -2- Overview of the project/R1
6.	Attachment 6	Part 2, Section VII-2: Employer's Requirements – Particular Specifications (PS) - 2x25 kV AC Traction electrification and associated work – Chapter 3 - Scope of the Works 1. Sub Clause – 3.3.5 – Scope of the Works under lumpsum Schedule 'A' 2. Sub Clause – 3.3.6 – Scope of the Works under Schedule 'B'
7.	Attachment 7	Part 2, Section VII-2: Employer's Requirements – Particular Specifications (PS) - 2x25 kV AC Traction Electrification and associated work ,Chapter 5 – Performance Requirements for Traction Power Supply System 1. Sub Clause 5.2 Rolling Stock Characteristics and Train Operation Data

S. No.	Attachment	Description
8.	Attachment 8	Part 2, Section VII-2: Employer's Requirements – Particular Specifications (PS) - 2x25 kV AC Traction Electrification and associated work, Chapter 7- Power Supply Control Posts and Details of Equipment 1. Sub-Clause–7.3-220kV/132/2x25kV Traction Transformers 2. Sub-Clause – 7.4 – Auto Transformers
9.	Attachment 9	Part 2, Section VII-2: Employer's Requirements – Particular Specifications (PS) - 2x25 kV AC Traction Electrification and associated work, Chapter 18 –Interface Management 1. Table 18.4.1 (a) and Table 18.4.1 (b) 2. Table – 18.4.4 / R1
10.	Attachment 10	Part 2, Section VII-3: Employer's Requirements, Tender Drawings/R1
11.	Attachment 11	Section VII-4: Employer's Requirements – Environment, Social, Health and Safety Management (ESHS) Manual / R1
12.	Attachment 12	Part 3, Section IX - Particular Conditions of Contract (PCC) – Part A – Contract Data Table 2.0: Sections for Taking Over of the Works
13.	Attachment 13	Part 3, Section IX –PCC, Part B-Specific Provisions 1. Annexure A -Copy of Notification No. 84/97 dated 11th Nov 1997, as amended time to time

Tender No. HORC/HRIDC/SYS-1/2023
Attachment 1
to
Corrigendum No. 2

Part 1, Section III – Evaluation and Qualification Criteria

i. **Sub-Clause 3.4.2 (a) - Specific Construction & Contract Management Experience/R1**
ii. **New Sub-Clause 3.4.2 (b), Specific Construction Experience in "Key Activities"**

No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
3.4.2 (a)	Specific Construction & Contract Management Experience	Participation, as a Prime Contractor, Joint venture[6] Member or Management Contractor[7] or Sub-Contractor[8] in at least (i) One "similar work" of minimum value of **INR**	Must meet requirement of either (i) or (ii) or (iii)	Must meet requirement of either (i) or (ii) or (iii)	Must have the experience of execution of at least one "similar work" of minimum value of **INR 1500.00 million or**	Must have the experience of execution of at least one "similar work" of minimum value of **INR 1500.00 million or**	Form EXP-3.4.2 (a)

[6] Value of completed work done by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for purpose of satisfying his/her experience criteria mentioned in 3.4.2(a).

[7] A management contractor is a firm which takes on the role of contract management as a "general" contractor of sort could do. It does not normally perform directly the work(s) associated with the Contract. Rather, it manages the work of other Contractors/Sub-Contractors while bearing full responsibility for quality, and timely performance of the contract. If the Tenderer or any of the JV member submits experience certificate as a Management Contractor, then the documents issued by the Employer (owner of the work) */Independent Engineer/Concessionaire* in support of his being appointed as Management Contractor shall only be considered for evaluation and qualification purpose. In case the Tenderer fails to submit such document(s) issued by the Employer (owner of the work) */Independent Engineer/Concessionaire*, the offer of the Tenderer shall be summarily rejected.

[8] If a tenderer has successfully completed a work as Sub-Contractor, the work experience certificate issued only by the Employer (owner of the work*) /Independent Engineer/Concessionaire* for such work to Sub-Contractor shall be considered for the purpose of fulfillment of credentials. Tenders submitted without this documentary proof shall be summarily rejected.

For example: Entity **'A'** is the owner of the work and awards a contract for execution of work to Contractor **'X'**. Thereafter, Contractor **'X'** sublets part of the work to Sub-Contractor **'Y'**. In this case, experience certificate of Sub-Contractor **'Y'** issued by Entity **'A'/** */Independent Engineer/Concessionaire* shall be considered for the purpose of evaluation of the Tender. Experience certificate issued by Contractor **'X'** to Sub-Contractor **'Y'** shall not be considered and the offer submitted based on such certificate shall be summarily rejected.

No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		3000.00 million or the equivalent amount in a freely convertible currency. **OR** (ii) Two "similar works" each of minimum value of **INR 2000.00 million or the equivalent amount in a freely convertible currency.** **OR** (iii) Three "similar works" each of minimum value of **INR 1500.00 million or the equivalent amount in a freely convertible currency**			**equivalent amount in any freely convertible foreign currency.** The above work must have been successfully **completed or substantially completed**[10] since 1st April 2016 till 28 days prior to deadline of Tender submission.	**equivalent amount in any freely convertible foreign currency.** The above work must have been successfully **completed or substantially completed**[10] since 1st April 2016 till 28 days prior to deadline of Tender submission.	

No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		The works mentioned in (i), (ii) and (iii) above must have been successfully completed or substantially completed[9] since 1st April 2016 till 28 days prior to deadline of Tender submission and that are similar to the proposed works. **"Similar Work"** shall be "Railway Project"[10] involving supply, installation, testing & commissioning of 1 x 25kV / 2 x 25kV Overhead Electrification (OHE) Works/Traction Substation (TSS).					

[9] Substantial completion shall be based on 80% or more of the original value of works completed under the contract. Completion/Substantial completion of works shall be based on Completion Certificate /Provisional Completion Certificate/Provisional Acceptance Certificate (PAC) issued by the Employer (owner of the Work)/Independent Engineer*/Concessionaire*.

[10] "Railway Projects" includes projects of Railway/ Metro Rail/ RRTS/High Speed Rail/*Dedicated Freight Corridor (DFC).*

No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
3.4.2 (b)	Specific Construction Experience in Key Activities	Participation, as a Prime Contractor, Joint Venture member or Management Contractor or Sub-Contractor: (i) of having completed supply, installation, testing & commissioning of 1 x 25kV/2x25kV, Overhead Electrification (OHE) works of minimum a) **110 TKM** in **one** contract **OR** b) **145 TKM** in **two** contracts combined together **OR** c) **165 TKM** in **three** contracts combined together	Must meet requirement of (i) **AND** (ii)	Must meet requirement of (i) **AND** (ii)	Must meet requirement of either (i) **OR** (ii)	Must meet requirement of either (i) **OR** (ii)	Form EXP-3.4.2 (b)

No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		The above key activity should be completed in Railway / Metro Rail / RRTS / High Speed Rail/DFC projects. **And** (ii) Must have completed supply, installation, testing & commissioning of minimum **One (01) Traction Substation (TSS)** of 1 x 25kV/ 2 x 25kV in **One** contract (either in any of the works under (i) (a), (i) b and (i) c mentioned above **OR** in a separate contract.) for Railway / Metro Rail / RRTS / High Speed Rail/DFC projects. The key activity mentioned in (i) and (ii) above should have been executed in **completed/ongoing**					

No.	Subject	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	Lead Member	
		contracts[11]. The contracts for completed works must have been completed between 1st April 2016 and 28 days prior to deadline of Tender submission.					

[11] *OHE/TSS works in completed/ongoing contracts shall be considered only if Completion Certificate/Provisional Completion Certificate/Provisional Acceptance Certificate (PAC) has been issued by the Employer/Independent Engineer/Concessionaire for the quantities specified in Sub-Clause 3.4.2 (b) above.*

Notes:

1. Exchange Rate for Qualification Criteria

Wherever a Form in Section IV, Tender Forms, requires a Tenderer to state a monetary amount, Tenderers shall indicate the INR equivalent as indicated in the respective form using the rate of exchange determined as follows:

(i) For construction turnover or financial data required for each year – Exchange rate prevailing on the last day of the respective financial year.

(ii) Value of single contract - Exchange rate prevailing on the date of the Contract Award i.e. the date of issue of Letter of Acceptance.

(iii) Exchange rates shall be taken from reference rate published by the Reserve Bank of India (RBI) on its website https://www.rbi.org.in. In case the exchange rate of particular currency on given date is not available on RBI web site, it will be as per the web site https://www.fbil.org.in of Financial Benchmark India Private Limited (FBIL). Any error in determining the exchange rates may be corrected by the Employer. In the case, where a Tenderer is required to convert a monetary amount from a currency other than those currencies for which the RBI/FBIL reference rate is not published, the INR equivalent shall be worked out using the rate of exchange as published by the central bank of the country issuing the said currency. In case the exchange rate of that currency is not directly available in INR on the website of the central bank of the country issuing the said currency then the currency will be first converted to USD as per that web site and then converted from USD to INR as Per RBI or FBIL reference rates.

2. Value of completed work done by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for purpose of satisfying his/her experience criteria mentioned in 3.4.2(a).

3. For past experience of a firm in earlier JV for specified key activity in sub clause 3.4.2 (b) credit shall be given for execution of only the quantity executed by the firm as part of a JV, duly certified by the Employer. If the Employer's Certificate does not indicate the quantity of specified key activity executed by each member, in such a case credit for quantity of specified key activity shall be given as per following provisions in order of priority:

(i)As per details given in JV agreement forming part of the relevant Contract Agreement.

(ii) If JV agreement does not provide such details, then credit shall be given in proportion of the percentage share of the firm in that JV mentioned in the Employer's Certificate/ JV Agreement.

4. In case a JV quoting for the Tender has executed similar work specified in Sub-Clause 3.4.2(a) and Key activity specified in Sub-Clause 3.4.2 (b) with the same constitution of

JV, the requirement specified to be met under Sub-Clause 3.4.2(a) and Sub-Clause 3.4.2 (b) shall be considered to have been met treating the JV as a single entity for this purpose.

5. *For Sub-Clause 3.3.2, Average Annual Construction Turnover, the Tenderer should submit actual construction turnover figures for the specified financial years. For Evaluation purposes the figures of previous years shall be updated @ 5% per year compounded annually based on Rupee value to bring them to the level of the last Financial Year specified in Sub-Clause 3.3.2. If the figure for turnover in an individual year is in a currency other than INR, then the same shall first be converted to INR based on the exchange rates derived as mentioned in Note 1 above and then the figures in INR shall be updated.*

6. *For Sub-Clause 3.4.2 (a) Specific Construction & Contract Management Experience, the Tenderer should submit actual Value of Work completed/ substantially completed. Value of Work for Evaluation purposes shall be updated @ 5% per year compounded annually based on Rupee value to bring them to the price level of date of deadline for submission of Tenders. Updated value shall be calculated as per formula given below:-*

$$A = B \times [1.05]^{N/365}$$

Where

A = updated value of work on deadline for submission of Tenders.

B = value of work on the date of completion/substantial completion as indicated in the Employer's certificate.

N = Number of days between date of completion and deadline for submission of Tenders.

Tender No. HORC/HRIDC/SYS-1/2023
Attachment 2
to
Corrigendum No. 2

Part 1, Section IV – Tender Forms

1. **Form EXP-3.4.2 (a)/R1 - Specific Construction & Contract Management Experience**
2. **New Form EXP-3.4.2 (b), Specific Construction Experience in "Key Activities"**

Form EXP-3.4.2(a)/R1

Specific Construction and Contract Management Experience

[Ref. ITT Sub-Clause 17.2 and Section III, Evaluation and Qualification Criteria, Sub-Clause 3.4.2 (a)]

[The following table shall be filled in for the Tenderer or in case of JV, each member of a Joint Venture]

Tender No.: HORC/HRIDC/SYS-1/2023

Tenderer's Name: _____

JV Member's Name_____
Page _____of _____pages

Similar Contract No.	**Information**		
Contract Identification			
Award date			
Completion date			
Role in Contract as Prime Contractor or Member in JV or Management Contractor or Sub-Contractor	*[insert the role in Contract]*		
Total Contract Amount	*[insert Contract amount(s) and currency(ies)]*		INR [insert *exchange rate and total Contract amount in INR equivalent]
If member in a JV or Sub-Contractor, specify participation in total Contract amount	*[insert Percentage participation]*	*[insert amount(s) and currency) of participation]*	*INR [insert exchange rate(i) and amount of participation in INR equivalent]*
Employer's Name (Owner of the Work):			
Address: Mobile: Telephone/fax number E-mail:			
Description of the similarity in accordance with Sub-Clause 3.4.2 (a) of Section III:			
1. Amount (in INR)			

2.	supply, installation, testing & commissioning of 1 x 25kV or 2 x 25kV, Overhead Electrification (OHE) works **(TKM)**	
3.	Traction Sub Station **(TSS)** 1 x 25kV or 2 x 25kV	

**Refer to Notes: Exchange Rate for Qualification Criteria, Section III, EQC.*

Tenderer's Authorized Representative

Signature: ……..

Date: ……..

Company stamp: ……..

Notes:

(i) Value of completed work done by a Member in an earlier JV shall be reckoned only to the extent of the concerned member's share in that JV for purpose of satisfying his/her experience criteria mentioned in 3.4.2(a).

(ii) The Tenderer shall submit copy of Completion Certificate /Provisional Completion Certificate/Provisional Acceptance Certificate (PAC) issued by the Employer (Owner of the Work) / Independent Engineer / Concessionaire as documentary proof clearly indicating the similarity of the work as per Sub-Clause 3.4.2 (a), actual completion cost, actual completion date. Tenders submitted without this documentary proof shall not be evaluated.

(iii) In case Tenderer submits work experience certificate issued by other than Govt. / Public Sector undertakings, the Tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

(iv) If a tenderer has successfully completed a work as Sub-Contractor, the work experience certificate issued only by the Employer (owner of the work) /Independent Engineer/Concessionaire for such work to Sub-Contractor shall be considered for the purpose of fulfillment of credentials. Tenders submitted without this documentary proof shall be summarily rejected.

Form EXP-3.4.2(b)(i)

Specific Construction Experience in Key Activities

[Ref. ITT Sub-Clause 17.2 and Section III, Evaluation and Qualification Criteria, Sub-Clause 3.4.2 (b) (i)]

[The following table shall be filled in for the Tenderer or in case of JV, each member of a Joint Venture]

Tender No.: HORC/HRIDC/SYS-1/2023

Tenderer's Name: _____

JV Member's Name_____
Page _____of _____pages

Similar Contract No.	**Information**		
Contract Identification			
Award date			
Completion date			
Role in Contract as Prime Contractor or Member in JV or Management Contractor or Sub-Contractor	*[insert the role in Contract]*		
Total Contract Amount	*[insert Contract amount(s) and currency(ies)]*		INR [insert *exchange rate and total Contract amount in INR equivalent]
If member in a JV or sub-contractor, specify participation in total Contract amount	*[insert Percentage participation]*	*[insert amount(s) and currency) of participation]*	*INR [insert exchange rate(i) and amount of participation in INR equivalent]*
Employer's Name (Owner of the Work):			
Address: Mobile: Telephone/fax number E-mail:			
Description of the similarity in accordance with Sub-Clause 3.4.2 (b) (i) of Section III:			
1. Supply, installation, testing & commissioning of 1 x 25kV/2x25kV, Overhead Electrification (OHE) works (**TKM)** in Railway / Metro			

Rail / RRTS / High Speed Rail/DFC projects	

**Refer to Notes: Exchange Rate for Qualification Criteria, Section III, EQC.*

Tenderer's Authorized Representative

Signature: ……..

Date: ……..

Company stamp: ……..

Notes:

(i) For past experience of a firm in earlier JV for specified key activity in Sub-Clause 3.4.2 (b), credit shall be given for execution of that quantity of the specified key activity executed by the firm as per the Note 3 under Sub-Clause 3.4.2 (b).

(ii) The Tenderer shall submit copy of certificates issued by the Employer (Owner of the Work) / Independent Engineer/ Concessionaire as documentary proof clearly indicating the completed quantities and *actual completion date. OHE/TSS works in completed/ongoing contracts shall be considered only if Completion Certificate/Provisional Completion Certificate/Provisional Acceptance Certificate (PAC) has been issued by the Employer/Independent Engineer/Concessionaire for the quantities specified in Sub-Clause 3.4.2 (b). Tenders submitted without this documentary proof shall not be evaluated.*

(iii) In case Tenderer submits work experience certificate issued by other than Govt. / Public Sector undertakings, the Tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

(iv) If a tenderer has successfully completed a work as Sub-Contractor, the work experience certificate issued only by the Employer (owner of the work) /Independent Engineer/Concessionaire for such work to Sub-Contractor shall be considered for the purpose of fulfillment of credentials. Tenders submitted without this documentary proof shall be summarily rejected.

Form EXP-3.4.2(b)(ii)

Specific Construction Experience in Key Activities

[Ref. ITT Sub-Clause 17.2 and Section III, Evaluation and Qualification Criteria, Sub-Clause 3.4.2 (b) (ii)]

[The following table shall be filled in for the Tenderer or in case of JV, each member of a Joint Venture]

Tender No.: HORC/HRIDC/SYS-1/2023

Tenderer's Name: _____

JV Member's Name_____
Page _____of _____pages

Similar Contract No.	**Information**		
Contract Identification			
Award date			
Completion date			
Role in Contract as Prime Contractor or Member in JV or Management Contractor or Sub-Contractor	*[insert the role in Contract]*		
Total Contract Amount	*[insert Contract amount(s) and currency(ies)]*		INR [insert *exchange rate and total Contract amount in INR equivalent]
If member in a JV or sub-contractor, specify participation in total Contract amount	*[insert Percentage participation]*	*[insert amount(s) and currency) of participation]*	*INR [insert exchange rate(i) and amount of participation in INR equivalent]*
Employer's Name (Owner of the Work):			
Address: Mobile: Telephone/fax number E-mail:			
Description of the similarity in accordance with Sub-Clause 3.4.2 (b) (ii) of Section III:			
1. Supply, installation, testing & commissioning of Traction Sub-Station (TSS) (Nos.) in			

Railway / Metro Rail / RRTS / High Speed Rail/DFC projects	

**Refer to Notes: Exchange Rate for Qualification Criteria, Section III, EQC.*

Tenderer's Authorized Representative

Signature: ……..

Date: ……..

Company stamp: ……..

Notes:

(i) For past experience of a firm in earlier JV for specified key activity in Sub-Clause 3.4.2 (b), credit shall be given for execution of that quantity of the specified key activity executed by the firm as per the Note 3 under Sub-Clause 3.4.2 (b).

(ii) The Tenderer shall submit copy of certificates issued by the Employer (Owner of the Work) / Independent Engineer/ Concessionaire as documentary proof clearly indicating the completed quantities and *actual completion date. OHE/TSS works in completed/ongoing contracts shall be considered only if Completion Certificate/Provisional Completion Certificate/Provisional Acceptance Certificate (PAC) has been issued by the Employer/Independent Engineer/Concessionaire for the quantities specified in Sub-Clause 3.4.2 (b). Tenders submitted without this documentary proof shall not be evaluated.*

(iii) In case Tenderer submits work experience certificate issued by other than Govt. / Public Sector undertakings, the Tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

(iv) If a tenderer has successfully completed a work as Sub-Contractor, the work experience certificate issued only by the Employer (owner of the work) /Independent Engineer/Concessionaire for such work to Sub-Contractor shall be considered for the purpose of fulfillment of credentials. Tenders submitted without this documentary proof shall be summarily rejected.

Tender No. HORC/HRIDC/SYS-1/2023
Attachment 3
to
Corrigendum No. 2

Part 1, Section IV – Tender Forms

Appendix B to Financial Part: Price Schedules

Sub Clause - 5.3 Schedule 'B'/R1

5.3 Schedule 'B' OHE works for IR Connectivity and Feeder (Harsana Kalan IR SSP to New Harsana Kalan OHE)
Schedule "B' is subdivided into eight Sub-Schedules as given below:

S. No.	Sub-Schedule	Description	No. of Items	Material (M) (INR)	Erection (E) (INR)	Total (INR)
1	**2**	**3**	**4**	**5**	**6**	**7=5+6**
1	B1	General Items	71	5,35,48,996.48	86,56,360.25	6,22,05,356.72
2	B2	Concrete	6	1,77,99,799.48	39,55,897.31	2,17,55,696.79
3	B3	Ferrous	27	5,63,53,342.11	40,28,799.76	6,03,82,141.87
4	B4	Non Ferrous	29	1,86,89,084.64	12,90,687.09	1,99,79,771.73
5	B5	Contact & Catenary wire	2	4,73,84,107.67	-	4,73,84,107.67
6	B6	Insulators	6	1,49,68,948.95	-	1,49,68,948.95
7	B7	SCADA at Harsana Kalan IR SSP	3	18,89,146.86		18,89,146.86
8	B8	Non Schedule Items	16	1,36,54,013.00		1,36,54,013.00
		Grand Total for IR & DFC Connectivity in INR				**24,22,19,183.59**

5.3.1 Sub-Schedule 'B1' : General

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
1 (a)	Preparation of designs and drawings for overhead equipment, TSWR and as built drawings. All designs, LOP, CSD, Foundations, cable trench, gantry connections, FOB, ROB, SPS, Turnout, Cross Overs, Overlaps, PTFE, fencing, gate, earthing, control room building, gantry for interrupter, motorised Isolators etc including cross feeder and along feeders etc required for OHE works and SP at Sultanpur and Asaudah.	TKM	0.00	17175.77	13.956	0.00	2,39,705.05	2,39,705.05
1(b)	Preparation of design and drawing for switching station Gantry, Locations, modifications in cross feeder, earthing, drop jumpers etc. Supply of as-built drawings in 6 hard copies and soft copies (cad and PDF) for DFC Prithla South SSP	LS	0.00	29504.31	1	0.00	29,504.31	29,504.31
2	Supply (without insulator) and erection of mounting arrangements for span wire. All components including adjusters, terminal fitting and mast attachments required to attach a span wire or a head span wire or a cross span wire or a support span wire for supporting contact wire to the structure.	Each	6272.86	797.76	10	62,728.60	7,977.60	70,706.20

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
3	Marking/painting of temperature & 'Y'-Measurement of OHE mast at BWA locations including cost of paint	Each	0.00	113.97	36	0.00	4,102.92	4,102.92
4 (a)	Supply (without insulator) and erection of material for termination of Single conductor of Overhead equipment or terminating wire including terminating wire on structure along with mast anchor fittings, clevis assembly, adjuster, anchor double strap, ending clamp for catenary or contact wire and fittings including 9 ton assembly fitting.	Each	4727.68	749.97	8	37,821.44	5,999.76	43,821.20
4 (b)	Extra on erection under power block @100% on Item 4 (a)	Each	0.00	749.97	4	0.00	2,999.88	2,999.88
5	Supply without Insulator and erection of material for termination of all 25KV Feeder / return conductor including all materials required for termination along with mast anchor fitting, adjuster, strain clamp and fitting and 9-ton insulator assembly.	Each	5966.96	749.97	14	83,537.44	10,499.58	94,037.02
6 (a)	Supply (without insulator) and erection of anti-creep with Galvanised Steel wire including all materials for anticreep including adjuster, mast anchor fitting at its termination on either side, structure ending clamp, fittings etc	Each	5474.78	2420.86	10	54,747.80	24,208.60	78,956.40

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
6 (b)	Extra on erection under power block @100% on Item 6 (a)	Each	0.00	2420.86	5	0.00	12,104.30	12,104.30
7 (a)	Supply (without insulator) and erection of cut-in (9Tonne) Insulator including components required for cut-in insulators assembly, Terminal fittings for conductor etc.	Each	1349.09	520.17	418	5,63,919.62	2,17,431.06	7,81,350.68
7 (b)	Extra on erection under power block @100% on Item 7(a)	Each	0.00	520.17	218	0.00	1,13,397.06	1,13,397.06
8	Supply (without insulator) and erection of a suspension (9 Tonne) Insulator including 9 ton suspension insulator assembly for suspension of feeder wire etc including supply of all components, clamps, nuts bolts etc. including armour tape.	Each	1398.11	308.81	21	29,360.31	6,485.01	35,845.32
9	Supply (without insulator) and erection of 25 kV Post Insulator including supply of all components and fittings, (Out rigger) support jumpers including nuts bolts etc	Each	1009.85	238.96	32	32,315.20	7,646.72	39,961.92

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
10 (a)	Transfer of equipment from one mast or support to another including dismantling of erected bracket from old structure and consequent adjustment to OHE require such as respacing of dropper (including cost of dropper wire) levelling etc.	Each	1576.55	2167.18	166	2,61,707.30	3,59,751.88	6,21,459.18
10 (b)	Extra on erection under power block @100% on Item 10 (a)	Each	0.00	2167.18	166	0.00	3,59,751.88	3,59,751.88
11 (a)	Erection of an additional bracket assembly/ assemblies on a mast or support include dismantling of an existing bracket assembly and erection of multiple cross arm wherever required and erection of bracket assembly on multiple cantilever cross arm along with any consequential adjustment to traction overhead such as respacing of droppers, levelling including nut, bolts, washers etc.	Each	0.00	1924.55	170	0.00	3,27,173.50	3,27,173.50
11 (b)	Extra on erection under power block @100% on Item 11 (a)	Each	0.00	1924.55	170	0.00	3,27,173.50	3,27,173.50
12 (a)	Re-adjustment of head-span include readjustment of headspan to enable the additional equipment to be suspended form headspan.	Each	0.00	2124.91	100	0.00	2,12,491.00	2,12,491.00

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
12 (b)	Extra on erection under power block @100% on Item 12 (a)	Each	0.00	2124.91	100	0.00	2,12,491.00	2,12,491.00
13 (a)	Dismantling of overhead equipment (Catenary, Contact, Dropper, Cantilever, Jumpers, Connectors and 9 Ton Insulator) include dismantling of equipment along with termination, tensioning devices, guy rod assemblies, bracket assemblies, associated SPS etc.	Km	0.00	11437.03	2	0.00	22,874.06	22,874.06
13 (b)	Extra on erection under power block @100% on Item 13 (a)	Km	0.00	11437.03	2	0.00	22,874.06	22,874.06
14 (a)	Dismantling of Feeder/ Return Conductor including guy rods, terminations, suspension assemblies, super mast and associated SPS.	Km	0.00	4957.52	0.5	0.00	2,478.76	2,478.76
14 (b)	Extra on erection under power block @100% on Item 14 (a)	Km	0.00	4957.52	0.5	0.00	2,478.76	2,478.76

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
15 (a)	Splicing & extension of an anchored overhead equipment include splicing of terminated overhead equipment for extension and consequent adjustment of affected equipment. The extended overhead equipment shall be deemed as starting from the centre line of the structure preceding the old terminating structure and the extended overhead equipment including nuts, bolts and washers etc.	Each	0.00	2124.91	20	0.00	42,498.20	42,498.20
15 (b)	Extra on erection under power block @100% on Item 15 (a)	Each	0.00	2124.91	20	0.00	42,498.20	42,498.20
16 (a)	Dismantling of a Section Insulator Assembly include dismantling of contact wire, catenary wire, droppers and dismantling of section insulator and splicing of catenary/ contact wire and necessary adjustment to droppers (including dropper material).	Each	1313.79	2124.91	10	13,137.90	21,249.10	34,387.00
16 (b)	Extra on erection under power block @100% on Item 16 (a)	Each	0.00	2124.91	10	0.00	21,249.10	21,249.10

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
17	Slewing and putting back of OHE in original shape include temporary slewing or lowering of erected OHE and/ or on adjusted to ground for special work and restoration and readjustment of the equipment after completion of special works.	Span	0.00	1722.36	50	0.00	86,118.00	86,118.00
18	Dismantling of Guy Rod include dismantling of all fittings and SPS.	Each	0.00	694.09	50	0.00	34,704.50	34,704.50
19 (a)	Dismantling of Cantilever include dismantling of catenary/contact wire, anticreep wire (if any), fitting and SPS supporting the cantilever.	Each	0.00	687.03	110	0.00	75,573.30	75,573.30
19 (b)	Extra on Dismantling under power block @100% on Item 19 (a)	Each	0.00	687.03	110	0.00	75,573.30	75,573.30
20 (a)	Dismantling of Mast/TTC/Gantry include dismantling of foundation 150 mm below the ground level and cutting of mast/structure and finishing the ground by proper compaction and stacking of Mast/Gantry properly. (Dismantled Materials shall be handed over to IR/DFC in store.	MT	0.00	4587.13	20	0.00	91,742.60	91,742.60
20 (b)	Extra on Dismantling under power block @100% on Item 20 (a)	MT	0.00	4587.13	20	0.00	91,742.60	91,742.60

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
21 (a)	Dismantling of Portal include Dismantling of foundation 150 mm below the ground level and cutting of portal and finishing the ground by proper compaction and stacking of portal, boom properly. Materials shall be handed over to IR/DFC in store.	MT	0.00	6426.00	10	0.00	64,260.00	64,260.00
21 (b)	Extra on Dismantling under power block @100% on Item 21 (a)	MT	0.00	6426.00	10	0.00	64,260.00	64,260.00
22 (a)	Dismantling of Copper/ Aluminium Jumper include dismantling of all clamps, PG clamps, nut bolt etc.	Each	0.00	360.00	20	0.00	7,200.00	7,200.00
22 (b)	Extra on Dismantling under power block @100% on Item 22 (b)	Each	0.00	360.00	20	0.00	7,200.00	7,200.00
23 (a)	Shifting of ATD with BWA from one mast/ Support to another including nut, bolts, washers etc.	each	0.00	3091.30	20	0.00	61,826.00	61,826.00
23 (b)	Extra on Dismantling under power block @100% on Item 23 (a)	Each	0.00	3091.30	20	0.00	61,826.00	61,826.00
24 (a)	Dismantling of ATD with BWA include all fittings, attachment and SPS and anchoring of OHE at Structure.	Each	0.00	2049.51	20	0.00	40,990.20	40,990.20
24 (b)	Extra on Dismantling under power block @100% on Item 24 (a)	Each	0.00	2049.51	20	0.00	40,990.20	40,990.20

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
25 (a)	Adjustment on Bracket Assembly for lower/raising the height of contact and catenary wire where encumbrance is changed	Each	0.00	2093.82	73	0.00	1,52,848.86	1,52,848.86
25 (b)	Extra on Dismantling under power block @100% on Item 25 (a)	Each	0.00	2093.82	73	0.00	1,52,848.86	1,52,848.86
26	Adjustment on Bracket Assembly for lowering /raising the height of contact and catenary wire where encumbrance is not changed	Each	0.00	1914.77	73	0.00	1,39,778.21	1,39,778.21
27 (a)	Dismantling OHE Termination Assembly including all fittings and SPS etc.	Each	0.00	1149.54	23	0.00	26,439.42	26,439.42
27 (b)	Extra on Dismantling under power block @100% on Item 27 (b)	Each	0.00	1149.54	23	0.00	26,439.42	26,439.42
28 (a)	Dismantling of anchor Assembly include dismantling of anchor terminations and SPS.	Each	0.00	894.76	20	0.00	17,895.20	17,895.20
28 (b)	Extra on Dismantling under power block @100% on Item	Each	0.00	894.76	20	0.00	17,895.20	17,895.20
29	Loading, Leading, Transportation, Unloading and stacking of steel structure, conductor, cantilever assembly, ATD, etc form dismantling site to concerned Engineer in charge store	MT	0.00	3343.50	100	0.00	3,34,350.00	3,34,350.00

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
30	Dismantling of an Isolator including dismantling of connections to the overhead equipment and associated SPS	Each	0.00	1152.53	10	0.00	11,525.30	11,525.30
31	Dismantling of a Post/ Pedestal Insulator including dismantling of connection to the overhead equipment and associated SPS.	Each	0.00	374.98	40	0.00	14,999.20	14,999.20
32	Loading of all type of Steel Structures include BFB/ RSJ, B -series, special structure, N,O & R type) tailor/ truck over and above the requirement given by the contractor for the completion of work or actual qty utilised in the completion of work.	MT	0.00	207.71	200	0.00	41,542.00	41,542.00
33	Unloading of all type of Steel Structures include BFB/ RSJ, B -series, special structure, N,O & R type) tailor/ truck over and above the requirement given by the contractor for the completion of work or actual qty utilised in the completion of work.	MT	0.00	112.13	200	0.00	22,426.00	22,426.00

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
34	Unloading of all type of Copper & Aluminium conductors include for all type of copper conductors (contact wire, catenary wire, dropper, briddle wire, jumpers etc) and aluminium conductors (spider conductors etc) into tower wagon/ trailer/truck over above the requirement given by contractor for the completion of work or actual qty utilised in the completion of work.	MT	0.00	101.10	12	0.00	1,213.20	1,213.20
35	Loading of all type of Copper & Aluminium conductors include for all type of copper conductors (contact wire, catenary wire, dropper, briddle wire, jumpers etc) and aluminium conductors (spider conductors etc) into tower wagon/ trailer/truck over above the requirement given by contractor for the completion of work or actual qty utilised in the completion of work.	MT	0.00	101.10	12	0.00	1,213.20	1,213.20
36	Supply and erection of copper control cables include installation and connecting up of cables for control and indication from the equipment (interrupter, motorised isolators etc) to the terminal board and terminal connectors at both end. If required to the conduits may be provided where it is necessary	m	394.14	12.87	7900	31,13,706.00	1,01,673.00	32,15,379.00

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
37	Supply and erection of LT power cables copper (for motorised isolators, interrupter and other applications) with route markers	m	425.51	18.38	7500	31,91,325.00	1,37,850.00	33,29,175.00
38	Excavation of trench for laying LT power cables and control cables with brick protection (class designation not below 7.5) and back filling with sand and earth etc with route marker as per drawing.	m	224.15	0.00	19500	43,70,925.00	0.00	43,70,925.00
39	Supply and laying GI/HDPE pipe under road/ground/ floor/Railway Tracks in already excavated trench as per site and as per drawing.	m	369.39	0.00	400	1,47,756.00	0.00	1,47,756.00
40	Provision of wooden key box with glass front in frame with hinges	Nos	2701.00	0.00	4	10,804.00	0.00	10,804.00
41	Supply and erection of electric shock treatment chart and first aid coloured calendar	Nos	58.00	0.00	14	812.00	0.00	812.00
42	Supply and erection of protective screen include fabrication of protective screen and angle, Tee, expanded metal (jali), GI sheet, paints etc.	sqm	7684.47	830.48	100	7,68,447.00	83,048.00	8,51,495.00
43 (a)	Supply and erection of Aerial Earth Wire 92 sqmm ASCR including mast fittings and terminations.	TKM	56651.63	2832.58	1.2	67,981.96	3,399.10	71,381.05

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
43 (b)	Extra on erection under power block @100% on item-43 (a)	TKM	-	2832.58	1.2	-	3,399.10	3,399.10
44 (a)	Supply and erection of Negative feeder Wire 288 sqmm AAAC	TKM	185554.32	19167.50	1.2	2,22,665.18	23,001.00	2,45,666.18
44 (b)	Extra on erection under power block @100% on item-44 (a)	TKM		19167.50	1.2		23,001.00	23,001.00
45	Supply and erection of termination assembly for NFW	Nos	9698.00	987.00	0.756	7,331.69	746.17	8,077.86
46	Supply of suspension clamp assembly for NFW	Nos	2980.00		4	11,920.00		11,920.00
47	Supply (without insulator) and erection of material for termination of all 25KV Feeder / return conductor including all materials required for termination along with mast anchor fitting, adjuster, strain clamp and fitting and 9-ton insulator assembly.	Nos	5,967.02	749.90	6	35802.12	4499.40	40,301.52

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
48 (a)	Supply (without insulator) and erection of materials for termination of copper cross feeder with gantries include mast anchor fitting, clavis, 9 ton adjuster, feeder ending clamp, double clavis and other component as necessary along with 9 ton insulator assembly and termination of cross feeder at either end. fitting component required for termination of one cross feeder at both ends constitute one set.	Set	5,676.81	749.90	22	124889.82	16497.80	1,41,387.62
48 (b)	Extra on erection under power block @100% on item No.69	Set	0.00	749.90	12	0.00	8998.80	8,998.80
48 (c)	Extra on Dismantling under power block @100% on Item 69 (Dismantled materials shall be handed over to DFC in store).	set	0.00	749.90	12	0.00	8998.80	8,998.80
49	Supply & Erection of 25kV Vacuum type Interrupter include single pole outdoor type interrupter and components and erection of the same complete with supporting frame and terminal connectors and grouting on foundation block etc. Including enabled number plate.	Nos	3,40,198.50	3,516.09	10	3401985.00	35160.9	34,37,145.90

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
50	Supply and Erection of 25kV Potential Transformers Type-I include complete fitting with accessories, terminal connectors and fixing boards including enabled number plates with fixing bolts and all SPS.	Nos	87,193.38	788.50	9	784740.42	7096.5	7,91,836.92
51	Supply and Erection of 42KV Lightning Arrestors (station class) include all fittings, accessories, and terminal connectors along with enabled number plate and all SPS.	Nos	29,646.85	510.96	8	237174.80	4087.68	2,41,262.48
52	Supply and Erection of 7.5 KV Lightning Arrestors include all fittings accessories and terminal connectors along with enabled number plate and all SPS.	Nos	1,382.43	266.51	0	0	0	0.00
53	Supply and Erection of Terminal Boards in control cubicles include wall mounted terminal boards with six numbers of two-way terminal blocks for connecting the cables form the outdoor equipment.	Nos	9,924.11	374.95	3	29772.33	1124.85	30,897.18
54	Supply and Erection of an Iron clad 15A, 110 V.D.C Fuse Box complete with 2 fuse carriers and bases.	Nos	3,123.71	86.39	3	9371.13	259.17	9,630.30

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
55	Supply and erection of an Iron clad 230 V.A.C Fuse Box. The fuse box shall contain 4 fuse carriers and bases.	Nos	3,455.11	86.39	3	10365.33	259.17	10,624.50
56	Supply and Erection of Lead Acid Batteries. (40 AH) include 110 V, 40 AH laid acid batteries complete with stands, accessories, and tool board with all connectors. This will also include supply of electrolyte, tool board with thermometer, hydrometer, and wrench.	Nos	83,759.84	5,633.47	2	167519.68	11266.94	1,78,786.62
57	Supply and Erection of Battery chargers for 110 V, 40 AH laid acid batteries complete with connecting lead and plug for connection to 230V AC supply.	Nos	81,547.95	768.28	2	163095.9	1536.56	1,64,632.46
58	Supply and Installation of cables (copper) for Heater supply from interrupter to 230 V AC fuse box and from fuse box to LT distribution board inside the control cubicle and include terminal connectors at both ends.	Metre	186.29	12.87	400	74516	5148	79,664.00

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
59	Supply and Installation of cables (copper) for Catenary indication from potential transformer to terminal board in the control cubicle including terminal connectors at both ends with all fasteners on structural members and conduit etc.	Metre	268.64	12.87	400	107456	5148	1,12,604.00
60	Supply and Installation of cables (copper) for L.T. Power supply, laying in trenches, and connecting LT Power supply cable between LT supply auxiliary transformer at switching station and LT distribution board inside the control cubicle along with suitable cable boxes and connectors at both ends.	Metre	425.52	18.38	95	40424.4	1746.1	42,170.50
61	Supply and Installation of copper cables for 110V D.C. supply between 110V battery charger and battery, between battery and the D.C fuse box and between D.C fuse box and terminal board including terminal connectors.	Metre	268.64	18.38	150	40296	2757	43,053.00
62	Supply, Erection, oil- filtration, testing and commissioning of L.T. supply auxiliary transformers (25 kVA).	Nos	1,83,561.81	8,403.34	62	11380832.22	521007.08	1,19,01,839.30

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
63	Supply, Erection, oil- filtration, testing and commissioning of L.T. supply auxiliary transformers (10 kVA).	Nos	67,906.00	11,320.00	0	0	0	0.00
64	Supply and laying of 2 core 70 sqmm, 1.1 kV grade LT XLPE insulated armoured copper conductor cable, making good the damages and termination with copper crimping socket/plug. Provision of cable route markers, testing and commissioning etc. Laying includes excavation of trench, filling the trench with earth/sand with protective bricks etc as per drawing, from auxiliary transformer to Panel Board.	m	737.80	184.15	0	0	0	0.00
65	Supply and laying of 2 core 130 sqmm, 1.1 kV grade LT XLPE insulated armoured copper conductor cable, making good the damages and termination with copper crimping socket/plug. Provision of cable route markers, testing and commissioning etc. Laying includes excavation of trench, filling the trench with earth/sand with protective bricks etc as per drawing, from auxiliary transformer to Panel Board.	m	1,521.63	184.15	12000	18259560	2209800	2,04,69,360.00

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
66	Supply and erection of Iron clad 230 V.A.C Fuse Box and mounting near auxiliary transformer on mast. The fuse box shall contain 2 nos. 63 A double pole MCB (one being spare). The GI pipe of 75 mm dia pipe about 2-3 m long as per site condition and having round bend at one end for cable exit 300 mm below the ground level and upper end properly sealed, shall be provided along with necessary clamps etc.	Nos	4,955.11	270.54	60	297306.6	16232.4	3,13,539.00
67	Supply without Insulator & erection of 25 kV D.O. fuse switch completes with all mounting accessories and terminal connectors.	Nos	9,675.08	439.28	62	599854.96	27235.36	6,27,090.32

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
68	Supply and Erection of materials for internal and external lighting of Switching Station Building (SP/SSP). This includes fixing of GI conduit on wall and drawings of wire circuit with cast iron switch boxes concealed in wall with switches plug etc. provision of main board and distribution board and connections. provision of light fittings, exhaust fan, outdoor luminaires complete with tubes, bulb etc. Provision of earthing station and connection between earthing station to main board with 8 SWG GI wire. All material i.e., light fitting, exhaust fan switch sockets, sealing rose etc shall be ISI mark. Provision of 150-watt HPSV streetlight fitting complete in respect including lamp on wall of the building, complete testing of wiring and earthing etc.	Nos	25,752.11	6,034.52	3	77256.33	18103.56	95,359.89
69	Design and drawings for Modification in Harsana Kalan IR SSP and Feeders from Harsana Kalan IR SSP to New Harsana Kalan HORC OHE (Feeder Length Approximate 5 TKM)	Nos	33,147.30	0.00	0	0.00	0	0.00
70 (a)	Shifting and modification to terminalisation of aluminium cross feeder from SSP tower to gantries (slack feeder) including ending cone and fittings etc. (for DFC Prithla south SSP).	set	0.00	749.90	12	0.00	8998.80	8,998.80

SUB-SCHEDULE 'B1': GENERAL								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
70 (b)	Extra on Shifting under power block @100% on Item 91	set	0.00	749.90	12	0.00	8998.80	8,998.80
71	Supply, Erection, Testing in commissioning of control and distribution panel (Auto change over) for colour light signalling for 25 kVA AT supply in 25 kV AC traction system as per RDSO technical specification TI/SPS/PSI/CLS/0020(Ambendment-4 or latest).	Nos	77,563.80	15,512.76	60	4653828.00	930765.60	55,84,593.60
	Total of Sub-Schedule 'B1': General					**5,35,48,996.48**	**86,56,360.25**	**6,22,05,356.72**

5.3.2 Sub-Schedule 'B2': Concrete

SUB-SCHEDULE 'B2': CONCRETE								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
1	Supply and Erection of concrete of foundation and Plinth in all type of soil using M-20 Grade concrete for Main Foundation and M -20 for Grouting and Muffing including Reinforcement along with excavation, dressing, and compaction of earth etc.	Cum.	9458.66	2102.90	1770	1,67,41,828.20	37,22,133.00	2,04,63,961
2	Supply of materials and construction of Super Structure of SP/SSP building (Control cubicles) include RCC work including reinforcement precast RCC slab, concrete flooring, cable trench, brick masonry, plastering work, doors, window grills, rolling shutter, water pipe line ventilators and painting, white washing and colour washing, acid proof or painting of floor and wall in battery room, spreading of stone metal, provision of RCC pipe etc. The window glasses shall be minimum 5 mm thick toughened glass, plastering work 1: 4 cement sand ratio, minimum concrete grade M-20 and minimum brick compressive strength class 10.	Nos	215951.91	50639.47	3	6,47,855.73	1,51,918.41	7,99,774
3	Brick work in foundation plinth, retaining walls and drainage. Brick class designation minimum 10.	Cum.	3191.80	748.46	100	3,19,180.00	74,846.00	3,94,026

SUB-SCHEDULE 'B2': CONCRETE								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
4	Plastering of retaining wall with 1:4 cement & sand mortar. (Erection include material)	Sqm	95.52	22.40	300	28,656.00	6,720.00	35,376
5	Supply & Spreading of Ballast/Gravel in the Switch Yard of 20 mm nominal size (single sized) and having minimum 150 mm layer depth on the finished ground	Sqm	1144.19	6.22	45	51,488.55	279.90	51,768
6	Earth work in excavation and dumping at site of SSP/SP upto required level include all material and labour, necessary tools & plants including transportation, watering, ramming, levelling, and compaction to more than 95%.	cum	107.91		100	10,791.00	0.00	10,791
	Total of Sub-Schedule 'B2': Concrete					**1,77,99,799.48**	**39,55,897.31**	**2,17,55,696.79**

5.3.3 Sub-Schedule 'B3': Ferrous

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
1	Supply and erection of fabricated and galvanised structures ((O, N & R type portals and Gantry portal (600x600mm) with all necessary components. Portal for High rise OHE include Erection, Alignment and setting before grouting, wherever required of portals assembly of boom components and erection of the same including galvanised bolts, nuts, washers etc.	MT	140052.71	8561.82	120	1,68,06,325.20	10,27,418.40	1,78,33,743.60
2	Extra on erection under power block @100% on Item 1 erection of steel	MT	0.00	8561.82	65	0.00	5,56,518.30	5,56,518.30
3	Supply and erection of Structure steel (traction masts) fabricated and galvanised of all Type: B-Series Mast. B- series Traction mast for conventional and high-rise OHE include Erection, Alignment and setting before grouting of individual traction mast	MT	118127.05	2503.84	177.12	2,09,22,663.10	4,43,480.14	2,13,66,143.24
4	Extra on erection under power block @100% on Item 3 erection of steel	MT	0.00	2503.84	92	0.00	2,30,353.28	2,30,353.28
5	Supply only of fabricated steel other than masts (SPS)	MT	172307.95	0.00	16.96	29,22,342.83	0.00	29,22,342.83

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
6	Supply and erection of a Guy Rod Assembly include both conventional and High rise OHE, of various lengths for traction masts, feeder line towers or supports complete with mast/ portal guy rod fittings, guy rod with adjustments and parts be grouted in the anchor block and erection of dwarf or stub mast with anchor plates drilled and welded in position, where required, for anchorage, SPS works, complete with bolts and nuts etc.	Each	10626.05	1142.06	72	7,65,075.60	82,228.32	8,47,303.92
7	Supply and erection of 25 kV Caution Boards, Warning Board, Number Plate, PTFE Board, Sigma Board etc. including all type boards, SPS items, nuts, bolts etc	Each	340.68	101.41	168	57,234.24	17,036.88	74,271.12
8	Supply without insulator and erection of Single bracket assembly on the traction mast or support on drop arm and shall include those on high/low level platform, in the vicinity on the turnouts, over bridges or and at locations with reduced encumbrance or terminating wires. All components including galvanised steel tubes, dropper wires, bolts and nut etc.	Each	14911.84	1035.82	319	47,56,876.96	3,30,426.58	50,87,303.54
9	Extra on erection under power block @100% on item 8	Each	0.00	1035.82	181	0.00	1,87,483.42	1,87,483.42

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
10	Supply and erection of Regulating Equipment ATD (3-Pulley type) with counter weight assembly for conventional/Regulated OHE 2400 Kgf Tension include counter weight assembly (for both conventional and high rise OHE) including 9 Ton adjuster with double strap assembly normal/ anti-theft guide tube assembly and regulating equipment and stainless steel wire rope(various length as required) required for the regulating equipment and SPS works including nuts, bolts, washers etc.	Each	83702.91	4259.18	33	27,62,196.03	1,40,552.94	29,02,748.97
11	Extra on erection under power block @100% on item 8	Each	0.00	4259.18	18	0.00	76,665.24	76,665.24
12	Supply without Insulator and erection of materials for termination of Double conductor include all materials necessary for the termination of two overhead equipment conductors on a traction mast or structure, including appropriate mast anchoring, clavis 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 section-5) assembly and terminating wire if any.	Each	10883.51	1132.40	49	5,33,291.99	55,487.60	5,88,779.59

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
13	Extra on erection under power block @100% on item 12	Each	0.00	1132.40	25	0.00	28,310.00	28,310.00
14	Supply and erection of a structure bond include GI flat (40x 6 mm) required to provide a structure bond connecting a traction mast or structures to the nearest non-track circuited rail, or earth electrode, including shaping and drilling of the bond and erection of all fasteners (GI) at both ends. provision of heat shrinkable PVC tube for structure bond under track circuit rail.	Each	1373.12	316.30	307	4,21,547.84	97,104.10	5,18,651.94
15	Supply and erection of a longitudinal bond including GI flat (40x 6 mm), GI fasteners etc. required to provide longitudinal bond connecting two rails at the rail joint at the locations including shaping and drilling of the bond and erection of all fasteners at both ends.	Each	774.98	282.50	60	46,498.80	16,950.00	63,448.80

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
16	Supply & erection of a transverse and special bond including GI flats (50x 6 mm), fasteners etc. required to provide transverse bond connecting rails of the same/ adjacent tracks at locations. Including GI flat to provide special bonds at level crossing, FOB, ROB, bridge/protective screen etc. including shaping and drilling of the bond and erection of all fasteners at both ends	Each	1765.81	338.03	31	54,740.11	10,478.93	65,219.04
17	Supply & erection of a steel Rod Copper cladded 3 m Long, 19.3 mm dia earth electrode include embedded into the ground by driving or otherwise complete with protective concrete box and lugs suitable for directly connecting to GI flat.	Each	3097.31	1202.42	343	10,62,377.33	4,12,430.06	14,74,807.39

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
18	Supply and erection of earth bus for PTFE, Auxiliary Transformer etc include GI flats (50 x 6 mm) for providing earth bus. The earth bus buried at a depth of 300 mm below ground level. It shall be include connecting the earth bus to earth electrode and to various floor or wall mounted equipment or structure to be earthed and also connections to non-track circuited rail, wherever required. The connection of earth strip to each strip to each other shall be made either by riveting or by welding. The connection of earth strip to various equipment, structures, fencing shall be made with GI bolts, nuts, spring washer, locknuts etc.	Metre	327.68	84.51	21	6,881.28	1,774.71	8,655.99
19	Supply and erection of galvanised traction masts, main masts of switching stations fabricated in various lengths.	MT	1,10,502.09	2,503.84	10	1105020.9	25038.4	11,30,059.30
20	Supply & erection of a single earth electrode copper cladded steel rod 19.3 mm dia and minimum 3 mtr length including excavation, back filling and compaction of earth with all connectors	Nos	3,097.31	1,202.42	128	396455.68	153909.8	5,50,365.44

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
21	Supply and erection of earth bus for include GI flats (50 x 6 mm) for providing earth bus. The earth bus either buried at a depth of 300 mm below ground level. It shall be include connecting the earth bus to earth electrode and to various floor or wall mounted equipment or structure to be earthed and connections to non-track circuited rail, wherever required. The connection of earth strip to each strip to each other shall be made either by riveting or by welding. The connection of earth strip to various equipment, structures, fencing shall be made with GI bolts, nuts, spring washer, locknuts. etc.	Metre	327.68	84.51	500	163840	42255.0	2,06,095.00
22	Supply and erection of 8 SWG G.I. wire for earthing	Metre	28.61	21.73	100	2861	2173.0	5,034.00
23	Supply and erection of fencing panels at switching stations include GI fencing panels as per drawing with height of 2.4 mtr with all GI fasteners etc	Metre	5,976.18	94.17	400	2390472	37668.0	24,28,140.00
24	Supply and erection of fencing GI uprights and embedded in foundation as per drawing	MT	1,65,270.73	4,512.70	6	991624.38	27076.2	10,18,700.58
25	Supply and erection of anticlimbing device for Switching stations include galvanised steel fixtures mounted on fencing panels and GI barbed wire as per drawing	Metre	397.89	9.66	100	39789	966.0	40,755.00

SUB-SCHEDULE 'B3': FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
26	Supply and erection of anticlimbing device for L.T. Supply Transformer Stations. Include galvanised steel fixtures mounted on fencing panels and GI barbed wire.	Nos	1,651.38	357.35	64	105688.32	22870.4	1,28,558.72
27	Supply and erection of anti-monkey menace. Include hot dipped galvanised wire with GI angle 16 x16x8 mm with all GI bolts nuts barbed wire etc.	Nos	6,589.92	357.35	6	39539.52	2144.1	41,683.62
	Total of Sub-Schedule 'B3': Ferrous					**5,63,53,342.11**	**40,28,799.76**	**6,03,82,141.87**

5.3.4 Sub-Schedule 'B4': Non-Ferrous

SUB-SCHEDULE 'B4': NON-FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
1 (a)	Supply and erection of large span wire (150 sqmm).150 sqmm Jumper specification shall DIN 43138 or Latest RDSO specification.	Metre	1147.65	51.25	2200	25,24,830.00	1,12,750.00	26,37,580.00
1 (b)	Extra on erection under power block @100% on item 1 (a)	Metre	0.00	51.25	700	0.00	35,875.00	35,875.00
2 (a)	Erection of Contact wire, Catenary wire, Large Span wire and Supply and erection of Droppers, Jumpers, PG Clamps, Splices, parallel clamp, dropper clip with Nut Bolts, ending clamps, anchor, large span wire clamp, 9 ton adjuster, anchor double strap assembly, compensating/ equalising plate etc.	KM	107747.91	30100.63	14	15,08,470.74	4,21,408.82	19,29,879.56
2 (b)	Extra on erection under power block @100% on item 2 (a)	KM	0.00	30100.63	7	0.00	2,10,704.41	2,10,704.41
3	Supply and Erection of Copper 25KV Feeder/ Return conductor (150 sqmm) for cross feeder/along feeder including erection of suspension assembly, termination and SPS complete with nut bolt etc. 150 sqmm Jumper specification shall DIN 43138 or Latest RDSO specification.	KM	202434.34	5512.10	5.24	10,60,755.94	28,883.40	10,89,639.35

SUB-SCHEDULE 'B4': NON-FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
4 (a)	Supply and Erection of 25KV copper 160 sqmm cross feeder (HDBC) conductor. PG clamps shall be provided in 2x160 sqmm feeder at an interval not more than 5 meters (2 Runs of 160 sqmm wire shall laid for each cross feeder) (for DFC Prithla south SSP).160 sqmm Jumper specification shall DIN 43138 or Latest RDSO specification.	KM	949190.00	18000.00	1.2	11,39,028.00	21,600.00	11,60,628.00
4 (b)	Extra on erection under power block @100% on item 4 (a)		0.00	3526.32	1.2	0.00	4,231.59	4,231.59
4 (c)	Extra on Dismantling under power block @100% on Item 4 (c). (Dismantled materials shall be handed over to DFC in store).		0.00	3526.32	1.2	0.00	4,231.59	4,231.59
5 (a)	Supply and erection of light weight section insulator assembly	Each	134226.00	3130.06	20	26,84,520.00	62,601.20	27,47,121.20
5 (b)	Extra on erection under power block @100% on item 6	Each	0.00	3130.06	12	0.00	37,560.72	37,560.72
6	Supply & Erection of Short Neutral section assembly (PTFE)	Each	607005.76	4839.79	4	24,28,023.04	19,359.16	24,47,382.20
7 (a)	Supply without Insulator and erection of 25 KV single pole motorised isolator without earth contact assembly along with copper busbar	Each	117602.19	2898.53	13	15,28,828.47	37,680.89	15,66,509.36
7 (b)	Extra on erection under power block @100% on item 7 (a)	Each	0.00	2898.53	6	0.00	17,391.18	17,391.18

SUB-SCHEDULE 'B4': NON-FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
8(a)	Supply & erection of large copper jumpers including drop jumper for cross feeder copper wire 150/160 sqmm include all clamps and GI nut bolts etc. (2 nos 160 sqmm copper drop jumpers shall come from cross feeder and one no. each shall be connected to catenary and contact wire).160 sqmm Jumper specification shall DIN 43138 or Latest RDSO specification.	Each	5779.49	525.39	62	3,58,328.38	32,574.18	3,90,902.56
8 (b)	Extra on erection under power block @100% on item 8 (a)	Each	0.00	525.40	33	0.00	17,338.20	17,338.20
9 (a)	Supply & erection of large copper drop jumpers 160 sq.mm between cross feeder and OHE including all clamps and GI bolts etc.(2 nos 160 sqmm copper drop jumpers shall come from cross feeder and one no. each shall be connected to catenary and contact wire).160 sqmm Jumper specification shall DIN 43138 or Latest RDSO specification.	Each	11063.53	525.39	12	1,32,762.42	6,304.64	1,39,067.05
9 (b)	Extra on erection under power block @100% on item 17		0.00	525.39	12	0.00	6,304.64	6,304.64
9 (c)	Extra on Dismantling under power block @100% on Item 9 (a) (Dismantled materials shall be handed over to DFC office).		0.00	525.39	12	0.00	6,304.64	6,304.64

SUB-SCHEDULE 'B4': NON-FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
10	Supply of Earth wire include 19/2.5 mm galvanised steel stranded wire with termination, clamps, adjuster etc. It shall also include connecting by means suitable terminal spades, the end of earth screen wire to the main members of the column of portals, Gantries across which these wires are strung or to 50/6 mm G.I flat earth leads.	KM	99,575.72	2,689.25	0.5	49787.86	1344.63	51,132.49
11	Supply without Insulator and erection of a 25 KV single pole isolator without earth contact assembly. (1600 Amp) for switching station.	Nos	41,717.05	2,898.51	10	417170.50	28985.10	4,46,155.60
12	Supply without Insulators & erection of 25kV Double Pole Isolator.	Nos	68,029.85	3,201.28	10	680298.50	32012.80	7,12,311.30
13	Supply & erection of large copper jumpers including for cross feeder copper wire 150 sqmm include all clamps and GI nut bolts etc.150 sqmm Jumper specification shall DIN 43138 or Latest RDSO specification.	Nos	5,779.18	525.38	50	288959.00	26269.00	3,15,228.00
14	Supply & erection of small copper jumpers of 50 sqmm copper include supply of parallel clamp bimetallic strips wherever required and bolted type connector wherever required	Nos	677.46	525.38	72	48777.12	37827.36	86,604.48

SUB-SCHEDULE 'B4': NON-FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
15	Supply of materials and erection of large copper jumper and drop jumper 160 Sq. mm between Aluminium bus and cross feeders	Nos	7,267.76	525.38	12	87213.12	6304.56	93,517.68
16	Supply and erection of copper strips for equipment earthing.	Metre	624.47	71.24	45	28101.15	3205.80	31,306.95
17	Supply & erection of: Aluminium bus-bars 36mm x 28mm.include bending shaping and clamping to insulators, connectors or terminals etc.	Metre	449.40	69.05	400	179760.00	27620.00	2,07,380.00
18	Supply & erection of Solid copper busbars 18mm. Include bending shaping etc.	Metre	2,025.50	97.96	80	162040.00	7836.80	1,69,876.80
19	Supply and erection of Aluminium bus-bar connectors: - Bus terminal (6480) including nut bolts etc at junctions and terminations	Nos	3,090.17	42.36	80	247213.60	3388.80	2,50,602.40
20	Supply and erection of Aluminium bus-bar connectors: - Bus splice (6490) including nut bolts etc at junctions and terminations	Nos	3,414.97	42.35	80	273197.60	3388.00	2,76,585.60
21	Supply and erection of Aluminium bus-bar connectors: - Bus tee connector (6500) including nut bolts etc at junctions and terminations	Nos	3,444.93	37.85	80	275594.40	3028.00	2,78,622.40

SUB-SCHEDULE 'B4': NON-FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
22	Supply and erection of Aluminium bus-bar connectors: - Terminal connector 36/20 (6530) including nut bolts etc at junctions and terminations	Nos	3,108.50	37.85	80	248680.00	3028.00	2,51,708.00
23	Supply and erection of Aluminium bus-bar connectors: - Tap connector (6520) including nut bolts etc at junctions and terminations	Nos	3,108.50	42.30	80	248680.00	3384.00	2,52,064.00
24	Supply and erection of Aluminium bus-bar connectors: - Flexible bus splice (6550) including nut bolts etc at junctions and terminations	Nos	9,042.07	42.30	80	723365.60	3384.00	7,26,749.60
25	Supply and erection of Aluminium bus-bar connectors: - Terminal connector Bolted Type (6830-1) including nut bolts etc at junctions and terminations	Nos	2,458.69	37.85	80	196695.20	3028.00	1,99,723.20
26	Supply & erection of solid copper bus-bar connectors: Bus terminal (6310) including nut bolts etc at junctions and terminations	Nos	2,046.22	42.35	80	163697.60	3388.00	1,67,085.60
27	Supply & erection of solid copper bus-bar connectors: Bus splice (6320) including nut bolts etc at junctions and terminations	Nos	2,258.21	42.35	80	180656.80	3388.00	1,84,044.80

SUB-SCHEDULE 'B4': NON-FERROUS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
28	Supply & erection of solid copper bus-bar connectors: Bus tee joint (6330) including nut bolts etc at junctions and terminations	Nos	6,138.66	42.34	80	491092.80	3387.20	4,94,480.00
29	Supply & erection of solid copper bus-bar connectors: Bus terminating tee (6351) including nut bolts etc at junctions and terminations	Nos	4,156.96	42.31	80	332556.80	3384.80	3,35,941.60
	Total of Sub-Schedule 'B4": Non-Ferrous					**1,86,89,084.64**	**12,90,687.09**	**1,99,79,771.73**

5.3.5 Sub-Schedule 'B5': Catenary and Contact Wire

SUB-SCHEDULE 'B5' CATENARY AND CONTACT WIRE								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
1	Supply 150 sqmm Hard Drawn Grooved Copper Contact Wire	TKM	1130172.62	0.00	23.476	2,65,31,932.43	0.00	26531932.43
2	Supply 120 sqmm, Cadmium copper catenary wire	TKM	970952.47	0.00	21.476	2,08,52,175.25	0.00	20852175.25
	Total of Sub-Schedule 'B5' : Catenary and Contact Wire					**4,73,84,107.67**	**0**	**4,73,84,107.67**

5.3.6 Sub-Schedule 'B6': Insulators

SUB-SCHEDULE 'B6' : INSULATORS								
Item No.	**Description**	**Unit**	**Material Rate (INR)**	**Erection Rate (INR)**	**Qty.**	**Materials amount (M) in INR**	**Erection amount (E) in INR**	**Total Amount in (M+E) in INR**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9 = 7+8**
1	Stay Arm Porcelain Insulators	Each	3341.31	0.00	370	12,36,284.70	0.00	12,36,284.70
2	Bracket Porcelain Insulators	Each	2875.71	0.00	370	10,64,012.70	0.00	10,64,012.70
3	9-Ton Porcelain Insulators	Each	4217.35	0.00	667	28,12,972.45	0.00	28,12,972.45
4	Supply of Post & Operating rod insulators	Set	44233.90	0.00	207	91,56,417.30	0.00	91,56,417.30
5	Supply of 25 kV Post Insulator	Nos	8,483.25	0.00	72	610794.00	0.0	6,10,794.00
6	Supply of Post & Operating rod insulators for single pole Isolator	Set	22,116.95	0.00	4	88467.80	0.0	88,467.80
Total of Sub-Schedule 'B6': Insulators						**1,49,68,948.95**	**0.00**	**1,49,68,948.95**

5.3.7 Sub-Schedule 'B7': SCADA at Harsana Kalan IR SSP

SUB-SCHEDULE 'B7' SCDA AT HARSANA KALAN IR SSP					
Item No.	**Description**	**Unit**	**Qty.**	**Unit Rate of Supply & Erection in INR**	**Total Amount in INR**
1	**2**	**3**	**4**	**5**	**6 = 4x5**
1	Design and drawings of all work of supply, erection, testing and commissioning of SCADA for the remote-control centre and the controlled station include supply of requisite number of copies of designs, drawings, operating, maintenance and troubleshooting manuals, technical booklets, and completion drawings.	Lumpsum	1	197332.55	1,97,333
2	Supply, erection, testing and commissioning of Remote station equipment (RTU) at remote station for Sub-sectioning Post (SSP) including power supply units, separate earthing, interconnecting cables, wiring etc. and all materials necessary for proper functioning of RTU including testing of materials and equipment at manufacturer's works. This will also include necessary transducers, summation CT, PT, supply change over arrangement, digital analogue modules, limit settings, CPU cards, surge arrester, relays, and contactors etc.	Nos	1	908444.86	9,08,445
3	Modification/upgradation, testing and commissioning in existing standard SCADA software at RCC equipment for configuration, integration/hooking up of additional RTU with master station equipment/RCC.	Nos	1	783369.45	7,83,369
Total of Sub-Schedule 'B7' : SCADA at Harsana Kalan IR SSP					**18,89,146.86**

5.3.8 Sub-Schedule 'B8': Non-Schedule (NS) Items

SUB-SCHEDULE 'B8' NON-SCHEDULE (NS) ITEMS					
Item No.	**Description**	**Unit**	**Qty.**	**Unit Rate of Supply & Erection in INR**	**Total Amount in INR**
1	**2**	**3**	**4**	**5**	**6 = 4x5**
1	Supply and erection of OHE caution board with supply of fixing material (Clamp, back flat strip & fastener) for "caution clearance to OHE nearby rectified" Board Size 400mmx270mmx2mm	Nos.	60	758.27	45,496.20
2	Fabrication, developing and supply of sectioning diagram, schematic and TSWR board developing the sectioning diagram, schematic diagram & TSWR diagram with computerised digital printing on adhesive vinyl of adequate size as required.	Square foot	500	548.39	2,74,192.50
3	Setting up of earthing Station with buried rail at Switching post include supply of 75x8 mm GI flat for connection between buried rail and earth electrode and for connection between buried rail and running rail including nuts, bolts, copper rivets, spring washers, drilling of holes in flat /rail along with excavation and compaction of buried rail pit.	Job	3	65,313.00	1,95,939.00
4	Supply & Erection of Safety item with supply of fixing material (Plastic/wooden/gritty & Screw) for supply & erection of electric shock treatment chart (Glass framed) size 22"x28" complete with aluminium angle beading 1"x1" all around	Nos.	12	736.02	8,832.24
5	Provision of First Aid box and stretcher with wooden box and hanging arrangement etc.	Nos.	4	11,869.00	47,476.00

SUB-SCHEDULE 'B8' NON-SCHEDULE (NS) ITEMS					
Item No.	**Description**	**Unit**	**Qty.**	**Unit Rate of Supply & Erection in INR**	**Total Amount in INR**
1	**2**	**3**	**4**	**5**	**6 = 4x5**
6	Provision of Wooden key box with glass front in frame with hinges and locking arrangement 18x24x6 inch.	Nos.	3	2,701.00	8,103.00
7	Supply of hand Gloves (Tested for 25 kV AC)	Nos.	6	1,155.00	6,930.00
8	Provision of Portable firefighting Dry Chemical powder 5 Kg ISI mark	Nos.	3	3,270.00	9,810.00
9	Provision of Portable firefighting- CO2 fire extinguisher 10 Kg	Nos.	3	14,527.00	43,581.00
10	Provision of Portable firefighting- Fire bucket 10 Litres	Nos.	8	320.00	2,560.00
11	Provision of Portable firefighting- Fire bucket Stand	Nos.	4	2,139.00	8,556.00
12	Supply & Erection of Electric Shock treatment chart & its first aid coloured calendar in Hindi & English Size-550mm x 900mm with plastic at top & bottom	Nos.	6	58.00	348.00
13	Supply of AC and DC distribution board.	Nos.	3	41,787.07	1,25,361.21
14	Erection of AC and DC distribution board.	Nos.	3	886.83	2,660.49
15	(1) Hiring of AC vehicles Innova Crysta on monthly basis for the use of GC/HRIDC officials at Manesar/Gurugram for 2500 km per month. The rates are inclusive of all duties, GST, royalties, cost of maintenance, major/minor repairs, cost of lubricants, fuel, drivers, and other taxes etc for the complete job. Toll tax and parking charges shall be paid extra on certification of official using vehicle. Vehicles shall not be more than one year old.	vehicle month	96	69,345.00	66,57,120.00
	(2) Extra charge beyond 2500 km per month per vehicle (96x500=48000)	km	48000	13.09	6,28,320.00

SUB-SCHEDULE 'B8' NON-SCHEDULE (NS) ITEMS					
Item No.	**Description**	**Unit**	**Qty.**	**Unit Rate of Supply & Erection in INR**	**Total Amount in INR**
1	**2**	**3**	**4**	**5**	**6 = 4x5**
16	(1) Hiring of AC vehicles Bolero / Ertiga (SUV) on monthly basis for the use of GC/HRIDC officials at Manesar/Gurugram for 2500 km per month. The rates are inclusive of all duties, GST, royalties, cost of maintenance, major/minor repairs, cost of lubricants, fuel, drivers, and other taxes etc for the complete job. Toll tax and parking charges shall be paid extra on certification of official using vehicle. Vehicles shall not be more than one year old.	vehicle month	96	51,670.91	49,60,407.36
	(2) Extra charge beyond 2500 km per month per vehicle (96x500=48000)	km	48000	13.09	6,28,320.00
Sub-Schedule 'B8": Non-Schedule (NS) Items:					**1,36,54,013.00**
Grand Total of Schedule 'B': (B1+ B2+B3+B4+B5+B6+B7+B8)					**24,22,19,183.59**

Total Estimated amount for Schedule 'B': *INR 24,22,19,183.59*

Tender No. HORC/HRIDC/SYS-1/2023
Attachment 4
to
Corrigendum No. 2

Part 2, Section VII-1: Employer's Requirements – General Specifications (GS)- 2x25 kV AC Traction Electrification and associated work,

CHAPTER 15 – APPENDICES

Appendix – 15/R1 – Key Dates

APPENDIX-15: KEY DATES/R1

The Key Dates (KD) Schedule for Package SYS-1, from Commencement Date:

Key Date	Days	Prithla to Harsana Kalan section and connectivity
KD-1	60	(a) Submission of Initial Works Programme with all activities. (b) Submission of preliminary design of OHE/ROCS; TSS, SP/SSP and SCADA.
KD-2	84	(a) Submission and approval of detailed Works Programme and OHE Sectioning Diagram incorporating comments of Engineer. (b) *Finalisation of LOP/CSD/ design- OHE of New Patli to Sultanpur* (including complete *Sultanpur* yard and SP *at Sultanpur*) and New Patli to Patli.
KD-3	180	(a) Finalisation of all simulation studies (b) Completion of all surveys, for OHE and PSI works of available formation front. Final pollution study report.
KD-4	240	*(a) Finalisation of LOP/CSD/ design- OHE of* Manesar to New Patli *(b) New Patli to Sultanpur* (including complete *Sultanpur* yard and SP *at Sultanpur*) and New Patli to Patli: **completion of OHE Foundation work**. *(c)* TSS Chandla Dungerwas and SSP Manesar, SP Sultanpur- SLD, GAD, civil design (land preparation, boundary wall, fencing), earth mat.
KD-5	270	(a) Finalisation of GTP & source of Traction transformer & Auto transformer and placement of purchase order. (b) Finalisation of GTP, ITP/QAP and sources of supply of all items of OHE. *(c) Manesar to New Patli:* ***completion of OHE Foundation work****.*
KD-6	300	(a) Finalisation of GTP, ITP/QAP and sources of supply of all items of PSI & SCADA. (b) Manesar to New Patli, *New Patli to Sultanpur* (including complete *Sultanpur* yard and SP *at Sultanpur*) and New Patli to Patli: Completion of erection work of OHE steel structures, isolators, wiring, droppering, earthing etc. (c) SP Sultanpur completion of structure erection and material erection.

KD-7	400	(a) Manesar to New Patli, *New Patli to Sultanpur* (including complete *Sultanpur* yard and SP *at Sultanpur*) and New Patli to Patli; completion of OHE adjustment, earthing and bonding, Tower wagon checking, EIG and Commissioning. (b) OHE Dhulawat to Manesar: completion of foundation and steel structures erection. (c) TSS Chandla Dungerwas and SSP Manesar: completion of land preparation, boundary wall, fencing, earth mat. (d) Finalisation of General Power Supply Diagram (GPSD) with equipment numbering.
KD-8	500	(a) OHE Dhulawat to Manesar: completion of erection work isolators, wiring, dropering, earthing etc. Finalisation of cross feeder design. (b) TSS Chandla Dungerwas and Manesar SSP works: Control room building, equipment foundations, cable trench, water recharge pit, oil soak pit, structure erection, arrival of material at site. (c) SCADA material at site and erection work at OCC.
KD-9	600	(a) OHE Dhulawat to Manesar: Completion of all OHE works and testing and commissioning. (b) Finalisation of Traction Station Working Rules (TSWR). (c) Finalisation of design of all OHE, ROCS, TSS/SP/SSP. (d) TSS Chandla Dungerwas and SSP Manesar works: equipment erection, control cable laying, CRP erection, PFC erection, earthing, yard lighting and Testing and Commissioning. (e) SCADA erection work completion for OHE and TSS/SSP. Testing from OCC.
KD-10	800	(a) OHE Prithla to Dhulawat: Completion of Foundation work. (b) TSS Mandothi and SP Prithla, SP Badsa, SP Harsana Kalan, SP Asaudah and SSP Sohna, SSP Dhulawat, SSP Badli, & SSP Jasaur Kheri: completion of land preparation, fencing, boundary wall, control room building, water recharge pit etc. (c) Finalisation of GTP, ITP/QAP and sources of supply of all items of ROCS.
KD-11	*975*	*Completion of ROCS (Tunnel-1) work.*

KD-12	1100	(a) OHE New Patli to Harsana Kalan: Completion of foundation and mast erection work. (b) OHE Prithla to Dhulawat: Completion of Mast erection, wiring, earthing work etc. *(c) OHE Prithla to Dhulawat along with connectivities: Completion of Testing & Commissioning and EIG.* *(d) ROCS (Tunnel 1): Testing & Commissioning and EIG.* (e) TSS Mandothi and SP Prithla, SP Badsa, SP Harsana Kalan, SP Asaudah and SSP Sohna, SSP Dhulawat, SSP Badli, & SSP Jasaur Kheri: completion of foundations, structure erection, equipment erection etc.
KD-13	1300	*(a) New Patli to Harsana Kalan along with connectivities: Completion of Testing & Commissioning and EIG.* *(b) TSS* Mandothi and SP Prithla, SP Badsa, SP Harsana Kalan, SP Asaudah and SSP Sohna, SSP Dhulawat, SSP Badli, & SSP Jasaur Kheri work: Testing & *Commissioning and EIG.* *(c)* Training of staff.
KD-14	1500	(a) ROCS (Tunnel -2) completion, Testing and Commissioning. (b) Integrated Testing completion from Prithla to Harsana Kalan. (c) Supply of spares, tools & tackles and measuring instruments including Tower Wagon.

Tender No. HORC/HRIDC/SYS-1/2023
Attachment 5
to
Corrigendum No. 2

Part 2, Section VII-2 : Employer's Requirements - Particular Specifications (PS)

2X25KV, AC, TRACTION ELECTRIFICATION AND ASSOCIATED WORKS

1. Chapter -1- INTRODUCTION AND OBJECTIVE/R1
2. Chapter -2- OVERVIEW OF THE PROJECT/*R1*/R1

CHAPTER- 1 - INTRODUCTION AND OBJECTIVE/R1

1.1 INTRODUCTION

1.1.1 Haryana Rail Infrastructure Development Corporation Limited (HRIDC) was Incorporated on 22nd August, 2017 as a Joint Venture between Government of Haryana and Ministry of Railways with equity Participation of 51% and 49% respectively. The Haryana Orbital Rail Corridor (HORC) is the project of HRIDC, from Prithla (near Palwal station of Indian Railways) to New Harsana Kalan (near Sonepat station of Indian Railways).

1.1.2 Haryana Orbital Rail Corridor (HORC) route will be Broad Gauge, Double Line, *with High Rise OHE (2x25 kV, AC) from* Prithla *station* to New Harsana Kalan *station* including connectivity to Indian Railway (IR) and DFC. *HORC project shall be provided with Automatic Signalling System.*

1.1.3 Deleted.

1.1.4 *There are* 17 stations out of *which 5* are Junction Stations namely Manesar, New Patli, Badsa, Mandothi, *and New Harsana Kalan* are proposed with proper connectivity with IR stations.

(i) Prithla station (HORC) with High Rise OHE *shall be* connected by *single* line with New Prithala station of *DFC* with High Rise OHE

(ii) New Patli station (HORC) with High Rise OHE shall be connected by single line with IR Patli station with High Rise OHE.

(iii) New Patli station (HORC) with High Rise OHE *shall be* connected by single line to Sultanpur station (IR) with High Rise OHE.

(iv) Sultanpur (IR) station with High Rise OHE *shall be* connected by single line to Badsa station with High Rise OHE.

(v) Mandothi station (HORC) with High Rise OHE *shall be* connected by single line with Asaudah station of IR with normal OHE.

(vi) Manesar station (HORC) with High Rise OHE *shall be* connected with Maruti Suzuki India Limited (MSIL) factory siding *and* to IR Patli station *with single* line with High Rise OHE. MSIL-Patli work *for single line* is being executed by another agency.

(vii) The proposed double lines (HORC) will be ending at New Harsana Kalan station. Prithla - New Harsana Kalan section shall be connected by double lines with Harsana Kalan station of IR. New Harsana Kalan *station (HORC) shall be with conventional OHE and necessary gradient in OHE between Tarakpur and New Harsana Kalan stations shall be provided.*

1.1.5 *HORC Project has twin tunnels & a viaduct between IMT Sohna and Dhulawat stations*.

1.1.6 Deleted.

1.1.7 Deleted

1.1.8 The HORC entails construction of mostly double-track, High Rise 2x25 kV, 50 Hz, electrified railway *lines. The* Haryana Orbital Rail Corridor is planned to cater to double*/triple* stack containers. Up-gradation of transportation technology, increase in productivity and reduction in unit transportation costs as guiding principles for formulating the project.

1.2 OBJECTIVE

1.2.1 These specifications describe the objectives, guidelines and requirements for the design, manufacture, supply, construction, installation, testing and commissioning of High Rise 2x25kV, 50Hz, AC, Electric Traction System, Power Supply System, Overhead Equipment (OHE) & Rigid Overhead Conductor System(ROCS), Supervisory Control & Data Acquisition (SCADA) System, Single Phase 240V power supply by installing 25kV/240V auxiliary transformers *at Auto Location Huts (ALH)*, and stations including other associated works for New Prithla to New Harsana Kalan of the HORC Project. The objective of this Particular Specification (PS) is to provide a safe and reliable Electric Traction System meeting application duty requirements in conformance to relevant standards and requirements, performance benchmarks and Contractor demonstrates to the satisfaction of the Engineer/ Employer through modelling, simulation and design validation that the performance requirements are met by the designed system. Further the specifications is to use good industry practice so as to minimise the accidents, breakdowns due to workmanship/ material failure and incidents during implementation phase of the contract as well as to reduce the same when the electrified section is in use.

1.2.2 The objective of the Specifications to Design & Provide a system that renders a satisfactory life of 30-years. The Traction systems its components installed shall be capable of mid-life up gradation with minimum disruption and be supportable for the installation lifetime.

1.2.3 The objective of the Specifications is to minimize maintenance costs by design and selection of Maintenance friendly System which have high Availability, low Life Cycle Cost (LCC), higher Meantime between Failure (MTBF) and minimum Maintenance Time to Restore (MTTR).

1.2.4 The objective is to select a High Rise 2x25kV Electric Traction System which is easy to install and maintain in the least time possible commensurate with the project aims. To achieve this, the system may be designed on a modular approach such that a generic design is used as far as possible with variations to meet local requirements. The system may be designed in such a way that it can be pre-fabricated and pre-assembled unit and tested away from the site of installation and then delivered to site, installed and commissioned.

1.2.5 The objective of the specifications is to ensure that the environmental impact of the electrification and associated works are minimized.

1.2.6 The objective of the specifications is to minimize energy usage. The requirement is to reduce energy consumption by employing the energy efficient system design and product specification.

(End of Chapter-1)

CHAPTER- 2 - OVERVIEW OF THE PROJECT/R1

2.1 HARYANA ORBITAL RAIL CORRIDOR

2.1.1 HRIDC has developed Haryana Orbital Rail Corridor (HORC) from Palwal to Sonepat in the state of Haryana, bypassing Delhi. It is envisaged that the Haryana Orbital Rail Corridor (HORC) will facilitate the diversion of goods traffic not meant for Delhi region and will help in developing multimodal hubs in National Capital Region (NCR) region of Haryana.

2.1.2 The trains are planned to be hauled by electric locomotives with 3-phase drives and/ or existing electric locomotives of Indian Railways employing up to 12000 HP loco for a single train of 6500T.

2.1.3 The Power Supply Installations, OHE and other associated equipment shall be capable of handling projected traffic as per HORC Train operation Plan.

2.1.4 The HORC will utilize 2X25 kV AT feeding system for HORC Project.

2.1.5 The flexible, regulated polygonal Overhead Equipment (OHE) shall be provided for movement of trains within MMD as per the Indian *Railway Schedule* of Dimensions *(IRSOD)* for *HORC project* at a maximum permissible speed of 160 kmph. In the Tunnel Rigid Overhead Conductor System (ROCS) shall be provided.

2.1.6 There are 17 stations in the section and details are as under:

SN	Station	Chainage (km)
1	Prithla	0.00
2	Silani	10.40
3	Sohna IMT	19.01
4	Dhulawat	32.77
5	Chandla Dungerwas	42.60
6	Panchgaon	46.29
7	Manesar	51.89
8	New Patli	58.00
9	Badsa	64.75
10	Deverkhana	71.14
11	Badli	76.83
12	Mandothi	90.45
13	New Asaudah	94.03
14	Jasaur Kheri	100.22
15	Kharkhoda	108.72
16	Tarakpur	114.20
17	New Harsana Kalan	125.13

Out of 17 stations, *5* are junction stations namely Manesar, New Patli, Badsa, Mandothi and *New Harsana Kalan*, 6 are crossing stations namely *Prithla, IMT Sohna, Dhulawat, Badli, Kharkhoda & Tarakpur and remaining six stations are halt stations namely* Silani, Chandala Dungerwas, Panchgaon, Deverkhana, New Asaudah, and Jasur Kheri.

2.2 POWER SUPPLY FOR THE HARYANA ORBITAL RAIL CORRIDOR

2.2.1 *Electric power supply at 220 kV through Transmission lines from SEB Grid Substation to TSS shall be provided.*

2.2.2 The *220 kV* power supply shall be suitably stepped down at TSS as follows:

(a) For feeding 2X25 kV AT systems for AC traction OHE, this shall be distributed between feeder wire and catenary – contact wires.

(b) For feeding 240 V, single phase A.C. for auxiliary power supply requirements drawn from Traction OHE circuit through Auxiliary Transformer(s).

2.2.3 The 25kV/ 240V Auxiliary Transformers shall be provided for meeting the auxiliary power requirement of switching posts like SP, SSP, SS installation and stations etc. as described in relevant chapters of this Particular Specification.

2.2.4 The power supply shall be monitored and controlled through a Supervisory Control and Data Acquisition (SCADA) system.

2.3 CIVIL, *BRIDGE, TUNNEL, TRACK* , S&T AND ELECTRICAL WORKS

The Civil, *bridge, tunnel, track , S&T and Electrical works have* been planned to be assigned to Other Contractors. *Tentative list of Contract packages in HORC Project are hereunder:*

S. No.	***Package***	***Name of Work***
1.	*C-1*	*Priority Section - Construction of Earthwork, Bridges, Station Buildings, Retaining Walls and other miscellaneous works in connection with laying of New BG Double Railway line of HORC Project from Km 49.7 to Km 55.6 and its connectivity (new BG single line) from proposed Manesar Station of HORC to existing Patli Railway Station of IR Network.*
2.	*T-1*	*T-1: Laying of Track and track related works including supply of ballast, special sleepers, switches and crossings track fittings but excluding supply of Rails and line Sleepers in connection with laying of New BG Double Railway Line of HORC project from Km 32.00 to Km 61.5 and its connectivities to IR Network from Manesar to Patli Stations and New Patli to Patli & New Patli to Sultanpur Stations.*
3.	*Br-1*	*Fabrication, assembly & launching of 1X76.2 m span Open Web Girder (OWG) each over three lines on NH-352W (Pataudi Road) between Manesar and Patli stations including supplying & fixing of H-beam sleepers in connection with laying of New BG Double Railway Line of HORC project at Km 54.498.*
4.	*C-23*	*Design and Construction of Civil Works (Earthwork, Bridges, Station Buildings, Retaining Walls and other miscellaneous Works) from km 29.68 to km 49.70 & from km 55.60 to km 61.50 and its connectivities to IR network from New Patli to Patli station & New Patli to Sultanpur station including modifications/civil works at Sultanpur Station in connection with laying of New BG Double Railway line of HORC project.*

S. No.	*Package*	*Name of Work*
5.	*C-4*	*Composite Contract package in connection with New BG Railway Line of HORC project for:* *(i) Design & Construction of Twin Tunnel using NATM and Cut & Cover method from km 24.850 to km 29.580;* *(ii) Design & Installation of Ballastless Track (excluding supply of rails) from km 24.843 to km 29.680;* *(iii) Detailed Design, Supply, Installation, Testing & Commissioning of General Electrical Services including Supply, Erection, Testing and Commissioning of 11kV HT/LT Power and Control Cable Network, GIS Substation (11/0.433) kVA, Tunnel lighting system, etc. from km 24.843 to km 29.680;* *(iv) Design & Construction of Embankment, Bridges and other miscellaneous works from km 12.00 to km 18.00.*
6.	*C-5*	*Composite Contract package in connection with New BG Double Railway Line of HORC project between stations Prithla and Dhulawat for:* *(i) Design & Construction of viaduct including Ballastless track between km 20.910 to km 24.85;* *(ii) Design and Construction of Civil Works (Earthwork, Bridges, Stations and Retaining Walls) from km -2.112 to km 12.00 & km 18.00 to km 21.330; and* *(iii) Design, Supply, Installation, Testing & Commissioning of General Electrical Services from km -2.112 to km 12.00 and Km 18.00 to Km 24.85;*
7.	*C-6*	*Design and Construction of Civil Works (Earthwork, Bridges, Station Buildings, Retaining Walls & other miscellaneous Works) and General Electrical Services works from km 61.50 to km 125.98 and its connectivities to IR network from proposed Badsa Station of HORC to Existing Sultanpur station and proposed Mandothi station to existing Asaudha Station in connection with laying of New BG Double Railway line of HORC Project.*
8.	*SYS-1*	*Design, Supply, Installation, Testing & Commissioning of 2x25kV, 50Hz, AC, High Rise Overhead Electrification (OHE), Power Supply System and SCADA in connection with laying of New BG Double Railway Line from Prithla to New Harsana Kalan of Haryana Orbital Rail Corridor (HORC) Project from Km (-)2.099 to Km 125.98 Including Rigid Overhead Conductor System (ROCS) in Tunnel Portion i.e from km 24.850 to km 29.580 and its connectivity to IR/DFC networks at New Prithla, Patli, Sultanpur, Asaudah and New Harsana Kalan including modifications in New Prithla, Sultanpur, Asaudah and New Harsana Kalan Station Yards (approximately 145 RKM and 320 TKM).*
9.	*SYS-2*	*Design, Supply, Installation & Commissioning of Signalling & Telecom system in connection with laying of New BG Railway Double line of HORC Project from Prithla station (Ch: Km (-) 2.099 Km to existing New Harsana Kalan Junction (Ch: Km 125.98 Km) and Railway single line connectivity from New Patli Junction Station (Ch: Km 58.00) to existing Sultanpur railway station (RKM:3.22 approx.) and to Badsa Junction (Ch: Km 64.75) (RKM 3.84) and Mandothi to Asaudha including modifications in Patli, Sultanpur and Asaudha station yards.*
10.	*T-2*	*Design, Supply and laying of Track and Track related works in connection with laying of New BG Double Railway Line of HORC project from Km -2.099 to Km 24.87, Km 29.06 to Km 32.00 and from Km 61.50 to Km 125.98 including its connectivities from proposed Badsa station of HORC to existing Sultanpur station on IR Network and proposed Mandothi station to existing Asaudha Station on IR Network.*

S. No.	*Package*	*Name of Work*
11.	*MSIL* (OHE)*	*Design, Supply, Erection, Testing & Commissioning of 25kV, 50 HZ, Single Phase, High Rise OHE System for Electrification Works including foundations, structures and all ancillary equipments for (i) Electrification of Maruti Suzuki Railway Yard" and "General Electrical works of proposed Station Building in Maruti Yard in connection with Railway Siding for Maruti Suzuki India Ltd. Manesar" and (ii) OHE modification of PATLI YARD area including provision of double line Sectioning Post (SP) with CB arrangement & SCADA Equipment at PATLI STATION and electrification of PATLI-MANESAR Single line connectivity in connection with HORC Project, in the State of Haryana.*

Notes:

1. *The above list is only tentative and has been provided for giving overview of the Project to the Tenderers. However, it may undergo change in future at the sole discretion of HRIDC/HORC.*
2. *Automatic Signalling System is proposed for HORC project*
3. **Patli (including)-Manesar-MSIL connectivity line OHE Works*

2.4 INTERFACE MANAGEMENT AND COORDINATION

The contractor shall maintain the required liaison and interface with other contractors for thedelivery of the work as described in this specification.

(End of Chapter 2)

Tender No.: HORC/HRIDC/SYS-1/2023

Attachment 6

to

Corrigendum No. 2

Part 2, Section VII – 2 – Employer's Requirements - Particular Specifications (PS) - for 2x25 kV, AC Traction electrification and associated works

Chapter 3 - Scope of Works/R1

1. **Sub Clause – 3.3.5 – Scope of the Works under lumpsum Schedule 'A'**
2. **Sub Clause – 3.3.6 – Scope of the Works under Schedule 'B'**

3.3.5 Scope of the Works under lumpsum Schedule 'A'

Schedule 'A' includes all items of works necessary to complete the Works as per Employer's Requirements (except those included in Schedule 'B'). The scope of works under Schedule 'A' (140 RKM and 304 TKM) shall include design, supply, manufacture, construction, Installation, Testing & Commissioning of Traction power supply system, AT feed system, High Rise Over Head Equipment (2x25 kV, 50 Hz OHE), ROCS in tunnel, SCADA and associated works for entire section i.e. Prithla to New Harsana Kalan of HORC and connecting lines to IR/DFC. Chainages mentioned in the scope of works pertain to UP main line (i.e. line immediately adjoining KMP Expressway). Hence, corresponding chainages of DN main line may differ slightly. Broadly scope of works under Schedule 'A' is as given below:

1. **Design of all works included in Schedule 'A'**

2. **OHE Works**

2.1 HORC Main Line and HORC Station yards-

a) 2x25 kV High Rise OHE from Prithla Ch. Km (-) 1.500 to New Harsana Kalan Ch. Km 124.300 including item b) and item c) given hereunder
b) 2x25 kV High Rise ROCS in twin tunnels, Tunnel No. 1 and Tunnel No. 2 from Ch. Km 24.850 to Ch. Km 29.580 between IMT Sohna and Dhulawat stations.
c) 2x25 kV High Rise OHE on viaduct from Ch. Km 20.910 to Ch. Km 24.850 between IMT Sohna and Dhulawat stations.
d) HORC Station yards enroute (i.e. 4 junction stations namely Manesar, New Patli, Badsa and Mandothi, 6 crossing stations namely *Prithla, IMT Sohna, Dhulawat, Badli, Kharkhoda & Tarakpur and remaining six halt stations namely* Silani, Chandala Dungerwas, Panchgaon, Deverkhana, New Asaudah, and Jasur Kheri). Station loop lines will be 1x25kV.

2.2 Connecting Lines for IR- 1x25 kV OHE

a) New Patli (Ch. Km 0.00) to Patli (Ch. Km 3.000) High Rise OHE
b) New Patli (Ch. Km 0.00) to Sultanpur (Ch. Km 3.900) High Rise OHE
c) Badsa (Ch. Km 0.00) to Sultanpur (Ch. Km 3.100) High Rise OHE
d) Mandothi (Ch. Km 0.00) to Asaudah (Ch. Km 4.300).
Mandothi is with High Rise OHE and Asaudah is with normal OHE. Hence, OHE gradient shall be provided from Mandothi to Asaudah

3. **TSS and all allied works- 2 Nos. (**Chandla Dungerwas, Mandothi)
4. **SP and all allied works - 3 Nos.** (Prithla, Badsa, New Harsana Kalan)
5. **SSP and all allied works - 5 Nos.** (Sohna, Dhulawat, Manesar, Badli, Jasaur Kheri)
6. **SCADA– For all TSS, SP, SSP including SP at Sultanpur and Asaudah**

6.1 SCADA for the entire HORC network including TSS- 2 Nos., 2x25kV SPs- 3 Nos., 2x25kv SSPs -5 Nos. and at all sixteen Main line stations of HORC & and New Harsana Kalan station.
6.2 SCADA system of 1x25kV SP at Sultanpur & Asaudah.
6.3 Motorized isolators at Sultanpur and Asaudah. SCADA of Sultanpur station.

6.4 Integration of IR SCADA with Remote Terminal Units (RTUs) for SPs at Sultanpur, Asaudah and New Harsana Kalan.
6.5 SCADA integration of Patli SP with OCC Manesar of HORC
6.6 Integration of Prithla SP with DFC SCADA.

7. LT Supply

7.1 Provision of LT power supply through 25kV/240V auxiliary transformers with associated LT cable upto stations, auto change over panel at stations along with all accessories to OHE at all sixteen main line stations.

7.2 Provision of LT power supply through 50kVA, 25kV/240V auxiliary transformers with associated LT cable upto stations, auto change over panel at stations along with all accessories to OHE at Sultanpur and New Harsana Kalan stations.

8. Operating & Maintenance Manuals

9. Supply of Tower Wagon, Mandatory Spares, Special Tools, testing and Diagnostic equipment and measuring instruments.

10. Maintenance for 3 years as per scope given in Chapter-20 of Particular Specifications (PS).

3.3.6 Scope of the Works under Schedule 'B'

Under this Schedule, the Contractor is required to carry out works which are not covered in Schedule 'A'. The scope of works under Schedule 'B' (5 RKM and 11 TKM) shall include design, supply, manufacture, construction, Installation, Testing & Commissioning. The specifications mentioned in this Particular Specifications shall be applicable to Schedule 'B' also. Broadly scope of works under Schedule 'B' shall be as given below:

1. IR Connectivity Lines

1.1 New Patli-Sultanpur

1x25 kV High Rise OHE works from New Patli (Ch. Km 3.900) to Ch. Km 4.114

1.2 Badsa-Sultanpur

1x25 kV High Rise OHE works from Badsa (Ch. Km 3.100) to Ch. Km 4.400

1.3 Modifications in OHE in existing Sultanpur Yard

1. 4 Sultanpur SP

All PSI works along with PTFE, cross feeder and along feeder suitable for double line

1.5 Mandothi -Asaudah

1x25 kV Conventional OHE works from Ch. Km 4.300 from Mandothi to Ch. Km 4.597 including modifications in existing IR Asaudah yard.

Mandothi is with High Rise OHE and Asaudah is with normal OHE. Hence, OHE gradient shall be provided on approach of Asaudah.

1.6 Asaudah SP

All PSI works along with PTFE, cross feeder and along feeder suitable for single line.

1.7- New Harsana Kalan Station from Ch. Km 124.300 to Ch. Km 126.023 on existing IR Delhi-Ambala route

1x25 kV Conventional OHE works at New Harsana Kalan station.

There shall be High Rise OHE in Tarakpur-New Harsana Kalan Section and New Harsana Kalan station shall be with Conventional OHE. Hence, gradient in OHE shall be provided on approach of New Harsana Kalan.

1.8 Modifications at existing Harsana Kalan IR SSP along with SCADA and provision of two nos. 1x25 kV feeders from Harsana Kalan IR SSP to New Harsana Kalan OHE

2. DFC Connectivity

2.1- New Prithla (DFC) to Prithla (HORC)

2x25 kV High Rise OHE works from Ch. Km (-) 2.099 (New Prithla) to Ch. Km (-) 1.500 (Prithla) with single line. New Prithla and Prithla both are having High Rise OHE.

2.2- Prithla station south SSP gantry modification

Prithla station south SSP gantry modification in cross feeder gantry involving erection of new steel structures and modification in cross feeder wires with drop jumpers.

3. Provision of LT power supply for Automatic Signalling System

Provision of LT power supply through 25 KVA, 25 KV/240 V Auxiliary transformer in entire open route and at other locations as decided by the Engineer for Automatic Signaling System. This will also include provision of connection to OHE, LT board near Auxiliary transformer with its Earthing, laying of copper cable from auxiliary transformer to ACO panel and provision of Auto Change Over (ACO) panel along with associated works.

4. **Proposed Connectivity between Dhulawat-New Tauru Stations**

Dhulawat station is proposed to be connected to New Tauru station of DFCCIL by single line (approx. 5 TKM) with 2x25 kV high rise OHE system. The Contractor shall be required to execute this work (if required) and payment shall be made under Schedule 'B'.

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Attachment 7
to
Corrigendum No. 2

Part 2, Section VII – 2 – Employer's Requirements - Particular Specifications (PS) - for 2x25 kV, AC Traction electrification and associated works

Chapter 5 – Performance Requirements for Traction Power Supply System

1. Sub Clause 5.2: Rolling Stock Characteristics and Train Operation Data

5.2 ROLLING STOCK CHARACTERISTICS AND TRAIN OPERATION DATA

5.2.1 Traction power supply for Prithla to New Harsana Kalan section of HORC shall be designed taking into consideration the rolling stock characteristics and train operation data given below in *Table 5.2.1.1, 5.2.1.2 and* Table 5.2.2. The Tractive effort Vs Speed Characteristic of 12000HP locomotives to be utilised on HORC shall be as included in the Part-2, Section VII - 3: Tender Drawings. The following data shall be used for all normal and emergency performance requirements of traction power supply system.

Table 5.2.1.1: Rolling stock characteristics *for Goods Trains***

Item	Values
Maximum permissible speed	*100 km/h*
Adhesion	40% Starting (Indicative)/ 30 % Continuous
Locomotive weight	Weight 180 tonnes ± 1% upgradable to 200 tonnes + 1%.
Starting Tractive effort (up to speed not less than 10 kmph)	Not less than 785 kN for 25 T axle load
Type of rolling stock	BoBo+BoBo, 8 axle Locomotive hauling BOXN and bulk wagons.
Type of Braking	Electrically controlled-pneumatic service friction brake, Electric regenerative brake for the loco
Pneumatic brake effort	7 % - 9 % of gross weight
Emergency braking distance (with pneumatic brake only)	900 m maximum for light engine from 100 Kmph to standstill on level tangent dry track
Efficiency of propulsion system	Not less than 87% at full load
Auxiliary Power requirement of Locomotive	300 kVA
Design Head way between trains	*12 min.*

**Ref: RDSO specifications no. RDSO/2006/EL/SPEC/0044 Rev. '13' for 12000 hp locomotive.

The Tractive effort versus speed curve is shown hereunder:

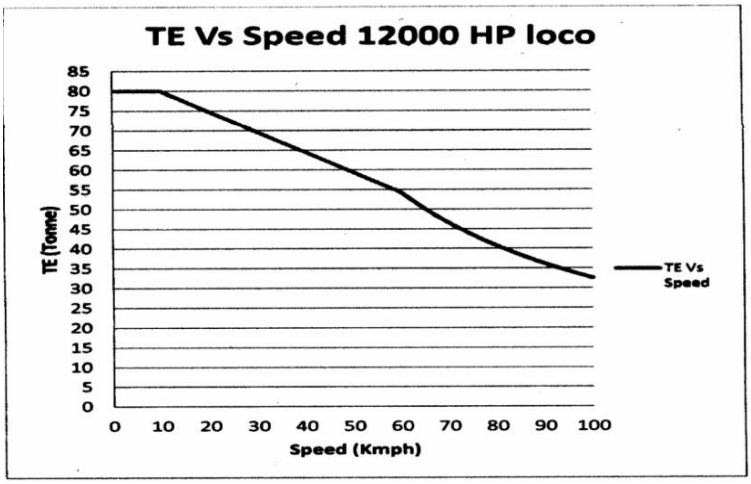
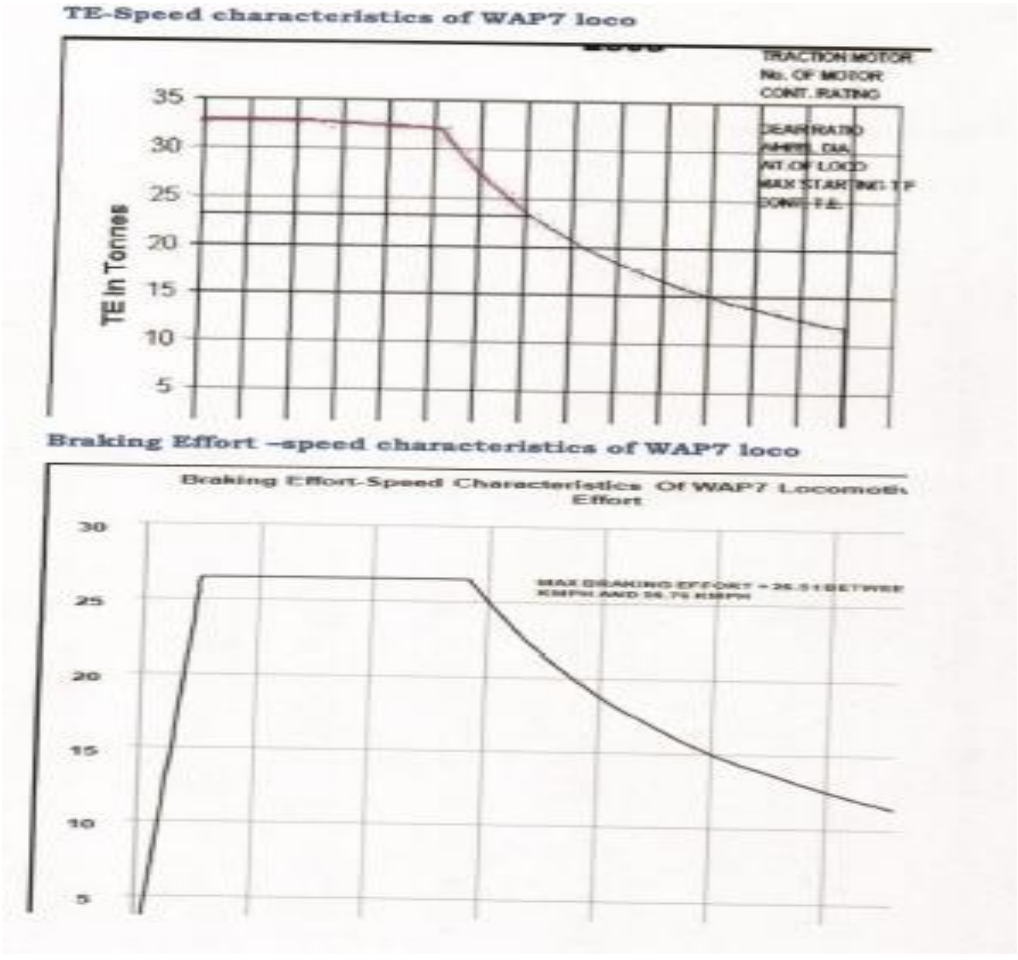


Table 5.2.1.2: Rolling stock characteristics (Passengers)*

Item	***Values***
Maximum permissible speed	*160 kmph*
Adhesion	*40% Starting (Indicative)/ 30% Continuous*
Locomotive weight	*Weight 132 tonnes*
Starting Tractive effort (up to speed not less than 10 kmph)	*33 T and continuous 23.13 T for 25 T axle load.*
Type of rolling stock	*CO-CO, 6 axle Locomotive.*
Type of Braking	*Electrically controlled-pneumatic service friction brake, Electric regenerative brake for the loco*
Pneumatic brake effort	*7 % - 9 % of gross weight*
Auxiliary Power requirement of Locomotive	*300 kVA*

*** RDSO Technical report for up-gradation of speed of WAP-7 locos from 140 kmph to 160 kmph No. RDSO/2018/EL/RM/0183(Rev. 0) May, 2018

Tractive effort versus speed of WAP-7 locomotive shown hereunder.



5.2.2 These characteristics are as per RDSO Specifications and are subject to confirmation from IR.

Further details such as power drawn, harmonics and various time and distance characteristics for Level of services at design headway shall be ascertained from IR.

Table 5.2.2: Train Operation plan

SN	Train Operation Plan
1	The contractor will prepare the train operation chart considering the traffic requirement of passenger and goods trains as given in clause 3.2.5 of PS.
2	The goods trains per day shall be a mix of single and double trains in the ratio of 2:1 for both UP and DN trains.
3	Train operation time shall be 20 hours and 4 hours shall be maintenance time per day.
4	For double trains – 13000 T; For single train – 6500 T.
5	Passenger trains load shall be 26 AC coaches per train.

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Corrigendum No. 2

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Chapter 7 – Power Supply Control Posts and Details of Equipment

1. **Sub-Clause–7.3-220kV/132/2x25kV Traction Transformers**
2. **Sub-Clause – 7.4 – Auto Transformers**

7.3 *220kV*2x25kV TRACTION TRANSFORMERS

7.3.1 The indicative typical TSS conceptual Scheme Diagram and layout are attached in Part-2, Section *VII -3*: Tender Drawings. The Scott — connected traction transformers shall be manufactured and supplied as per *RDSO Specifications No. TI/SPC/PSI/TRNPWR/5200 (latest). TSSs shall be provided with 2 Nos. Scott connected traction transformer each.*

7.3.2 Traction Transformer's minimum ratings are as follows. However, these are to be confirmed by the system simulation study by the Contractor and subject to the approval of the Engineer:-

Table 7.3.2

Salient Features of Scott connected Traction Transformers

Sr.	Parameter	Rating
1	Power Rating (MVA)	60 (Minimum) (ONAN) / 84 (ONAF) / 100(OFAF) MVA as per General arrangement as referred in Part-2, Section VII Volume 3 : Tender Drawings
2	Cooling	ONAN / ONAF/ OFAF
3	Connection type*	Scott Connected type

7.3.3 The transformers shall be installed on a suitable foundation that can withstand the transformers static and dynamic load. The foundation shall be able to support the loads during installation and removal.

7.3.4 The substation transformer bays shall be provided with suitable pulling eyes to allow the transformer to be moved and positioned.

7.3.5 Each transformer shall be located in its own bund (liquid containment). The bund shall contain stone metal soaking pits with voids of capacity adequate to contain at least 110% of total quantity of oil.

7.3.6 The oil drums shall be stored on their own bund to prevent spillage. The bunds used for oil storage barrels shall be positioned so that they do not get filled with rain water.

7.3.7 Outdoor oil-insulated transformers shall be separated from each other by fire walls for the purpose of limiting the damage and potential spread of fire from a transformer failure. There shall be a Fire wall between adjacent transformers. Fire wall shall comply with NFPA 221, NFPA 851, IE rules and Indian Standards as per application duty requirement. The wall shall be sufficient to protect adjacent transformers in the event of a catastrophic failure/fire of one of the traction transformers. Fire wall shall be rated for minimum of 4 hour fire rating, the height and length of firewall conforming to IE rules, NFPA 221, 251, 850/851 and designed to withstand the effects of projectiles from exploding transformer bushings or lightning arresters to prevent spread of fire. Firewall provided between transformers should extend at least 30 cm above the top of the transformer casing and oil conservator tank and at least 60 cm beyond the width of the transformer and cooling radiators on either side. The contractor shall calculate the fire load, fire Plume height and fire plume temperature, effect of wind velocity on plume including the forces due to blast if any and demonstrate the adequacy of Fire wall withstand capacity as supported by a calculation or fire modelling.

7.3.8 The design of the substation layout shall be such that one transformer can be removed by road without disturbing the operation of the HORC.

7.3.9 The safety provision shall comply with Section - 44 of Central Electricity Regulation– 2010 or as revised (measures relating to safety and electricity supply) and CBIP guidelines.

7.4 AUTO TRANSFORMERS

7.4.1 The Contractor shall supply Auto Transformers as per RDSO Technical Specification No. TI/SPC/PSI/AUTOTR//1200 (effective from 02.02.2021) and specifications furnished in Chapter 19, Appendix-9 of these specifications in compliance to EN 60076-1 for Capacities and (required if any by simulation) higher than the minimum specified, shall get it approved from the Engineer (if RDSO specification is not available). The auto Transformers shall not be less than the minimum rating and short circuit capacity of auto transformers as per table below:

Auto transformer	**TSS**	**SP, SSP**
Rating	12.3 MVA (Minimum) ONAN	8 MVA (Minimum) ONAN
Short circuit Capacity	35 times	25 times

7.4.2 *Deleted.*

7.4.3 *Deleted.*

7.4.4 *Deleted.*

7.4.5 *Deleted.*

7.4.6 The Auto transformers shall be provided with necessary fire wall between two ATs on thelines of TSS as per applicable standards.

7.4.7 *The number of Auto Transformers at each TSS, SP and SSP shall be as follows:*

(i) At each TSS- 4 Nos.,

(ii) At each SP- 4 Nos.,

(iii) At each SSP- 2 Nos.

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to

Corrigendum No. 2

Part 2, Section VII – 2 – Employer's Requirements - Particular Specifications (PS) - for 2x25 kV, AC Traction electrification and associated works

Chapter 18 – Interface Management

1. Table – 18.4.1 (a) & 18.4.1 (b)
2. Table – 18.4.4 / R1

Table-18.4.1 (a)

Interfacing Requirement with Civil and Track Contractors

Item No.	Item Description	System Contractor (SYS-1)	Civil and Track Contractors (C-5, C-4, C-23, C-1, C-6, BR-1, T-1 and T-2)
1.	Information exchange on alignment with following details: a) Formation Cross section b) Track alignment Drawing c) Coordinates of track Centre d) Curves e) gradient f) Rail levels, g) Yard layouts	Based on the information received from Civil and Track Contractors: (i) SYS-1 Contractor shall carry out detailed survey and verify the alignment drawings, Centre line, cross sections, track geometry at mainline and station yards and advisethe Civil and Track Contractors regarding infringements and modifications required, if any: (ii) SYS-1 Contractor shall develop Traction System Design & drawings based on the data shared by Civil and Track contractors. (iii) SYS-1 Contractor shall prepare General Arrangement Drawing (GAD) and layout plans fortraction supply installations and OHE/ROCS of main line, connectivity lines, station yards and siding including finalization of the Foundation Design & Drawings.	(i) Civil and Track Contractors shall provide final Track alignment drawings &plans, details of track geometry /structure, curves, gradients and Rail levels etc. alongwith details for the main line, connectivity lines, station yards and siding and tunnel data. (ii) Civil and Track Contractors shall share with SYS-1 Contractor, the coordinates of Centre lines of tracks as finalized and approved by the Engineer to facilitate the OHE & Foundation design and drawing by the Contractor (SYS-1).

Item No.	Item Description	System Contractor (SYS-1)	Civil and Track Contractors (C-5, C-4, C-23, C-1, C-6, BR-1, T-1 and T-2)
2.	(i) Handing over of formation by Civil Contractors to SYS-1 Contractor for casting of foundations and erection of masts	(i) SYS-1 Contractor shall take the access to the formation received from Civil and Track Contractors and complete OHE foundation & Mast erection work within 30 days. There after shall complete SPS erection, Cantilever, AEW, NFW, Earthing work etc. in co-ordination with Civil and Track Contractor in shared access.	(i) Civil Contractors shall share the handing over schedule with SYS- 1 Contractor and hand over formation to SYS- 1 Contractor as per schedule
	(ii) Handing over of track fit for movement of tower wagon/ wiring train by Track Contractors to SYS-1 Contractor for erection of masts/ portals and wiring works	(ii) SYS-1 Contractor shall co-ordinate with Track Contractors for linking of track fit for movement of tower wagon/ wiring train and shall undertake OHE wiring work etc. in shared access with Civil/Track Contractors.	(ii) Track Contractors shall share the handing over schedule of track fit for movement of tower wagon/ wiring train with SYS-1 Contractor and hand over track to SYS-1 Contractor as per schedule
	(iii) Final aligning and levelling of track by Track Contractors for SYS-1 Contractor to carry out final OHE adjustments	(iii) SYS-1 Contractor shall coordinate with Track Contractors for final aligning and levelling of track for SED checking in shared access with Civil/Track Contractors.	(iii) Track Contractors shall complete final aligning and levelling of track and shall handover the track to SYS-1 Contactor for undertaking final OHE adjustments.

Item No.	Item Description	System Contractor (SYS-1)	Civil and Track Contractors (C-5, C-4, C-23, C-1, C-6, BR-1, T-1 and T-2)
3.	OHE masts and anchor locations for viaduct	(i) SYS-1 Contractor shall furnish design data of OHE mast to facilitate Civil Contractor for provision of foundation bolts and anchor bolts. (ii) SYS-1 Contractor shall furnish OHE Layout Plan to C-5 Contractor. (iii)SYS-1 Contractor shall coordinate with C-5 Contractor during fixing of bolts.	(i) C-5 Contractor shall share the relevant drawings of viaduct with SYS-1 Contractor (ii)C-5 Contractor shall provide foundation bolts and anchor bolts as per design given by SYS-1 Contractor and also provide template for keeping bolts in position during concreting.
4.	Provision of support brackets and anchors for ROCS in tunnels.	(i) SYS-1 Contractor shall provide support brackets and anchors for ROCS in tunnels. (ii) SYS-1 Contractor shall coordinate with Civil Contractor for any other requirements in tunnels. (iii) SYS-1 Contractor shall coordinate with C-4 Contractor for provision of earthing arrangement.	(i) C-4 Contractor shall share the tunnel data with SYS-1 Contractor for providing support brackets and anchors for ROCS in tunnels. (ii) C-4 Contractor shall provide access to SYS-1 Contractor in tunnels for carrying out ROCS works

Item No.	Item Description	System Contractor (SYS-1)	Civil and Track Contractors (C-5, C-4, C-23, C-1, C-6, BR-1, T-1 and T-2)
5.	Provision of GI pipes below tracks for crossing of power cables across tracks at locations near substations, SP, SSP, switching stations and yards	SYS-1 Contractor shall provide GI Pipe for cablecrossings across tracks	Civil and Track Contractors shall facilitate SYS-1 Contractor for laying of GI pipes below track as per requirement.
6.	Provision of Buried Earth Conductor (BEC) if required, and Earthing & Bonding connections Longitudinal to the Alignment, Connections & terminals including crossing under the tracks	SYS-1 Contractor shall provide BEC as per approved drawings.	Civil/Track Contractor shall facilitate SYS-1 Contractor.
7.	Earthing of metallic structure in parallelism with OHE	SYS-1 Contractor shall Provide earthing & bonding of all metallic structures in parallel with OHE by means of two separate and distinct connections with BEC (if required).	Civil/Track Contractors shall provide drawings of fencing and other metallic structures running along the track.

Item No.	Item Description	System Contractor (SYS-1)	Civil and Track Contractors (C-5, C-4, C-23, C-1, C-6, BR-1, T-1 and T-2)
8.	Bridges (Concrete / Steel)- OHE Load on the Pier cap of bridges due to OHE Masts	(i) SYS-1 Contractor shall provide OHE Layout Plan (LOP) of proposed locations of OHE Masts. (ii) SYS-1 shall coordinate with Civil contractor and confirm for suitability and extend all assistance for providing Holding Down Bolts (HDB) as per approved design/drawings. (iii) SYS-1 shall also share values of Max direct load, Bending Moment, etc. arising due to the OHE Masts, fittings and anchors, which have to be considered in the design of Piers. (iv) SYS-1 Contractor shall provide staff to witness the provisions made by the Civil contractor for adequacy and suitability. (v) SYS-1 Contractor shall amend the design & install the OHE system appropriately as per the provisions available on the bridges finally executed.	(i) Civil Contractors shall share the relevant drawings of bridges with SYS-1 Contractor (ii) Civil Contractors shall take into account the OHE mast location, loads and bending moment etc. and ensure that the Pier Caps are designed and constructed for OHE Mast . (iii) Civil Contractors shall provide foundation bolts as per design given by SYS-1 Contractor and also provide template for keeping bolts in position during concreting.

Item No.	Item Description	System Contractor (SYS-1)	Civil and Track Contractors (C-5, C-4, C-23, C-1, C-6, BR-1, T-1 and T-2)
9.	Electrical Clearances at Bridges(FOB, ROB) Over Head Structures above tracks or OHE	(i) SYS-1 Contractor shall interface for infringements to IRSOD if any and Electrical Clearances and required modifications / improvements. (ii) SYS-1 Contractor shall update /modify traction OHE drawings based on the interface information. (iii) SYS-1 Contractor shall interface and get all drawings & schemes approved from the Engineer ascertaining adequacy of electrical clearances.	(i) Civil Contractors shall supply list of Over Head Structures (FOB & ROB) indicating specific locations, cross-sections, height above rail level and dimensions details for evaluation of infringements, if any. (ii) Civil Contractors shall accommodate the requirement of the SYS-1 Contractor as approved by the Engineer.
10.	Earthing and bonding of Over Head Structure -Steel Bridges – (including FOB, ROB)	(i) SYS-1 Contractor shall provide schematic drawings for Earthing & Bonding of steel bridges. (ii) SYS-1 Contractor shall provide earthing of Over Head steel structures.	Civil Contractors shall facilitate SYS-1 Contractor for earthing and bonding of Over Head structures.

Item No.	Item Description	System Contractor (SYS-1)	Civil and Track Contractors (C-5, C-4, C-23, C-1, C-6, BR-1, T-1 and T-2)
11.	Earthing & Bonding of concrete bridges /Viaduct.	(i) SYS-1 Contractor shall provide schematic drawings for earthing & bonding connections with dedicated reinforcement bars in concrete of Piers capto Piles/legs of concrete bridges. (ii) SYS-1 Contractor shall interface and get all drawings & schemes approved from the Engineer. (iii) SYS-1 Contractor shall supply and install flexible cable / jumper and connect the terminal plates with BEC (if required) at every consecutive spans. SYS-1 Contractor shall arrange adequate supervision of appropriate level and at various stages ofconstruction to ensure the provisions of earth continuity in the concrete structures.	(i) Civil Contractors shall install dedicated reinforcement earth bars in concrete to ensure earth continuity as per approved schemes. (ii) Civil Contractors shall allow witnessing by the Contractor (SYS-1) of casting to ensure the continuity of the Earth conductor as per the schemes. (iii) Civil Contractors shall paint marker on the designated earth bar to facilitate the supervision. (iv) Civil Contractors shall supply and install brought-out connections. Viz. Terminal Plates on every Pier Cap and on consecutive span of Viaduct to ensuring earthing & bonding connection with BEC (if required).

Table-18.4.1 (b)

Interfacing Requirement with Signalling & Telecommunication Contractor (SYS-2)

Item No.	Item Description	System Contractor (SYS-1)	Signalling & Telecommunication Contractor (SYS-2)
1.	Rail continuity bond/impedance bonds, cross bonds	SYS-1 Contractor shall provide Rail continuity bond/impedance bonds, cross bonds as required.	SYS-2 Contractor shall provide the SIP (Signalling Interlocking Plan) and location of Rail continuity bond/impedance bonds, cross bonds etc. as required
2.	OHE mast/structure Locations and Neutral Section (PTFE) locations	SYS-1 Contractor shall provide OHE mast/structure locations and Neutral section (PTFE) locations	SYS-2 Contractor shall provide the SIP (Signalling Interlocking Plan) and location of signals so that there is no infringement to signal, OHE and Neutral section.
3.	SCADA system in OCC, TSS, SSP, SP, station building and General Electric supply sub-stations (33/11 kV/440V)	SYS-1 Contractor shall provide SCADA RTU at OCC, TSS, SSP, SP, station building and General Electric supply sub-stations (33/11 kV/440V)	SYS-2 Contractor shall provide the Telecommunication connectivity (by OFC) at RTU location and Ethernet LAN SIP at OCC, TSS, SSP, SP, station building and General Electric supply sub-stations (33/11 kV/440V).
4.	Access control System and Intruder alarm in TSS, SSP, SP.	SYS-1 Contractor shall provide Access control System and Intruder alarm in TSS, SSP, SP in RTU and status to be shown in OCC. Shall Coordinate with Contractor (SYS-2)	SYS-2 Contractor shall provide communication system for Access control System and Intruder alarm in TSS, SSP and SP.

Table – 18.4.4 / R1

Indicative Interface with Indian Railways, DFCCIL and Contractor MSIL(OHE) at boundary locations;-

Item No.	Item Description	System Contractor (SYS-1)	Indian Railways, DFCCIL and Contractor MSIL(OHE)
1.	Design and erection of OHE and Earthing & Bonding and SCADA arrangements at boundary locations at Sultanpur, Asaudah and New Harsana Kalan.	(i) Shall coordinate with IR for collecting as erected drawing of existing electrified line at Sultanpur, Asaudah and New Harasana Kalan. (ii) Shall coordinate and share the design for the common section to finalize the plan. Shall coordinate with Indian Railways for finalising the locations of portals and/or single line cantilever structures. (iii) If portals are required to be provided for the common section, Contractor (SYS-1) shall provide and install mast / structure as per design and as approved by the Engineer. (iv) Shall coordinate and provide SCADA controls at IR SCADA center.	IR on the request of HRIDC/Engineer will provide the power and Traffic Blocks to Contractor (SYS-1) for making changes in OHE as per approved drawing. The charges claimed by Indian Railways and DFCCIL for granting traffic/Power black etc, for yard modification work and OHE connection shall be borne by the Employer (HRIDC).
2.	OHE and SCADA arrangements at boundary locations at Patli station (IR) and Manesar HORC.	(i) Shall coordinate with IR and contractor MISL (OHE) for collecting as erected drawing of existing electrical (ii) Shall coordinate with Contractor MSIL(OHE) and install all equipments at	Contractor MSIL(OHE) shall coordinate with Contractor (SYS-1) and provide all SCADA system of Patli SP to Contractor (SYS-1) who shall provide all controls and indications of Patli SP at OCC, Manesar.

Item No.	Item Description	System Contractor (SYS-1)	Indian Railways, DFCCIL and Contractor MSIL(OHE)
		OCC Manesar to control and monitor status of Patli SP.	
3.	OHE and SCADA arrangements at boundary locations at Prithla SP	(iii) Shall coordinate with DFCCIL and provide SCADA controls and indications of Prithla SP as per DFCCIL requirements (OCC of DFCCIL).	Shall coordinate with Contractor (SYS-1) and give their SCADA system requirements of Prithla SP which are essential for DFCCIL for control and indications purpose.

Tender No. HORC/HRIDC/SYS-1/2023

Attachment 10

to

Corrigendum No. 2

Part 2, Section VII-3

Employer's Requirements, Tender Drawings/R1

Section VII-8: Tender Drawings/R1

Tenderer shall download Tender drawings from HRIDC website. Tender Drawings are available for downloading under Active Tender Section on HRIDC website (https://hridc.co.in/active-tender.php). Tender drawings uploaded on HRIDC website for Package SYS-1 shall be deemed to form part of Corrigendum No. 2. List of Tender Drawings are enclosed hereunder.

List of Tender Drawings

	-Black colour shows Tender drawings which have not been revised
	-Blue colour shows Tender drawings which have been revised
	-Red colour shows New additional Tender drawings

A. Electrical Drawings

SN	Description	Drawing No.
1	Indicative General Power Supply Diagram	GC-HRIDC-SYS1-DRW-ELE-001_A1
2	Indicative OHE System for Open Route on Tangent Track	GC-HRIDC-SYS1-DRW-ELE-002_A1
3	Indicative OHE System for Open Route on Curved Track	GC-HRIDC-SYS1-DRW-ELE-003_A1
4	Indicative Typical Arrangement of Portal and Earthing of OHE Structure and Rails	GC-HRIDC-SYS1-DRW-ELE-004_A0
5	Indicative Typical Arrangement of BEC with OHE Structure and Rails	GC-HRIDC-SYS1-DRW-ELE-005_A0
6	Indicative OHE, Earthing & Bonding Arrangement on RCC Bridge/ Viaduct	GC-HRIDC-SYS1-DRW-ELE-006_A0
7	Indicative OHE Guy Rod Arrangement on Steel Bridge/ Viaduct	GC-HRIDC-SYS1-DRW-ELE-007_A0
8	Indicative Typical Sectioning Arrangement of Station	GC-HRIDC-SYS1-DRW-ELE-008_A1
9	Indicative OHE Mast on Girder Bridge with Earthing	GC-HRIDC-SYS1-DRW-ELE-009_A1
10	Indicative Earthing & Bonding of OHE Structure along the Bridge, Girders (RCC) & Piers	GC-HRIDC-SYS1-DRW-ELE-010_A0
11	Indicative 2x25 kV High Rise ROCS in Tunnel	GC-HRIDC-SYS1-DRW-ELE-011_A1
12	Indicative Single Line Diagram of Traction Substation 220/132/2x25kV Scott Connected Transformer	GC-HRIDC-SYS1-DRW-ELE-012_A0
13	Indicative Control Room Building at TSS	GC-HRIDC-SYS1-DRW-ELE-013_A1
14	Indicative Single Line Diagram of Sectioning Post(SP)	GC-HRIDC-SYS1-DRW-ELE-014_A1
15	Indicative Single Line Diagram of Sub-Sectioning Post(SSP)	GC-HRIDC-SYS1-DRW-ELE-015_A1

16	Indicative Control Room Building for SP& SSP	GC-HRIDC-SYS1-DRW-ELE-016_A1
17	Indicative Drawing for TSS/SP/ SSP Fencing	GC-HRIDC-SYS1-DRW-ELE-017_A1
18	Indicative General Arrangement Block Diagram for Traction SCADA Control	GC-HRIDC-SYS1-DRW-ELE-018_A1
19	Indicative General Arrangement Block Diagram for Auxiliary SCADA Control	GC-HRIDC-SYS1-DRW-ELE-019_A0
20	Indicative Plan and Elevation for Tower Wagon Shed	GC-HRIDC-SYS1-DRW-ELE-020_A1
21	Indicative Cable Route Plan for Motorised Isolator	GC-HRIDC-SYS1-DRW-ELE-021_A0
22	Indicative Traction Line Diagram	GC-HRIDC-SYS1-DRW-ELE-022_A0
23	Indicative portal arrangement in Maneasr station yard and Manesar – Patli open route	GC-HRIDC-SYS1-DRW-ELE-023_A0

B. Civil Drawings

SN	Description	Drawing No.
1	Conceptual Plan & Longitudinal Section (– 2.12 km to - 0.6 km)	GC-HRIDC-ALL-DRW-ALN-P&P-(-2.12)- (-0.6) KM_A0
2	Conceptual Plan & Longitudinal Section (- 0.6 km to 0 km)	GC-HRIDC-ALL-DRW-ALN-P&P-(-0.6)-0 KM-A0
3	Conceptual Plan & Longitudinal Section (0 km to 5 km)	GC-HRIDC-ALL-DRW-ALN-P&P-0-5 KM_A0
4	Conceptual Plan & Longitudinal Section (5 km to 10 km)	GC-HRIDC-ALL-DRW-ALN-P&P-5-10 KM_A0
5	Conceptual Plan & Longitudinal Section {10 km to 15 km (Tunnel)}	GC-HRIDC-ALL-DRW-ALN-P&P-10-15 KM_A2
6	Conceptual Plan & Longitudinal Section (15 km to 20 km)	GC-HRIDC-ALL-DRW-ALN-P&P-15-20 KM_A2
7	Conceptual Plan & Longitudinal Section (20 km to 25 km)	GC-HRIDC-ALL-DRW-ALN-P&P-20-25 KM_A0
8	Conceptual Plan & Longitudinal Section {24 km to 30 km (Tunnel)}	GC-HRIDC-ALL-DRW-ALN-P&P-24-30 KM_A0
9	Conceptual Plan & Longitudinal Section 29 km to 33 km	GC-HRIDC-ALL-DRW-ALN-P&P-29-33 KM_A1
10	Conceptual Plan & Longitudinal Section (33 km to 35 km)	GC-HRIDC-ALL-DRW-ALN-P&P-33-35 KM_A1
11	Conceptual Plan & Longitudinal Section (35 km to 40 km)	GC-HRIDC-ALL-DRW-ALN-P&P-35-40 KM_A1
12	Conceptual Plan & Longitudinal Section (40 km to 45 km)	GC-HRIDC-ALL-DRW-ALN-P&P-40-45 KM_A1

SN	Description	Drawing No.
13	Conceptual Plan & Longitudinal Section (45 km to 50 km)	GC-HRIDC-ALL-DRW-ALN-P&P-45-50 KM_A1
14	Conceptual Plan & Longitudinal Section (49.7 km to 55.6 km) (Main Line)	HRIDC/PS/LS-1
15	Conceptual Plan & Longitudinal Section (55 km to 61.5 km)	GC-HRIDC-ALL-DRW-ALN-P&P-55-61.5 KM_A1
16	Plan & Longitudinal Section (60 km to 65 km)	AA/2245/AL/DR/P&P/R3
17	Plan & Longitudinal Section (65 km to 70 km)	AA/2245/AL/DR/P&P/R3
18	Plan & Longitudinal Section (70 km to 75 km)	AA/2245/AL/DR/P&P/R3
19	Plan & Longitudinal Section (75 km to 80 km)	AA/2245/AL/DR/P&P/R3
20	Plan & Longitudinal Section (80 km to 85 km)	AA/2245/AL/DR/P&P/R3
21	Plan & Longitudinal Section (85 km to 90 km)	AA/2245/AL/DR/P&P/R3
22	Plan & Longitudinal Section (90 km to 95 km)	AA/2245/AL/DR/P&P/R3
23	Plan & Longitudinal Section (95 km to 100 km)	AA/2245/AL/DR/P&P/R3
24	Plan & Longitudinal Section (100 km to 105 km)	AA/2245/AL/DR/P&P/R3
25	Plan & Longitudinal Section (105 km to 110 km)	AA/2245/AL/DR/P&P/R3
26	Plan & Longitudinal Section (110 km to 115 km)	AA/2245/AL/DR/P&P/R3
27	Plan & Longitudinal Section (115 km to 120 km)	AA/2245/AL/DR/P&P/R3
28	Plan & Longitudinal Section (120 km to 125 km)	AA/2245/AL/DR/P&P/R3
29	Plan & Longitudinal Section (125 km to 126 km)	AA/2245/AL/DR/P&P/R3
30	Detailed Plan and Longitudinal Section from Chainage (0 km to 5.72 km (Connectivity Line)	HRIDC/PS/LS-2
31	Conceptual Plan & Longitudinal Section Connectivity Towards Patli	GC-HRIDC-C2-DRW-ALN-P&P-03001_A2
32	Conceptual Plan & Longitudinal Section Connectivity Towards Sultanpur	GC-HRIDC-C2-DRW-ALN-P&P-04001_A2
33	Conceptual Plan & Longitudinal Section Connectivity Towards Sultanpur from Badsa	GC-HRIDC-C2-DRW-ALN-P&P-05001_A0

SN	Description	Drawing No.
34	Conceptual Plan & Longitudinal Section Mandothi to Asaudah Connectivity	AA/2245/AL/DR/P&P/R3
35	Re-Grading of Garhi Harsaru-Farukhnagar Main Line of Sultanpur Station Yard (Conceptual)	GC-AA/RLY/2245/HRIDC/ESP-07/REV-03
36	Conceptual Plan Typical Embankment/ Cutting Profile	GC-HRIDC-SK-GEN-001_A2
37	Conceptual Engineering Scale Plan of Prithla Junction Yard CH: 00.00m from Pritla	GC-HRIDC-C5-DRW-STN-ESP-PRI01_A0
38	Conceptual Engineering Scale Plan Silani Station Yard CH: 10341.882m from Prithla	GC-HRIDC-C5-DRW-STN-ESP-SIL01_A0
39	Conceptual Engineering Scale Plan of IMT Sohna	GC-HRIDC-C5-DRW-STN-ESP-SOH01_A0
40	Conceptual Engineering Scale Plan of Dhulawat station CH:32767m F/from Prithala	GC-HRIDC-C23-DRW-STN-ESP-DHU01_A1
41	Conceptual Engineering Scale Plan of Chandla Dungerwas Station Yard CH:42606.159m F/Prithala	GC-HRIDC-C23-DRW-STN-ESP-CDU01_A2
42	Conceptual Engineering Scale Plan of Panchgaon Station Yard CH:46279.352m from Prithala	GC-HRIDC-C23-DRW-STN-ESP-PCG01_A2
43	Conceptual Engineering Scale Plan of Manesar Station	GC-HRIDC-C1-DRW-STN-ESP-MAN01_A1
44	Conceptual Engineering Scale Plan of New Patli Junction CH: 58135.513m	GC-HRIDC-C23-DRW-STN-ESP-NPA01_A3
45	Conceptual Engineering Scale Plan of Badsa Junction CH:64742.718m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-BDS01_A0
46	Conceptual Engineering Scale Plan of Deverkhana Station Yard CH: 71098.961m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-DEV01_A0
47	Conceptual Engineering Scale Plan of Badli Crossing Station Yard CH: 76829.080m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-BDL01_A0
48	Conceptual Engineering Scale Plan of Mandothi Station Yard CH: 90449.137m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-MAN01_A0
49	Conceptual Engineering Scale Plan of New Asaudah Station CH:94031.161m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-NAS01_A0
50.	Conceptual Engineering Scale Plan of Jasaur Kheri Station Yard CH 100228.880m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-JSK01_A0

SN	Description	Drawing No.
51	Conceptual Engineering Scale Plan of Kharkhoda Kirholi Station Yard CH: 108728.865m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-KHR01_A0
52	Conceptual Engineering Scale Plan of Tarakpur Crossing Station Yard CH: 114218.885m from Prithala	GC-HRIDC-C6-DRW-STN-ESP-TAR01_A0
53	Conceptual Engineering Scale Plan of New Harsana Kalan Junction CH 125091.992m from Prithala	AA/RLY/2245/HRIDC/ESP-17/REV-5
54	Conceptual Engineering Scale Plan DFC New Prithla yard	GC-HRIDC-C5-DRW-STN-ESP-NPR01_A0
55	ESP of Patli Station	GC-HRIDC-C2-DRW-ALN-ESP-001_A0
56	Conceptual Engineering Scale Plan of Asaudah	GC-HRIDC-C6-DRW-STN-ESP-IRA01_A0
57	Conceptual Engineering Scale Plan of Sultanpur Kaliawas Junction CH 36774.74m from Badsa KM:6/375	GC-HRIDC-C2-DRW-ALN-ESP-003_A0
58	Conceptual Drawing for single track tunnel cross section (ROCK)	GC-HRIDC-C4-DRW-TTL-CLT-01001_A1
59	Conceptual Drawing for single track tunnel cross section (SOIL)	GC-HRIDC-C4-DRW-TTL-CLT-01002_A1
60	Conceptual General Arrangement Drawing for Viaduct BR.NO.70	GC-HRIDC-C5-DRG-BRD-GAD-01070_A0
61	Conceptual plan for location of OHE mast for Composite Girder Bridges	GC-HRIDC-SK-GEN-031
62	Conceptual plan for location of the OHE mast in viaduct	GC-HRIDC-SK-GEN-032
63	General Arrangement Drawing of Proposed Major bridge (RFO) No.277 AT CH : 94381.195m 3x30.5m Open Web Girder (Crossing Railway on Delhi – Rohtak Section)	GC-HRIDC-C6-DRW-BRD-GAD-01277_A0
64	Conceptual Plan of OHE Portal for OWG Girder	GC-HRIDC-SK-GEN-036

Note: Section VII-8: Tender Drawings/R1 are available for downloading under Active Tender Section on HRIDC website (https://hridc.co.in/active-tender.php).

Tender No. HORC/HRIDC/SYS-1/2023

Attachment 11
to
Corrigendum No. 2

Part 2- Section VII-4: Employer's Requirements
Environment, Social, Health and Safety Management (ESHS) Manual/R1

Section VII-4: Employer's Requirements

Environment, Social, Health and Safety Management Manual

Table of Contents

1.0 ESHS FRAMEWORK

1.1 General

1.1.1. The Contractor shall be responsible for the Environment, Social, Health and Safety (ESHS) on the Site and any other areas being used by him for the purposes of the Contract. Each Contractor shall develop his own contract specific ESHS Management Plan, which will represent his approach to the management of ESHS activities on his work sites under the Contract with the Employer. The ESHS Management Plan should contain all the measures as given in the project Environmental and Social Management Plan (ESMP) which is part of the project ESIA.

1.1.2. The Contractor shall ensure that all appropriate ESHS measures are implemented throughout the execution of the Works.

1.2 Scope

1.2.1 The ESHS Manual defines the principal requirement of the Employer and forms an essential part of the overall Environment, Social, Health and Safety Management System proposed to be employed by the Employer for the construction of the Project.

1.3 Application of This Document

1.3.1 This document applies to all aspects of the Contractor's Scope of Work including Sub-contractors and all other agencies. There shall be no activity associated to the Contract, which is exempted from the purview of this document.

1.4 Purpose of This Document

1.4.1 The objective of these guidelines is to ensure that adequate precautions are taken for incident/occupational illness free safe work execution as well as to avoid harmful effects on the environment and social during construction.

1.4.2 This document:

a) Describes the Environment, Social, Health and Safety interfaces between the Engineer and the Contractor.

b) Details the processes by which the Contractor shall manage Environment, Social, Health and Safety issues while carrying out the work under the contract.

1.4.3 These requirements shall be read together with, ISO 45001: 2018 Occupational Health and Safety Management System and ISO 14001: 2015 Environmental Management Systems.

1.4.4 The Contractor shall be responsible for obeying all Laws, Rules & Regulations in force at any point of time regarding the Environment, Social, Health & Safety of workers.

2.0 ESHS MANAGEMENT

2.1 General

2.1.1 This document defines the principal requirements to be practiced at the Site at all times.

2.2 ESHS Targets and Goals

2.2.1 Following ESHS targets and goals shall be set and achieved by the Contractor/Sub-contractor based on time bound work plan:

a) Zero total recordable injuries;

b) Zero non-conformances in respect of statutory laws related to Environment, Health, Social andWelfare measures, living conditions and Safety regulations;

c) Total compliance of recording and reporting of all types of incidents;

d) 100% compliance on Safety Induction of all personnel;

e) Total compliance of conducting inspections and audits as per approved ESHSManagement Plan;

f) 100% incident recording and reporting;

g) 100% adherence to usage of appropriate PPEs at work;

h) Executing construction work with least disturbance to the environment, adjoining road users and traffic;

i) Minimize waste generated at sites and maximize reuse of materials;

j) Maintaining environment conditions of site as per statutory requirement of HPCB, NGT etc. to avoid penalty;

k) To achieve construction site as zero discharge site as far as possible.

2.3 Contractor's Obligation to Abide by Mandatory Legislations and Standards

2.3.1 The construction works shall be undertaken in accordance with the Employer's ESHS Management Policy and Management Systems as amended from time to time.

2.3.2 The construction works shall be undertaken in accordance with all updated applicable legislation listed below, but not limiting to:

a) Indian Electricity Act 2003 and Electricity Rules, 2005;

b) National Building Code, 2016;

c) Factories Act, 1948 and state respective factory Rules;

d) Motor Vehicles Act as amended in 1994 and The Central Motor Vehicles Rules,1989;

e) Indian Road Congress Code IRC: SP: 55-2014 'Guidelines on Safety in Road Construction Zones';

f) The Petroleum Act, 1934 and Rules, 1976;

g) Gas Cylinder Rules, 2003;

h) Indian Explosives Act, 1884, along with the Explosives Substance Act, 1908 andthe Explosives Rules, 1983;

i) Environmental and Social Legislations as listed in Clause 6.0 of this document.

2.4 Contractor's Environmental, Social, Health and Safety Management Policy and Plan

2.4.1 The Contractor as per Rule 39 of the BOCW Central Rules shall formulate an Environment,

Social, Health & Safety policy and display it at conspicuous places at work sites in English and Hindi so that the policy shall be understood by majority of the construction workers.

2.4.2 The Contractor shall revise the policy whenever any modification having implication on the Environment, Social, Health and Safety of the workers is made or any new construction work, substances, or technique are introduced which have implication on environment, health and safety of workers.

2.4.3 The contractor shall submit the ESHS Management plan for review by the engineer within 28 days after the commencement date.

2.4.4 The Contractor shall revise and submit the ESHS Management Plan if at any time the ESHS Management Plan is insufficient in the Engineer's opinion. The Contractor, within 7 days of such intimation shall submit the revised ESHS Management Plan to the Engineer for review.

2.4.5 Any omissions, inconsistencies, and errors in the ESHS Management Plan or the Engineer's acceptance or rejection of the ESHS Management Plan and/or supplements thereto shall be without prejudice to the Contractor's obligations with respect to site ESHS and shall not be excused for any failure by the Contractor to adopt proper and recognized ESHS practices throughout the execution of the Works. The Contractor shall adhere to the ESHS Management Plan and shall ensure, as far as practically possible, that all supervisors and sub-contractors of all tiers have a copy of the ESHS Management Plan on the Site and comply with its provisions.

2.4.6 The details of contents to be covered in the ESHS Management Plans are given in Clause 8.0, Attachment -1[Contents of ESHS Management Plan] of this document.

2.5 Designer's Role

2.5.1 The Designer's primary role includes to minimize the risk to Environment, Social, Health and Safety of those who are going to construct, maintain, clean, repair, dismantle or demolish the structures and anyone else like adjoining road users/public, who might be affected by the work.

2.5.2 Every temporary structure like scaffold, temporary deck, earth retaining structures etc. shall be properly designed.

2.6 Site ESHS Organisation

2.6.1 The Contractor shall appoint the required ESHS Management Personnel as prescribed in the Contract.

2.6.2 **Conduct and Competency**

The Contractor shall ensure that all personnel are competent to perform the job assigned to them. In the event that the Contractor is unable to demonstrate the competency of any person whose activities can directly impact the Works' ESHS performance, the Engineer shall remove that person from the Site without any procedural formalities.

2.6.3 **Approval from The Engineer**

The name, address, educational qualification, work experience of each ESHS personnel deployed shall be submitted to the Engineer for approval well before the start of the Works or before deployment whichever is earlier. These personnel are authorized to work only after the approval of the Engineer. In case any ESHS personnel leaves the Contractor, the same shall be intimated to the Engineer within a week. The Contractor shall recruit new personnel and fill up the vacancy before relieving a person. Proper handing over of all the documents shall be ensured before relieving an ESHS person.

2.7 Responsibility of ESHS Personnel

2.7.1 The Contractor ESHS Management Personnel shall report to Contractor's ESHS Expert who shall always report directly to the Contractor's Project Manager. Their primary role is to oversee Environment, Social, Health and Safety aspects at work Site. The Engineer shall always monitor

adherence to this procedure.

2.7.2 No Contractor shall engage ESHS manpower from any outsourcing agencies as in that case the effectiveness would be lost. All ESHS manpower shall be on the payroll of the main contractor only and not on the payroll of any sub-contractor or outsourcing manpower agencies etc.

2.8 ESHS Committee

2.8.1 After the commencement of actual sitework, the Contractor shall form Site ESHS Committee and the same shall be communicated to the members.

2.8.2 The Terms of Reference for the Site ESHS Committees shall be as follows:

a) To oversee implementation of the Contractor's Environment, Social, Health and Safety policies and practices;

b) To monitor the adequacy of the Contractor's ESHS Management Plan and ensure its implementation;

c) To review ESHS training;

d) To review the Contractor's ESHS monthly reports;

e) To identify probable causes of accident and unsafe practices in construction work and to suggest remedial measures;

f) To stimulate interest of the Workers in ESHS by organizing environment/safety week, safety competition, talks and film-shows on environment/safety, preparing posters or taking similar other measures as and when required or as necessary;

g) To go around the Site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectifications including first-aid medical and welfare facilities;

h) Committee team members should perform a site inspection before every committee meeting and to monitor ESHS inspection reports;

i) To bring to the Notice of the Engineer hazards associated with use, handling and maintenance of the equipment used during the course of construction work;

j) To suggest measures for improving environment, social, health and safety in construction work at the Site;

k) To investigate the health hazards associated with handling different types of explosives, chemicals, and other construction materials and to suggest remedial measures including personal protective equipment; and

l) To review the last ESHS committee meeting minutes and the remedial measures taken for Non-Compliance.

m) Following shall be the composition of the Site ESHS Committee:

2.8.3 Site ESHS Committee meeting shall be conducted once in a calendar month and participation of following members shall be ensured.

Chairman	Project Manager
Secretary	ESHS Expert (Will be nominated by Project Manager)

Members	i) Contractor's ESHS staff. ii) Labour Welfare Officer; iii) In -charge of Plant and Machinery & Site Electricals; iv) In-charge of Special Work Operations (e.g. bridge, viaduct, and tunnel, etc.); v) In-charge of Stores; vi) Subcontractor's representative; and vii) Workers' representatives;
Engineer's Representatives	To be nominated by the Engineer

2.8.4 **Minimum time between two monthly ESHS Committee meetings**

A minimum period of 21 days shall be maintained between any two ESHS monthly committee meetings.

2.8.5 **Agenda**

The Secretary shall circulate the agenda of the meeting at least seven working days in advance of the scheduled date of the meeting to all members as well as to the Employer.

2.8.6 The agenda should broadly cover the following:

a) Chairman's overview of ESHS Management Performance;
b) Confirmation of minutes of last meeting;
c) Previous month ESHS statistics;
d) Incident and accident investigation/Dangerous occurrence/Near miss report;
e) Site ESHS inspection and compliance report;
f) The Contractors' ESHS issues;
g) Report from the Employer and Engineer;
h) Non-compliances raised by Engineer/Statutory Authorities;
i) Report and compliance of GRC; and
j) Any other concern.

2.8.7 In case of station and other contiguous areas where more than one main Contractor is working together, the Engineer shall instruct the other Contractors/ Sub-contractors to join for the monthly ESHS committee meeting of the main civil Contractor, to discuss and decide about the common provision of safety, security, lighting, toilet, drinking water etc. and sharing the maintenance cost of the same etc.

2.8.8 The Minutes of the Meeting shall be prepared as per the format provided and sent to all members within 2 working days by mail. Minutes of ESHS Committee Meeting shall also be displayed on the notice board for wider publicity to all concerned.

2.9 ESHS Induction Training and ID Card

2.9.1 The Contractor shall ensure that all personnel working at the Site receive an ESHS induction

training immediately on the first day of joining explaining the nature of the work, the hazards that may be encountered during the site work. Personnel shall only be deployed at site once he/she has completed ESHS induction training. The training shall cover the contents as given in Clause 8.0, Attachment-4 [General Instruction: ESHS/GI/001].

2.9.2 All personnel shall be issued a photo identity card as per the format given in Clause 8.0, Attachment-4[General Instruction: ESHS/GI/002].

2.9.3 The Contractor shall also issue a Personnel pocket ESHS Booklet in a language known to the Workers, which provides information on ESHS and emergency procedures.

2.10 Other ESHS Training

2.10.1 The Contractor shall organize the ESHS trainings to managers, supervisors and other personnel in behavioral change and improve ESHS performance.

2.10.2 The Contractor shall provide a training/workshop on ESHS to all its workers/staff/employees/subcontractors of at least 2 days. It shall be completed in various modules and each employee/worker shall have a record of completing all modules.

2.10.3 On-the spot practical skill development training on height safety including scaffold safety, crane safety, welding safety, electrical safety, and traffic safety for marshals shall also be conducted.

2.10.4 Every employee including workman shall take a ESHS oath followed by toolbox talk every day.

2.10.5 All vehicles and machine drivers including heavy work vehicle and machine operators shall be trained on defensive driving with necessary certificate or license.

2.11 ESHS Inspections

2.11.1 The Contractor shall evolve and administer a system of conducting ESHS inspection and other risk management analysis on a periodical basis.

2.11.2 The purpose of ESHS inspection is to identify any deviation in construction activities and operations, machinery, plant and equipment and processes against the ESHS Management Plan and its supplementary procedures and programs.

2.11.3 The Contractor shall initiate a monthly joint site ESHS Management inspection with the Engineer and report shall be generated on the same day with the corrective action and accepted target date (within a week) by the Engineer.

2.11.4 The Contractor project manager & ESHS expert with site team shall be participating in the ESHS inspection.

2.11.5 The Compliance of the joint inspection "Non-Conformance" shall be witnessed/accepted by the Engineer.

2.11.6 The Contractor shall submit follow up compliance report of the ESHS inspection report within six days of the date of Inspection in a coloured soft copy.

2.11.7 Following ESHS inspections program shall be adopted:

a) Planned general inspection;

b) Routine inspection;

c) Specific inspection; and

d) Other inspection.

2.11.8 **Planned general inspections** are performed at predetermined intervals. Inspections that will be

classified under this inspection program are:

a) Monthly Contractor and sub-contractor's Site ESHS committee inspection;

b) Weekly ESHS inspection by construction supervisors (the Contractor and the Subcontractor); and

c) Daily ESHS inspection by the Contractor Site ESHS team.

2.11.9 **Routine inspections** are often referring to the inspection of the Site, equipment and temporary structures performed by the Site and equipment operators and temporary structure erectors.

Inspections that will be classified under this inspection program are:

a) Daily inspection of plant and equipment by operators;

b) Weekly inspection of scaffold by scaffolding supervisors;

c) Monthly Inspection of electrical hand tools by competent electrical supervisors;

d) Quarterly inspection of temporary electrical systems by competent electrical supervisors; and

e) Half-yearly inspection of lifting machinery, lifting appliances, equipment and gears by Govt. approved competent persons.

f) Quarterly inspection of lifting gears, tools tackles and appliances.

g) Quarterly colour coding of lifting gears, tools & tackles. The recommended colour coding for the 4 quarters of the years shall be as under

i) January – March: GREEN

ii) April – June: YELLOW

iii) July – September: BLUE

iv) October – December: WHITE

2.11.10 The list mentioned above is not exhaustive. The Contractor may add additional categories. The ESHS Expert shall ensure that a system of routine inspections is carried out periodically to all plants, equipment, powered tools and any other temporary structures that will pose a hazard to operators and workmen.

2.11.11 **Specific Inspection**

Specific inspections are performed on activities without a predetermined date. Competent supervisors usually perform inspections for ensuring an activity whether it is executed in accordance to a general set of rules; Method Statement submitted or developed procedures.

The following are examples that will be commonly performed as required on the Site:

a) Inspection performed before a heavy lifting operation;

b) Inspection performed before and after the entry of person into a confined space;

c) Inspection performed before and after a welding and gas cutting operation;

d) Inspection of formwork before concreting by formwork erector.

2.11.12 The list mentioned above is not exhaustive. The Contractor shall ensure that a competent supervisor inspects all high-risk processes and activities.

2.11.13 **Other inspections** include the following:

a) Mandatory inspections by Labour Department of Government of Haryana; and

b) HRIDC/Engineer site ESHS management team.

c) Inspections by Central Pollution Control Board, Haryana Pollution Control Board, Ministry

of Environment and Forest and Climate Change, National Green Tribunal etc.

2.11.14 The Contractor shall prepare all required ESHS inspection checklists for all activity operations and equipment. Checklists will be prepared based on the Indian SafetyStandards, Rules and Regulations and the Works requirements.

2.11.15 All inspection records and reports will be properly kept and filed for audit purpose. Inspection reports of planned general inspection and routine inspection will be used for discussion during safety committee meetings.

2.12 ESHS Audit

2.12.1 The purpose and scope of ESHS Audit is to assess potential risk, liabilities and the degree of compliance of the ESHS Management Plan and its supplementary procedures and programs against applicable and current ESHS legislation regulations and the Works requirements.

2.12.2 The Contactor's project manager shall hold the ultimate responsibility in ensuring implementation of ESHS audit program during the construction work.

2.12.3 Monthly Audit Rating Score (MARS)

2.12.4 Monthly Audit Rating Score (MARS) will be performed once in a month. A team consisting of the Contractor's project manager, ESHS experts and the Engineer's representative based on the pre-designed score-rating format will conduct it.

2.12.5 This Monthly ESHS Audit Rating Score (MARS) report will enable the Engineer to evaluate the general compliance by the Contractor with the Conditions of Contract, and the ESHS Management Plan. A Minimum Compliance level to achieve 75% overall Audit Rating is essentially required. Failing this, the Engineer will take punitive action which includes non-processing of running account bills.

2.12.6 **Timing**

The Monthly Audit Rating Score (MARS) should be conducted at least 7 days prior to the scheduled date of monthly ESHS Committee Meeting.

2.12.7 **Evaluation**

The numerical scoring has been weighed on a 1-10 scale. The audit team will use their observations noted in evaluating the points to be awarded against each of the elements of the audited section. Wherever some topics and sub-topics are not applicable the score rating need not be given. The overall audit ratings shall be achieved by:

$$\text{Overall Audit rating} = \frac{\text{Actual Score Achieved}}{\text{Maximum Possible Score}} \times 100$$

The criticality of the required actions for the respective sections of the Audit will be classified as:

S.No.	Score	Description	Action
1	< 60%	Immediate	Require the Contractor to rectify within 24 hours
2	< 75%	Improvement Necessary	The Contractor rectification within 7 days and confirmed in writing to the Engineer
3	< 90%	Improvement Desirable	The Contractor rectification within 1 month and confirmed in writing to the Engineer

2.12.8 **Report**

A copy of each Audit Report will be sent to the Engineer and to all subcontractors, with whom it will then be discussed in detail at the monthly ESHS Committee Meeting to ensure that any corrective actions are agreed upon.

2.12.9 **Monthly Electrical Safety Audit**

2.12.10 A team comprising of Contractor's Senior ESHS (Electrical) Manager along with the Engineer representatives shall conduct a monthly electrical safety audit covering the following and submit the report to the Engineer. The report shall be submitted in the format as prescribed by the Engineer.

i) Electrical accidents investigation findings and remedy.

ii) Adequacy of power generation and power requirements.

iii) Power distribution and transmission system in place.

iv) Updated electrical single line diagram showing the current condition of power source and distribution including the IP rated DBs arrangement.

v) Electrical Protection devices-selection, installation and maintenance.

vi) Earth or ground connection and earth pit maintenance details.

vii) Education and training of electrical personnel undertaken.

viii) Routine electrical inspection details.

ix) Electrical maintenance system and register

x) Name plate details of major electrical equipment.

xi) Classified zones in the Site, if any

2.12.11 **External ESHS Audit**

External ESHS Audit is to be conducted by external agencies that are competent with ISO qualified auditors with the prior approval of the Engineer.

a) Areas of Competence of Audit Team

i) The Audit team shall have practical understanding of BOCWA/R statutory requirements on health/medical and welfare of workmen, construction hazards and its prevention and control, traffic management, electrical safety, rigging, safety of construction equipment and environment and social management.

ii) The Audit team shall have a Team leader and at least one Team member.

iii) Audit shall be conducted as per the guidelines of ISO, ILO and national standards. Audit report shall also be presented as per the formats given in thestandards; and

iv) External ESHS Audit shall be conducted on a quarterly basis throughout the currency of the Contract.

b) Targets of ESHS Audit

The contents and coverage of the audit shall include the following items:

i) ESHS Management:

- ESHS Organization;
- ESHS Policy and Plan;
- ESHS committee;
- ESHS orientation;

- ESHS training;
- ESHS communication and motivation;
- ESHS submittals to the Employer;
- ESHS promotional and awareness program;
- Incident reporting &investigation;
- Onsite/offsite emergency preparedness plan;
- Hazard identification and risk assessment;
- Implementations of work permit system.

ii) Technical

- Work Method Statement;
- Operational control procedures/ Safe operating procedures;
- Working at height;
- Hand tools and power tools;
- Electrical safety;
- Fire prevention and control;
- Housekeeping;
- Overhead protection;
- Slipping, tripping, cutting, drowning and falling hazards;
- Lifting appliances and gear, tools and tackles;
- Lifting and launching operation;
- Construction plant and machinery;
- Machine and area guarding;
- Material handling;
- Hot work;
- Demolition;
- Excavation and tunnelling;
- Work permit system;
- Traffic management;
- Chemical handling;
- Dangerous and harmful Environments;
- Maintenance matrix of mechanical and electrical machines / equipment;
- Working on or under water;
- Working near or under high tension line;
- Personal protective equipment;
- Visitors at Site;
- Occupational health and welfare measures;
- All statutory forms, returns under various statutes;

- First-aid and medical facilities;
- Welfare measures; and
- Environmental and Social management.

c) Audit Documents

The Contractor shall make the below itemized documents available for review by the Audit team;

a) ESHS Policy;

a) ESHS Management Manual;

b) ESHS Rules and Regulation;

c) ESHS Organization chart;

d) Annual ESHS objectives/programs;

e) Accident/near miss statistics and analysis;

f) ESHS training program/records for all personnel;

g) Operating manuals and maintenance manual of all equipment;

h) Safe worthiness certificates of all lifting appliances and gears;

i) Medical fitness record for all personnel;

j) Risk identification, assessment and control details;

k) Environmental and Social management reports;

l) Emergency management records including mock drill;

m) Housekeeping inspection records;

n) Minutes of ESHS committee meetings;

o) Calibration and testing records;

p) Records of previous audits;

q) ESHS inspection records;

r) First Aid, medical facilities and other welfares measures;

s) Maintenance procedure of plant &machinery;

t) Records of Industrial hygiene surveys (noise, ventilation, and illumination level, airborne and toxic substances, explosive gases).

d) Audit Preparation

i) Audit team members are required to gather information by observations through interviews and by checks of documentation.

ii) Audit team shall prepare checklist to cover all parts based on ESHS legislations Rules and Regulations and ESHS Conditions of Contract requirements.

iii) Audit team members shall verify the facts and findings of leading to the identified gaps and weakness.

iv) Audit leader has overall responsibility for reaching a conclusion**.**

e) Reporting

Audit report shall be prepared and directly sent to the Engineer within 7 days of conducting the audit.

f) Report Contents

a) *Executing Summary* - Based on the finalized checklists as written the findings to the Engineer by the audit team members, the audit leader will compile a concise and accurate summary of observations and findings;

b) *Introduction* - This will contain basic information regarding the facilities or organization audited, the specific audit dates (inclusion of those for preparation and post-audit activities);

c) *Principal Positive Findings* - This will contain the summary of positive aspects as observed by the auditors. It will also contain highlights of those issue, which may warrant dissemination as best practice regarding methodology used or achievement;

d) *Audit Findings* - All audit findings as detailed in the audit checklists shall be grouped together as priority 1 and 2 as detailed below in a separate listing:

i. *Priority 1*: Actions to rectify gaps or weakness should generally be implemented within two-weeks' time if risk potential is high or unacceptable; and

ii. *Priority 2:* Actions should be generally implemented or rectified with a maximum of 3- 4 weeks, if not rectified would create a likelihood of minor injury or business loss.

g) Conformity Report Action to the Engineer

a) The auditor shall inspect the Site after 14 days of conducting initial audit for checking the adequacy of implementation of items maintained under priority 1 by the Contractor and shall submit a Conformity/Non-conformity Report to the Engineer within 7 days ;

b) The auditor shall again inspect after 28 days of conducting initial audit for checking the adequacy of implementation of items mentioned under priority 2 by the Contractor and shall submit a Conformity/Non-conformity Report to the Engineer within 7 days; and

c) In case of non-conformity of items mentioned by auditor, the Engineer shall take necessary steps including stoppage of work and suggestion for corrective action to the Contractor.

2.13 ESHS Communication

2.13.1 The Contractor shall make every effort to communicate the ESHS Management measures through posters campaigns/billboards/banners/glow signs being displayed around the Site as part of the effort to raise ESHS awareness amongst the work force. Posters should be in Hindi, English and other suitable language deemed appropriate. Posters/billboards/ banners/glow signs should be changed at least once in a month to maintain the impact.

2.13.2 The Contractor shall also observe important days as listed in Clause 8.0, Attachment-4 [General Instruction: ESHS/GI/003] and printing and displaying ESHS signage and posters as listed in Clause 8.0, Attachment-4 [General Instruction: ESHS/GI/004].

2.14 ESHS Submittals

2.14.1 The Contractor's ESHS Management shall send the following reports to the Engineer periodically in soft copy:

a) Daily reporting of total number of workmen;

b) Monthly ESHS Report;

c) Minutes of ESHS Committee meeting;

d) ESHS inspection and compliance reports; and

e) ESHS audits reports;

- Monthly Audit Rating Score (MARS) reports;
- Monthly Electrical Safety Audit;
- External ESHS audits;

2.14.2 The Contractor shall prepare a Monthly ESHS Report consisting of the following within 7th of next month to the Engineer:

a) Monthly man-hour details as specified in the ESHS Management Plan;

b) Monthly accident/incident details as specified in the ESHS Management Plan;

c) ESHS committee details;

d) ESHS inspection and compliance report;

e) ESHS internal audit details;

f) ESHS communication activities undertaken in the month indicating the number of posters displayed and balance availability in stock;

g) Monthly Environment (including air, noise, water and soil testing results) and Social Report;

h) Graphical representation of monitored results over past four reporting periods;

i) Details of Clearance/ Permission//Permit obtained;

j) Compliance status for conditions of all relevant clearances /permissions / consents/permits for the Work, including quarries, etc.;

k) Tree felling, transplanting and compensatory planation details;

l) Details of consumption of construction material, energy and water;

m) Details of different types of waste and scrap generated during the month and sold to authorised recyclers;

n) Summary of complaints, results of investigations and follow-up actions;

o) Gender: Number of female workers, percentage of female workforce, gender issue raised and dealt with;

p) HIV/AIDS: Provider of health services, information& training;

q) GBV/SEA: Details of training conducted;

r) Grievances: List of grievances received in the reporting period and unresolved past grievances by date received, complaint how received, to whom referred to for action, resolution and date (if completed), date of resolution of community grievances if any.

s) Toolbox talks details;

t) PPE details: Quantity purchased, issued to the workmen and stock available;

u) Details on IP 44 panel boards, lighting poles, welding and cutting equipment, Ladders, Hoists, Tools & Tackles;

v) Monthly lux meter study results;

w) Housekeeping;

x) Barricade maintenance details;

y) No of critical excavations;

z) Health and welfare activities;

aa) ESHS activities planned for next month.

2.15 Accident Reporting and Investigation

2.15.1 All accidents and dangerous occurrences shall immediately be informed through message to the Engineer. This will enable the Engineer to reach the scene of accident/dangerous occurrences to monitor/assist any rescue work and/or start conducting the investigation process so that the evidences are not lost.

2.15.2 Reports of all accidents (fatal/injury) and dangerous occurrences shall also be sent to the Engineer within 24 hours by the Contractor.

2.15.3 In addition to the above verbal and written reporting to the Engineer, as per Rule 276 of HBOCWR, notice of any accident to a worker at the Site that:

a) Causes loss of life; or;

b) Disables a worker from working for a period of 48 hours or more immediately following the accident; shall forthwith be sent by telegram, telephone, fax, orsimilar other means including special messenger within 4 hours in case of fatal accidents and 72 hours in case of other accidents, to:

i) The Assistant Director, Industrial Safety and Health having jurisdiction in the area in which the establishment in which such accident or dangerous occurrence took place is located. The Assistant Director, Industrial Safety and Health shall be the authority appointed under section 39 of the Act;

ii) Board with which the building worker involved in accident was registered as a beneficiary;

iii) Chief inspector; and

iv) The next of kin or other relative of the Worker involved in the accident.

2.15.4 Further, notice of any accident shall be sent in respect of an accident which:

a) Causes loss of life; or;

b) Disables the injured worker from work (for a period of more than 10 days) to;

i) The Officer-in-charge of the nearest police station;

ii) The District Magistrate or, if the District Magistrate by order so desires to;

iii) The Sub-Divisional Magistrate.

2.15.5 In case of an accident-causing minor injury, first-aid shall be administered, and the injured worker shall be immediately transferred to a hospital or other place for medical treatment.

2.15.6 Where any accident-causing disablement that subsequently results in death, notice in writing of such death, shall be sent to the authorities within 72 hours of such death.

2.15.7 The following items are defined as dangerous occurrences and shall be reported to the inspector having jurisdiction, whether any disablement or death caused to the Worker, namely:

a) Collapse or failure of lifting appliances, or hoist, or conveyors, or similar equipment for handling of building or construction material or breakage orfailure of rope, chain or loose gears; or overturning of cranes used in construction work;

b) Falling of heavy objects from height;

c) Collapse or subsidence of soil, tunnel, pipelines, any wall, floor, roof or any other part of any structure, launching girder, platform, staging, scaffolding or means of access including formwork;

d) Fire and explosion causing damage to any place on the site where the Workers are

employed;

2.15.8 In case of failure of launching girder, lifting appliance, loose gear, hoist machinery and transport equipment at the site, such appliances, gear, hoist, machinery or equipment and the site of such occurrence shall, as far as practicable, be kept undisturbed until inspected by the Inspector having jurisdiction.

2.15.9 Every notice given for fatal accidents or dangerous occurrences shall be followed by a written report to the concerned Authorities under Section 39 of BOCWA and the Chief Inspector of Government of Haryana in the specified Form **XLVI** of the **HBOCWR.**

2.15.10 Actions to be taken post incident/accident:

a) In case any incident/accident happens at site leading to injury to the worker, the worker/s is/are required to be taken to the nearest hospital immediately;

b) Project Manager/ESHS Manager/Labour Welfare Officer of the Contractor needs to report the incident to the Engineer immediately without fail for all the death cases including natural deaths;

c) In case of fatal accident, doctor from the nominated hospital is the only authorized person to declare the death of the worker. It is not to be decided suo-moto by any other person. FIR should be registered for all the fatal cases which happen at the Site/labour camp;

d) Post Mortem of the dead body is mandatory in all the death cases i.e. whether it is natural or due to any incident / accident;

e) Family members of the injured / deceased worker are to be informed immediately;

f) In case of fatal accident, the dead body is to be handed over to the family members. Arrangement of sending the dead body to the native place shall be made by the contractor including cash payment for meeting out last rites expenses as per Rules;

g) Fatal accident report is to be sent to State Labour Authority in Form EE (as per workmen's compensations act) within seven days and to the Licensing Authority in Form XLVI within 24 hours of the incident/accident;

h) Copy of all the documents deposited with any labour authority, FIR, Post Mortem, Medical Reports etc. shall be submitted to the Engineer in duly approved Labour Welfare Fund (LWF) Form;

i) The Contractor shall be liable for getting disbursement of Provident Fund benefits, compensation under Employee compensation Act, benefits of ESI Act to the workman/dependents of the deceased workman. The Contractor shall also provide accommodation and transportation to dependents of the deceased workman or to the disabled workman who come for settlement ofterminal claims.

2.15.11 **Accident Investigation:**

a) Investigations shall be conducted in an open and positive atmosphere that encourages the witnesses to talk freely. The primary objective is to ascertain the facts with a view to prevent future and possibly more serious occurrences;

b) Accidents and dangerous occurrences which result in death, serious injury or serious damage must be investigated by the Contractor immediately to find out the cause of the accident/occurrence so that measures can be formulated to prevent any recurrence; and

c) Near misses and minor accidents should also be investigated by the Contractor as soon as possible as they are signals that there are inadequacies in the ESHS Management System.

2.15.12 Procedure of Incident Investigation

It is important after any accident or dangerous occurrence that information relating to the incident

is gathered in an organized way. The following steps shall be followed:

a) Take photographs and make sketches;

b) Examine involved equipment, work piece or material and the environmentalconditions;

c) Interview the injured, eye-witnesses and other involved parties;

d) Consult expert opinion where necessary; and

e) Identify the specific Contractor or subcontractor involved.

2.15.13 Having gathered information, it is then necessary to make an analysis of incident:

a) Establish the chain of events leading to the accident or incident;

b) Find out at what stage the accident took place;

c) Considering all possible causes and the interaction of different factors that led up to the accident and identify the most probable cause, the cause of an accident should never be classified as carelessness; and

d) The specific act or omission that caused the accident must be identified.

2.15.14 The next stage is to proceed with the follow-up action:

a) Report on the findings and conclusions;

b) Formulate preventive measures to avoid recurrence; and

c) Publicize the findings and the remedial actions taken.

2.15.15 The Engineer's Independent Incident Investigation

In case of fatal/dangerous occurrence, the Engineer shall also conduct independent investigation. The Contractor and his staff shall extend necessary co-operation and testify about the accident.

2.15.16 The Contractor shall take every effort to preserve the scene of accident till the Engineer completes the investigation.

2.15.17 All persons summoned by the Engineer in connection to witness recording shall obey the instructions without delay. Any wilful suppression of information by any person shall be removed from the site immediately and/or punished.

2.16 Emergency Preparedness Plan

2.16.1 The Contractor shall prepare, as required under BOCWR, an Emergency Response Plan for the Site as a part of the Contractor ESHS Management Plan. The plan shall integrate the emergency response plans of the Contractor and all other Subcontractors. The Emergency Response Plan shall detail the Contractor's procedures, including detailed communication arrangements, for dealing with all emergencies that could affect the Site. The plan shall address items such as injury, sickness, evacuation, fire, chemical spillage, severe weather and rescue.

2.16.2 The Contractor shall ensure that the Emergency Response Plan is prepared to deal with emergencies arising out of, but not limited to:

a) Fire and explosion;

b) Collapse of lifting appliances and transport equipment.

c) Collapse of building, sheds or structure etc.

d) Landslides getting workers buried, floods, earthquake, storms and other natural calamities etc.

The above list is not exhaustive and other emergencies can also be included.

2.16.3 Arrangement shall be made for emergency medical treatment and evacuation of the victim in the

event of an accident or dangerous incident occurring, the chain of command and the responsible persons of the Contractor with their telephone numbers and addresses for quick communication shall be adequately publicized and conspicuously displayed in the workplace.

2.16.4 The Contractor shall require to tie-up with the hospitals and fire stations located in the neighborhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.

2.16.5 The Contractor shall conduct an onsite emergency mock drill once in every quarter for all his workers and his sub-Contractor's workers.

2.16.6 It shall be the responsibility of the Contractor to keep the Local Law and other Authorities informed and seek urgent help to mitigate the consequences of an emergency. Prompt communication to the Employer and Engineer, through telephonically initially and followed by a written report, shall be made by the Contractor.

2.17 Experts/Agencies for Environment, Social, Health & Safety Services

2.17.1 The Contractors may utilise the services of experts/agencies empanelled for the purpose of training, audit and any other ESHS services with prior approval of the Engineer. This approval can be withdrawn by the Engineer at any time if the quality of output of the agency is found not satisfactory.

3.0 LABOUR PROTECTION

3.1 General

3.1.1 The Contractor shall comply in full of the project Workplace Policy as described in Clause-8.0 Attachment-2 [Workplace Policy on HIV/AIDS, Prevention & Control] and Clause-8.0 Attachment -3 [Covid 19 policy].

3.2 Engagement of Staff and Labour

3.2.1 The Contractor shall ensure that the employees deployed by him in the premises of the Employer are physically and mentally fit and do not have any criminal record.

3.3 Payment of Minimum Wages

3.3.1 The Contractor shall ensure payment of at least the minimum wages as prescribed and applicable from time to time under the Minimum Wages Act, 1948 in the presence of an authorised representative of the Engineer and shall maintain proper records of their timely disbursement. These records shall be preserved for a period of at least 3 years and made available even after the Contract is over for any verification by the statutory authorities.

3.4 Conditions of Labour

3.4.1 The Contractor shall observe conditions of labour that are no less favourable than those established for the relevant trade or industry.

3.4.2 During the work, the Contractor shall afford all employees all basic rights enumerated in the conventions of the International Labour Organisation, including freedom of association, right to freedom from forced labour, and right to freedom from discrimination based on race, colour, sex, religion, political opinion and social origin.

3.4.3 The Contractor shall ensure coverage of his employees under the Employees Provident Fund and Miscellaneous Provisions Act, 1952 and the Employees State Insurance Act, 1948 via independent code numbers allotted to them by the Central Provident Fund Organisation and Employees State Insurance Corporation respectively.

3.4.4 The Contractor shall insure all his employees under Group Personal Accident Insurance scheme through a recognised and registered insurance company.

3.5 Labour Laws

3.5.1 The Contractor shall ensure that all his employees and the Subcontractors obey applicable following laws and regulations, including those concerning safety at work.

a) Minimum Wages Act, 1948;

b) Payment of Wages Act, 1936;

c) Equal Remuneration Act, 1976;

d) Employees Provident Fund and Miscellaneous Provisions Act, 1952;

e) Employees State Insurance Act, 1948;

f) Maternity Benefit Act, 1951;

g) Child Labour (Prohibition and Regulation) Act, 1986;

h) Building and Other Construction Workers (Regulation of Employment of Service) Act, 1996;

i) Haryana Building and Other Construction Workers (Regulation of Employment and

Conditions of Service) Rules, 2005;

j) Building and Other Construction Workers Welfare Cess Act, 1996;

k) Building and Other Construction Workers Welfare Cess Rules, 1998;

l) Haryana Major Accident, Hazard Control Rules, 2009; and

m) Workmen's Compensation Act. 1923;

3.5.2 The Contractor shall comply with all other statutory requirements, rules, regulations and notifications in relation to employment of his staff and workers that may be issued from time to time by the concerned government authorities.

3.6 Working Hours

3.6.1 No work shall be carried out beyond the statutory limit given under BOCWA, 1996.

3.6.2 No work shall be carried out outside the normal working hours stated in the Contract unless otherwise:

a) The Engineer gives his consent in writing for additional work; and

b) The work is unavoidable or necessary for the protection of life or property or forthe safety of the Works, in which case the Contractor shall immediately inform the Engineer.

4.0 SAFETY GENERAL

4.1 General

4.1.1 The following standards whichever is more stringent shall be applicable:

a) The BOCW Acts 1996 and the Haryana BOCW Rules 2005 framed there under;
b) Other relevant National Legislations & IS Codes.

4.2 Housekeeping

4.2.1 General Housekeeping shall be carried out by the Contractor and ensured always at the Site, Construction Depot, Batching Plant, Labour Camp, Stores, Offices and Toilets/Urinals.

4.2.2 Full height fence, barriers, barricades etc. shall be erected around the Site to prevent the surrounding from excavated soil, rubbish etc., which may cause inconvenience to and endanger the public. The barricade especially those exposed to public shall be aesthetically maintained by regular cleaning and painting as directed by the Engineer. These shall be maintained in one line and level.

4.2.3 All surplus earth and debris are removed/disposed of from the working areas to officially designated dumpsites. Trucks carrying sand, earth and any pulverized materials etc. to avoid dust or odour impact shall be covered while moving. The tyres of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists

4.2.4 No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.

4.2.5 Roads shall be kept clear and materials like pipes, steel, sand, boulders, concrete, chips and brick etc. shall not be allowed on the roads to obstruct free movement of road traffic

4.2.6 Proper and safe stacking of material are of paramount importance at yards, stores and such locations where material would be unloaded for future use. The storage area shall be well laid out with easy access and material stored/stacked in an orderly and safe manner. Lumber with protruding nails shall be bent/removed and properly stacked.

4.2.7 Drip pans of suitable size shall be used to collect oil leakages and spills while plants/equipment/machinery maintenance.

4.2.8 The Contractor shall make available Material Supply Data sheet (MSDS) for material/chemicals/substances used at Site. Such material/chemicals/substances used shall be treated, handled, stored, transported and disposed off, by the Contractor, in a manner specified in the MSDS

4.3 Working at Height

4.3.1 Working at height means work in any place, including a place at or below ground level.

4.3.2 The Contractor shall ensure that work at height is properly planned, appropriately supervised, and carried out in a safe manner and without any appreciable risk. Appropriate care shall be taken during bad weather.

4.3.3 Adequate protection in the form of working platform with railing, toe board, safe access, safety net, roof ladder etc. shall be provided. Where fall hazards cannot be eliminated, use fall-arrest systems while erecting, modifying, and dismantling scaffolds.

4.3.4 A trained and certified person shall check working platform, railing, toe board, safe access, safety net, roof ladder etc. after erection and once in a week. A certificate shall be tagged on this equipment.

4.3.5 Employees involved in the erection, dismantling, moving, repairing, etc., of scaffolding and also workers who perform work on a scaffold shall receive training from a competent person. The purpose of the training is to recognize any hazards associated with the work.

4.3.6 When the height of a scaffold exceeds three times of the smallest width of the base, secure it to the building or structure at every other lift and every 9.0 m horizontally. The scaffold and scaffold working platform with handrails approximately 1.0 m high, mid rails, and toe boards, all secured rigidly by both ties and braces to prevent movement. Working platforms should be completely decked with safety planks, manufactured scaffold decking, or metallic planks.

4.3.7 Only metal frame working scaffold is permitted. Steel stairs are used as a means of raising and lowering the metal frame working scaffold, except for special cases. It is prohibited to directly raise and lower the framework with limbs or to use only ladder.

4.3.8 The Contractor shall ensure that following areas are clearly indicated:

a) where a workplace contains an area in which, owing to the nature of the work, there is a risk of any person at work;

b) Falling a distance; or

c) Being struck by a falling object:

4.3.9 The Contractor shall ensure that work equipment exposed to conditions causing deterioration, which is liable to result in dangerous situations, is inspected at suitable intervals and after any exception occurrence jeopardizing the safety of work/equipment.

4.3.10 In relation to work at height involved in construction work;

a) The top guard-rail or other similar means of protection shall be at least 1100 mm above the edge from which any person is liable to fall;

b) Toe-boards shall be suitable and sufficient to prevent the fall of any person, or any material or object, from any place of work; and

c) Any intermediate guardrail or similar means of protection shall be positioned sothat any gap between it and other means of protection does not exceed 550 mm.

4.3.11 Requirements for all Working Platforms:

a) Every working platform requires a firm & stable supporting structure for holding it;

b) A working platform shall possess a suitable surface and be so constructed that the surface of the working platform has no gap through which a person/material/object could fall;

c) A working platform and any supporting structure shall not be loaded to give rise to a risk of collapse or to any deformation, which could affect its safe use;

d) When altered or modified, it should be so altered or modified as to ensure that it remains stable;

e) A working platform shall be of sufficient dimension to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area having regard to the work being carried out there;

f) Depending on the complexity of the scaffolding selected, a responsible person shall draw up an assembly, use and dismantling plan;

g) A copy of the plan, including any instructions it may contain, shall be kept available for the use of persons concerned in the assembly, use, dismantling or alteration of scaffolding until

it has been dismantled; and

h) While a scaffold is not available for use, including during its assembly, dismantling or alteration, it shall be marked with general warning signs in accordance with and be suitably delineated by physical means preventing access to the danger zone.

4.3.12 Requirements for collective safeguards for arresting falls:

a) Collective safeguard is a safety net, airbag or other collective safeguard for arresting falls;

b) A safeguard shall be used only if:

i) A risk assessment has demonstrated that the work activity can (so far as is reasonably practicable) be performed safely while using it and without affecting its effectiveness;

ii) The use of other safer work equipment is not reasonably practicable; and

iii) A sufficient number of available persons have received adequate training specific to the safeguard, including rescue procedures.

4.3.13 Requirements for personal fall protection systems:

a) A personal fall protection system shall be used only if a risk assessment hasdemonstrated that;

i) The work can (so far as be reasonably practicable) be performed safely while using that system; and

ii) The use of other safer work equipment is not reasonably practicable.

The user and a sufficient number of available persons have received adequate training specific to the operations envisaged, including rescue procedures; and

b) A personal fall protection system designed for use with an anchor shall be securely attached to at least one anchor, and each anchor and the means of attachment thereto shall be suitable and of sufficient strength and stability to supporting any foreseeable loading.

4.3.14 Requirements for Ladders:

a) Every Contractor shall ensure that a ladder is used for work at height only if a risk assessment has demonstrated that the use of more suitable work equipment is not justified because of the low risk;

i) The short duration of use;

ii) Existing features on the Site, which he cannot alter;

b) Only metal ladders shall be allowed. Bamboo ladders are prohibited;

c) Any surface upon which a ladder rests shall be stable, firm, of sufficient strength and of suitable composition safely to support the ladder so that its rungs or steps remain horizontal, and any loading intended to be placed on it;

d) A ladder shall be so positioned as to ensure its stability during use;

e) A suspended ladder shall be attached in a secure manner and so that, with the exception of a flexible ladder, it can not be displaced and swinging is prevented.

f) A portable ladder shall be prevented from slipping during use by:

i). Securing the stiles at or near their upper or lower ends;

ii). An effective anti-slip or other effective stability devices; or

iii). Any other arrangement of equivalent effectiveness.

g) A ladder used for access shall be long enough to protrude sufficiently above the place of landing to which it provides access, unless other measures have been taken to ensure a firm

handhold.

h) No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use;

i) Where a ladder or run of ladders raises a vertical distance of 9.0 m or more above its base, there shall, where reasonably practicable, be provided at suitable intervals sufficient safe landing areas or rest platforms;

4.4 Overhead Protection

4.4.1 The Contractors shall provide overhead protections as per BOCW Act & Haryana BOCW Rules.

4.5 Slipping, Tripping, Cutting, and Falling Hazards

a) The Contractor shall follow guideline of Slipping, Tripping, Cutting and falling hazards as Per Rule 98 of HBOCWR.

b) Sharp projections or any protruding nails or similar objects shall be suitably guarded or shall even be avoided to make the place safe to work and All places should be free from dust, debris or similar materials;

c) Suitable safety net shall be provided at places of material / man falling is possible in accordance with national standards.

d) Reinforcement of pier/columns/walls/abutments shall be secured from the risk of tilting through provisioning of minimum four guy wires ropes/ steel bracing anchored to any concrete block/counterweight of sufficient capacity.

e) The Collapse of formwork in the construction industry has the potential for severe injury and death. The four stages of the use of formwork (erection, adjustment, concrete placement and dismantling) all need to be managed in a risk assessment framework. Implementing suitable control measures can eliminate or reduce the potential for events such as the collapse of formwork. Suitable control measures include:

i). Keeping the documentation for the formwork at the workplace;

ii). Follow the schematic drawing for erection of formwork;

iii). Erecting the formwork on foundations which will support the loads to be imposed on the formwork;

iv). Not erecting formwork near excavation;

v). Ensuring materials used in the erection of formwork are not defective;

vi). Securing loose material which may be dislodged as a result of inclement weather;

vii). Inspecting the formwork assembly before and during the placement of concrete;

viii). Not attaching equipment to the formwork assembly unless specifically designed for this purpose; and not using a stripping process which may cause damage to the permanent structure.

4.6 Lifting Appliances including Cranes

4.6.1 Lifting appliances means a crane, hoist hydra, derrick, winch, gin pole, sheer legs, jack, hoist drum, slewing machinery, slewing bearing fasteners, lifting machinery sheaves, pulley blocks, hooks or other equipment used for lifting materials, objects or the Workers and lifting gears means ropes, chain slings, shackles, hooks, lifting lugs, wire ropes, lifting eyebolts and eye nuts and other accessories of a lifting appliance.

4.6.2 Each of the lifting appliances and lifting gear including all parts thereof, whether fixed or moveable shall be thoroughly tested and examined by a competent person once at least in every 6 months or after it has undergone any alterations or repairs liable to affect its strength or stability. Within

the validity, if the lifting appliances are shifted to a new site, re-examination by the competent person for ensuring its safety shall also be done.

4.6.3 The Contractors shall utilize the services of any competent person as defined in Factories Act, 1948 with the permission of the Engineer.

4.6.4 No machine shall be selected to do any lifting on a specific job until its size and characteristics are considered adequate:

a) The weights, dimensions and lift radii of the heaviest and largest loads;

b) The maximum lift height, the maximum lift radius and the weight of the loads that must be handled at each;

c) The number and frequency of lifts to be made;

d) How long the crane will be required on site;

e) The type of lifting to be done (for example, is precision placement of loads important;

f) The type of carrier required (this depends on ground conditions and machine capacity In its operating quadrants: capacity is normally greatest over the rear, less over the side, and non-existent over the front;

g) Whether loads will have to be walked or carried;

h) Whether loads will have to be suspended for lengthy periods;

i) The site conditions, including the ground where the machine will be set up, access roads and ramps it must travel, space for erection and any obstacles that might impede access or operation.

4.6.5 The Contractor shall ensure that a valid certificate of fitness issued is available for all lifting appliances including synchronized mobile jacks, pre-stressing hydraulic jacks, jacks fitted with launching girders etc. and the Engineer approval is obtained before inducting to the site. Only after obtaining the approval from the Engineer any lifting appliances and gear shall be used.

4.6.6 The laminated photocopies of fitness certificate issued by competent person, the Engineers approval letter, the operators photo, manufactures load chart and competency certificate shall always be either kept in the operator cabin or pasted on the visible surface of the lifting appliances.

4.6.7 All lifting appliances and loose gears shall be clearly marked for its safe working load and identification by stamping or other suitable means.

4.6.8 The Contractor shall also maintain a register containing a system of identification of all tools and tackles, its date of purchase, safe working load, competent person date of examination etc.

4.6.9 Sufficient lighting arrangement shall be ensured at all lifting operations.

4.6.10 **Qualification of operator of lifting appliances etc.:** The Contractor shall not employ any person to drive or operate a lifting machine-like crane, hydra etc. whether driven by mechanical power or otherwise or to give signals to work as an operator of a rigger or derricks unless he:

a) Is above 21 years of age and possesses a valid heavy transport vehicle driving license as per Motor Vehicle Act and Rules;

b) Is competent and reliable;

c) Possesses the knowledge of the inherent risks involved in the operation of lifting appliances by undergoing a formal training at any institution of national importance acceptable to the Engineer; and

d) Is medically examined periodically as specified in schedule VII of BOCW Rules.

4.6.11 All hydraulic piping and fittings shall be maintained leak proof.

4.6.12 Only four legged slings shall be allowed which includes master link (ring), intermediate master link (ring) if necessary, chain / wire rope sling, sling hook or other terminal fitting.

4.6.13 Hand spliced slings up to 32mm diameter shall not be used at site for any lifting purpose. The slings used shall confirm to IS 2762: 2009 Wire rope slings and sling leg specification.

4.6.14 No load shall be slewed over public areas without stopping the road traffic first.

4.6.15 Automatic safe load indicator (ASLI) to be provided in crane with audible and visible warning system and made functional and calibrated by the manufacturer or its authorized representative every 6 months or after repair of the lifting equipment.

4.6.16 **Automatic safe load indicators and data logger in lifting appliances**

As stipulated in Rule 123 of HBOCW Rules, every lifting appliances and gears like cranes, hydras etc., if so constructed that the safe working load may be varied by raising or lowering of the jib or otherwise, shall be attached with an automatic indicator of safe working loads approved by Bureau of Indian standards/International certifying bodies which gives a warning to the operator whenever the load being handled exceeds the safe working limit.

a) Provision of functional data logger with alert facility through SMS and web in all cranes shall be mandatory;

b) Cut-out shall be provided which automatically arrests the movements of thelifting parts of every crane if the load exceeds the safe working limit.

4.6.17 The crane should have a substantial/durable safe working load chart which has clearly legible characters in English and Hindi and figures displayed inside the crane and is easily visible to the crane operator.

4.6.18 General Requirements

The sweep area (work area) of the construction machinery shall be always free from obstructions. All hydraulic piping and fittings shall be maintained leak proof. The operator cab shall posses good and safe:

a) Structure, windows and windshield wipers;

b) Drivers chair and footrest;

c) Control handles;

d) Cab instrumentation;

e) Telecommunication;

f) Cab outfitting;

g) Wind indicator with an adjustable set point shall be in a position representative for the wind on the crane. The indicator shall give continuous information regarding constant speeds and gusts.

4.6.19 Mandatory Rigging requirement

a) Rigging shall be done under experienced and qualified rigger only. All Load shall be adequately and safely rigged to prevent any danger;

b) The primary requirement in rigging shall be to assess the weight of load before attempting any lift;

c) All hooks shall be fitted with Master Rings having certificate of fitness from the competent person, so that the hooks are subjected to balanced vertical loading only;

d) Only four legged slings shall be allowed which includes master link (ring), intermediate master link (ring) if necessary, chain / wire rope sling, sling hook or other terminal fitting;

e) Requirements of outriggers

i) All outriggers shall be fully extended and at all tyres are clear of theground;

ii) Heavy duty blocking having large bearing area shall be necessary to prevent sinking of floats;

iii) Provision of heavy steel plates/ high density interconnected wooden logs of required dimension shall be used to uniformly distribute the load;

iv) The crane shall be setup on fully compacted ground;

4.6.20 Pick & carry operation

Prohibition on Use of "Tractor transmission type Pick and Carry Hydra Crane": Tractor transmission type Pick and Carry-1st Generation model is prohibited at HORC Project works. Contractor shall mobilize "Truck transmission type" Pick and Carry (Hydra)Crane– minimum 2nd Generation model only or higher model.

4.6.21 Operation of lifting appliances

Every Contractor shall ensure that:

a) The complete lifting operation shall be governed by signals as per established standards;

b) Adequate measures to be taken to ensure that no workers is allowed to stand, pass, rides or sit under the suspended load;

c) No lifting appliances shall be left by the operator while power is on or load is suspended;

d) After completion of the lifting operation, all doors of the appliances shall be closed by the operator and ignition/operation key should be handed over to competent reliever operator or site In-charge;

e) All loads are provided with minimum two tag lines to ensure that the load can be controlled at all times;

f) No close working to any live over head power line is permitted without system of a 'Permit to Work' and prior permission of the engineer shall be obtained before performing such operation;

g) Danger zone shall be identified and cordoned off for all lifting appliances during their operation;

h) All lifting gears & slings shall be stamped or appropriate tags for their identification no & SWL;

i) Knotting/wrapping of chains & slings shall not be allowed at site;

j) Lifting appliances shall not be used for any dragging or pulling purposes. Contract shall refer to 75% capacity load chart for ascertaining the suitability of crane for safe lifting of load;

k) During tandem lift, available capacity of crane in respect of SWL shall be considered after reduction of 15% for 75% (DIN) load chart respectively. In addition, additional de rating as advised by third party testing and certified agency shall also apply;

l) During hoisting of long material, use of suitable lifting beam is recommended;

m) Only original equipment manufacturer (OEM) supplied/provided load chart shall be used during lifting operation;

n) Before performing any lifting operation, all electronic devices, control levers, hydraulic oil, wind pressure etc. shall be checked and necessary spare parts to be kept in stock to handle any breakdown during time bound lifting operation;

o) Lifting point shall be considered on the I-Girders/U Girder/C Girder/Steel girder/parapet etc.

during the casting of the same. Design load calculation for the same should be conducted;

p) All lifting activities shall be stopped in case of high speed wind and similar adverse whether condition or as prescribed by the crane manufacturer; and

q) All cranes shall be provided with fail safe devices to avoid any hoist free fall in case of brake failure.

4.7 Launching Operation

4.7.1 As launching operation is one of the riskiest jobs, the Contractor shall take utmost precaution at all stages like; planning, establishing casing yard, casting segments, transporting segments, fabrication and erection of launching girders, launching of segments, pre-stressing, auto launching of girders and dismantling of launching girders.

4.7.2 The Contractor shall prepare a comprehensive Method Statement for the launching operation, adhering to the ESHS conditions laid down in conditions of contract on the ESHS Management Manual. Reference shall be made to the provisions on working at height. As the entire process of launching must be undertaken at an elevated level the safety of workers and the girder is paramount important. In addition to general precautions, such as trained personnel, PPE, etc. listed in earlier clauses, the following general guidelines shall be adhered to throughout the launching operation:

a) The segments shall rigidly secure to the truck with necessary wooden wedges and necessary red indicators/safety tapes provided so that the vehicle is clearly seen by other road users both in day/night time;

b) Every launching operation shall have a responsible engineer on duty all the time;

c) All the time from erection to dismantling the area between the two piers wherein launching is in progress shall always be barricaded;

d) Auto launching shall be done only after approval from the Engineer. After every auto launching the stability of launching girder shall be ensured;

e) The vertical deflection of launching girder shall be monitored at all critical stages like with/without loads and after every auto launching;

f) A register containing all important operational details from erection to dismantling of launching girders shall be maintained and made available to the Engineer whenever called for;

g) Driver shall also have undergone proper medical examination as per sub-Clause-5.2 (Medical Facilities) and checked for influence of alcohol before any kind of lifting operation;

h) Test certificate for all lifting gears including Macalloy Bars shall be maintained at a

i) location closer to the launching girder itself so that it can be referred during all inspections;

j) Proper & safe access stairways shall be maintained for safe ascending /descending of workmen /engineers to or from launchers;

k) Adequate collective and personnel fall protection measures like provision of safety nets while working over live roads/railways, lifeline for anchoring of safety harness, safe means of access on main box girder shall be ensured;

l) Before starting of the launching, valid third party test certificate of the launcher hoist shall be available;

m) Safe and fully deck working platform duly covered from all side shall be ensured for stressing work at front support;

n) Safety checklist for all activities of launching cycle shall be prepared, got approved & implemented;

4.8 Construction Machinery

4.8.1 Construction machineries may include dumpers and dump trucks, lift trucks and telescopic handlers, piling rigs, vibration hammers, rail welding equipment, mobile elevating work platforms, cranes, tipper lorries, lorry loaders, skip wagons, 360° excavators, 180° backhoe loaders, crawler tractors, scrapers, graders, loading shovels, trenchers, side booms, pavers, planers, chippers, road rollers, locomotives, tankers and bowsers, trailers, hydraulic and mechanical breakers etc.

4.8.2 Every construction equipment shall be in sound mechanical working condition and certified by either competent person under Factories Act or manufacturers' warranty in case of brand new equipment or authorized persons/firms approved by the Engineer before induction to any site.

4.8.3 Fitness of the machine shall be carried out on regular basis or after every maintenance work excluding any minor service/oil or filter change and be documented properly. The certificate shall be available in operator/driver cabin.

4.8.4 All vehicles shall be fitted with audible reverse alarms and maintained in good working condition. Reversing shall be done only when there is adequate rear-view visibility or under the directions of a banksman.

4.8.5 **General operating procedures:** Drivers entering site shall be instructed to follow the safe system of work adopted on site. These shall be verbal instructions or, preferably, written instructions showing the relevant site rules, the site layout, delivery areas, speed limits, etc.

a) No passengers shall be carried, unless specific seating has been provided in accordance with the manufacturer's recommendations;

b) Working on gradients beyond any equipment's capability shall not be allowed.

c) Prevention of dumper and dump truck accidents should be managed by providing for adequate lateral clearances, wheel stops at a sufficient distance from the edgesof excavations, spoil heaps, pits, markers, etc.;

d) No construction material, other than soil shall be carried in excavator buckets;

e) When two or more scrapers are working on the same job, a minimum distance of at least 25m shall be kept between them;

f) Every contractor shall ensure that Competency certificate for driver/operatorsshall be issued by their Plant and Machinery In-charge. The certificate shall be pasted on the machine body in such a way that drivers/operator vision is nothindered;

g) Checklist shall be prepared for all construction machinery and be filled on daily basis by the operator and be counter signed by plant & machinery person;

h) Provision of helper is mandatory for each construction appliances and vehicles during their movement inside and outside of site; and

i) All wood working machines shall be fitted with suitable guards and devices such astop guard, riving knife, push stick, guards for drive belts and chains, and emergency stop switch easily accessible by the operator.

4.9 Machine Guarding

4.9.1 The Contractor shall ensure at the site all motors, cog wheels, chains and friction gearing, fly wheels, shafting, dangerous and moving parts of machinery are securely fenced or legged.

4.9.2 Fencing of dangerous parts of machinery shall not be removed while the machinery is in use or in motion and when removed, it shall be replaced as soon as practicable and in any case before the machinery is again brought into use.

4.10 Site Electricity

4.10.1 The Contractor shall refer to the applicable guideline "Indian Electricity Rules, 1956" and any

amendment thereafter. ESHS requirements are:

a) Graduate Electrical Engineer having Electrical Supervisory Competency Certificate.

b) Diploma Electrical Engineer having Electrical Supervisory Competency Certificate;

c) ITI Certificate Holder Electrician with Wiremen Permit; and

d) Assessment of Electrical Load and properly designed power distribution system;

4.10.2 The Indian Electricity Rules 1956 and Indian Electricity Act 2003 as amended up to date shall be followed. The detailed instructions on safety procedures given in Indian Standards, Indian Electricity Rules and respective State Electricity Authorities' Regulation with up to date amendment shall be applicable.

4.10.3 **Assessment of Power**

a) The contractor shall assess the size and location of the electrical loads and the manner in which they vary with time during the currency of the contract.

b) The contractor shall elaborate as to how the total supply is to be obtained/generated. The details of the source of electricity, earthing requirement, substation/panel boards, distribution system shall be prepared and necessary approval from the Engineer obtained before proceeding of the execution of the job.

c) The main contractor shall take consideration, the requirements of the Subcontractors' electric power supply and arrive at the capacity of main source of power supply from diesel generators. All the norms on installation and maintenance have to be adhered.

d) As small capacity generators create more noise and safety hazards, no small capacity diesel generators shall be allowed for whatsoever the type of job to be executed under this contract.

e) Usage of Transformers inside the tunnel is strictly prohibited.

4.10.4 **Work on Site**

a) The contractor shall also submit electrical single line diagram, schematic diagram and the details of the equipment for all temporary electrical installation and these diagrams together with the temporary electrical equipment shall be submitted to the Engineer for necessary approval.

b) The LT/HT distribution diagrams of sub stations shall be prominently displayed. The substation premises, main switch rooms and D.B enclosure shall be kept clean whenever works are carried out either inside or outside.

c) No flammable material shall be stored in places other than the rooms specially constructed for this purpose in accordance with the provisions of Indian Explosives Act.

d) Protective and Safety equipment such as rubber gauntlets or gloves, earthing rods, linemen's belt, portable artificial respiration apparatus, safety goggles etc., shall be provided as per the requirements of the work.

e) Necessary number of caution boards such as "Man working on line, Don't switch on" shall be readily available in the vicinity of electrical installation.

f) Charts displaying methods of giving artificial respiration to a recipient of electrical shock (one in English and another one in the regional language) shall be prominently displayed at appropriate places.

g) No work shall be undertaken on live installations or on installation, which could be energized unless another person is present to immediately isolate the electrical supply in case of any accident and to render first aid, if necessary.

h) No work on live L.T bus bar or pedestal switch board in the sub stations should be handled by a person below the rank of a licensed wireman and such a work should preferably be

done in the presence of a qualified engineer.

i) When working on or near live installations, suitable insulated tool should be used and special care should be taken to see that those tools accidentally do not drop on live terminals causing shock or dead short.

j) The electrical switch controls in distribution boards shall be clearly marked to indicate the areas being controlled by them.

k) Before starting any work on the existing installation, it shall be ensured that the electric supply to that portion is cut off. Precautions, like displaying "Men at Work" caution boards on the controlling switches, removing fuse carrier from these switches shall be taken against accidental operation. Caution boards shall be kept with the person working on the installation.

l) All equipment/ sub systems shall conform to relevant IEC standard on Electromagnetic Compatibility (EMC)

m) The Contractor shall provide adequate stand by equipment to ensure the safety of personnel, the works and the public.

4.10.5 No electrical equipment shall be put into use where its strength and capability may be exceeded in such a way as may give rise to danger.

4.10.6 **Adverse or Hazardous Environments:**

4.10.6.1 Electrical equipment which may reasonably foreseeably be exposed to-

a) Mechanical damage.

b) The effects of the weather, natural hazards, temperature or pressure;

c) The effect of wet, dirty, dusty, or corrosive conditions; or

d) Any flammable or explosive substance, including dust, vapors, or gases, shall be of such construction or a necessary protected as to prevent, so far as is reasonably practicable, danger arising from such exposure.

e) In all the above situations, only appropriate IP-rated electrical panels, plugs, sockets etc. shall be used.

4.10.7 **Distribution System:**

a) The contractor shall provide a distribution system for control and distribution of electricity from a main AC supply of 50Hz for typical appliances.

i) Fixed plant – 400 V 3 phase

ii) Movable plant fed via trailing cable over 3.75 kW – 400 3 phases.

iii) Installation in Site buildings – 230V single phase.

iv) Fixed flood lighting – 230 V single phase

v) Portable and hand tools- 115V single phase

vi) Site lighting – 115V single phage

vii) Portable hand lamps – 115V single phase

4.10.8 **Electrical Protection circuits**

a) Appropriate electrical protection shall be provided for all circuits, against overload, short circuit and earth fault current.

b) The Contractor shall provide sufficient ELCBs (maintain sensitivity 30 mA)/ Residual Current Circuit Breakers (RCCBs) for all the equipment (including Potable equipment),

electrical switchboards, distribution panels etc. to prevent electrical shocks to the Workers.

c) All protection devices shall be capable of interrupting the circuit without damage to any equipment's and circuits in case of any fault may occur. No single insulation cable shall be used.

d) Rating of fuses and circuit breakers used for the protection of circuits should be coordinated with equipment power ratings.

e) Protection against lighting shall be ensured through lightening arrester for equipment's kept in open at Sites.

f) The contractor shall ensure that all generators and welding sets in use on Site are adequately and effectively always earthed during operation.

4.10.9 **Cables:**

a) Cables shall be selected after full consideration of the condition to which they shall be exposed and the duties for which they are required. Supply cable up to 3.3kV shall be in accordance with BS 6346:1997;

b) For supplies to mobile or transportable equipment where operating of the equipment subjects the cable to flexing, the cable shall conform to any of these codes BS 6007/BS 6500/BS 7375.

c) Flexible cords with a conductor cross section area smaller than 1.5 mm2 shall not be used and insulated flexible cable shall conform to BS 6500 and BS 7375.

d) Where low voltage cables are to be used, reference shall be made to BS 7375. The following standards shall also be referred to particularly for underground cables BS 6346 and BS 6708.

e) Cables buried directly in the ground shall be of a type incorporating armour or metal sheath or both. Such cables shall be marked by cable covers or suitable marking tape and be buried at a sufficient depth to avoid their being damaged by any disturbance of the ground. Cable routes shall be marked on the plans kept in the Site electrical register.

f) Cable passing under the walkway and across way for transport and mobile equipment shall be laid in ducts at a minimum depth of 0.6 meters.

g) Cables that need to cross open areas, or where span of 3m or more are involved, a catenary wire on poles or other supports shall be provide for convenient means of suspension. The minimum height shall be 6m above ground.

h) Cables carrying a voltage to earth in excess of 65V other than supply for welding process shall have metal armour or sheath, which has been effectively earthed and monitored by the contractor. In the case of flexible and trailing cables such earthed metal sheath and/or armour should be in addition to the earth core in the cable and should not be used as the protective conductor.

i) Armoured cables having an over-sheath of polyvinyl chloride (PVC) or an oil resisting and flame-retardant compound shall be used whenever there is a risk of mechanical damage occurring.

j) Electrical cable of five cores shall be used in all three-phase equipment.

4.10.10 **Plugs, socket-outlets, and couplers:**

a) The contractor shall ensure plugs, socket-outlets, and couplers are available in the construction Site as splash proof type. The minimum degree of ingress protection should be of IP44 and IP65 (in Tunnels and in continuous exposures water areas) in accordance with BS EN 60529.

b) Only plugs and fittings of the weatherproof type shall be used, and they should be colour coded in accordance with the Internationally recognized standards for example as detailed as follows:

i) 110 volts: Yellow.

ii) 240 volts: Blue.

iii) 415 volts: Red.

4.10.11 **Connections:**

a) Every joint and connection in a system shall be mechanically and electrically suitable for use to prevent danger. Proper cable connectors as per national/international standards shall only be used to connect cables.

b) No loose connections or tapped joints shall be allowed anywhere in the Sites.

4.10.12 **Potable and hand-held equipment:**

a) The contractor shall ensure the use of double-insulated or all-insulated portable electrical hand equipment.

4.10.13 **Other equipment:**

a) All equipment shall have a provision for major switch/cut-off switch in the equipment itself.

b) All non-current carrying metal parts of electrical equipment shall be earthed through insulated cable.

c) Isolate exposed high-voltage (over 415 Volts) equipment, such as transformer banks, open switches, and similar equipment with exposed energized parts and prevent unauthorized access.

d) Approved perimeter marking shall be used to isolate restricted areas from designated work areas and entryways and shall be erected before work begins and maintained for the entire duration of work. Approved perimeter marking shall be installed with either red barrier tape printed with the words "DANGER-HIGH VOLTAGE" or a barrier of yellow or orange synthetic rope, approximately 1 to 1.5 meter above the floor or work surface.

e) All temporary metal structures like barricade boards, temporary metal containers/shed etc. shall be adequately earthed through suitable means.

f) All earth pits shall be properly numbered along with display of resistance value and inspection records of the same shall be maintained.

4.10.14 **Work on or near live conductors**

No person shall be engaged in any work activity on or so near any live conductor (other than one suitably covered with insulating material so as to prevent danger) that danger may arise unless-

a) It is unreasonable in all the circumstances for it to be dead; and

b) It is reasonable in all the circumstances for him to be at work on or near it while it is live; and

c) Suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury.

4.10.15 Whenever pilling work is undertaken manually through tripod in the influence zone of live OHE, method statement shall be prepared, submitted, and got approved before start of work.

4.10.16 **Inspection and Maintenance**

a) All electrical equipment should be permanently numbered, and a record kept of the date of issue, date of last inspection and recommended inspection period.

b) Fixed installations shall be inspected at least at three monthly intervals; routine maintenance being carried out in accordance with equipment manufactures recommendations.

c) All Electrical panels/DG panels/Distribution boxes etc. shall be provided with rubbers mats.

4.10.17 **25KV AC 50Hz single phase Traction:**

a) Induction effect of 25 KV AC 50 Hz single phase Traction

i) The attention of all staff is drawn to the fact that under 25kv ac 50 Hz single phase traction, there is heavy induction on all metallic structures and conductors in the vicinity of the track. The induction is two- fold.

- Electro- static, which results from the high potential of 25 kv on the OHE system.
- Electro- magnetic, which is proportional to the currents passing from the sub- station to the OHE to the locomotives/EMUs and back partly through the earth.

ii) The voltage induced is quite appreciable on overhead conductors running parallel to the tracks depending on the length of parallelism. This explains why most of the overhead telecommunication's lines are replaced by underground cables. Special protective measures are required to reduce the adverse effects of induction.

iii) In a railway yard, voltage of the order of 200 volts may be induced on yard lighting mains situated 8 m away from the center of a double-line track, of it runs parallel to the 25 KV lines for a distance of about 270 m; it could be several thousand volts when parallelism is much longer. In such a case, a dangerous voltage due to induction will exist even after the power supply to the line has been switched off. No one should therefore attempt to work on any overhead line running alongside the electrified tracks without taking special precautions of earthing on both sides of the work. Before a section is electrified, the necessary modifications to distribution lines in all stations and yards should be carried out, so as to limit the induced voltage within permissible values, but this by no means limits the need for earthing the lines on both the sides of the working party. Earthing should be done individually by each working party as close to the work spot as possible. The distance between the two earths shall not exceed 1 km.

iv) Such inductive effects occur on large metallic structures such as fencing and structural steelwork of platforms running parallel to the track. They will therefore have to be earthed suitably to afford safety.

v) Inductive effects also show themselves on any metallic conductor, such as metallic clothes-lines, power lines and lines belonging to private parties running parallel and close to the electrified tracks. Wide publicity should be given to the effects of induction so that special precautions are taken by the private parties.

b) General Safety Precautions while working in OHE Area

The precautions laid down below must be followed under all circumstances in sections equipped for 25 kv as single phase, 50 Hz traction.

i) No work close to the live OHE shall be carried out without power block unless the work area is properly screened, barricaded, earthed and supervised by a competent Engineer subject to specific approval from Engineer/Employer.

ii) No work shall be done above or within a distance of 2 m from the live OHE without a "permit-to-work."

iii) No part of a tree shall be nearer than 4 m from the nearest live conductor. Any tree or branches likely to fall on live conductor should be cut or trimmed periodically to maintain this clearance. Cutting or trimming should be done by the OHE staff themselves or through an agency managed and supervised by them.

iv) Work for trimming of trees should also be done in the presence of authorized OHE staff or supervisor to maintain the safe clearance of 4 m any dispute regarding cutting of trees may be done on contract basis or departmentally of the terms & conditions of

concerning dept.

v) No fallen wire or wires shall be touched unless power is switched off and the wire or wires suitably earthed. In case the wires drop at a level crossing, the Gatekeeper shall immediately make arrangements to stop all road traffic and keep the public away.

vi) As far as possible closed wagons shall be used for material trains. In case open or hopper wagons are used, loading and unloading or such wagons in electrified tracks shall be done under the supervision of an Engineering official, who shall personally ensure that no tool or any part of the body of the worker comes within the 'danger zone' i.e., within 2 m of the OHE.

vii) Permanent way staff should keep clear of the tracks and avoid contact with the rails either when approaching or reaching the work-spot when an electrically hauled train is within 250m.

viii) When unloading rails alongside the tracks, it should be ensured that rails do not touch each other to form a continuous metallic mass of length greater than 300m.

c) Safety precautions on Electrified Sections (Chapter-IV), Electrical Accidents (Chapter-V), Fire precautions (Chapter-VI) of Indian Railways AC Traction Manual Volume – 1, as applicable may be followed.

d) While working near the OHE area, as a minimum the safety guidelines as specified in para 20301,20327, 20334, 20335, 20529, 20612, 20614, 20714, 20825, 20833, 21206 and 21207 of Volume II, Part 1 of AC Traction Manual of Indian Railways shall be followed.

e) The Training and Competency Certificates (Chapter XII) of Volume-II, Part-I of Indian Railways AC Traction Manual may be followed.

f) Power Blocks and permit to work are required to be taken in case of construction work going on in the vicinity of electrified line as per applicable Para of Chapter – VI of Volume-II, Part- I of Indian Railways AC Traction.

4.10.18 **Hand Tools and Power Tools**

a) The contractor is wholly responsible for the safe condition of tools and equipment used by his employees and that of his subcontractors.

b) Use of short/damaged hand tools shall be avoided, and the contractor shall ensure all his hand tools used at his work Site are safe to work with or stored and shall also train his employees (including his sub-contractors) for proper use thereby.

c) All hand tools and power tools shall be duly inspected before use for safe operation.

d) All hand tools and power tools shall have sufficient grip and the design specification on par with national/international standards on anthropometrics.

4.10.19 **Hand tools:** Hand tools shall include saws, chisels, axes and hatches, hammers, hand planes, screw drivers, crow bars, nail pullers.

4.10.20 The contractor shall ensure that;

a) For crosscutting of hardwood, saws with larger teeth points (no. of points per inch) shall be preferred to avoid the saw jumping out of the job.

b) Mushroom headed chisels shall not be used in the worksite where the fragments of the head may cause injury.

c) Unless hatchet has a striking face, it shall be used as a hammer.

d) Only knives of retractable blades shall be used in the worksite.

e) No screwdrivers shall be used for scraping, chiseling of punching holes.

f) A pilot hole shall always be driven before driving a screw.

g) Wherever necessary, usage of proper PPEs shall be used by his employees.

4.10.21 **Power tools**

Power tools include drills, planes, routers, saws, jackhammers, rinders, sprayers, chipping hammers, air nozzels and drills.

4.10.22 The contractor shall ensure that

a) Electric tools are properly grounded or/and double insulated.

b) Ground fault Circuit interrupters (GFCIs)/ Residual Circuit Breakers (RCCBs) shall be used with all portable electric tools operated especially outdoors or in wet condition.

c) When operating in confined spaces or for prolonged periods, hearing protection shall be required.

d) The tool is held firmly, and the material is properly secured before turning on the tool.

e) All drills shall have suitable attachments respective of the operations and powerful for ease of operation.

f) When any work/operation needs to be performed repeatedly or continuously, tools specifically designed for that work shall be used. The same applicable to detachable tool bit also.

g) Size of the drill shall be determined by the maximum opening of the chuck in case of drill bit.

h) Attachments such as speed-reducing screwdrivers and buffers shall be provided to prevent fatigue and undue muscle strain to his workers.

i) Stock should be clamped or otherwise secured firmly to prevent it from moving.

j) Workers shall never stand on the top of the ladder to drill holes in walls/ceilings, which can be hazardous, instead standing on the fourth or fifth rung shall be recommended.

k) Electric planes shall not be operated with loose clothing or long scarf or open jacket.

l) Safety guards used on right angle head or vertical portable grinders must cover a minimum of 180^0 of the wheel and the spindle/wheel specifications shall be checked.

m) All power tools/hand tools shall have guards at their nip points.

n) Low profile safety chain shall be used in case of wood working machines and the saw shall run at high rpm when cutting and also correct chain tension shall be ensured to avoid 'kickback'.

o) Leather aprons and gloves shall be used as an additional personal protection auxiliary to withstand kickback.

p) Push sticks shall be provided and properly used to hold the job down on the table while the heels move the stock forward and thus prevent kickbacks.

q) Air pressure is set at a suitable level for air actuated tool or equipment being used. Before changing or adjusting pneumatic tools, air pressure shall be turned off.

r) Only trained employees shall use explosive actuated tools and the tool shall also be unloaded when not in use.

s) Usage of such explosive actuated tools shall be avoided in the case of places where explosive/ flammable vapours or gases may be present.

t) Explosive actuated tools and their explosives shall be stored separately and be taken out and loaded only before the time of immediate use.

u) Misfired cartridges of explosive actuated tools must be placed in a container of water and be removed safely from the project.

v) No worker shall point any power operated/hand tool to any other person especially during loading/unloading.

4.11 Illumination

4.11.1 The Contractor shall provide sufficient site lighting, of the right type and at the right place for it to be properly effective as per the relevant national standards & guidelines.

4.12 Welding and Cutting

4.12.1 Gas cylinders in use shall be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal cap shall be kept in place to protect the valve when the cylinder is not connected for use.

4.12.2 Test Certificate for cylinders and Vendor license shall be obtained. The Gas Cylinder Act & Rules shall always be followed at the workplace.

4.12.3 All gas cylinders shall be fixed with pressure regulator and dial gauges. clamp or clip shall be used to connect hoses firmly in both sides of cylinders and torches.

4.12.4 Non-return valve and flashback arrester shall be fixed at both end of cylinder and torch.

4.12.5 Domestic LPG cylinders shall not be used for gas welding and cutting purposes.

4.12.6 Dry Chemical Pressure (DCP) or CO2 type Fire Extinguisher not less than 5 kg shall be fixed at or near to welding process zone in an easily accessible location. Fire extinguisher should confirm to IS 2190:1992.

4.12.7 Oxygen cylinders and flammable gas cylinders shall be stored separately, at least 6.6 m (20 feet) apart or separated by a fireproof, 1.5 m (5 feet) high partition. Flammable substances shall not be stored within 15m of cylinder storage areas.

4.12.8 Welding grounds and returns should be securely attached to the work by cable lugs, by clamps in the case of stranded conductors, or by bolts for strip conductors. The ground cable will not be attached to equipment or existing installations or apparatus.

4.12.9 All electrical installations shall meet the IS: 5571: 1997 and NFPA 70 for gas cylinder storage area and other hazardous areas.

4.12.10 Use firewatchers if there is a possibility of ignition unobserved by the operator (e.g. on the other side of bulkheads).

4.12.11 The transformer used for electrical arc welding shall be fixed with ammeter and voltmeter and fixed with separate main power switch.

4.12.12 Use a low voltage open circuit relay device if welding with alternating current in constricted or damp places.

4.12.13 The current for Electric arc welding shall not exceed 300 A on a hand welding operation.

4.13 Excavation General

4.13.1 References:

a) The Haryana Building and other construction workers (Regulation of Employment of conditions of Service) Rules, 2005;

b) IS: 3764 -1992 (Re-affirmed 1996): Code of Safety for Excavation Work;

c) IS: 4756 -1978 (Reaffirmed 1996): Safety Code for Tunnelling Work;

d) IS 4081:2013 Blasting and related drilling operations-code of safety.

4.13.2 The Contractor shall ensure:

a) Where any construction & building worker engaged in excavation is exposed to hazard of falling or sliding material or article from any bank or side of such excavation which is more than 1.5 m above his footing, such worker shall be protected by adequate piling and bracing against such bank or side.

b) Undercutting during excavation shall be avoided. Whenever it is inescapable and banks of an excavation are undercut, adequate shoring is provided to support the material or article overhanging such bank;

c) Excavated material is not stored at least 0.65 m from the edge of an open excavation or trench and banks of such excavation or trench are stripped of loose rocks and the banks of such excavation or trench are stripped of loose rocks and other materials which may slide, roll or fall upon a construction building worker working below such bank;

d) Metal ladders and staircases or ramps are provided, as the case may be, for safe access to and egress from excavation where, the depth of such excavation exceeds 1.5 m and such ladders, staircases or ramps comply with the IS 3696 Part 1&2 and other relevant national standards;

e) Trench and excavation is protected "against falling on a person by suitable measures if the depth of such trench or excavation exceeds 1.5m and such protection is an improved protection in accordance with the design and drawing ofa professional engineer, where such depth exceeds 4.0m;

f) Full height fence, barriers etc. will be installed at the site in order to preserve the surrounding area from excavated soil, rubbish etc. which may cause inconvenience to the public.

4.13.3 Warning Signs and Notices:

The Contractor shall ensure that suitable warning signs or notices, required for the safety of workers carrying out the work of an excavation, shall be displayed or erected at conspicuous places in Hindi and in a language understood by most of such workers at such excavation work.

4.14 Tunnelling Works

4.14.1 The Contractor shall appoint a responsible person for safe operation for tunnelling work as per BOCWR.

4.14.2 In addition to general precaution such as display of warning sign/notices, deployment of trained staff, housekeeping, etc., the Contractor shall ensure that:

a) All portable electrical hand tools and inspection lamp used in underground and confined space at an excavation or tunnelling work is operated at a voltage not exceeding 24V;

b) Every compressed air system in a tunnel is provided with emergency power supply for maintained continued supply of compressed air as per Rule 155 of BOCWR.

c) Only flame proof equipment of appropriate type as per IS: 5571:2000 and or another relevant national standard is used inside the tunnel;

d) Petrol or LPG of any other flammable substances are not used, stored inside the tunnel except with prior approval from the Engineer, and no oxy-acetylene gas is used in a compressed air environment in excavation or tunnelling;

e) Adequate number of water outlets provided for firefighting purpose, an audible fire alarm and adequate number and types of fire extinguishers are provided and maintained;

f) Temperature in any working chamber in an excavation or tunnelling work where workers employed does not exceed 29°C as per Rule 165 of BOCWR;

g) All working areas in a free air tunnel are provided with ventilation system as approved by the Chief Inspector of Government of Haryana and the fresh air supplied in such tunnel is

not less than 6 m3/min for each worker employed in tunnel and the free air flow movement inside such tunnel is not less than 9.0 m/min as per Rule 153 of BOCWR;

h) The oxygen level shall not be less than 19.5% in the working environment;

i) The excavated areas are made safe by use of suitably designed and installed steel sets, rock bolts or similar other means;

j) The responsible person referred to in BOCWR examines and inspects the workplaces in a tunnel before the commencement of work in such tunnel, and at regular intervals thereafter, to ensure safety of the Workers in such tunnel;

k) The portal areas of a tunnel with loose soil, or rock, likely to cause injury to a person are adequately protected with supports;

l) The Contractor shall ensure safe means of access to enter into tunnel.

m) The Contractor shall establish controlled Access/Egress system for the tunnel entry. Tally board system shall be adopted where any person entering the tunnel shall register his/her details before entering.

n) The Contractor shall ensure continuous gas monitoring inside the tunnel before and after the blasting. Monitoring of the gas shall also be conducted with the help of hand held gas monitors. Such instrument shall be calibrated on regular basis.

o) The Contractor shall install emergency illumination (with battery backup) at an interval of not less than 15 m.

4.14.3 Means of Communication

The Contractor shall ensure that: reliable and effective means of communication such as the telephone or walkie-talkie is provided and are maintained in working order for arranging better and effective communication at an excavation as per Rule 136 of BOCWR.

4.14.4 Permissible Limit of Exposure of Chemicals

The Contractor shall ensure that the responsible person referred to in BOCWR conducts necessary test before the commencement of a tunnelling work for the day and at suitable intervals as fixed by Chief Inspector to ensure that the permissible limits of exposure are not exceeded, and a record of such test is maintained and is made available for inspection to Chief Inspector, on demand.

4.14.5 Evacuation and Training

The Contractor shall ensure that:

a) Implementation of the training for evacuation and fire fighting immediately before the distance reaches about 100m from the portal to the tunnel face; and

b) Implementation of evacuation training by a responsible person appointed in terms of dealing with technical matters.

4.15 Material Transportation

4.15.1 The Contractor shall develop the method statement for heavy/big material/machinery transportation such as Rolling Stock, Transformer, and Bridge Main Girder, etc.

4.15.2 The Contractor shall ensure that the person in charge should inspects the safety implementation like properly fixing of wire with vehicle slab bed, condition of vehicle breaks etc. before starting the job.

4.15.3 The Contractor shall ensure that every vehicle/moving machinery should have a signal man who has a whistle, a flag or a signal light (in the night) with striking clothes and stands at a safe visible place from a machine operator by means of the proper signal and way determined.

4.15.4 Training related to moving and parking safely should be given to driver/operator like parking

construction vehicles at a specified place with a parking brake and making sure to put a drag.

4.16 Foundation Works

The Contractor is required to evaluate the risk in each activity and suggest a control measures of piling works:

a) Covering of bore holes with adequate warning signs;

b) Cage to be lowered by using crane;

c) The auxiliary hook of the rig shall not be used to pull or lower the cage in bore hole;

d) The tremie pipe lowering and lifting after concreting shall be done by using crane;

e) Control measure to arrest polymer spillage from the Site to avoid contaminating the surface drains;

f) An entry restraining fence shall be provided around the pier excavation completion;

g) No man suffering from any chronic disease, alcoholic excess, ear or heart troubles or having a sluggish blood circulation or who has excess of fat should be employed as a diver;

4.17 Batching Plant and Casting Yard

The Contractor is required to evaluate the risk in each activity and suggest Control Measures:

a) Adequate space between the casting bed, segment storage area and the adjoining road shall be maintained so that a steel railing could be installed to segregate the gantry crane movement area from the road;

b) All safety precautions stated in Sub-Clause 4.8 [Construction Machinery], Automatic Safe Load Indicator (ASLI) for crane and gantry shall be complied during erection of gantry crane and other equipment;

c) The aggregate/sand storage area shall be kept under the full coverage of effective water sprinkler to avoid dust generation;

d) The entire batching plant/aggregate storage Area shall be adequately walled of sufficient height, above which the Contractor is required to erect green dust protective net. This is a mandatory requirement to avoid dust in surrounding environment;

e) The batching plant and casting yard required to obtain ''Consent to Establish'' and ''Consent to Operate'' certificate from State Pollution Control Board;

f) LOTO (Lock Out Tag Out) system shall be installed.

g) The batching plant/casting yard shall be barricaded and made as a compulsory Personal Protective Equipment (PPE) zone;

h) Time office, canteen, drinking water, toilet and rest place shall be suitably located for the easy access to workers. All the facilities shall be properly cleaned and maintained during the entire period of operation;

i) Drainage shall be effectively provided, and wastewater shall be disposed after proper treatment; and

j) Manual handling of cement shall be avoided. Whenever it is necessary the workmen shall be given full body protection, hand protection and respiratory protection as a basic measure of ensuring better health.

4.18 Form Works

a) Ensure the inspection of formwork assembly before and during the placement of concrete; and

b) Ensure no attaching equipment to the formwork assembly unless specifically designed for this purpose; and not using a stripping process which may cause damage to the permanent structure.

4.19 Concrete Works

a) Concrete pumping equipment, trucks etc. are not to be washed down on site and any waste-water, concrete slurry or other contaminants are to be contained, ball catcher should be used during washing of the concrete; and

b) These contaminants are not to be discharged into or onto roadways, footpaths, gutters, drainage systems, watercourses or any other surface area that will result in damage to the environment or contravenes environmental legislation.

4.20 Pier Casting Works

a) Using crane to hold the pier reinforcement during the time gap between de-staging and placement of shutter; and

b) Location and pier height specific securing arrangement and specific Method Statement for pier more than 9.0 m shall be submitted and approved by the Engineer.

4.21 Bridge Erection Works

4.21.1 References:

a) The BOCW Acts and Rules;

b) The Haryana BOCW Rules 2005;

c) Indian Railways Bridge Manual; and

d) Safety Assessment with regard to Steel Bridge Erection Works 1985, Ministry of Health, Labour and Welfare;

4.21.2 General

As bridge erection works are one of the riskiest jobs, the Contractor shall take utmost precaution at all stages like; planning, establishing temporary yard, casting segments, transporting segments, fabrication and operation of erection machinery, if any, launching of segments/lifting of segments, pre-stressing, cutting and welding, auto (or manual) launching and dismantling of erection machineries. For pre-stressed concrete bridges, the Contractor shall further ensure that:

a) a responsible person should be appointed for post-tensioning works testing and inspection of tendon tensioning devices and using material;

b) installation of protective board behind a tensioning jack and keep out behind a jack during tensioning.

c) use of protective glasses, laver gloves, and masks during grouting for safety of the Workers; and

d) fall prevention installation of overall boarding at the bottom of a bridge and installation of funnel type boarding at the side of a bridge during construction in case of RFO (Railway Flyover) or ROB (Road over Bridge) for preventing the flying and fall of materials and tools by safety net, should be ensured.

4.21.3 The Contractors Obligation

The Contractor shall prepare a comprehensive method statement for the bridge erection works, adhering to the ESHS conditions laid down herein. Particular reference shall be made to the provisions on working at height. As the entire process of launching/lifting has to be undertaken at the Site especially during nighttime, the safety of workers is of paramount important. Daily inspection of scaffold structure and mechanical equipment for the traveller crane should be done.

4.21.4 Basic Consideration under Site Condition:

Erection works over or adjacent roads or highways:

a) The work area should be demarcated properly, and route map and traffic management plan should be developed and implemented with proper signages and caution;

b) The Contractor shall ensure the implementation of proper stop traffic and detour plan;

c) The Contractor shall arrange the proper guide and signs to be followed while working on highway or adjacent roads, railways; and

d) The Contractor should plan and establish all the required measures for the protection of overhead wires and buried utilities.

i) The regular inspection is done for all the installed protection equipment;

ii) The movement restriction site plan to be developed with defined operation path for safe working at site;

iii) watchmen should be appointed who are given training related to all type of traffic management and all signals used for smooth traffic flow and site transportation and works;

iv) The railway schedule is taken in consideration while planning the site works and ensures the safe management system with the details given regarding the kind of works suspended while a train is passing and clarifying the way of opening or closing railway in case of track closure works. For steel truss bridges;

v) The Contractor must install the protective net just after erecting truss upper chord material;

vi) The Contractor must install safety operation path to an end of erected member and a cross point of lateral bracing;

The Contractor may use any of the erection methods. However, following general points will be kept in view and ensured as applicable-

A. The Contractor should develop and confirm the Engineer his Method Statement with details of position of bearing, jacking operation, roller passing etc.;

B. Detailed inspection report related to the movement and condition of superstructure from the place of launching equipment and rollers should be given to the Engineer;

C. The Contractor shall give confirmation of binding situation such as a bolting erection member;

D. The Contractor shall give confirmation of displacement per every erection phase;

E. The Contractor shall give confirmation of fixing situation for bearings;

F. The Contractor must take measures to avoid a fall and lateral buckling of member; and

G. The Contractor shall take measures of fall prevention for main superstructure.

4.22 Building and Roof Erection Works

4.22.1 The Contractor shall prepare plan, erection sequence and work procedures properly under competent and experienced personnel to ensure the safety of workers and prevent structure failure during erection:

a) Contractor shall develop and confirm with the Engineer his method statement with details;

b) The stability of structural members is to be ensured by means of ties, braces, anchor/fixing bolts, or other suitable means before releasing lifting gear, slings, chains etc.;

c) Tag lines must be attached to the ends of components/loads to maintain control during crane lifting operations;

d) Structure stability is to be ensured always. Unattended and incomplete buildings/structures are NOT to be left in an unsafe and hazardous condition, to pose a risk to the safety and

health of site personnel or the public;

e) The Workers placing and securing roof battens are to be protected and are to work from an enclosed environment (e.g. scaffolding, deck guardrail or equivalent) and work up from the bottom of the truss/rafter towards and finish at the ridge /peak of the roof framing; and

f) When the spacing of trusses and roof battens exceed 600mm the appropriate procedures are to be considered and applied after conducting a risk assessment to provide the optimum fall protection.

4.23 Overhead Contact Wire Works

4.23.1 During starting of works using rack vehicle/moving scaffold/ladder/insulation tower/step ladder, etc., the Contractor's operation in charge shall confirm as follows:

a) The work sequence shall be determined while using Ariel Track vehicle. Communication system between drivers and conductors shall be developed and adopted;

b) A deck which must be used by workers, shall have enough capacity of carry necessary loads for work at a high place with a pre-operation inspection;

c) The workers shall be given the safety protection equipment which has enough capacity to hold necessary loads to prevent any accidental fall with a pre-operation inspection;

d) State of electrical equipment installation and a route of going up and down from ground;

e) The Worker is given required training for electrical works at height and the Worker must use a safety rope, an auxiliary rope, a fall prevention equipment such as a rolip which is a fall arrest device for a fixed rope when they work at high place;

f) The Worker shall fix the grip of an auxiliary ropes at the upper position of their safety ropes and uses special wires or a lift when delivering materials and tools from ground to high place;

g) The Contractor shall ensure that no one lean out of the rail of the track vehicles, or take a foot on the rail; and Shall take all the precautions for self-propellant or roll prevention when bringing the track vehicle to a stop;

h) The installation of medium rail at the place where handrail is more than 85cm high;

i) The training is given to all, for putting on a foot brake when bringing the rolling tower to a stop or working on the deck of the rolling tower suspended;

j) Putting on a foot brake and fixing the insulation tower by an assistant when bringing the insulation tower to a stop or working on its suspension;

4.23.2 While going up and down along an Electric Pole, Power Pylon or a High Steel Structure or working above it, the Contractor shall ensure the safety precautions mentioned below:

a) Use of a safety rope, an auxiliary rope and a fall prevention equipment with using an exclusive scaffold when going up and down along the electric pole;

b) Use of an escort rail, or both a Full Body Harness and an auxiliary rope when going up and down along the power pylon or the high steel structure;

c) While working on a Beam, the Contractor shall ensure the safety precautions mentioned below:

i. Use of a horizontal rope on working consecutively on the beam or painting the beam surface without an auxiliary rope; and

ii. Use of a safety rope and an auxiliary rope when moving on the beam under unavoidable circumstances.

4.24 Locomotives and Wagons

4.24.1 Speed limit is determined, and traffic signs of speed limits, lights and related hazards signage and

cautions shall be installed at work place.

4.24.2 Person in charge shall be nominated as maintenance officer to inspect and repair temporary rails or track surface situation regularly.

4.24.3 Ensure the installation of an alarm device such as a horn and a buzzer, a head light, and a flood light for the driver's seat.

4.24.4 Training and education shall be given to the driver and the signal man regarding how to send standard signal and operate vehicle diagram and turning off and putting on the brakes while the driver leaves his seat. And making sure to set wheel stoppers when stopping or parking at the slope track.

4.24.5 Each locomotive shall carry an extinguisher for fires

4.25 Fire Protection

4.25.1 The contractor shall ensure that the construction site is provided with—

a) Fire extinguishing equipment sufficient to extinguish any probable fire at such construction site;

b) An adequate water supply at ample pressure as per national standards;

c) Number of trained persons required to operate the fire extinguishing equipment provided; and

d) Is properly maintained and inspected at regular intervals of not less than once in a year by the responsible person and a record of such inspections is maintained.

4.25.2 The extinguishers shall be chosen as per type of fire load and surrounding location.

4.25.3 All construction machinery including crane shall carry a portable fire extinguisher in operator's cabin.

4.25.4 The Contractor shall prepare an emergency plan and Fire Evacuation plan and same shall be a part of Site ESHS Management Plan. Mock drills should be held on a quarterly basis to ensure the effectiveness of the arrangements and as a part of the programme, the telephone number of the local fire brigade should be prominently displayed near each telephone on site.

4.25.5 Recharging of fire extinguishers and their proper maintenance should be ensured and as a minimum should meet Indian National Standards.

4.25.6 All drivers of vehicles, foreman, supervisors and managers shall be trained on operating the fire extinguishers and firefighting equipment.

4.26 Demolition

4.26.1 All demolition works shall be carried out in a controlled manner under the management of experienced and competent supervision.

4.26.2 The concerned department of the Government or local authority should be informed, and permission obtained wherever required.

4.26.3 All glass or similar materials or articles in exterior openings should be removed before commencing any demolition work and all water, steam, electric; gas and other similar supply lines must be disconnected.

4.26.4 No demolition work should be performed if the adjacent structure seems to be unsafe unless and until remedial measures life sheet piling, shoring, bracing or similar means to be ensured for safety and stability for adjacent structure from collapsing.

4.26.5 Debris/bricks and other materials or articles should be removed by means of chute, bucket or other safe method.

4.26.6 No person other than the Workers or other persons essential to the operation of demolition work shall be permitted to enter a zone of demolition and the area be provided with substantial barricades.

4.27 Permit to Work

4.27.1 The Contractor shall develop work permit system, which is formal written system used to control certain types of work that are potentially hazardous. A work permit is a document, which specifies the work to be done, and the precautions to be taken.

4.27.2 Work Permits form an essential part of safe systems of work for many construction activities. They allow work to start only after safe procedures have been defined and they provide a clear record that all foreseeable hazards have been considered. Permits to Work are usually required in high-risk areas as identified by the Risk Assessments.

4.27.3 A permit is needed when construction work can only be carried out if normal safeguards are dropped or when new hazards are introduced by the work.

4.27.4 Examples of high-risk activities include but are not limited to:

a) Entry into confined spaces;

b) Hot work;

c) To dig where underground services may be located;

d) Work with heavy moving machinery;

e) Heavy lifting operations and lifting operations closer to live electric power line;

f) Work with using track motor vehicles etc.; and

g) Work under electric facility and overhead electric (OHE) line energized.

4.27.5 The Contractor shall prepare operation manuals above mention and implement training course at any time based on such manuals to the Workers given completion of certificates before the commencement of works.

4.27.6 The permit-to-work system should be fully documented, laying down:

a) How the system works;

b) The jobs it is to be used for;

c) The responsibilities and training of those involved; and

d) How to check its operation.

4.27.7 A work permit authorization form shall be completed with the maximum duration period not exceeding 12 hours or end of shift, which is earlier.

4.27.8 A copy of each permit to work shall be displayed at work place. during its validity, in a conspicuous location in close proximity to the actual works location to which it applies.

4.28 Traffic Management and Site Barricading

4.28.1 The basic objective of the following guiding principles is to lay down procedures to be adopted by the Contractor to ensure the safe and efficient movement of traffic and also to ensure the safety of workmen in the all work areas.

4.28.2 The guiding principles to be adopted for safety in construction zone are to:

a) Warn the road user clearly and sufficiently in advance;

b) Provide safe and clearly marked lanes for guiding road users;

c) Provide adequate traffic marshals to regulate the movement of traffic;

d) Provide safe and clearly marked buffer and work zones; and

e) Provide adequate measures that control driver behaviour through construction zones.

4.28.3 In all cases, the Contractor shall take proper precautions. Wherever operations undertaken are likely to interfere with public traffic, Specific Traffic Management Plans shall be drawn up and implemented by the Contractor in consultation with the approval of Local Police Authorities and/or the concerned politburo/Civil Authorities and followed to the IRC: SP;55- 2014 (Guidelines on Traffic Management in work zones) & IRC: 67 (Code of Practice for Road Signs).

4.28.4 Full height fence, barriers, barricades etc. shall be erected around the site in order to prevent the working area from the risk of accidents due to speedy vehicular movement. Same the way barricades protect the road users from danger due to construction equipment and other temporary structures.

4.28.5 All barricades shall be conspicuously seen in the dark/nighttime by the road users so that no vehicle hits the barricade. Conspicuity shall be ensured by affixing retro reflective stripes of required size and shape at appropriate angles at the bottom and middle portion of the barricade at a minimum gap of 1000mm. In addition minimum one red light blinker or rope light should be placed at the top of each barricade.

4.29 Working near Railway

4.29.1 The details of Safe work procedure for work near Railway Track are given in Clause 8.0, Attachment -5 of this document.

4.30 Other Works to be Scrutinized

4.30.1 Other works including, but not be limited to, the works in the Site (the ROW), the works in the Borrow Pit, the works in the Quarry and Works on road shall be included to be scrutinised with respect to the accident prevention.

4.30.2 If blasting is anticipated in excavation in rock, preventive measures against accidents and protective measures against environmental/social impacts shall be of paramount importance.

4.30.3 The Contractor shall include all those items as well as work elements to formulate the preventive and protective measures considering envisaged conditions, situations, and activities of the works which may induce accidents or hazard to environment and/or society.

4.31 Personal Protective Equipment

4.31.1 The Contractor shall provide required PPEs to workmen to protect against safety and/or health hazards. Primarily PPEs are required for the following protection:

a) Head protection (Safety helmet with a chin strap);

b) Foot protection (Safety footwear, Gumboot, etc.);

c) Body protection (High visibility clothing (Waistcoat/Jacket), Apron, etc.);

d) Personal fall protection (Full body harness, Rope-grip fall arrester, etc.);

e) Eye protection (Goggles, Welders Glasses, etc.);

f) Hand protection (Gloves, Finger coat, etc.);

g) Respiratory protection. (Nose mask, Self-contained breathing apparatus, etc.); and

h) Hearing protection (Ear plugs, Ear muffs, etc.).

4.31.2 The PPEs and safety appliances provided by the Contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS). If materials conforming to BIS standards are not available,.

4.31.3 The Contractor shall provide the PPEs which the Contractor deems necessary including; but not be limited to, safety helmets, safety shoes and Hi-Viz to all the Contractor's Employees including workmen (including those of its sub-contractors). High visibility clothing as per the following requirement.

a) Hi-visibility jacket covering upper body and meeting the following requirements as per BS EN 471:1994;

b) Background in fluorescent orange-red in colour;

c) Jackets with full-length sleeves with two bands of retro reflective material, which shall be placed at the same height on the garment as those of the torso. The upper band shall encircle the upper part of the sleeves between the elbow and the shoulder; the bottom of the lower band shall not be less than 5cm from the bottom of the sleeve;

d) Two vertical green strips of 5cm wide on front side, covering the torso at least 500 cm2;

e) Two diagonal strips of 5 cm wide on back in an 'X' pattern covering at least 570cm2;

f) Horizontal strips not less than 5cm wide running around the bottom of the vertical strip in front and 'X' pattern at back;

g) The bottom strip shall be at a distance of 5cm from the bottom of the vest; and

h) Strips shall be retro reflective and fluorescent.

Safety Helmet Colour Code (Every Helmet should have the LOGO*affixed/painted)	**Person to use**
Hard hat with company Logo (Employees)	Hard hat with reflective tape (Marshals)
White	Employer/Engineer
Grey	All designers, Architect, Consultants, etc.
Violet	Main Contractors (Engineers/Supervisors)
Blue	All subcontractors (Engineers/Supervisors)
Red	Electricians (Both Contractor and Subcontractor)
Green	Safety professionals (Both Contractor and Subcontractor)
Orange	Security guards/Traffic marshals
Yellow	All workmen
White (with "VISITOR" sticker)	Visitors
Safety Shoes (Anyone at the Siteincl. Marshals)	
All employees of the contractor including workmen	Traffic marshals

Note: LOGO·

a) Logo shall have its outer dimension 2"X2" and shall be conspicuous
ii) Logo shall be either painted or affixed
iii) No words shall come either on Top / Bottom of Logo

Logo of the corresponding main contracting company for their employees and sub-contracting company for their employees shall only be used.

4.31.4 In addition to the above any other PPEs required for any specific jobs like, welding and cutting, working at height, tunnelling etc. shall also be provided to all workmen and also ensure that all workmen use the PPEs properly while on the job.

4.31.5 The Contactor shall not pay any cash amount in lieu of PPEs to the workers/sub- contractors and expect them to buy and use during work.

4.31.6 The Contactor shall at all-time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Engineer during the inspections.

4.31.7 It is always the duty of the Contactor to provide the required PPEs for all visitors. Towards this required quantity of PPEs shall be kept always at the security post.

4.32 Visitor at Site

4.32.1 No visitor can enter the Site without permission. All authorised visitors should report at the Site office. The Contractor shall provide visitor's helmet (White helmet with visitor sticker) and other PPEs like Safety Shoe, reflective jacket, respiratory protection etc. as per requirement of the Site.

4.32.2 The Contractor shall be fully responsible for safety and health of all visitors within the Site.

4.33 Site Security

4.33.1 The Contractor shall be wholly responsible for security on the Site and any other areas being used by him or the Subcontractor's for the purposes of the Contract.

4.33.2 The Contractor shall assign on the Site a security officer (adequately trained person,) and his alternate(s), who shall be primarily responsible for the Contractor's security services and fully cooperate with the Engineer's security organization throughout the Time for Completion.

4.33.3 Where necessary, the Contractor shall install, modify, maintain the temporary security fences, gates, posts, security lightings and other facilities required for proper security control, in addition to those to be constructed as part of the Works. The Contractor shall operate these facilities to properly control ingress to and egress from the areas under his control throughout the Time for Completion. This control shall apply to every person including the Employer's Personnel.

5.0 OCCUPATIONAL HEALTH AND WELFARE

5.1 Physical Fitness of Workmen

5.1.1 The Contractor shall ensure that his employees/workers subject themselves to such medical examination as required under the law or under the contract provision and keep a record of the same.

5.1.2 The Contractor shall not permit any employee/workers to enter the work area under the influence of alcohol or any drugs.

5.1.3 The Contractor shall maintain the confidential records of medical examination or the physician authorized by the Engineer.

5.1.4 No worker is charged for the medical examination and the cost of such examination is borne by the Contactor employing such worker.

5.2 Medical Facilities

5.2.1 Occupational Health Centre (First Aid Station)

The Contractor shall ensure at the construction Site an occupational health center, mobile or static is provided and maintained in good order. Services and facilities as per the scale lay down in Schedule IV of HBOCWR. A construction medical officer appointed in an occupational health center, possess the qualification as laid down in Schedule V Rule no 113 of HBOCWR:

5.2.2 The Contractor shall appoint appropriate full-time staff including one nurse, one dresser- cum-compounder, one sweeper-cum-ward boy with each construction medical officer.

5.2.3 The Contractor shall communicate the complete details including name, qualification and experience of the construction medical officer, to the inspector having jurisdiction under HBOCWR.

5.2.4 Ambulance Room, Ambulance Van and Stretchers:

The Contractor shall ensure at a construction site of a building or other construction work that an ambulance van and room are provided at such construction Site, or an arrangement is made with a nearby hospital for providing such ambulance van for transportation of serious cases of accident or sickness of workers to hospital promptly and such ambulance van and room are maintained in good repair and is equipped with standard facilities specified in Schedule VI of Rule 114 & Schedule VII of Rule 115 of HBOCWR.

5.2.5 The Contractor shall provide enough stretchers at each site for use in an emergency.

5.2.6 First Aid Boxes and Emergency Care:

The Contractor shall ensure at construction site one First-aid box for 100 workers for providing first-aid to the workers. Every First-Aid box is distinctly marked "First-Aid" and is equipped with the articles specified in Schedule IX of Rule 119 of HBOCWR. Adequate no. of trained first aid persons shall be available at each work site in each shift.

5.2.7 HIV/AIDS Prevention and Control:

a) The Contractor shall adopt the Employer's "Workplace Policy on HIV/AIDS Prevention and Control for Workers Engaged by Contractors" and implement it. A copy of the policy is given in Clause 8.0, Attachment-2 [Workplace Policy on HIV/AIDS Prevention & Control];

b) The Contractor shall prepare and submit the plan for HIV/AIDS Prevention and Control for his workers in terms of the aforesaid Employer's Policy within 28 days of the date of notification of the Contract.

c) The Contractor shall organize awareness program for labourers on the risks of AIDS and STDs in coordination with Haryana State AIDS Control society.

5.2.8 COVID -19 Prevention and Control

The Contractor shall ensure that the latest guidelines issued by Ministry of Health and Family Welfare (MoHFW), local government and the district administration are strictly followed at the construction works site. The Workplace Policy on COVID-19 Prevention and Control is given in Clause 8.0, Attachment-3 [Workplace Policy on COVID-19 Response]. The Contractor shall undertake a COVID-19 risk assessment of project area and prepare and submit COVID-19 Response and Management Plan.

5.2.9 Prevention of Mosquito Breeding

Measures shall be taken to prevent mosquito breeding on the Site. The measures to be taken shall include:

a) Empty cans, oil drums, packing and other receptacles, which may retain water, shall be deposited at a central collection point and shall be removed from the site regularly;

b) Stagnant water shall be treated at least once every week with oil to prevent mosquito breeding;

c) The Contractor's equipment and other items on the site, which may retain water, shall be stored, covered, or treated in such a manner that water could not be retained; and

d) Water storage tanks shall be provided.

5.2.10 Posters in local language, Hindi and English, which draw attention to the dangers of permitting mosquito breeding, shall be displayed prominently on the Site.

5.2.11 The Contactor at periodic interval shall arrange to prevent mosquito breeding by fumigation/spraying of insecticides, and the ideal larvicide etc.

5.2.12 Alcohol, Smoking and Drugs

a) The Contactor shall always ensure that no employee is working under the influence of alcohol/drugs which are punishable under BOCWR;

b) Smoking at public places by any employee is also prohibited as per Government Regulations. The Contractor shall comply with the legal provisions in this regard, such as; Prohibition of Smoking in Public Places Rules, 2008. He shall be solely responsible for any penalty or punitive action by the government authorities because violations of the provisions contained in these rules by him or his representatives or his employees or his Subcontractors. Requisite notice boards, posters, etc., shall be put by him, as per the Rules.

5.3 Welfare Measures for Workers

5.3.1 Latrine and Urinal Accommodation:

a) Latrine and urinals shall be provided as per Chapter VI, Part – II of Rule 80 of Haryana BOCWR and shall also comply with the requirements of public health authorities; and

b) When women are employed, separate latrine and urinals accommodation shall be provided.

5.3.2 Moving Sites:

a) In case of works like track laying, the zone of work is constantly moving. In such cases, mobile toilets with proper facility to drain the sludge shall be provided at reasonably accessible distance; and

5.3.3 **Canteen**

In every workplace wherein not less than 250 workers are employed, the Contractor shall provide an adequate canteen conforming to Chapter VI, Part – II of Rule 81 of Haryana BOCWR

5.3.4 **Drinking Water.**

As per Section 32 of BOCWA, the Contractor shall make in every site, effective arrangements to provide sufficient supply of wholesome drinking water. Quality of the drinking water shall conform to the requirements of national standards on Public Health Laws. While locating these drinking water facilities due care shall be taken so that these are easily accessible from the place of work for all workers at all location of the Site. All such points shall be legible marked "Drinking Water" in a language understood by most of the workmen employed.

5.3.5 **Crèche**

In every workplace where in more than 50 female workers are ordinarily employed, there shall be provided and maintained a suitable room for use of children under age of 6 years, conforming to the provisions of Section 35 of BOCWA.

5.3.6 Labour Accommodation Camps

The Contractor shall prepare Labour camp management plan as part of site ESHS plan. Where workers are based some distance from their normal place of residence, the Contractor shall provide them with suitable and safe accommodation free of charge and shall take all necessary precautions to protect their health and welfare. The accommodation shall conform to the requirements of Section 34 of BOCWA and include but not be limited to the further measures specified hereunder.

5.3.7 All accommodation camps shall be provided always with a sufficient supply of clean drinking water (of potable quality according to national legal standards), in suitable and easily accessible locations:

5.3.8 The quality of drinking water shall be tested once a fortnight as prescribed in IS 10500:2012and immediate remedial action shall be taken if quality falls below the standard. Test results shall be provided to the Engineer at least monthly.

5.3.9 The Contractor shall provide all accommodation camps with clean and properly equipped and staffed kitchen and canteen facilities to supply meals for workers.

5.3.10 The Contractor shall provide sufficient toilet and bathroom facilities for the numbers of workers accommodated in each camp. Separate accommodation and toilet/bathroom facilities shall be provided for men and women and all facilities shall be kept in full working order always and cleaned and re-equipped daily.

5.3.11 The Contractor shall provide a laundry facility at the Labour Accommodation Camps.

6.0 ENVIRONMENT AND SOCIAL MANAGEMENT

6.1 General Conduct of the Works

6.1.1 The purpose and objective of these guidelines is to outline how the project will avoid, minimise or mitigate effects on the environment and surrounding area. These guidelines detail the implementation of measures in accordance with environmental and social commitments of HRIDC. These guidelines will be 'live' guidelines that will be reviewed and updated at regular intervals throughout the project life cycle. These guidelines will ensure that the development is compliant with current Environmental and Social legislations and will guide and assist the Contractor in exploring all reasonable and feasible means for reducing construction related Environmental and Social impacts.

6.1.2 The Contractor shall comply with the Environment and Social Management Plan (ESMP) given in the Environmental and Social Impact Assessment (ESIA) report available on HRIDC portal for information disclosure and will note and implement any requirements therein, in addition to those found in this specification.

6.1.3 The Contractor is required to build good public relations before the commencement of the Works particularly with the local level representatives such as the Gram Panchayat, by informing the expected impacts by the Works and their schedule and dispute resolution mechanism known as GRM set by the Employer.

6.2 Environmental Legislation

6.2.1 The Contractor shall always comply with all relevant National and State legislations regarding environmental protection, pollution prevention and control, waste management and other relevant environmental matters, including but not necessarily limited to, the following with their latest amendments:

a) The Environment (Protection) Act, 1986 and Rules 1986

b) The Indian Wildlife (Protection) Act, 1972;

c) The Forest (Conservation) Act, 1980 &Rules;

d) Punjab Land Preservation Act, 1900;

e) The Noise Pollution (Regulation and Control) Rules, 2000;

f) Notification on Control of Noise from Diesel Generator (DG) sets, 2002;

g) The Air (Prevention and Control of Pollution) Act, 1981and Rules 1981;

h) The Water (Prevention and Control of Pollution) Act, 1974 and Rules 1974;

i) Guidelines to control and regulate ground water extraction in India, 24th September2020, Central Ground Water Authority;

j) The Solid Management Rules, 2016;

k) The Construction and Demolition Waste Management Rules, 2016;

l) The Hazardous and Other Wastes (Management and Transboundary Movement)Rules, 2016;

m) The Bio-medical Waste Management Rules, 2016;

n) Plastic Waste Management Rules, 2016;

o) E-Waste (Management) Rules 2016;

p) The Batteries (Management and Handling) Rules, 2001;

q) Manufacture, Storage, and Import of Hazardous Chemical (Amendment) Rules,1989;

r) Ancient Monuments and Archaeological Sites and Remains (Amendment andValidation) Act 2010;

s) Fly ash utilization notification, Sept 1999;

t) Applicable NGT Guidelines issued time to time; and

u) Provisions of Graded Response Action Plan notified by the MoEF&CC.

6.2.2 The Contractor shall comply the Environmental and Social Framework (ESF) of Asian Infrastructure Investment Bank (AIIB) February 2016.

6.2.3 If the requirements stated in this document are in conflict or inconsistent with the requirements of applicable laws, the more stringent requirements shall apply.

6.2.4 It is also the Contractor's responsibility to obtain all environmental clearances, official approvals, consents, or other authorizations as may be necessary to comply with the relevant statutes, and to pay all related fees and other costs. The Contractor shall obtain all authorizations in a timely manner and submit to the Engineer as the evidence for the regulatory obligations before commencement of any related construction activity. The indicative clearances/permission/permit are presented in Table below and Contractor is required to take any other clearance as required for its construction activities.

Clearance/ Permission/Permit	**Relevant Acts/Rules**	**Concerned Agency**
Consent to Establish and Consent to Operate batching plants and casting yards	• The Water (Prevention and Control of Pollution) Act, 1974, and its amendments; • The Air (Prevention and Control of Pollution) Act 1981 and its amendments	Haryana Pollution Control Board
Authorization for generation, handling, storage, and transportation of hazardous waste	Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016	Haryana Pollution Control Board
Permission for extraction of ground water	Central Ground Water Authority guidelines to regulate and control ground water extraction in India, 24th September, 2020	Haryana Water Resources (Conservation, Regulation and Management) Authority
Pollution Under Control Certificate	Central Motor and Vehicle Act 1998 Vehicular Exhaust Norms, CPCB 2007	Department of Transport, Government of Haryana
Construction and Demolition Waste Management Plan	Construction & Demolition Waste Management Rules, 2016	Local Authority (Municipal Corporation)

6.3 Environmentally Friendly Construction Practices

6.3.1 Containment of Air Pollution

a) All construction equipment's should be cleaned of visible dirt/mud before exiting the construction sites and streets shall be promptly cleaned by manual sweeping, or by deploying electro – mechanical devices if such material has been dropped;

b) The Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from work sites such as construction depots and batching plants. This facility will be provided with efficient drainage, water re-circulation apparatus and silt traps to prevent any excessive buildup of water. Where wheel-washing facility is not possible, the Contractor shall ensure manual cleaning of wheels by wire brushes or similar suitable means;

c) The Contractor shall ensure that vehicles carrying dust generating material shall be covered with tarpaulin, shall have properly fitted side and tailboards and dust potential material shall not be loaded to a level higher than the side and tail boards;

d) Materials should not be dropped from more than 1.5 m to limit fugitive dust generation;

e) Necessary water sprinkling to be carried out for dust control. For water sprinkling, emphasis should be given on use STP treated water or RO reject water;

f) Stockpiles of sand and aggregate greater than 20m3 for use in concrete manufacture shall be enclosed on three sides, with walls extending above the stockpile and two (2) meters beyond the front of the stockpile;

g) Areas within the Site such as construction depots and batching plants, where there is a regular movement of vehicles shall have an approved hard surface that is kept clear of loose surface material;

h) Unless the Engineer has given notice otherwise, the Contractor shall restrict all motorised vehicles on the Site to a maximum speed of 15 kilometers per hour and confine haulage and delivery vehicles to the designated roadways inside the site;

i) The Contractor shall erect hoardings as specified in Engineer requirements securely around all construction work sites during the main construction activity, to contain dust within the site area and also to reduce air turbulence caused by passing traffic. The hoarding shall be safely secured to the ground to prevent from toppling with minimum gap between the base of hoarding and ground surface.

j) Water spray should be used to control dust during breaking of rock/concrete;

k) The contractor shall take all necessary actions to control air pollution as per guidelines issued by the Commission for Air Quality Management (CAQM) in National Capital Region time to time;

l) The contractor shall take necessary actions as per the provisions of Graded Response Action Plan (GRAP) issued from time to time.

6.3.2 **Containment of Water Pollution and Efficient Use of Water**

a) List of sources (surface/ground) to be provided for approval from Engineer;

b) A water meter shall be installed to quantify the consumption of water;

c) Prior to use of source, written permission to be obtained from authority to use the water in construction activity, and submit a copy to Engineer;

d) During construction only permitted quantity (permission taken) from approved sources to be used in construction activity;

e) A Drainage system should be constructed during the commencement of the works, drain off all surface water at the site into suitable drains;

f) At construction depots and batching plants temporary drainage works should be maintained, removed, and reinstated as necessary and all other necessary precautions should be taken for avoidance of damage by flooding and silt;

g) The Contractor shall provide a hard surface with suitable drainage system for Transit Mixture washing at Casting Yard and/or Batching plant. The slurry water from Transit Mixture washing area shall go to sedimentation tank of suitable capacity to treat the slurry water. The contractor shall ensure the facility remains functional till the end of the contract;

h) The Contractor shall take measures to prevent discharge of oil on land and in water bodies. Oil separator/interceptors shall be provided at Batching Plant and Construction Depot location for vehicle maintenance to prevent the release of oils and grease into the drainage system. These shall be cleaned on a regular basis;

i) Rainwater pumped out from trenches or foundation excavation should be discharged into storm water drains after obtaining notice of no objection from the Agency controlling the system;

j) The Contractor shall always ensure that all existing wells, stream courses and drains within, and adjacent to the site are kept safe and free from any debris and any excavated materials arising from the Works;

k) The Contractor shall discharge wastewater arising from site offices, canteens or toilet facilities constructed by him into sewers after obtaining prior notice of no objection of agency controlling the system;

l) The Contractor shall ensure that earth, bentonite, chemicals and concrete agitator washings etc. are not deposited/drained in the watercourses but are suitably treated and effluents and residue disposed off in a manner approved by local Regulatory Authorities;

m) Construction works should be programmed to minimize soil excavation works in rainy season. If carried out during rains, temporarily exposed slope surfaces should be covered by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds.

n) Wastewater from Concrete Batching & Precast Concrete Casting and that generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled. The discharge of wastewater should be kept to a minimum;

o) The road between the vehicle washing bay and the public road should be paved to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains;

6.3.3 **Containment of Noise and Vibration**

a) Contractor shall minimize the use of impact devices, such as jackhammers, and pavement breakers and instead use concrete crushers or pavement saws;

b) Equip noise producing equipment such as jackhammers and pavement breakers with acoustically attenuating shields or shrouds recommended by the manufacturers thereof, to meet relevant noise limitations;

c) Use hydraulic tools instead of pneumatic impact tools and electric instead of diesel-powered equipment. If pneumatic impact tools and equipment are used, they shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations;

d) Provide mufflers or shield panelling for other equipment, including internal combustion engines, recommended by manufacturers thereof;

e) Employ prefabricated structures instead of assembling on-site;

f) Provide enclosures for stationary equipment and barriers around noisy areas;

g) Locate and operate stationary equipment in such a way, so as to minimize noise and vibration impact on community, sensitive locations and nearby buildings.

h) Schedule truck loading, unloading, and hauling operations in such a way so as to minimize

noise impact near noise sensitive locations and surrounding communities;

i) Plan noisier operations during times of highest ambient noise level, keep noise levels relatively uniform and avoid excessive and impulse noises;

j) Use only well-maintained, regular serviced plant/equipment, and not to be kept idling when not in use;

k) Maintain equipment such that parts of vehicles and loads are secure against vibrations and rattling;

l) Grading of surface irregularities on construction sites to prevent the generation of impact noise and ground vibrations by passing vehicles;

m) If back-up alarms are used on construction equipment, their noise emission level near noise sensitive receptors such as residences, schools, hospitals and similar areas where calmness is essential, should be regulated, especially at night time;

n) Avoid operating truck on streets that pass by schools during school hours;

o) Efforts to be made to bring down the noise levels due to the DG set, outside the premises, within the ambient noise requirements by proper setting and control measures;

p) The Contractor shall ensure that all necessary permissions/ approvals/consent is obtained from relevant authorities before installation and operation of Generator set;

q) A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacture;

r) At all times noise levels of DG sets shall comply the standards set out by CPCB/SPCB;

6.3.4 **Containment of Waste**

a) Construction activities are expected to generate a variety of waste such as:

   i) General refuse;

   ii) Construction and Demolition waste including waste from excavated material;

   iii) Chemical waste;

   iv) Hazardous waste; and

   v) Biomedical waste.

b) The Contractor is required to develop, institute and maintain a Waste Management Plan (WMP) during the construction of the project for his works. Such mechanism is intended to ensure that the designated area for the segregation and temporary storage of reusable and recyclable materials are incorporated in the WMP. The WMP shall be prepared and submitted to Engineer for approval.

General Refuse

c) General refuse like paper and food waste shall be stored in enclosed bins.

d) The refuse shall be stored and transported in accordance with good practice and disposed at licensed landfills;

e) An authorized waste collector shall be employed by the Contractor to remove general refuse from the site, on a daily basis to minimise odour, pest and litter impacts;

f) The Contractor shall not burn debris or vegetation on the site.

Construction and Demolition (C&D) Waste

g) C&D Waste would mainly arise from the project construction activities and from the demolition of existing structures where necessitated. It will include: material and equipment

wrapping packaging material, unusable/surplus concrete/grouting mixes, damaged/contaminated/surplus construction materials, wood from formwork and false work, concrete rubble, plastics, metal, glass, asphalt, wood and refuse obtained from demolition of houses.

h) The Contractor shall be responsible for collection, segregation, storage and disposal of C&D waste as directed or notified by the concerned local authority in consonance with the Construction & Demolition Waste Management Rules, 2016;

i) The Contractor shall ensure that there is no littering, deposition and disposal of C&D waste along the natural drainage and in water body;

j) The C&D waste should be disposed off either when the quality of C&D waste is 15 Tons from entire contract or such C&D waste has been stored for 15 days (irrespective of quantity) whichever is earlier;

k) A proper arrangement for record keeping has to be maintained to ensure disposal of C&D waste to C&D waste recycling plant. Contractor shall submit the record of C&D waste disposal to recycling facility, in his Monthly Environment Report;

Hazardous Waste

l) Hazardous waste would mainly arise from the maintenance of equipment. These may include, but not be limited to: Used engine oils, hydraulic fluids, waste fuel, spent mineral oils/cleaning fluids from mechanical machinery, scrap batteries or spent acid/alkali, spent solvents/solutions. Hazardous waste shall be disposed off in a manner in compliance with the procedure given in "Hazardous Waste (management, handling and trans-boundary movement) rules, 2016" only to authorized recyclers under intimation to the Employer's Representative;

m) Chemicals classified as hazardous chemicals under "Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 of Environment (Protection) Act, 1986 shall be disposed off in a manner in compliance with the procedure given in the rules under the aforesaid act;

n) The hazardous waste shall be stored on an impermeable surface with containment bunding to retain leaks, spills and ruptures;

o) All waste collection containers shall be of appropriate size with a closed lid. Each container will be clearly labelled with a colour code system in local language and English. Original labels of empty containers should be completely covered and the contents of the type of waste stored in the used containers clearly indicated;

p) Drip pans of suitable size and numbers shall be used to collect oil leakage and spills. The area shall be cleaned after completion of maintenance/repair and generated waste disposed off in approved manner.

Bio medical waste

q) Collection, segregation, storage and disposal of Bio Medical waste shall be in accordance with The Bio-medical Waste Management Rules, 2016;

r) Storage time of waste shall be as less as possible so that waste storage, transportation and disposal is done within 48 hours;

s) The contactor shall ensure that Posters/ placards for bio-medical waste segregation are installed at the point of generation;

t) Disposal of biomedical waste shall be through a licensed waste collector, duly authorized by MoEF&CC or Haryana Pollution Control Board as the case may be. License of the waste collector shall be shown to the Employer's Representative on demand. Staff handling the biomedical waste shall be provided with PPEs;

Colour coding of Waste storage bins

u) All waste shall be stored in different coloured bins as per table below:

Type of Waste	Colour
Wet/Organic/ Bio-Degradable Waste	Green Bins with lids
Dry/Recyclable waste (excluding Bio-medical waste/ hazardous waste)	Blue
Bio-Medical waste	Red with lids
E-Waste	Black
Hazardous Waste	Brown
COVID Waste	Yellow

6.3.5 **Landscape, Greenery and Aesthetics**

a) As far as is reasonably practicable, the Contractor shall maintain ecological balance by preventing deforestation and defacing of natural landscape. In respect of ecological balance, the Contractor shall observe the following instructions.

i) Prevent any avoidable destruction, scarring or defacing of natural surroundings in the vicinity of work;

ii) Any damage shall be repaired, replanted or otherwise corrected at Contractor's expense.

iii) Directional shielding for light used for illumination shall be used to prevent from striking adjacent areas, where feasible;

b) Tree Felling

i) All trees and shrubs, which are not specifically required to be cleared or removed for construction purposes, shall be preserved and protected from any damage by use of protective barriers or other methods approved by Engineer;

ii) The Contractor shall not fell, remove or dispose of any tree or forest produce in any land handed over to him for the construction of works and facilities related to project except with the previous permission obtained from the Forest Department;

iii) Trees shall not be used for anchorage.

6.3.6 **Energy Management**

a) The Contractor shall use energy efficient pumps and motors. The efficiency shall be measured during installation and also periodically;

b) The Contractor should rigorously follow the maintenance regime of his DG sets;

c) The Contractor shall maximize the use of energy efficient luminaries such as LED's, metal halide lamps and ensure optimum illumination levels to save energy;

d) The Contractor shall make provision of Earth Leakage Circuit Breakers (ELCBS) to prevent loss of excessive earth currents which are unsafe;

e) The Contractor shall plan in advance and select locations to receive and store material such that these are at the least distance from place of use;

f) The Contractor shall design site offices for maximum daylight and minimum heat gain.

6.3.7 **Archaeological And Historic Resources**

a) If any archeological and historic structure is likely to be affected, a resource protection plan shall be prepared by the Contractor in consultation with the Archaeological Survey of India (ASI) to identify and assess construction effects and seeks ways to avoid, minimize or mitigate adverse

effects on such monuments;

b) The Contractor shall stop work immediately and notify the Engineer if, during construction, an archaeological or burial site is discovered. The work will not recommence until approval of the Engineer is obtained for the same.

6.3.8 **Fly Ash**

MoEF&CC fly ash notification dated September 1999 and its subsequent amendments makes it mandatory for use of fly ash-based products in construction activities located within 300Km from coal or lignite based thermal power plants. The Contractor shall use fly ash as a percentage substitution of cement, in concrete for certain structures and works as prescribed in the latest amendment. The Contractor shall provide details of usage of such products to Engineer and shall maintain a detailed record of usage of Fly Ash.

6.4 Environmental Monitoring

6.4.1 **Baseline Study:** Before commencement of actual construction work, all items and parameters as specified in ESHS manual shall be monitored once as the baseline of the environmental condition prior to the construction and compared with the monitored values during the construction period;

6.4.2 **Qualification of Monitoring Agency:** Monitoring shall be conducted by MoEF&CC approved or NABL accredited laboratory and approved by the Engineer;

6.4.3 **Enforcement of the Monitoring**: Monitoring plan shall be proposed in the Contractor's ESHS Management Plan and must be approved by the Engineer before commencement of the monitoring. If the monitoring results are more than baseline and standards, cause analyses and necessary counter measures shall beproposed to the Engineer in the monitoring reports;

6.4.4 **Parameters, Location and Frequency of the Monitoring:** Environmental Monitoring parameters, locations and frequency is given in following table.

Parameters, Standards, Location and Frequency of Monitoring

Parameters	Sampling Standards	Location	Frequency
Air (PM_{10}, $PM_{2.5}$)	CPCB (2011) Guidelines for the Measurement of Ambient Air Pollutants, Manual Sampling & Analyses	One representative location within each construction yard and batching plant	Monthly
		Closest residential or commercial area (one location) within 100m from each active construction site or representative locations approved by theEngineer.	Monthly
		$PM_{2.5}$ In Tunnel portion	Bi-weekly
Noise Day Time (6 AM – 10PM) L_{max}, L_{min}, L_{eq}, L_{10}, L_{90}, L_{50}	CPCB (2015) Protocol for Ambient Level Noise Monitoring	One representative location within each construction yard and batching plant	Weekly

Parameters	Sampling Standards	Location	Frequency
Night Time (10PM – 6AM) L_{max}, L_{min}, L_{eq}, L_{10}, L_{90},L_{50}		Closest residential or commercial area (one location) within 100m from each active construction site or representative locations approved by the Engineer.	Weekly
Vibration (in mm/s orVdB)	IS 14884 (2000)	During complaints or as directed by employer.	
Drinking/GW (pH, Total Alkalinity, Electrical Conductivity, Total Dissolved Solids, Fluoride, Arsenic, Nitrate, Iron, Lead, Cadmium, E-coli)	IS 3025 (2008) & IS 10500 (2012)	**Drinking water**: construction yard, batching plant andlabour camps	Quarterly (April, July, October, January)
		Groundwater: one representative tube/bore well in the adjacent residential area or within 100m from each active construction site	Quarterly (April, July, October, January)
Surface Water pH, Total Dissolved Solids, Fluoride, Arsenic, Iron, Lead, E-coli	IS 3025 (2008) & IS 2296 (1982) & CPCB (2012) Guide Manual Water and Wastewater Analysis	Upstream and downstream of the river/stream if any. Any natural water course (ex. Pond etc.) located or within 100 m of each a) construction yard, b) labour camp, and c) active construction site	Quarterly (April, July, October, January)
Waste	Not available but fully complying with monitoring the quantities of wastes specified by the Solid Management Rules 2016 & the Construction and Demolition Waste Management Rules2016	Each construction yard and construction site	Quarterly (April, July, October, January)

Parameters	Sampling Standards	Location	Frequency
Hazardous waste	Not available but typed reporting (not handwriting) fully complying with monitoring the quantities of wastes specified by the Hazardous and Other Wastes (Managementand Transboundary Movement) Rules2016,	Each construction yard and active construction site	Quarterly (April, July, October, January)
Complaints if any		All Works' related locations	Weekly

6.5 Complaint Response Process

6.5.1 Enquiries, complaints and requests for information can be expected from a wide range of individuals and organisations both private and government. Most complaints are likely to be received by HRIDC, although the site offices are also likely to be contacted;

6.5.2 The objective of complaint process is to ensure that public and agency complaints are addressed and resolved consistently and expeditiously;

6.5.3 The Contractor's Project Manager will be notified immediately on receipt of complaint that may relate to environmental impacts. The Project Manager will immediately inform the Engineer;

6.5.4 Field investigation shall determine whether the complaint has merit, and if so, action shall be taken to address the complaint;

6.5.5 The outcome of the investigation and the action taken shall be documented on a complaint Performa prepared by the Contractor and submitted for notice by the Engineer in advance of the works;

6.5.6 Where possible, a formal response to each complaint received shall be prepared by the Contractor within seven days to notify the concerned person(s) that action has been taken.

6.6 Social Legal Requirement

6.6.1 The Contractor shall always comply with all relevant national and state legislations regarding social safeguard including but not necessarily limited to, the following with their latest amendments.

a) National Policy for the Empowerment of Women, 2001;

b) The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013;

c) The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Rules, 2013;

d) The Protection of Children from Sexual Offences Act, 2012;

e) The Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (Prevention and Control) Act, 2017;

f) Child Labour (Prohibition & Regulation) Act 1986

Some of the key International instruments for the protection of women include the following:

a) United Nations General Assembly, Resolution 52/86 on Crime Prevention and Criminal

Justice Measures to Eliminate Violence Against Women, 2 February1998;

b) United Nations Security Council Resolution 1325 on Women, Peace and Security, 31 October 2000;

c) Environmental and Social Framework (ESF) of Asian Infrastructure Investment Bank (AIIB) February 2016

6.7 Gender equality

6.7.1 The Contractor is responsible for providing equal opportunities to both genders and end gender related discrimination, if any. The ESHS Committee will proactively identify cases of gender discrimination with key focus on the following topics:

a) Gender based violence, including sexual harassment at the workplace;

b) Disparity in benefits provided;

c) Termination on account of pregnancy.

6.7.2 The Contractor shall enhance female workforce participation and maintain sex -disaggregated data for periodic reporting.

6.7.3 The Contractor shall ensure that women workers are paid at par with male workers

6.7.4 If women workers are deployed at site then day crèche facilities shall be provided to facilitate the women with infant working on site.

6.8 Labour Requirements

6.8.1 The contractor shall use unskilled labour drawn from local communities to avoid any additional stress on the existing facilities (medical services, power, water supply etc.)

6.8.2 The recruitment of women and members of vulnerable groups shall be prioritized.

6.8.3 The Contractor shall provide training to build the skills of locally recruited labour.

6.8.4 All staff, skilled and unskilled labours employed on a site shall be required to sign Code of Conduct that shall ensure compliance with the ESHS provision (Refer 6.11).

6.9 Cultural and Religious Issues

6.9.1 Disturbance from construction works to the cultural and religious sites, and Contractors lack of knowledge on cultural issues cause social disturbances. The Contractor shall

a) Communicate to the public through community consultation, informing the peers and newspaper announcements regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction;

b) Not block access to cultural and religious sites and sites of importance for livelihood activities, wherever possible;

c) Need to take mitigation measures while working near religious place/ educational institutions close to the construction sites;

d) Provide freedom to construction workers to observe their cultural and religious practices;

e) Monitor and be responsible for the behaviour of construction workers especially migrant workers towards the community. The workers must be debriefed well regarding local aspects and need to follow good behaviours, and informed regarding unexpected behaviours at the time of employing;

f) Provision of cultural sensitization training for migrant labours regarding engagement with local community;

g) Resolve cultural issues in consultation with local leaders and Project Manager;

h) Establish a mechanism that allows local people to raise grievances (directly and indirectly) arising from the construction process;

i) Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to maintain effective surveillance over public health, social and security matters.

6.10 Guidelines for Addressing GBV in Projects

6.10.1 The Contractor's ESHS Plan shall include implementation of Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) Prevention and Response Action Plan. This action plan shall describe Code of Conduct (CoC), mechanism to address such incidents, assess the project scenario and potential risks of GBV/SEA/SH, training plan for workers on GBV/SEA/SH and awareness programme amongst workers regarding socially, culturally appropriate behaviour that would ensure that the project community and women in particular are safe, secured, and not vulnerable to abuse. A sample GVB/SEA/SH action plan is given in Table below.

Table - GBV/SEA/SH Prevention Action Plan

Objective	Activity	Responsibility
Assess Potential Riskof GBV	Rapid assessment of worksite, project footprint (e.g. community structure, local self-governance, national regulations, history of incidence), type of workers (local or migrant) for possible GBV risk.	As part of the social impact assessment (to be updated at the time of construction).
Inclusive development	• Engage women in project planning and implementation • Incorporate women's feedback in project designand construction schedule • Organize systematic consultations with women to ensure continuous feedback on projects and identify any gender- sensitive adverse impacts	
Training – women	• Sensitization of women on GBV and women's rights to avoid/avert such incidents • Sensitization of women on actions to be taken in case of GBV	
Training – men	• Sensitization of maleworkers on GBV and women's rights to avoid/avert such incidents. • Sensitization of maleworkers on actions to be taken in case of GBV • Sensitization of male workers on appropriate socially and culturally acceptable behaviour towards women • Training of managers on methods of	

Objective	Activity	Responsibility
	dealing with cases of GBV.	
Awareness generation	• Distribution of leaflets propagating gender-appropriate behaviour. • Signing of self-declaration format on commitment towards gender-sensitive behaviour. • Awareness raising programme to the local communities on GBV/SEA,HIV/AIDS,COVID-19 and Human Trafficking.	

6.10.2 The Contractor shall constitute an appropriate Grievance Redress Mechanism (GRM) for addressing grievances at worksite. Grievances of workers will be first brought to the attention of supervisor at site. Grievances not redressed by the supervisor within 7 days will be brought to the Grievance Redress Committee (GRC). The composition of GRC will have representatives from workers, women representative, ESHS staff of the Contractor ESHS staff of GC. The main responsibilities of the GRC are to: (i) provide support to workers on problems arising at worksite, (ii) record workers grievances, categorise, prioritize grievances and resolve them, (iii) immediately inform the Engineer of serious cases and (iv) report to workers on development regarding their grievances and decisions of GRC. The panel of the GRC will function without any prejudice or fear of retaliation. The well-being of the panel members will be protected by HRIDC. The GRC will redress the grievances within 14 days. The Contractor shall provide grievance box at Project Site Office.

6.10.3 This project has zero tolerance of any form of:

a) **Gender-based violence (GBV)**, that is perpetrated against a person's will and that is based on socially ascribed gender-related differences between people.

b) **Sexual exploitation and abuse (SEA**) which is attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.

c) **Sexual harassment (SH**) which is unwelcome sexual advances, requests for sexualfavors, and other unwanted verbal or physical conduct of a sexual nature.

6.10.4 Any incidence of GBV, SEA or SH should be reported to the Grievance Redress Committee (GRC). The panel of the GRC should take appropriate gender-sensitive actions to verify authenticity of the incident with due consideration to the safety, security, and dignity of the offended person. The investigation should be concluded within three days of receiving the report or as reasonably possible. Depending on the severity of the incident, the panel may report the case to appropriate authorities.

Following the investigation, the GRC shall recommend appropriate actions to the company which may include but not limited to:

a) Informal warning

b) Formal warning

c) Additional training

d) Loss of up to one week's salary

e) Suspension of employment (without payment of salary), for a minimum period of one month up to a maximum of six months

f) Termination of employment

6.10.5 The affected person will be provided with appropriate support (e.g. psychological counselling, medical support and any other support as needed).

6.10.6 A self-declaration format for adherence to gender-sensitive behaviour should be signed by all contractors, subcontractors, employees, and senior managers, engaged by the Project to avoid GBV/SEA/SH at worksite. A self-declaration format is given in below:

6.10.7 **Commitment Statement for all Project Workers**

(to be translated into local language or explained in a manner that is appropriate for general understanding of the signee)

I, (name of person), acknowledge that preventing Gender-Based Violence (GBV), Sexual exploitation and abuse (SEA) and Sexual harassment (SH) is essential, and that preventing it is my responsibility. At [Company], GBV activities constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment. All forms of GBV are unacceptable, be it on the worksite, the worksite surroundings, at workers' camps, or in the community. Prosecution of those who commit GBV may be pursued if appropriate.

I agree that while working on the [Project], I will:

- Cooperate with any relevant investigations.
- Treat women, children (definition of "child" shall be as specified in Child Labour (Prohibition and Regulation) Act, 1986) and men with respect regardless of race; color; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status.
- Not use language or behaviour towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
- Not request or engage in sexual favors - for instance, making promises or favorable treatment dependent on sexual acts, in or outside the work site.
- Refrain from abusive and violent behaviour, in the workplace, labor camp or surrounding communities.
- Attend and actively partake in training courses related to HIV/AIDS, GBV, SEA and SH as requested by my employer.
- Report through the grievance redress mechanism or to my manager any suspected or actual GBV by a fellow worker, whether in my company or not, or any breaches of this Code of Conduct.

[Company] recognizes that false accusations of sexual harassment can have serious effects on innocent persons. If, after the investigation, it is found that the complainant has maliciously or recklessly made a false accusation, the complainant will be subject to appropriate sanctions. In such a case, the company will also take appropriate action to restore the reputation of the accused.

I understand that it is my responsibility to use common sense and avoid actions or behaviours

that could be construed as GBV or breach this Self-declaration format. I do hereby acknowledge that I have read the foregoing Self-declaration format, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to GBV. I understand that any action inconsistent with this Self-declaration format or failure to act, as mandated by this Self-declaration format may result in disciplinary action and may affect my ongoing employment.

I have familiarized myself with the contents of this Self-declaration format. By my signature below, I acknowledge, understand, accept and agree to comply with the information contained in

the Self-declaration format provided to me.

I hereby confirm I have read and understand the Self-declaration format.
Name (Employee)

Signature
Date

6.11 Code of Conduct for Contractor's Workers

6.11.1 The Contractor shall have a Code of Conduct for the Contractor's Personnel. The Contractor shall ensure that each Contractor's Personnel is provided a copy of this Code of Conduct, written in a language comprehensible to that person, and shall seek to obtain that person's signature acknowledging receipt of the same. Reference code of conduct is place below:.

Code of Conduct for Contractor's Workers

We are the Contractor, [*enter name of Contractor*]. We have signed a contract with [*enter name of Employer*] for [*enter description of the Works*]. These Works will be carried out at [*enter the Site and other locations where the Works will be carried out*]. Our contract requires us to implement measures to address environmental and social risks related to the Works, including the risks of sexual exploitation and abuse and gender-based violence.

This Code of Conduct is part of the measures to deal with environmental and social risks involving the workers, related to the labor camps and the workplace. It applies to all our staff, laborers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "**Contractor's Personnel"** and are subject to this Code of Conduct.

This Code of Conduct identifies the conduct that is required from all Contractor's Personnel.

Our workplace is an environment where unsafe, offensive, abusive, or violent behavior will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

Contractor's Personnel shall:

1. Make earnest efforts to understand his/her responsibilities detailed in this Code of Conduct and any other documents and training, as directed by the Employer. Proactive seek clarifications to enable work to be undertaken in strict compliance with this Code of Conduct.
2. Carry out his/her duties competently and diligently.
3. Comply with this Code of Conduct and all applicable laws, regulations, and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Workers and any other person.
4. Maintain a safe working environment including by:
    a. ensuring that workplaces, machinery, equipment, and processes under each person's control are safe and without risk to health.
    b. wearing required personal protective equipment.

   c. all works are conducted with safety clearance and under appropriate supervision.
   d. using appropriate measures relating to chemical, physical, and biological substances and agents.
   e. following applicable emergency operating procedures.
   f. providing separate, safe, and easily accessible working and accommodation facilities for women and men working on the site.
5. Report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health.
6. Treat other people with respect, and not discriminate against specific groups such as women, gays, people with disabilities, migrant workers, or children.
7. Not engage in sexual harassment which includes unwelcome sexual advances, requests for sexual favors, and other unwanted verbal or physical conduct of a sexual nature.
8. When engaging with the community and/or project affected persons, this should be done professionally and with utmost respect. Intimidation, threats, and coercive behavior will not be tolerated.
9. Not engage in sexual exploitation and abuse, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.
10. Not engage in sexual assault, which means any form of non-consensual sexual contact.
11. Not engage in any form of sexual activity with individuals under the age of 18.
12. Not make any inappropriate and unwanted sexual advances to people in the adjoining communities or settlements.
13. Not work or be present in the worksite(s) under the influence of any intoxicating substances, such as alcohol or drugs.
14. Not possess alcohol or any other intoxicating substances while on duty or in the labor camps.
15. Return to the labor camp no later than 22:00, unless working on night shift.
16. Complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, Gender-based violence (GBV), Sexual Exploitation, Abuse and Harassment (SEAH).
17. Report violations of this Code of Conduct.
18. Not retaliate against any person who reports violations of this Code of Conduct, whether to AIIB or the Employer, or who makes use of the grievance mechanism for Contractor's Workers or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behavior that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact [*enter name of the Contractor's Social Expert*] in writing at this address [X] or by telephone at [X] or in person at [X]; or
2. Call [X] to reach the Contractor's hotline *(if any)* and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due

and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in [X] language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [*enter name of Contractor's contact person with relevant experience in handling gender-based violence*] requesting an explanation.

Name of Contractor's Personnel: [insert name]
Signature: _____
Date: (day month year): _____

Countersignature of authorized representative of the Contractor: [insert name]
Signature: _____
Date: (day month year): _____

7.0 FINANCIAL DEDUCTION/WITHHOLDING

7.1 Financial deductions from Contractor on occurrences of an incident.

7.1.1 Table No. 1 below indicates ESHS incidents and the corresponding deductions to be made from the Contractor under Sub-Clauses 20.1 [Employer's Claims], Sub-Clauses 14.3 [Application for Interim Payment], Sub-Clauses 14.6 [Issue of Interim Payment Certificates] and Sub-Clauses 14.7 [Payment] of the General Conditions of Contract.

7.1.2 The affected part of the Works shall remain suspended until all necessary investigations are completed as prescribed in Clause 2. [ESHS Management], Sub-Clause 2.15 Accident Report and Investigation and as per the related local laws of the state.

7.1.3 Upon submission of the Contractor's Request for Inspection (RFI), a joint inspection of the affected part of the Works shall be carried out by the Engineer and the Contractor. On receipt of the Engineer's Consent (Notice of No Objection: NONO), the Contractor may resume the work.

7.1.4 The Contractor shall not be entitled to any extension of time or to the payment of any cost or profit due to any suspension in accordance with this Sub-Clause 8.5 [Extension of time for Completion]

7.1.5 The maximum amount of delay damages set out in Sub-Clause 8.8 [Delay Damages] of the General Conditions of Contract shall not be applicable where the cause of delay to completion is suspension of part of the Works due to the Contractor's non-compliance as described in this clause 7.1.

7.1.6 The Engineer may issue a notice to the Contractor in accordance with Sub-Clause 3.5 [Engineer's Instruction] of the General Conditions of Contract to rectify any unsafe act or condition (including but not limited to error, default, or omission) upon discovery of same on the Site by the Engineer, in a form of Nonconformity Report.

7.1.7 The Contractor shall promptly comply with such notification, investigate the noncompliance of the Condition of Contract on ESHS and Project ESHS Manual as soon as possible (but no later than 7 days, or within such other period from receipt of the Engineer's notification as may be approved by the Engineer), submit to the Engineer for review full details of the proposed correction, prevention and any other measures (hereinafter referred to as the "measures") to be taken by the Contractor to rectify and close-out the matter and to prevent re-occurrence. Such measures shall be to the satisfaction of the Engineer.

7.1.8 The Contractor shall not proceed with the affected works until its measures are accepted by the Engineer.

Table No. 1: Incidents

Sl. No.	Incident		Financial deductions from the Contractor in Indian Rupees
1.	Injury and Incidence reporting	i) Fatal accidents	i) Rs.100,000 for the first fatality and Rs.200,000 for every subsequent fatality.
		ii) Injury accident	ii) Rs.50,000 for first grievously injured person and Rs.75,000 for every subsequent grievously injured person (Grievous Injury as defined by Workmen's Compensation Act)

8.0 ATTACHMENT

Attachment -1 Contents of ESHS Management Plan

1.0 General

1.1 The Contractor shall prepare an Environment, Social, Health and Safety (ESHS) Management Plan, which provides measures to protect the Environment, Health and Safety of workers and the public.

1.2 The Contractor's ESHS Management Plan shall be based on Environment, Social, Health and Safety considerations submitted with the Tender and shall have the content shown in the following section [Contents of ESHS Management Plan].

1.3 The Contractor shall submit his ESHS Management Plan for review by the Engineer within 28 days after the Commencement Date and shall amend the ESHS Management Plan to address any comments made by the Engineer and submit a Final ESHS Management Plan within 14 days of receipt of comments.

1.4 The Final ESHS Management Plan shall be binding on the Contractor for the duration of the Contract.

2.0 Content of ESHS Management Plan

2.1 The Contractor's ESHS Management Plan shall cover the following aspects:

Site ESHS Management Plan	
Contract No.	
Contractor Name	
Project Name	
1	Project Highlights i) Title of the content; ii) Contract number; iii) Brief scope of work; iv) Location map/key plan; v) Period of the project;
2	ESHS Management Policy
3	Site organization chart Chart indicating reporting of ESHS Management personnel, appointment, duties, and responsibilities
4	Roles &responsibility Individual responsibility of the i) The Contractor's representative ii) Health & Safety Expert/manager iii) Environment Expert/manger

	iv) Social expert v) Construction manager vi) ESHS Committee members vii) ESHS Engineer viii) Site Engineer ix) Bridge Engineer x) Construction Supervisors xi) Subcontractors
5	ESHS Site Committee i) Details - Chairman, secretary, members, and employer's representative ii) Procedures for effective conduct of meeting
6	ESHS Training
7	Subcontractor Evaluation, Selection, Control and ESHS Code of Conduct
8	ESHS Inspection and audit
10	Accident, Incident, Near miss, Dangerous occurrence, investigation reporting procedures
11	First Aid, Occupational Health and Emergencies measures
12	Staff and labour welfare measures
13	Hazards and Risks with Risk assessment and mitigation procedures
14	Safe Work Procedures e.g. i) Excavation ii) Structural steel erection iii) Form works iv) Concrete placement v) Work at height vi) Switch-over works vii) Floor, wall openings and stairways viii) Welding, cutting and bracing ix) Lifting appliances x) Electrical equipment xi) Mechanical equipment xii) Fire prevention xiii) Hazardous chemicals and solvent

	xiv) Lighting xv) Abrasive blasting xvi) Launching operation/girder erection.
15	Work permit system
16	List of standard job specific PPEs to be used in the site
17	Maintenance of regime for construction equipment and machinery
18	Traffic management plan
19	Housekeeping
20	i) Environmental and Social Management ii) Applicable National and State legislation and regulations iii) Specific procedures for achieving environmental and social performance requirements as given in the Employer's requirements on Environment. iv) Details on air monitoring and noise monitoring control plan which details mitigation measures / corrective action / preventive action and monitoring schedule. v) The ESHS Management Plan must contain procedures on prevention and control of water pollution, storage, handling and disposal of waste, including municipal, C&D, plastic, bio-medical, chemical and hazardous wastes, reuse/recycle of waste, selling to authorised recyclers and records thereof, preservation of landscape disturbed due to construction, housekeeping/Environmental sanitation and traffic management as required under the contract. vi) Procedures for recording environmental complaints and response process. vii) Waste Management Plan viii) HIV Prevention and Control Plan ix) Gender Based Violence (GBV) and sexual Exploitation and Abuse (SEA) Prevention and Response Plan x) COVID-19 Response and Management Plan xi) Labour Camp Management Plan
21	Emergency Response plan
22	Visitors and security arrangement
23	ESHS promotion and awareness;
24	ESHS equipment and ESHS of the Contractor's construction and office equipment;

Note: -The Environment, Social, Health and Safety (ESHS) Management Plan shall be incorporated in the relevant sections.

Attachment -2 Workplace Policy (on HIV/AIDS Prevention & Control)

Haryana Rail Infrastructure Development Corporation Limited (HRIDC) recognizes HIV/AIDS as a developmental challenge and realizes the need to respond to it by implementing regular HIV/AIDS prevention programmes and creating a non- discriminatory work environment for HIV infected workmen engaged by Contractors. For the purpose of making conscientious, sensitive and compassionate decision in addressing the realities of HIV/AIDS, HRIDC has established these guidelines based on ILO code of practice on HIV/AIDS.

- Creating awareness through professional agency using IEC (Information, Education and Communication) package specially designed for migrant workers.
- Institutional capacity building by training the project implementation team, Environmental, Social, Health & Safety (ESHS) Managers, establishing linkages for deficient diagnosis and treatment of the affected workers, effective monitoring of implementation and documentation for further learning.
- Establishing peer educators by selecting them in consultation with Contractors and training them through professional agencies so that they become focal point for any information, education and awareness campaigns among the workmen throughout the contract period.
- Promotion of social marketing of condom

Attachment -3 Workplace Policy on COVID-19 Prevention and Control

It is likely that Corona virus Disease 2019 (COVID-19) will continue to occur in the community in the foreseeable future. It is therefore necessary to have a plan/policy in place to prevent the spread of this virus within the workplace. In order to reduce the risk of infection, Haryana Rail Infrastructure Development Corporation Limited (HRIDC) recommends to the Contractor to consider the following measures:

a) The Contractor shall ensure that the latest guidelines issued by Ministry of Health and Family Welfare (MoHFW), local government and the district administration are strictly followed at the construction works site.

b) On day 0, before resuming the work on sites post lockdown period, mandatory medical check-up will be arranged for all workers.

c) Only medically fit workers will be deployed at site and medical assistance will be arranged for unfit workers.

d) A unique photo identity card with serial number will be issued to all the workers and their family members staying at site.

e) All the essential items will be made available to them at site only. Mandatorily wear face masks while working on site or going outside.

f) No outside worker will be allowed to stay at site without following proper procedure and instructions.

g) The workers staying outside (which are always nearby) shall reach the site either by walking or by their individual mode of transport (bicycle, two-wheeler etc.).

h) During attendance, training and other sessions, social distancing guidelines will be followed along with provision of no-touch attendance.

i) All workers may be advised to take care of their own health and look out for respiratory symptoms/fever and, if feeling unwell, shall leave the workplace immediately after informing their reporting officers.

j) Workers shall not shake hands when greeting others and while working on the site.

k) Avoid large gatherings or meetings. Maintain at least 1 metre (3 feet) distance from persons, especially with those having flu-like symptoms, during interaction.

l) Workers shall clean hands frequently by washing them with soap and water for at least 40 seconds.

m) Workers shall not share their belongings like food, water bottles, utensils, mobile phones etc. with others.

n) The utensils shall be washed properly post use at designated places.

o) Post work, workers shall change their clothes before leaving the site and clothing shall not be shook out.

p) Avoid touching your eyes, nose, or mouth with unwashed hands.

Attachment -4 Reference for ESHS Activities

General Instruction: ESHS/GI/001

Topics for ESHS Orientation Trainings for Workmen for First Day at Work

1) **Hazard Identification Procedure**

Hazards on site:

- Working at Height, Electricity, lifting work, Work close to railway tracks or roads, Construction machinery and Safety of nearby located structures.

2) **Personal Protective Equipment**

- What is available?
- How to obtain it?
- Correct use and care.

3) **Health**

- Site welfare facilities;
- Potential health hazards;
- First Aid/Cardiopulmonary Resuscitation (CPR). /Automated External defibrillator (AED).

4) **Duties of the Contractor**

- Brief outline of the responsibilities of the Contractor by law;
- Details of the Contractor's ESHS Policy;
- The Employer ESHS Management Manual (if any);
- Building and other Constructions Welfare Law.

5) **Employee's Duties**

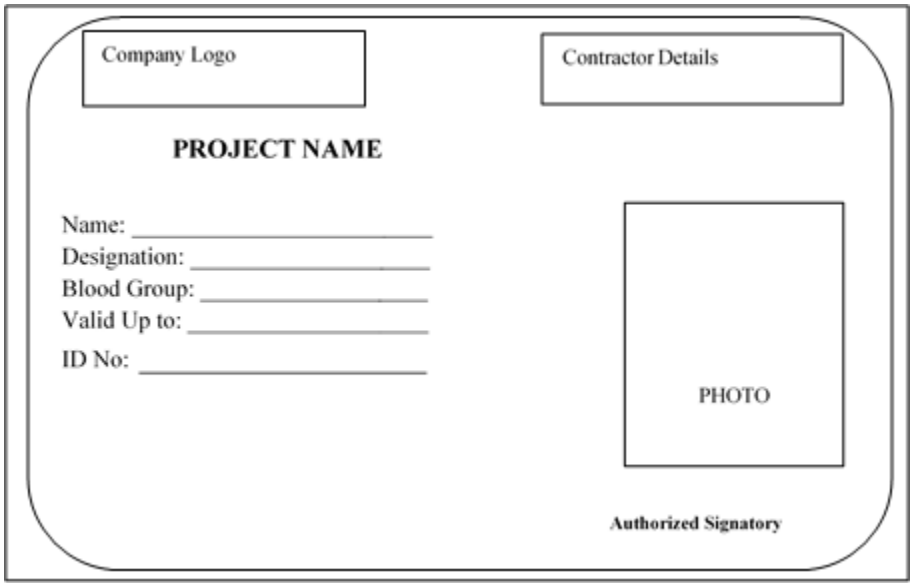
- Brief outline of responsibilities of employee under law

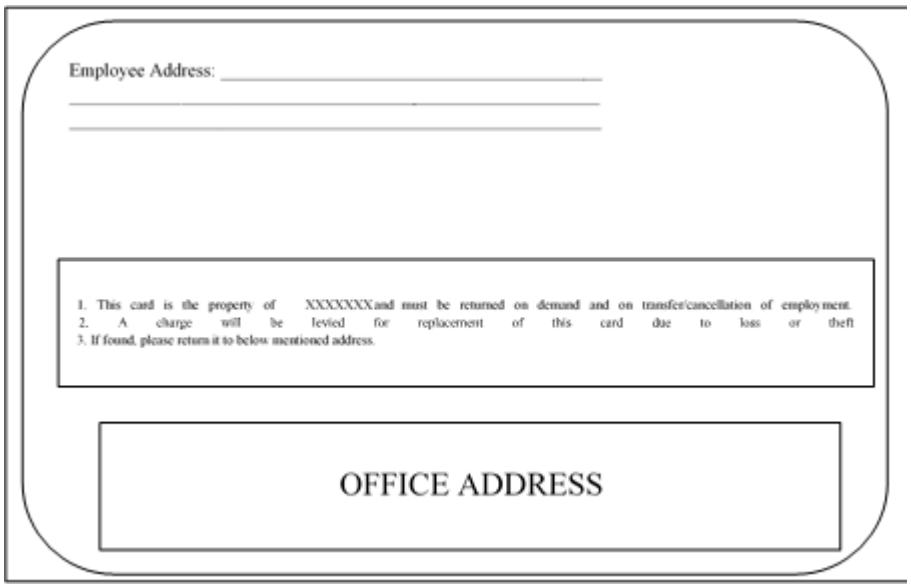
6) **Environment And Social**

- Contractor's Environment Policy
- Key legal requirements
- Avoidance of Nuisance
- Environmental Sanitation
- Dust Control Measures
- Water Pollution and Control
- Occupational noise mitigation
- Waste Management and Disposal
- Gender Based Violence and Sexual Exploitation and abuse (GBV/SEA)
- HIV/AIDS prevention
- Grievance Redressal Mechanism for GBV/SEA

General Instruction: ESHS/GI/002

ID CARD FORMAT (85 mm x 55mm) FRONT SIDE OF ID CARD:





General Instruction: ESHS/GI/003

WEEK/DAYS TO BE OBSERVED FOR CREATING ESHS AWARENESS

1st Monday to Sunday of January	Road Safety Week (Subjected to confirmation from Ministry of Road Transport, Govt. of India every year.)
16th February	Kyoto Protocol Day
March	Red Cross Month
4th March	National Safety Day
8th March	International Women's Day
22ndMarch	World Water Day
7th April	World Health Day
14th April	Fire Safety Day
18th to 22nd April	Earth Week
20th April	Earth Day
20th April	Noise Awareness Day
28th April	ILO World Day for Safety and Health at Work Day
1st to 7th May	Emergency Preparedness Week
5th June	World Environmental Day
12th June	World Day against Child Labours
21st June	World Yoga Day
9th July	Occupational Health Day
17th October	World Trauma Day
1st December	World AIDS Day

General Instruction: ESHS/GI/004

Minimum Requirements of ESHS Communication Posters/Signage/Video:

a) Every Contractor shall prepare a ESHS Communication Plan as a part of site specific ESHS Management Plan and shall include the following minimum requirement of Posters/Signage/Video as applicable. In case readymade posters are available in any of the category from National Safety Council or any other safety related organizations they may procure the same and display it. In case the same is not available, then the Contractors shall make necessary arrangements to get the posters designed and printed on their own. All posters shall each be in Hindi, English and the regional language; and

b) All the above is to be detailed in the Contractor's ESHS Management Plan and he shall obtain the Engineer's prior consent for the numbers, contents, locations, etc.

Table No.: 1 - Minimum No. of Posters

Sl. No	ESHS Poster Title	No. of Posters/Signages
1.	Daily Safety Oath	5
2. a)	Signage to display the messages like PPE ZONE,NO PPE ZONE, HARD HAT AREA etc.	5
b)	Helmet	5
c)	Shoe	5
d)	Goggles & Ear Protection	5
e)	Full Body Harness	5
f)	Hi-Vi Jacket	5
3.	Working at Heights	5
a)	Ladder, Stairway, Scaffold -Signage to display the messages like SAFE, UNSAFE, FIT FOR USE, AVOID USE etc.	5
4.	Site Electricity	5
5.	Crane Safety	5
6.	Rigging Procedures	5
7.	Excavation	5

7.	Occupational Health (Mosquito Control, HIV/AIDS awareness, DustControl, Noise Control, No Smoking/Spitting, etc.)	5
8.	First – Aid	5
9.	Labour Welfare Measures (Payment of Minimum Wages, Avoidance of Child labour, signing in the MusterRoll, in case of accidents- what to do? Etc.	5
10.	Traffic Safety (Speed limit, safe crossingand working within barricaded area etc.)	5
11.	Environmental Management	5

Note: The above minimum numbers are for guidance only. The actual number, material of posters/signages will be as per project specific requirement.

Table No.: 2 – Size of Posters/Signage

Sl. No	Item	Size
1.	Posters – Standard	17"x22" –135 GSM 4 Colour Printing
2.	Posters – Special (Wherever required)	17"x22" card laminated FA Poster
3.	Posters - Mega size (Wherever required)	32"x40" Flex FA Poster
4.	First-Aid Booklet	6"x4"
5.	Safety Handbook	6"x4"
6.	Signage	Small: 12"x6" Big: 24"x12"
7.	Road Traffic Sign Boards	Strictly as per Indian Road Congress (IRC) specifications

Table No.: 3 – Safety Signage Colour (as per IS: 9457)

Sl. No	Type of signage	Colour
1	Mandatory	Blue
2	Danger	Yellow
3	Prohibitory	Red
4	Safe conditions	Green

Attachment -5 Safe Work Procedure for Work Near Railway Track

1.0 Safety precautions and measures to be observed during execution of ROB/ RUB/ Viaduct/ any other works in Railway and adjoining areas:

1.1 The Contractor(s) shall not allow any road vehicle belonging to him or his suppliers, etc. to ply in HRIDC/railway land next to the running line. If for execution of certain works viz. earthwork for parallel railway line and supply of ballast for new or existing rail line gauge conversion, etc. road vehicles are necessary to be used in railway/HRIDC land next to the railway line, the Contractor(s) shall apply to the Engineer-in-Charge for permission giving the type and number of individual vehicles, names and license particulars of the drivers, location, duration and timings for such work/movement. The Engineer-in-Charge or his authorized representative will personally counsel, examine and certify the road vehicle drivers, Contractor(s)' flagmen and supervisors and will give written permission giving names of road vehicle drivers, Contractor(s)' flagmen and supervisors to be deployed on the work, location, period and timing of the work. This permission will be subject to be following obligatory conditions:

1.2 **Construction Activities and Safety:**

a) The 'Methodology of Working' shall be incorporated in GAD and Temporary Arrangement Drawings.

b) The activities of work to be taken up during the railway traffic block/under speedrestriction, etc. should be clearly mentioned in such drawings. If at any stage of execution, any discrepancy is found in the drawing with respect to the site condition affecting safety or some new activity of work is required to be done, the same should be brought to the notice of Railway & HRIDC Engineers and such works should be done only after approval by Railways & HRIDC representative. In such cases, the scheme may be modified and, if required, fresh CRS sanction shall have to be obtained.

1.2.1 The works required to be done under traffic block protection are to be carried out only in the presence of Railway & HRIDC Engineering Officials. The Railway's and HRIDC's Supervisor has to certify safe conditions for passage of trains before resumption of traffic. The works to be done under traffic shall be carried out under the provision of banner flag and protection by Engineering Flagman.

1.2.2 Following important activities of works shall be carried out under supervision of Railway/HRIDC Engineer or his nominated Supervisor:

a) Excavation at foundation/ground level near to railway track

b) Concrete casting and/or masonry work very close to railway track

c) Erection of temporary structures near to running lines.

d) Casting of structures like girder/slab over railway track

e) Stage-prestressing of girders when placed across railway tracks properly supported

f) Launching of precast/pre-assembled girders across railway tracks

g) Any work of lifting, side shifting and slewing of girders over the railway track

h) Dismantling of temporary structures, shuttering, scaffolding, etc. adjacent to and above the railway track. For carrying out activities of casting, erection, launching, handling, and dismantling as listed above, the Contractor's Engineer shall furnish the Construction Programme in advance to HRIDC Supervising Engineer & Engineer representative. No such work should be taken up in the absence of the HRIDC Supervising Engineer & Engineer representative. For the activities which are to be done in presence of the HRIDC Engineer and prior intimation shall be given in writing and acknowledgement obtained from HRIDC's representative.

1.2.3 To ensure 'Safety' during construction activities, HRIDC Site Engineer & Engineer representative may direct the Contractor's Supervisor/Engineer or their nominated representative for safe working procedures/ instructions, notwithstanding the contractual or MOU conditions prevailing between/ among Railways/other Departments like NHAI/Contractors/ Concessionaire.

1.2.4 All the records of Quality Assurance/Quality Control, testing of the materials and satisfactory completion of an activity shall be maintained at site by the Contractor's Engineer and Supervisor. On the basis of these records, HRIDC Site Engineer shall do stage-wise clearance of the works at following stages:

i) Completion of foundation

ii) Completion of substructure

iii) Completion of superstructure

Without such stage clearance, the work in the next stage of construction shall not be allowed bythe HRIDC Supervisor, unless proper system of check and exercise is followed at the site.

1.2.5 Normally, the high beam PSC girders are designed with wider top flange and shorter bottom flange with very high beam which makes the girder unsuitable during lowering, slewing and launching time.

1.2.6 During launching of girders and subsequent adjustments for placement of bearing, special attention and precautions are required at site to be followed rigorously without resorting to shortcut practice or leaving the work at site to untrained or inexperienced Engineers. Normally, end diaphragms are not cast for the extreme both side girders. These shall be cast minimum 300mm on both sides for all 'I' beam girders to provide temporary supports for ensuring stability.

"OR"

For side adjustments and bearing placements below 'I' section girders, end brackets made of steel angles should be provided for all 'I' beams sequentially to avoid side titling of individual girders. End brackets shall be removed only after placing girders on bearing and casting of diaphragms.

1.2.7 During lowering, the jacks shall be operated duly keeping wooden packing of various thicknesses fixing the amount of lowering to the barest minimum, so that even if the jack fails, the wooden packing will take load and further stability of girder is not endangered.

1.2.8 Temporary crib support staging shall be interlaced with clamps and angles. Adequate base width shall be maintained proportionate to the height of stage, which is very essential for avoiding the oblong effect during launching of girders. During launching by RH girder method, the movement of the PSC girders shall be controlled both from front and rear with sync mechanism having simultaneous operation, so that the speed of the launching is always under control. Spare hydraulic jacks shall always be kept at site. Lowering of girder shall always be carried out at one end only. Further, the other end should be adequately secured by wire ropes, end brackets, etc. Thereafter, the process shall be continued alternately.

1.2.9 As far as possible, launching of girders by temporary staging shall be avoided and launching by heavy capacity cranes, wherever feasible, shall be adopted.

1.2.10 Steel girder launcher if used for launching of PSC girders should be pre-tested for the critical loading (likely to be encountered during actual launching) before deployment on the approaches regarding its strength as well as amount of permissible deflection using actual test PSC girder as a testing load. Connections at supports shall be inspected and

certified prior to actual launching. It shall be adequately secured to the base support system on the pier cap.

1.3 General Construction Safety:

1.3.1 General safety precautions as applicable for civil works shall be adopted in field.

1.3.2 Working near running line: Safe practices at site and at all times non-infringement to moving trains shall be ensured. Road vehicles, material trolleys, dollies with any tendency to roll off towards the running lines to be checked by providing chains, locking arrangements, blocks, etc. shall be ensured and the Site-in-Charge of the Contractor shall be primarily responsible, secondary responsibility being of Contractor's Consultant.

1.3.3 Testing of cranes, lifting jacks and other equipment: All equipment like cranes, lifting jacks shall be tested, duly calibrated and certified prior to use at the construction site.

1.3.4 Routine safety checks, validity of test certificates for load bearing equipment especially for cranes outsourced from third party shall be ensured prior to deployment.

1.3.5 Construction workers at site shall be provided with personal safety gear like reflective vest, helmet, Safety shoes, gloves & eyewear approved as per construction industry standards. For persons working at pier top/girder level, temporary supports, hand railing, protection with help of ropes, slings and temporary railings shall be provided.

2.0 **Safety Guidelines and Precautions for working close to Railway tracks.**

2.1 A large number of men and machinery are deployed by the contractors for track renewals, gauge conversions, doublings, bridge rebuilding etc. It is therefore essential that adequate safety measures are taken for the safety of the trains as well as the workforce. The following measures should invariably be adopted.

A. The contractor shall not start any work without the presence of the HRIDC Engineer at site.

B. Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the Railway's schedule of dimensions. For this purpose, the area where road vehicles and/or machinery are required to ply, shall be demarcated, and acknowledged by the contractor. Special care shall be taken for turning/ reversal of road vehicles/machinery withoutinfringing the running track. Barricading shall be provided wherever justified and feasibleas per site conditions.

C. The look out and whistle caution orders should be issued to the trains and speed restrictions imposed where considered necessary. Suitable flagmen/detonators shall be provided where necessary for protection of trains.

D. The supervisor/workmen should be counseled about safety measures. A competency certificate to the contractor's supervisor as per Performa annexed shall be issued by DGM/HRIDC, which will be valid only for the work for which it has been issued.

E. The unloaded ballast/rails/sleepers/other P-Way materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.

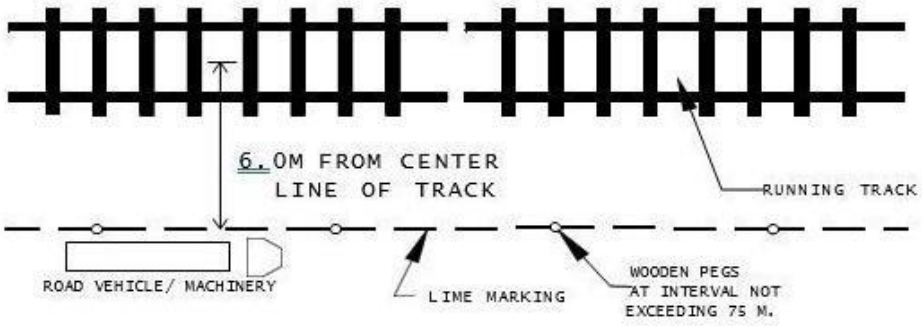
F. Supplementary site-specific instructions, wherever considered necessary, shall be issued by the HRIDC's representative.

2.2 PLYING OF ROAD VEHICLES AND WORKING OF MACHINERIES CLOSE TO RUNNING TRACKS

A. Normally, the road vehicles shall be run, or machinery shall be worked so as not to come closer than 6.0m from center line of nearest running track.

B. The land strip adjacent to running tracks, where road vehicles are to ply or machinery is to

work, shall be demarcated by lime in advance in consultation with the Railway's & HRIDC's Engineer. Wooden pegs at interval not exceeding 75mtr. shall be provided along the line marking as permanent marks. The road vehicles shall ply or machinery shall work so as not to infringe the line of demarcation.



C. If a road vehicle or machinery is to work closer to 6.0m due to site conditions or requirement of work, following precautions shall be observed:

a) In no case the road vehicle shall run, or machinery shall work at distance less than 3.5m from center line of track.

b) Demarcation of land shall be done by bright colored ribbon/nylon cord suspended on 120 cm high wooden/bamboo posts at distance of 3.5 m from center line of nearest running track.

c) The presence of an authorized HRIDC's representative shall be ensured before plying of vehicle or working of machinery.

d) Railway's Supervisor shall issue suitable caution order to Drivers of approaching train about road vehicles plying or machineries working close to running tracks. The train drivers shall be advised to whistle freely to warn about the approaching train. Whistle boards shall be provided wherever considered necessary.

e) Lookout men shall be posted along the track at a distance of 800m from suchlocations who will carry red flag and whistles to warn the road vehicle/machinery users about the approaching trains.

f) On curves where visibility is poor, additional lookout men shall be posted.

D. If vehicle/machinery is to be worked closer to 3.5m from running track - Under unavoidable conditions, if road vehicles is to ply or machinery is to work closer to 3.5m due to site conditions or requirement of work, following precautions shall be observed:

a) Plying of vehicles or working of machinery closer to 3.5m of running track shall be done only under protection of track. Traffic blocks shall be imposed wherever considered necessary. The site shall be protected as per the provisions of Para No. 806 & 807 of P-Way Manual as case may be.

b) The presence of a Railway's/, HRIDC's Supervisor shall be ensured at worksite.

c) Railway's& HRIDC's Supervisor shall issue suitable caution order to Drivers of approaching train about road vehicles plying or machinery working close to running tracks. The train drivers shall be advised to whistle freely to warn about the approaching train.

E. Precaution to be taken while reversing road vehicle alongside the track

The location where vehicle will take a turn shall be demarcated duly approved by Railway's/HRIDC's representative. The road vehicle driver shall always face the Railway

track during the course of turning/reversing his vehicle. Presence of an authorized Railway/HRIDC representative shall be ensured at such location.

F. Road vehicle shall not be allowed to run along the track during night hours generally. In unavoidable situations, however, vehicles shall be allowed to work during night hours only in the presence of an authorized Railway's/HRIDC's representative and whereadequate lighting arrangements are made and where adequate precautions as mentioned earlier have been ensured.

G. Road vehicles/machinery/plant etc. when stabled near running tracks shall be properly secured against any possible roll off and always be manned even during off hours.

2.3 EXECUTION OF WORKS CLOSE TO OR ON RUNNING LINES

A. Any work close to or on running tracks shall be executed under the presence of a HRIDC's Supervisor only.

B. **Precautions to be taken to ensure safety of trains while execution of work close to the running line or on running lines**.

a) Such works shall be planned and necessary drawings particularly with regard to infringement to moving dimensions shall be finalized duly approved by competent.

authority before execution of work. The work shall be executed only as per approved procedure and drawings.

b) All temporary arrangements required to be made during execution of work shall be made in such a manner that moving dimensions do not infringe.

c) Suitable speed restriction shall be imposed, or Traffic block shall be ensured as required. *The requirement of Traffic and Power Blocks shall be submitted by the Contractor to the Engineer for approval. The Traffic and Power Blocks will be finalized in consultation with Delhi Division of Northern Railway. No cost shall be charged for Traffic and Power Blocks from the Contractor.*

d) Necessary equipment for safety of trains during emergency shall be kept ready at site.

C. Precautions to be taken to ensure safety of electrical/signal/ telephone cables while excavating near tracks.

a) Particular care shall be taken to mark the locations of buried electrical/signal/telephone cables on the plans jointly with S & T/Electric supervisor and also at site so that these are not damaged during excavation.

b) Copy of the cable plan should be given to the contractor's authorized representative before handing over the site to start the work.

c) Due care shall be taken to ensure that any part of the equipment or machinery or temporary arrangement does not come close to cables while working.

d) Joint procedure order No. 17/2013 issued by Railway Board vide letter No.2003/Tele/RCIL/1 Pt IX dated 24.06.2013 shall be followed for undertaking digging work in the vicinity of underground signaling, electrical and telecommunication cables.

D. Precautions to be taken during execution of works requiring traffic blocks.

a) Any work which infringes the moving dimensions shall be started only after the traffic block has been imposed.

b) Before closing the work, the track shall be left with the proper track geometry so that the trains run safely.

c) After completion of work the released sleeper and fittings should be properly stacked

away from the track to be kept clear of moving dimensions.

d) Block shall be removed only when all the temporary arrangement, machineries, tools, plants etc. have been kept clear of moving dimensions.

E. Precaution to be taken during execution of works during night:

The work close to the running line, generally, shall be carried out only during day hours. At locations, however, where night working is unavoidable, proper lighting arrangement should be made. The engineering indicator boards shall be lighted during night hours as per the provisions of IRPWM. The staff deputed for night work should have taken adequate rest before deploying them in night shift. We can specify the duration of night shift from 20.00 hrs to 04.00 hrs. All other safety precautions applicable for daytime work should be strictly observed during night working.

F. Precautions to be taken to ensure safety of workers while working close to running lines:

a) Necessary lookout men with red flags and whistles shall be provided to warn the workmen about the approaching train.

b) Railway's/HRIDC's supervisor shall issue suitable caution order to Drivers of approaching train for whistling to warn the workers about the approaching train. Whistle boards shall be provided wherever considered necessary.

c) A "First aid kit" shall always be kept ready at site

G. Precautions shall be taken for safety of public or passengers, while executing works at locations, used by passengers and public.

The worksite shall be suitably demarcated to keep the public and passengers away from the work area. Necessary signage boards such as "Work in progress. Inconvenience is regretted" etc. shall be provided at appropriate locations to warn the public/ passengers. Adequate lighting arrangement of worksite wherever required shall be done to ensure safety of public/passengers during night.

H. Precaution to be taken before stacking materials alongside the track to ensure that safety of trains is not affected –

The following precautions shall be taken before stacking the materials along the track for stacking of ballast, rails, sleepers etc.

a) The sites for material stacking should be selected in advance in such a manner as to ensure that no part of the material to be stacked is infringing the Standard Moving Dimensions. A plan of proposed stacking locations be made and signed jointly by an authorized HRIDC's/Railway's representative and contractor's representative.

b) The selected locations shall be marked by lime in advance.

c) The presence of an authorized HRIDC's/Railway's representative while unloading and stacking shall be ensured.

d) The material shall be stacked at such a height so as to not to infringe SOD in case of accidental roll off.

I. Precaution for handling of departmental material trains –

Instructions for the working of material trains are contained in Chapter VIII of IRPWM which should be brought to the notice of the supervisors and other staff working on the material trains. In addition to this,following precautions should be taken:

a) Issue of 'fit to run' certificate:

As per Para 848 before a material train is allowed to work, the complete rake should be examined by the Carriage and Wagon staff and a 'fit to run' certificate issued tothe

Guard.

b) As per Para 849 of IRPWM, a qualified Engineering official should be deputed on the train to ensure the working of the material train as the Guard is not qualified to carry out such duties like Supervising of loading and unloading of materials.

c) As per Para 845 of IRPWM, the material train should not be permitted to work during the period of poor visibility due to fog, storm or any other cause except with the permission of the ADEN/DEN. Working of the material trains carrying labour should not be permitted between sunset and sunrise except in an emergency.

d) While unloading rail panels by the side of the running track, placement of the panels, clear of the maximum moving dimensions should be ensured.

e) The unloading of rail panels should be done by a team of trained staff under the active supervision of a competent Supervisor/Officer.

f) Before unloading of rail panels, site should be prepared by way of leveling/removing extra ballast, if any, from the crib and shoulder with the objective to ensure requisite lateral and vertical clearances so as to prevent slippage of rail panels due to vibration during the passage of trains.

g) Reasonably adequate block should be asked for and provided for unloading of the material and the work should be done preferably in daylight to avoid shortcut in haste which may infringe the safety requirements.

J. Safety aspects to be observed while working in OHE area.

a) No electrical work close to the running track shall be carried out without permission of HRIDC representative.

b) A minimum distance of 2m has to be maintained between live OHE wire and the bodypart of worker or tools or metallic supports etc.

c) No electric connection etc. can be tapped from OHE.

d) Authorized OHE staff should invariably be present when the relaying work or any major work is carried out.

e) Power block is correctly taken and 'permit to work' is issued.

f) The structure bonds, track bonds, cross bonds, longitudinal rail bonds are not disturbed and if disconnected for the work, they are reconnected properly when the work is completed.

g) The track level is not raised beyond the permissible limit during the work.

2.4 PROTECTION OF TRACK DURING EMERGENCY

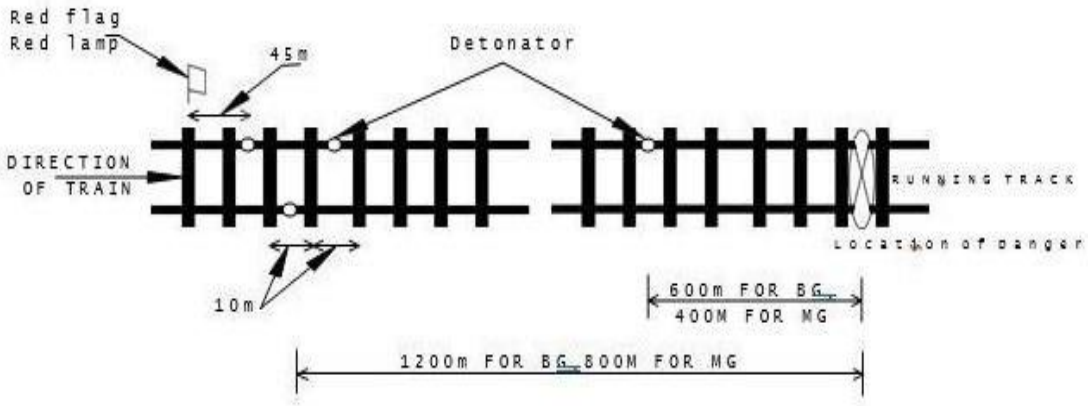
A. Action to be taken when a contractor's supervisor or vehicle operator apprehends any unusual circumstances likely to infringe the track and endanger the safe running of trains.

a) At any time if a contractor's supervisor or vehicle operator observes any unusual circumstances likely to infringe the track and apprehend danger to safe running of track, he shall take immediate steps to advise a HRIDC official of such danger and assist him in protection of track.

b) The track shall be protected as under. One person shall immediately plant a red flag (red lamp during night) at the spot and proceed with all haste in the direction of approaching train with a red flag in hand (red lamp during night) and plant a detonator on rail at a distance of 600m from the place of obstruction of BG track (400m for MG track) after which he shall further proceed for not less than 1200m from the place of obstruction from BG track (800m for MG track) and plant three detonators at 10m apart

on rails. After this he shall display the red flag (red lamp during night) at a distance of 45m from the detonators.

c) Attempts shall also be made to send an advice to the nearest Railway/HRIDC station about the incident immediately.



B. Action to be taken if train is seen approaching to site of danger and there is no time to protect the track as per guidelines mentioned above.

In such a case the detonators shall be planted on rails immediately at distance away from place of danger as far as possible and attention of driver of approaching train shall be invited by whistling, waving the red flag vigorously, gesticulating and shouting.

C. What action shall be taken if more than one track is obstructed.

a) In case of single line protection as above shall be done in both the directions from place of danger.

b) In case of double line or multiple lines, if other tracks are also obstructed, theprotection as above shall be done for other track also.

c) The protection shall be done in that direction and on that track first on which train is likely to arrive first.

d) The Contractor's Supervisors, Operators and lookout men shall be properly explained about the direction of trains on running tracks.

D. Equipment required for protection of track.

Minimum compliment of protection equipment i.e. 10 detonators, 4 red hand flags, 4 red hand lamps, 4 banner flags and whistles etc. shall always be kept ready at worksites for use in case of emergency. HRIDC will arrange to provide detonators, whereas Contractor shall arrange other equipment at his own cost.

E. Arrangement of lookout men and competency required for lookout man to warn labour about approaching train.

a) Contractor will provide lookout men.

b) The lookout men shall be properly trained in warning to staff at worksite about approaching train.

c) Only those lookout men shall be provided at site who have been issued with a competency certificate by the Railway's/HRIDC's Supervisor.

d) In case, it is felt necessary to provide lookout men by Contractor, the charges for

the same as fixed by HRIDC Administration shall be recovered from Contractor.

2.5 Training to Supervisors and Operators of Contractor

The Supervisors and Operators of the contractor proposed to be deployed at wok site, which is close to the running track, shall be imparted mandatory training by the HRIDC at site free of cost about the safety measures to be adopted while working in the vicinity of running track. HRIDC's Engineer-in charge of the work shall decide the scale, extent & adequacy of training. In case training is imparted at a recognized Railway training institute, the charges for the same, as decided by HRIDC, shall be recovered from the Contractor. A competency certificate to this effect to the individual Supervisor/Operator shall be issued as given below,by a HRIDC Officer not below the rank of DGM/HRIDC. No Supervisor/Operator of the Contractor shall work or be allowed to work in the vicinity of a running track that is not in possession of valid competency certificate.

All the labour, materials, tools, plants etc. except detonators, required for ensuring the safe running of trains shall be provided by Contractor at his own cost. Wherever lookout men are provided by HRIDC, charges at the rate of Rs. 1000/- per man day shall be recovered from Contractor.

A sample of training competency certificate is provided below for reference:

Competency Certificate

Certified that Shri …… Supervisor/Operator of M/s. ……has been trained and examined in safety measures to be followed while working in the vicinity of running railway track for the work. His knowledge has been found satisfactory and he is capable of supervising the work safely.

This certificate is valid only for the work mentioned in this certificate only.

Signature and designation of the officer

Tender No. HORC/HRIDC/SYS-1/2023
Attachment 12
to
Corrigendum No. 2

Part 3, Section IX - Particular Conditions of Contract (PCC)

Part A – Contract Data

Table 2.0: Sections for Taking Over of the Works

Table 2.0 Sections for Taking Over of the Works

(Ref. Sub-Clause No. 1.1.76 and 10.1 of GCC)

S. No.	Section	Contract Package	Approximate Chainage	Percentage value of the Section (Ref. Sub-Clause 14.9 of GCC)
1.	Section 1	C-1 and C-23	(i) Main Line Ch. Km 32.00 to Ch.km 59.00 including New Patli station. (ii) Connectivity Line – a. New Patli to Patli b. New Patli to Sultanpur including Sultanpur station (iii) Completion of SCADA works in OCC Manesar	30% (Thirty percent) of "Accepted Contract Amount less Provisional Sum"
2.	Section 2	C-23, C-4 and C-5	Main Line – Ch. Km (-) 2.12 to Ch. Km 32.00 including Tunnel 1(Ch.km 24.850 to Ch.km 29.580)	20% (Twenty Percent) of "Accepted Contract Amount less Provisional Sum"
3.	Section 3	C-23 and C-6	(i) Main Line – Ch. Km 59.00 to Ch. Km 109.330 including Kharkhoda station, (ii) Connectivity Line – a. Badsa-Sultanpur b. Mandothi-Asaudah	40% (Forty Percent) of "Accepted Contract Amount less Provisional Sum"
4.	Section 4	C-6	Main line Kharkhoda Station (Excl.) to Harsana Kalan (Incl.) from Ch. Km 109.408 to Ch. Km 125.813	9% ((Nine Percent) of "Accepted Contract Amount less Provisional Sum"
5.	Section 5	C-4	Tunnel 2 (Ch.km 24.850 to Ch.km 29.580)	1% (One percent) of "Accepted Contract Amount less Provisional Sum"

Note: 1**. S**ections shall be considered complete for Taking Over when all the Works within the geographical Chainages are completed.

Tender No.: HORC/HRIDC/SYS-1/2023

Attachment 13
to
Corrigendum No. 2

Part 3- Conditions of Contract

Section IX –PCC, Part B-Specific Provisions

1. Annexure A to Section IX-PCC Part B-Specific Provisions
(Copy of Notification No. 84/97 dated 11th Nov 1997, as amended time to time)

GENERAL EXEMPTION NO. 128

Exemption to Imports by U.N. or International Organisation for execution of projects in India - [Notfn. No. 84/97-Cus. dt. 11.11.97 as amended by Notfn. Nos. 85/99, 119/99, 75/01, 107/01 and 24/08, 22/14, 44/17].

In exercise of the powers conferred by sub-section (1) of section 25 of the Customs Act, 1962 (52 of 1962), read with sub-section (4) of section 68 of the Finance (No.2) Act, 1996 (33 of 1996), the Central Government, being satisfied that it is necessary in the public interest so to do, hereby exempts all the goods imported into India for execution of **projects financed by the United Nations or an international organisation** and approved by the Government of India, from the **whole of the duty of customs** leviable thereon under First Schedule to the customs Tariff Act, 1975 (51 of 1975), and the whole of the **special duty of customs** leviable under section 68 of the Finance (No.2) Act 1996 (33 of 1996):

Provided that the importer, at the time of clearance of the goods, produces before the Assistant Commissioner of Customs or Deputy commissioner of Customs, as the case may be, having jurisdiction,-

(i) in case the said goods are -

(a) **imported by an international organisation** listed in the Annexure appended to this notification and intended to be **used in a project** that has been **approved by the Government of India and financed (whether by a loan or a grant) by such an organisation**, a certificate from such organisation that the said **goods are required for the execution of the said project** and that the said project has duly been approved by the Government of India; or

(b) **imported for use in a project** that has been **approved by the Government of India** and **financed** (whether by a loan or a grant) **by an international organisation listed in the said Annexure**, a certificate from an officer not below the rank of **Deputy Secretary** to the Government of India, in the **Ministry of Finance** (Department of Economic Affairs) that the said **goods are required for the execution of the said project** and that the said **project** has duly been **approved by the Government of India;**

(ii) in case the said goods are intended to be used in a project financed (whether by a loan or a grant) by the **World Bank, the Asian Development Bank or any international organisation**, other than those listed in the Annexure and the said project has been **approved by the Government of India**, a certificate from the **executive head of the Project** Implementing Authority and countersigned by an officer not below the rank of a **Joint Secretary** to the Government of India, **in the concerned Line Ministry** in the Government of India, that the said goods are required for the execution of the said project and that the said project has duly been approved by the Government of India, and

(iii) in case the said goods are intended to be used in a project financed (whether by a loan or a grant) by the World Bank, the Asian Development Bank or any international organisation other than those listed in the Annexure and the said project has been approved by the Government of India for implementation by the Government of a State or a Union Territory, a certificate from the **executive head of the Project Implementing Authority and countersigned by the Principal Secretary or the Secretary (Finance)**, as the case may be, in the concerned State Government or the Union Territory, that the said goods are required for the execution of the said project, and that the said project has duly been **approved by the Government of India for implementation by the concerned State Government.**

2. Where the goods are imported prior to the 1st March, 2008, the importer may-

(a) transfer the goods to a new project subject to the condition that the importer produces before

the Assistant Commissioner of Customs or Deputy Commissioner of Customs, as the case may be, having jurisdiction over the port of import, a certificate from the officer concerned of the Central Government, State Government or Union territory Administration, as the case may be, that the goods are no longer required for the project and a declaration from the United Nations, the World Bank, the Asian Development Bank or any other international organization listed in the Annexure to the said notification that the said goods are required for the said new project which has duly been approved by the Government of India; or

(b) re-export the goods when the goods are no longer required for the existing project subject to the condition that the identity of the goods is established and no export incentive is claimed against such re-export; or

(c) pay the duty of customs which would have been payable but for the exemption contained herein on the depreciated value of the goods subject to the condition that the importer produces before the Assistant Commissioner of Customs or Deputy Commissioner of Customs, as the case may be, having jurisdiction over the port of import, a certificate from the officer concerned of the Central Government, State Government or Union territory Administration, as the case may be, that the goods are no longer required for the project. The depreciated value of the goods shall be equal to the original value of the goods at the time of import reduced by the percentage points calculated by straight line method as specified below for each quarter of a year or part thereof from the date of clearance of the goods, namely:-

(i) for each quarter in the first year at the rate of 4 per cent;
(ii) for each quarter in the second year at the rate of 3 per cent;
(iii) for each quarter in the third year at the rate of 2.5 per cent; and
(iv) for each quarter in the fourth year and subsequent years at the rate of 2 per cent,
subject to the maximum of 70%.

Explanation 1 - For the purposes of this notification,-

(a) *"international organisation"* means an international organisation to which the Central Government has declared, in pursuance of section 3 of the United Nations (Privileges and Immunities) Act, 1947 (46 of 1947), that the provisions of the Schedule to the said act shall apply;

(b) *"Line Ministry"* means a Ministry in the Government of India, which has been so nominated with respect to a project, by the Government of India, in the Ministry of Finance (Department of Economic Affairs).

Explanation 2 - For the removal of doubts, it is herebyclarified that the benefit under this notification, in the case of goods supplied to the projects financed by the United Nations or an international organisation, is available when the goods brought into the project are not withdrawn by the supplier or contractor and the expression " goods are required for the execution of the project" shall be construed accordingly.

** Corrigendum vide F.No.605/187/2001-DBK dt.22.10.01.*

ANNEXURE

1. United Nations Development Programme,
2. United Nations International Childrens' Fund,
3. Food and Agricultural Organisation,
4. International Labour Organisation,
5. World Health Organisation
6. United Nations Population Fund.
7. United Nations World Food Programme
8. United Nations Industrial Development Organisation