(MM3-CBS-REL-PYL)

"Procurement, Supply, Installation, Testing and Commissioning of various Power Supply works including associated Civil works, required for diversion of 220 kV and 33 kV Transmission Lines along with the Transmission towers belonging to M/s Reliance Infrastructure Ltd. in Aarey depot area for Mumbai Metro Line -3"

Addendum No. 2 **Date: - 16th May 2017**

Sr. No.	Description	Clause No. and Page No. of Original Tender Document	Amendment
1.	Sr. No. 1 of Addendum 1	**Clause No. 1.1.3.1 (vi), Page No. 3** A firm, who has purchased the bid document in their name, can submit the tender either as Individual firm or in joint venture/Consortium. The tenderer shall submit details of works executed by them to fulfil the work experience **of similar work as defined below,** based on their % shared in previous Contract***. Documentary proof such as completion certificates from client clearly indicating the nature/scope of work, actual completion cost and actual date of completion for such work should be submitted. Experience certificate of an official below the rank of Executive engineer or equivalent will not be accepted as proof for Eligibility. The offers submitted without this documentary proof shall not be evaluated. The work, executed for private client will not be considered for eligibility evaluation. However, the work executed under public sector, government under taking, semi government companies will be considered for Eligibility evaluation. • The client's certificate clearly indicating the amount pertaining to the each similar work shall be furnished by the tenderer along with their submission. *** a) Volume, number of production of any key activity can be demonstrated in one or more contracts combined if executed during same time period. ***b) Volume, number of production of any key activity can be demonstrated in one or more contracts combined among Consortium/JV if executed during same time period.	**Clause No. 1.1.3.1 (vi), Page No. 3** A firm, who has purchased the bid document in their name, can submit the tender either as Individual firm or in joint venture/ Consortium.

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>2.</td><td>Sr. No. 4 & 5 of Addendum 1</td><td>Clause No. 1.1.10 (ii), Page No. 9 & C20, Page No. 19

(In case of joint venture/consortia, Bank Guarantee for Tender Security shall be in the name of joint venture/consortia. The Tender Security Bank Guarantee shall be submitted by the respective JV/Consortium members of the Contractor in proportion to their percentage shares.)</td><td>Clause No. 1.1.10 (ii), Page No. 9 & C20, Page No. 19

(In case of joint venture/consortia, Bank Guarantee for Tender Security shall be in the name of joint venture/consortia.)</td></tr>
<tr><td>3.</td><td>Sr. No. 29 of Addendum 1</td><td>Page 788

Add Note

All the required quantity and sizes of Power and Control Cables for commissioning of various equipments like Battery Charger, Control & Relay Panels, Fire Fighting Panels, SCADA etc shall be included in the respective item by the Bidders.</td><td>Page 788

Add Note

All the required quantity and sizes of Power and Control Cables for commissioning of various equipments like Battery Charger, Control & Relay Panels, Fire Fighting Panels, SCADA etc shall be included in the respective item by the Bidders.
Various Sizes of Power and Control Cables along with Tentative quantities of the same are as below:

<table>
<tr><th>Sr. No.</th><th>Cable Size</th><th>Tentative Quantity in KMs</th></tr>
<tr><td>1</td><td>10C, 2.5 Sqmm</td><td>9.24</td></tr>
<tr><td>2</td><td>3.5C, 25 Sqmm</td><td>1.045</td></tr>
<tr><td>3</td><td>3.5C, 70 Sqmm</td><td>0.7</td></tr>
<tr><td>4</td><td>3.5C, 150 Sqmm</td><td>4</td></tr>
<tr><td>5</td><td>2C, 4 Sqmm</td><td>1.29</td></tr>
<tr><td>6</td><td>1C, 150 Sqmm</td><td>0.4</td></tr>
<tr><td>7</td><td>5C, 1.5 Sqmm</td><td>0.12</td></tr>
<tr><td>8</td><td>16C, 1.5 Sqmm</td><td>0.12</td></tr>
<tr><td>9</td><td>4C, 6 Sqmm</td><td>6.6</td></tr>
<tr><td>10</td><td>2C, 6 Sqmm</td><td>1.8</td></tr>
<tr><td>11</td><td>7C, 2.5 Sqmm</td><td>3.4</td></tr>
<tr><td>12</td><td>4C, 2.5 Sqmm</td><td>1.6</td></tr>
<tr><td>13</td><td>14C, 2.5 Sqmm</td><td>2.4</td></tr>
<tr><td>14</td><td>4C, 1.5 Sqmm</td><td>0.4</td></tr>
<tr><td>15</td><td>24C, 1.5 Sqmm</td><td>0.4</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td>16</td><td>12C, 0.5 Sqmm</td><td>0.4</td></tr>
<tr><td>17</td><td>8C, MM FO Cable</td><td>0.2</td></tr>
<tr><td>18</td><td>16C, 1 Sqmm</td><td>2</td></tr>
<tr><td>19</td><td>10C, 2.5 Sqmm</td><td>0.5</td></tr>
<tr><td>20</td><td>5C, 1.5 Sqmm</td><td>0.5</td></tr>
</table>

Any Other Sizes of Power & Control Cables as well as any other material required for commissioning the equipment that are mentioned in the specification shall be provided by the bidder.</td></tr>
<tr><td>4.</td><td>Section VIII: Technical Specification</td><td>Clause No. 13 (a) & (c), Page No. 574

(a) Type tests reports as per IS 10918:1984, clause no.10.1.1 shall be submitted and not be older than 2 (two) years on the date of submission. Tests shall have been conducted at an accredited laboratory.
(c) Acceptance test shall be carried out as per IS 10918:1984, clause no.10.1.2 in the manufacturer’s works on samples selected from a lot for the purpose of verifying acceptability of the lot according to standards as specified.</td><td>Clause No. 13 (a) & (c), Page No. 574

Delete
(a) :1984
(c) :1984</td></tr>
<tr><td>5.</td><td>Section VIII: Technical Specification</td><td>Clause No. 4 (iv), Page No. 586

(iv) Technical Parameters
<table>
<tr><th>Requirement</th><th>Parameter</th></tr>
<tr><td>Application</td><td>a. Uninterrupted aux power supply to Substation</td></tr>
<tr><td>Charger</td><td>Float cum boost charger</td></tr>
<tr><td>Type</td><td>SMPS charger</td></tr>
<tr><td>System Voltage</td><td>415V ± 10%, 3P4W System (Three (3)</td></tr>
</table></td><td>Clause No. 4 (iv), Page No. 586

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<table>
<tr><th>Requirement</th><th>Parameter</th></tr>
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<tr><td>Charger</td><td>Float cum boost charger</td></tr>
<tr><td>Type</td><td>SMPS charger</td></tr>
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<tr><td></td><td></td><td>
<table>
<tr><td></td><td>phase four (4) wire)</td></tr>
<tr><td>System Frequency</td><td>50 Hz ± 5%</td></tr>
<tr><td>Combined voltage and frequency variation</td><td>10%</td></tr>
<tr><td>System Earthing</td><td>i. Input supply will be effectively earthed when fed from normal 415V supply and DG.
ii. DC system shall be unearthed</td></tr>
<tr><td>Fault level @ 415V</td><td>Max 50kA, 1 sec</td></tr>
<tr><td>DC system voltage</td><td>220V, +10% - 15% at DCDB</td></tr>
<tr><td>Details of Battery</td><td>100Ah 220V NiCd battery</td></tr>
</table>
</td><td>
<table>
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<tr><td>System Frequency</td><td>50 Hz ± 5%</td></tr>
<tr><td>Combined voltage and frequency variation</td><td>±10%</td></tr>
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<tr><td>Details of Battery</td><td>100Ah 220V NiCd battery</td></tr>
</table>
</td></tr>
<tr><td>6.</td><td>Section VIII: Technical Specification</td><td>
Clause No. 4 (v), Page No. 586

(v) System Description
<table>
<tr><td>1. Configuration</td><td>1. Two sets of SMPS type float cum boost chargers. Configuration of battery charger to be supplied is indicated in Annexure -1, Single Line Diagram (SLD)</td></tr>
<tr><td>2. Sizing</td><td>1. Boost charger is sized to restore the fully discharged battery to full charge condition as per charging hours of respective type of battery with 20% design margin over maximum charging rate.
2. Float charger is sized to cater to continuous DC load and trickle charging current of battery with 20% design margin.</td></tr>
</table>
</td><td>
Clause No. 4 (v), Page No. 586

(v) System Description
<table>
<tr><td>1. Configuration</td><td>1. Two sets of SMPS type float cum boost chargers. Configuration of battery charger to be supplied is indicated in Annexure -1, Single Line Diagram (SLD)</td></tr>
<tr><td>2. Sizing</td><td>1. Boost charger is sized to restore the fully discharged battery to full charge condition as per charging hours of respective type of battery with 20% design margin over maximum charging rate.
2. Float charger is sized to cater to continuous DC load and trickle charging current of battery with 20% design margin.
3. FCBC current rating is selected based on boost</td></tr>
</table>
</td></tr>
</table>

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<tr><td></td><td></td><td>
<table>
<tr><td></td><td>3. FCBC current rating is selected based on boost charge current rating or float charge current rating, whichever is higher.</td></tr>
<tr><td>3.Initial charging</td><td>1. FCBC shall be capable of providing the initial charging current of 220V DC, 100Ah NiCd battery.</td></tr>
<tr><td>4.Float charging</td><td>1. In case of normal operation, both Float-cum-Boost chargers will supply load and trickle charge current of battery.
2. If load exceeds the charger capacity, the excess load shall be supplied by the battery.</td></tr>
</table>
</td><td>
<table>
<tr><td></td><td>charge current rating or float charge current rating, whichever is higher.
4. N-1 Redundancy of modules shall be considered in case of charger sizing.</td></tr>
<tr><td>3.Initial charging</td><td>1. FCBC shall be capable of providing the initial charging current of 220V DC, 100Ah NiCd battery.</td></tr>
<tr><td>4.Float charging</td><td>1. In case of normal operation, both Float-cum-Boost chargers will supply load and trickle charge current of battery.
2. If load exceeds the charger capacity, the excess load shall be supplied by the battery.</td></tr>
</table>
</td></tr>
<tr><td>7.</td><td>Section VIII: Technical Specification</td><td>Clause No. 9 (iii), Page No. 591

(iii) Indication lamps
1. DC power ON
2. AC power ON (for each phase)
3. Float / booster Charger ON
4. Charger fault.</td><td>Clause No. 9 (iii), Page No. 591

(iii) Indication lamps
1. DC power ON
2. AC power ON (for each phase)
3. Float / booster Charger ON
4. Charger fault.
5. Charger on Auto/Manual Mode</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>8.</td><td>Section VIII: Technical Specification</td><td>Clause No. 19, Page No. 619

19. Bill of Material (BOM)
<table><tr><td>Sl No</td><td>Item description</td><td>Unit</td><td>Qty</td></tr><tr><td>1</td><td>Supply of integrated 220V, 30A SMPS type float cum boost battery charger with following accessories at MMRC Substation Yard

a) Software of controller - 2Nos</td><td>1 Set (comprises redundant charger for one battery)</td><td>2</td></tr></table></td><td>Clause No. 19, Page No. 619

19. Bill of Material (BOM)
<table><tr><td>Sl No</td><td>Item description</td><td>Unit</td><td>Qty</td></tr><tr><td>1</td><td>Supply of integrated 220V, 30A SMPS type float cum boost battery charger as per single line diagram with following accessories at MMRC Substation Yard

a) Software of controller - 2Nos</td><td>1 Set (comprises redundant charger for one battery)</td><td>2</td></tr></table></td></tr>
<tr><td>9.</td><td>Section VIII: Technical Specification</td><td>Clause No. 20, Page No. 621</td><td>Clause No. 20, Page No. 621

Please add
Battery Charger SLD.</td></tr>
<tr><td>10.</td><td>Section VIII: Technical Specification</td><td>Clause No. 6 (c), Page No. 627

<table><tr><td>c.</td><td>Motorized Moulded Case Circuit Breakers (MCCB)</td><td>d) Voltage rating of MCCB shall be 1.1 KV. Minimum breaking capacity shall be 15 KA. Tripping time shall not be more than 10 ms. Three (3) NO & three (3) NC potential free aux contacts shall be provided for monitoring purpose. All contacts shall be wired up to terminal Block.</td></tr></table></td><td>Clause No. 6 (c), Page No. 627

<table><tr><td>c.</td><td>Motorized Moulded Case Circuit Breakers (MCCB)</td><td>d) Voltage rating of MCCB shall be 1.1 KV. Minimum breaking capacity shall be 50 kA. Tripping time shall not be more than 10 ms. Three (3) NO & three (3) NC potential free aux contacts shall be provided for monitoring purpose. All contacts shall be wired up to terminal Block.</td></tr></table></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>11.</td><td>Section VIII: Technical Specification</td><td>Clause No. 7 (l), Page No. 687
<table><tr><td>l.</td><td>Self-Monitoring for all types of Numerical Relays</td><td>b) It shall be possible to report device fail signal on IEC 103/ IEC 61850 to SCADA. In addition to this, any failure detected shall be annunciated through a dedicated output contact (watchdog).</td></tr></table></td><td>Clause No. 7, Page No. 687
<table><tr><td>l.</td><td>Self-Monitoring for all types of Numerical Relays</td><td>b) It shall be possible to report device fail signal on IEC 103 & IEC 61850 to SCADA. In addition to this, any failure detected shall be annunciated through a dedicated output contact (watchdog).</td></tr></table></td></tr>
<tr><td>12.</td><td>Section VIII: Technical Specification</td><td>Clause No. 9 (4), Page No. 694
9. Preferred Sub-Vendor list<table><tr><th>Sl No</th><th>Equipments / Components</th><th>Preferred Vendor</th></tr><tr><td>1</td><td>Numerical relays</td><td>ABB / GE / Siemens</td></tr><tr><td>2</td><td>DC Supervision relays</td><td>ABB / GE</td></tr><tr><td>3</td><td>Aux relays / Contactors</td><td>ABB / GE</td></tr><tr><td>4</td><td>Ethernet switch</td><td>Ruggedcom / Dlink</td></tr><tr><td>5</td><td>Control Switches</td><td>Switron</td></tr><tr><td>6</td><td>Push button</td><td>Siemens / ABB / GE</td></tr><tr><td>7</td><td>MCB</td><td>ABB / GE / Siemens</td></tr><tr><td>8</td><td>Heater / Thermostat</td><td>APT Control</td></tr><tr><td>9</td><td>Heater ON/OFF switch, power plug and socket</td><td>Anchor</td></tr><tr><td>10</td><td>Cubicle illumination lamp</td><td>Philips</td></tr><tr><td>11</td><td>TB</td><td>Connectwell</td></tr><tr><td>12</td><td>Test switch</td><td>GE</td></tr><tr><td>13</td><td>Test terminal block</td><td>Nelster</td></tr><tr><td>14</td><td>Multifunction meter</td><td>Secure</td></tr></table></td><td>Clause No. 9 (4), Page No. 694
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</table>

<table>
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<tr><td>13.</td><td>Section VIII: Technical Specification</td><td>
Clause No. 10 Sr. No. 1, Page No. 695
<table>
<tr><th>Sl No</th><th>Item description</th><th>Unit</th><th>Qty</th></tr>
<tr><td rowspan="12">1</td><td>Supply of Integrated 220kV Relay Panel for line feeder with control and protection scheme as per this specification along with following accessories at MMRC Substation Yard
e) Relay software - 2Nos per each type of relay
f) Relay front communication cord with laptop - 2Nos per each type of relay
g) USB Converter (if applicable) – 1 per relay</td><td>No of panels</td><td>4</td></tr>
<tr><td>h) Spare Equipments-</td><td></td><td></td></tr>
<tr><td>d.1) Main-I differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.2). Main-II differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.3) Ethernet Switch</td><td>No</td><td>1</td></tr>
<tr><td>d.4). DC Supervision relay</td><td>No</td><td>2</td></tr>
<tr><td>d.5) MCB</td><td>No</td><td>5</td></tr>
<tr><td>d.6). Switch</td><td>No</td><td>1</td></tr>
<tr><td>d.7) Annunciator</td><td>No</td><td>1</td></tr>
<tr><td>d.8) TTB</td><td>No</td><td>1</td></tr>
<tr><td>d.9) Multifunction meter</td><td>No</td><td>1</td></tr>
</table>
</td><td>
Clause No. 10 Sr. No. 1, Page No. 695
<table>
<tr><th>Sl No</th><th>Item description</th><th>Unit</th><th>Qty</th></tr>
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<tr><td>h) Spare Equipments-</td><td></td><td></td></tr>
<tr><td>d.1) Main-I differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.2). Main-II differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.3) Ethernet Switch</td><td>No</td><td>1</td></tr>
<tr><td>d.4). DC Supervision relay</td><td>No</td><td>2</td></tr>
<tr><td>d.5) MCB with 1 NO + 1 NC</td><td>No</td><td>5</td></tr>
<tr><td>d.6). Switch</td><td>No</td><td>1</td></tr>
<tr><td>d.7) Annunciator</td><td>No</td><td>1</td></tr>
<tr><td>d.8) TTB</td><td>No</td><td>1</td></tr>
<tr><td>d.9) Multifunction meter</td><td>No</td><td>1</td></tr>
<tr><td>d.10) Auxiliary Relay</td><td>No</td><td>1</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>14.</td><td>Section VIII: Technical Specification</td><td>Clause No. 10 Sr. No. 2, Page No. 696.
<table>
<tr><td rowspan="9">2</td><td>Supply of integrated 220kV Relay Panel for line feeder with control and protection scheme as per this specification along with following accessories at Rinfra Aarey Substation
a) Relay software - 2Nos per each type of relay
b) Relay front communication cord with laptop - 2Nos per each type of relay
c) USB Converter (if applicable) – 1 per relay</td><td>No of panels</td><td>4</td></tr>
<tr><td>d) Spare Equipments-</td><td></td><td></td></tr>
<tr><td>d.1) Main-I differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.2). Main-II differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.3). DC Supervision relay</td><td>No</td><td>2</td></tr>
<tr><td>d.4) MCB with two aux contacts</td><td>No</td><td>5</td></tr>
<tr><td>d.5). Switch</td><td>No</td><td>1</td></tr>
<tr><td>d.6) Annunciator</td><td>No</td><td>1</td></tr>
<tr><td>d.7) TTB</td><td>No</td><td>1</td></tr>
</table></td><td>Clause No. 10 Sr. No. 2, Page No. 696.
<table>
<tr><td rowspan="10">2</td><td>Supply of integrated 220kV Relay Panel for line feeder with control and protection scheme as per this specification along with following accessories at Rinfra Aarey Substation
a) Relay software - 2Nos per each type of relay
b) Relay front communication cord with laptop - 2Nos per each type of relay
c) USB Converter (if applicable) – 1 per relay</td><td>No of panels</td><td>4</td></tr>
<tr><td>d) Spare Equipments-</td><td></td><td></td></tr>
<tr><td>d.1) Main-I differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.2). Main-II differential protection relay</td><td>No</td><td>1</td></tr>
<tr><td>d.3). DC Supervision relay</td><td>No</td><td>2</td></tr>
<tr><td>d.4) MCB with two aux contacts</td><td>No</td><td>5</td></tr>
<tr><td>d.5). Switch</td><td>No</td><td>1</td></tr>
<tr><td>d.6) Annunciator</td><td>No</td><td>1</td></tr>
<tr><td>d.7) TTB</td><td>No</td><td>1</td></tr>
<tr><td>d.8) Auxiliary Relay</td><td>No.</td><td>1</td></tr>
</table></td></tr>
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<tr><td>15.</td><td>Section VIII: Technical Specification</td><td>Clause No. 11, Page No. 703
<table><tr><td>10</td><td>Annunciator</td><td></td></tr><tr><td>a</td><td>Make and Type</td><td>Vendor to specify</td></tr><tr><td>b</td><td>Aux supply</td><td>Universal (220V DC/240V AC)</td></tr><tr><td>c</td><td>Number of windows</td><td>12 No</td></tr><tr><td>d</td><td>Hooter provided</td><td>Yes</td></tr><tr><td>e</td><td>Accept & reset button provided</td><td>Yes</td></tr></table></td><td>Clause No. 11, Page No. 703
<table><tr><td>10</td><td>Annunciator</td><td></td></tr><tr><td>a</td><td>Make and Type</td><td>Vendor to specify</td></tr><tr><td>b</td><td>Aux supply</td><td>Universal (220V DC & 240V AC)</td></tr><tr><td>c</td><td>Number of windows</td><td>12 No</td></tr><tr><td>d</td><td>Hooter provided</td><td>Yes</td></tr><tr><td>e</td><td>Accept & reset button provided</td><td>Yes</td></tr></table></td></tr>
<tr><td>16.</td><td>Section VIII: Technical Specification</td><td>Clause No.7 (y), Page No. 722
<table><tr><td>y.</td><td>Training</td><td>b) The supplier shall arrange necessary training (as per Clause 1.2) to R Infra Engineers during commissioning at site.</td></tr></table></td><td>Clause No.7 (y), Page No. 722
<table><tr><td>y.</td><td>Training</td><td>Delete
b) “……. (as per Clause 1.2)</td></tr></table></td></tr>
<tr><td>17.</td><td>Section VIII: Technical Specification</td><td>Clause No.7, Sr. No. 5.1, Page No. 733
<table><tr><td>5.1</td><td>Distance cum current differential protection relay – Main -I</td><td>Make shall be M/s Siemens, M/s ABB or M/s GE</td><td>Shall be finalized after meeting with M/s Tata</td></tr></table></td><td>Clause No.7, Sr. No. 5.1, Page No. 733
<table><tr><td>5.1</td><td>Distance cum current differential protection relay – Main -I</td><td>Make shall be M/s Siemens, M/s ABB or M/s GE or approved make by M/s TPC</td></tr></table></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>18.</td><td>Section VIII: Technical Specification</td><td>Clause No.7, Sr. No. 5.2, Page No. 733
<table><tr><td>5.2</td><td>Distance cum current differential protection relay – Main -II</td><td>Make shall be M/s Siemens, M/s ABB or M/s GE</td><td>Shall be finalized after meeting with M/s Tata</td></tr></table></td><td>Clause No.7, Sr. No. 5.2, Page No. 733
<table><tr><td>5.2</td><td>Distance cum current differential protection relay – Main -II</td><td>Make shall be M/s Siemens, M/s ABB or M/s GE or approved make by M/s TPC</td></tr></table></td></tr>
<tr><td>19.</td><td>Section VIII: Technical Specification</td><td>Clause No xviii (iii) - c, d, e, f, g, Page No. 748

c) 2.03.03 The Panel shall be equipped with space heaters which may be located at proper place in protection panel. The panels shall have 240V, single phase, 50 Hz fluorescent lighting fixtures for interior illumination controlled by ON/OFF switches and 240V, 1 phase, 3 pin receptacles. Power source for interior lighting and receptacle shall be completely independent of control power source

d) 2.03.04 Panel shall be designed in such a way that all component/ equipment’s operate satisfactorily without exceeding their respective maximum permissible temperature rises under temperature conditions prevailing within the cubicles. Reference ambient temperature outside the switchgear cubicles is specified in the specifications.

e) 2.03.05 Cable entries shall be from bottom unless specified. Suitable removable cable gland plate shall be provided on the cabinet for this purpose. Necessary number of cable glands shall be supplied/fitted on to this gland plate. Cable glands shall be screw-on type and made of brass.

f) 2.03.06 All sheet steel work shall be degreased, pickled, phosphate and then applied with two coats of zinc chromate</td><td>Clause No xviii (iii) - c, d, e, f, g, Page No. 748

Delete

c) “2.03.03

d) “2.03.04

e) “2.03.05

f) “2.03.06

g) “2.03.07</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td></td><td></td><td>primer and two coats of finishing synthetic enamel paint, both inside and outside. The paint shade shall be RAL7032, texture finish.

g) 2.03.07 Each panel shall be provided with necessary arrangement for receiving, distributing, isolating and protection of DC and AC supplies for various control,</td><td></td></tr>
<tr><td>20.</td><td>Section VIII: Technical Specification</td><td>Clause No 12, Page No. 754

12. Bill of Material

<table>
<tr><td>Sr. No</td><td>Item Description</td><td>Qty.</td></tr>
<tr><td>A</td><td>Borivli R/S</td><td></td></tr>
<tr><td>1</td><td>Completely wired Simplex Relay Panel comprising of all the Protection Schemes & accessories for Line protection system for 220 kV GIS (2 nos. Main IEDS with 87L +21 + A/R+25 + 67 +67N + LBB (50Z) + OLTS 67).
The panels shall be Bottom entry panel.
Main I & Main II shall be of Different Make.</td><td>1 Set</td></tr>
<tr><td>2</td><td>Additional current differential protection relays to enable/disable Auto reclosure of line</td><td>2 Nos</td></tr>
<tr><td>B</td><td>Material required (patch cord, switches, data cable, LIUs etc.) for Integration of IEDS mentioned with SCADA system and for retrieving DR and Parameterization from remote location</td><td></td></tr>
</table></td><td>Clause No 12, Page No. 754

12. Bill of Material

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The panels shall be Bottom entry panel.
Main I & Main II shall be of Different Make
Specify communication for Line Differential Protection</td><td>1 Set</td></tr>
<tr><td>2</td><td>Additional current differential protection relays to enable/disable Auto reclosure of line</td><td>2 Nos</td></tr>
<tr><td>B</td><td>Material required (patch cord, switches, data cable, LIUs etc.) for Integration of IEDS mentioned with SCADA system and for retrieving DR and Parameterization from remote location</td><td>1 LS</td></tr>
</table></td></tr>
</table>

Sr. No.	Description	Clause No. and Page No. of Original Tender Document	Amendment
21.	Section VIII: Technical Specification	**Clause No xix (iv, v), Page No. 749** (iv) 2.04.03 Engraved core identification ferrules, marked to correspond with the wiring diagram shall be fitted at both ends of each wire. Ferrules shall fit tightly on the wires, and shall not fall off when the wire is removed. Spare auxiliary contacts of the relays etc. shall be wired to terminal blocks. All wiring shall be terminated on terminal blocks using crimping type of tinned copper lugs. Insulated sleeves shall be neatly punched and cleaned without affecting access to equipment mounted within the cabinet. Wiring troughs shall be provided for vertical cabinet wiring and for interconnecting wiring between front and rear section of the cabinet. (v) 2.04.04 One piece moulded, 1.1 kV grade terminal blocks complete with insulated barriers, terminal studs, washers, nuts and locknuts and identification strips shall be used. For Simplex panel, they shall be mounted on the sides. All the terminals shall be mounted horizontally (vertical mounting is not acceptable) on anodized channels at an angle to provide easy access at a height of minimum 300mm from the base. All the TBs shall be of disconnecting type. End plates shall be provided. Disconnecting TBs shall be mounted in such a manner that when it is dropped it falls down due to gravity. TBs shall be of Elmex, Connectwell make CDTTS type. Terminals for power connections shall be adequately rated for the circuit current and the rating of other terminal blocks for central indication etc. shall not be less than 15 amps. At least ten percent spare terminal blocks shall be provided. Terminal blocks for control indication etc. shall be suitable for connecting at least two conductors of PURCHASER's cable of following sizes.	**Clause No xix (iv, v), Page No. 749** **Delete** (iv) "2.04.03 (v) "2.04.04

Sr. No.	Description	Clause No. and Page No. of Original Tender Document	Amendment
22.	Section VIII: Technical Specification	**Clause No. xix (vii, viii, ix), Page No. 750** (vii) 2.04.06 PURCHASER's external cable connections to the control cabinet will be carried out using 1.1 kV grade, stranded copper conductors, PVC insulated, PVC sheathed, armored and PVC jacketed cables. All necessary cable terminating accessories such as packing glands, crimp type tinned copper lugs, supporting clamps and brackets, etc. for PURCHASER's cables shall be included in Vendor's scope of supply. (viii) 2.04.07 Separate MCBs shall be considered for the switches. All armored communication cables shall be terminated on LIUs/Patch Panels. All inter panel communication cabling shall be carried out through separate cable trough/tray. (ix) 2.04.08 All wiring for equipment supplied by the PURCHASER for which vendor has to provide cutouts, shall be provided upto the terminal blocks.	**Clause No. xix (vii, viii, ix), Page No. 750** **Delete** (vii) "2.04.06 (viii) "2.04.07 (ix) "2.04.08
23.	Section VIII: Technical Specification	**Clause No. ix (c), Page 312** **ix. Constructional details** (c) **Insulation:** Insulation shall be cross-linked polyethylene (XLPE) and of very high degree of purity and radiant cured (i.e., dry curing and dry cooling process). This XLPE insulation shall be applied by extrusion and vulcanized to form a compact homogenous body free from micro voids and contaminants. The nominal thickness of the insulation between conductor screen & insulation screen shall be 23 mm. & all other requirements shall be as per latest relevant IEC.	**Clause No. ix (c), Page 312** **ix. Constructional details** (c) **Insulation:** Insulation shall be cross-linked polyethylene (XLPE) and of very high degree of purity and radiant cured (i.e., dry curing and dry cooling process). This XLPE insulation shall be applied by extrusion and vulcanized to form a compact homogenous body free from micro voids and contaminants. The nominal thickness of the insulation between conductor screen & insulation screen shall be as per IEC 62067 clause no. 10.6.2 & all other requirements shall be as per latest relevant IEC.

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>24.</td><td>Section VIII: Technical Specification</td><td>Clause No. (viii) Sr. No. 15, Page 311

(viii) Cable design features

<table>
<tr><td>15</td><td>Cable Accessories</td><td>As per IEC standards with latest amendments. Silicon or EPDM rubber based stress cones are acceptable.

a) The straight through joints shall be pre-molded type with metal casing (for sheath continuity) and compound filled FRP / HDPE casing.

b) Outdoor termination (composite type -with resin-glass fiber tube equipped with silicone sheds (including connectors /clamp). Outdoor type terminations / housing shall be suitable for hot line washing with Insulator creepage distance of 8500 mm minimum

c) The GIS termination shall be dry type but dimensions of oil filled type

d) 220 KV termination at transformer side shall meet the DIN EN 50299 requirements (Standard for Oil Immersed Cable connection assemblies)

e) Overall dimension of the GIS / transformer side termination shall be achieved as per IEC standard preferably without using any extension adaptor.</td></tr>
</table></td><td>Clause No. (viii) Sr. No. 15, Page 311

(viii) Cable design features

<table>
<tr><td>15</td><td>Cable Accessories</td><td>As per IEC standards with latest amendments. Silicon or EPDM rubber based stress cones are acceptable.

a) The straight through joints shall be pre-molded type with metal casing (for sheath continuity) and compound filled FRP / HDPE casing.

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<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>25.</td><td>Section VIII: Technical Specification</td><td>Clause No. 13 Sr. No. 17, Page 321

13. Guaranteed Technical data sheets - 220 kV Cables
<table>
<tr><td>Sr No</td><td>Description</td><td>Unit</td><td>Data specified by the purchaser</td><td>Data to be filled by the Bidder</td></tr>
<tr><td>17.</td><td>Nominal cross sectional area of conductor & the type of conductor</td><td>Sq. mm</td><td>1200

Milliken type</td><td></td></tr>
</table></td><td>Clause No. 13 Sr. No. 17, Page 321

13. Guaranteed Technical data sheets - 220 kV Cables
<table>
<tr><td>Sr No</td><td>Description</td><td>Unit</td><td>Data specified by the purchaser</td><td>Data to be filled by the Bidder</td></tr>
<tr><td>17.</td><td>Nominal cross sectional area of conductor & the type of conductor</td><td>Sq. mm</td><td>1600

Milliken Segmental type</td><td></td></tr>
</table></td></tr>
<tr><td>26.</td><td>Section VIII: Technical Specification</td><td>Clause No. viii (10), Page 310

(viii) Cable design features
<table>
<tr><td>10</td><td>Outer Sheath</td><td>The outer sheath (with termite repellant, anti-rodent, U/V resistant & Free from chlorinated paraffin, resistant to sulphide found in the ground & flame retardant) shall consist of extruded black colored HDPE. The minimum thickness at any point shall be in line with IEC standards. Extruded Semi conductive layer on outer sheath shall be considered.</td></tr>
</table></td><td>Clause No. viii (10), Page 310

(viii) Cable design features
<table>
<tr><td>10</td><td>Outer Sheath</td><td>The outer sheath (with termite repellant, anti-rodent, U/V & Free from chlorinated paraffin, resistant to sulphide found in the ground) shall consist of extruded black colored HDPE. Minimum thickness of outer sheath at any point shall be 4.3 mm (mentioned in GTP Sr. No. 38 also) & Nominal thickness shall be in line with IEC standards. Extruded Semi conductive layer on outer sheath shall be considered.</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Clause No. and Page No. of Original Tender Document</th><th>Amendment</th></tr>
<tr><td>27.</td><td>Section I: NIT</td><td>Clause No.1.1.2, Page No. 1
<table>
<tr><th>Sr. No.</th><th>Tender Schedule</th><th>Bidder Schedule</th><th>Start Date & Time</th><th>End Date & Time</th></tr>
<tr><td>1.</td><td>Tender Authorization and Publishing</td><td>---------</td><td>---------</td><td>10/04/2017, 1800 hrs</td></tr>
<tr><td>2.</td><td>---------</td><td>Tender Document Download</td><td>11/04/2017, 1000 hrs</td><td>24/05/2017, 1800 hrs</td></tr>
<tr><td>3.</td><td>Pre-bid Meeting</td><td>---------</td><td>21/04/2017, 1100 hrs</td><td>---------</td></tr>
<tr><td>4.</td><td>---------</td><td>Seeking Clarification</td><td>11/04/2017, 1000 hrs</td><td>05/05/2017, 1800 hrs</td></tr>
<tr><td>5.</td><td>Tender Closing</td><td>---------</td><td>25/05/2017, 1000 hrs</td><td>25/05/2017, 1800 hrs</td></tr>
<tr><td>6.</td><td>Opening Envelope, A – Tender Fees, EMD</td><td>---------</td><td>26/05/2017, 1000 hrs</td><td>26/05/2017, 1800 hrs</td></tr>
<tr><td>7.</td><td>Opening Envelope B – Technical Bid</td><td>---------</td><td>26/05/2017, 1000 hrs</td><td>26/05/2017, 1800 hrs</td></tr>
<tr><td>8.</td><td>Opening Envelope C – Financial Bid</td><td>---------</td><td>To be notified later</td><td>To be notified later</td></tr>
</table></td><td>Clause No.1.1.2, Page No. 1
<table>
<tr><th>Sr. No.</th><th>Tender Schedule</th><th>Bidder Schedule</th><th>Start Date & Time</th><th>End Date & Time</th></tr>
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<tr><td>2.</td><td>---------</td><td>Tender Document Download</td><td>11/04/2017, 1000 hrs</td><td>08/06/2017, 1800 hrs</td></tr>
<tr><td>3.</td><td>Pre-bid Meeting</td><td>---------</td><td>21/04/2017, 1100 hrs</td><td>---------</td></tr>
<tr><td>4.</td><td>---------</td><td>Seeking Clarification</td><td>11/04/2017, 1000 hrs</td><td>26/05/2017, 1800 hrs</td></tr>
<tr><td>5.</td><td>Tender Closing</td><td>---------</td><td>09/06/2017, 1000 hrs</td><td>09/06/2017, 1800 hrs</td></tr>
<tr><td>6.</td><td>Opening Envelope, A – Tender Fees, EMD</td><td>---------</td><td>12/06/2017, 1000 hrs</td><td>12/06/2017, 1800 hrs</td></tr>
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</table></td></tr>
</table>

Sr. No.	Description	Clause No. and Page No. of Original Tender Document	Amendment
28.	Section II - ITT	**Clause No. B3, Page No. 12** **B.3 Clarification of Tender Documents** Should the Tenderer for any reason whatsoever, be in doubt about the meaning of anything contained in the Invitation to Tender, Tender documents or the extent of detail in the Employer's Requirements, the Tenderer shall seek clarification from Executive Director (Electrical) of MMRC, on or before the latest date of seeking clarification given in the Notice of Invitation to Tender.	**Clause No. B3, Page No. 12** **B.3 Clarification of Tender Documents** Should the Tenderer for any reason whatsoever, be in doubt about the meaning of anything contained in the Invitation to Tender, Tender documents or the extent of detail in the Employer's Requirements, the Tenderer shall seek clarification from Executive Director (Electrical) of MMRC, no later than fourteen (14) days prior to the Tender Closing date given in the Notice Inviting Tender (NIT).
29.	Section I: NIT	**Clause No. 1.1.3.2 (a), (b), (c), Page No. 3 & 4** **1.1.3.2 Minimum Eligibility Criteria:** **A.** The bidders individually or as consortium/ JV should fulfil the following **Eligibility Criteria**: **(a) For Supply, Erection, Testing & Commissioning of EHV/HV Transmission Towers, Termination Yard Equipments & associated Civil Works:** The Bidder should have achieved the following eligibility criteria of having successfully completed **Similar works**** during the last 7 years preceding 31st January, 2017: **Three Similar works**** completed, costing not less than Rs. 8 Crores each. **or** **Two Similar works**** completed costing not less than Rs. 10 Crores each. **or** **One Similar work**** completed costing not less than Rs. 16 Crores.	**Clause No. 1.1.3.2 (a), (b), (c), Page No. 3 & 4** **1.1.3.2 Minimum Eligibility Criteria:** **A.** The bidders individually or as consortium/ JV should fulfil the following **Eligibility Criteria**: **(a) For Supply, Erection, Testing & Commissioning of EHV/HV Transmission Towers, Termination Yard Equipments & associated Civil Works:** The Bidder should have achieved the following eligibility criteria of having successfully completed **Similar works**** during the last 7 years preceding 30th April, 2017: **Three Similar works**** completed, costing not less than Rs. 8 Crores each. **or** **Two Similar works**** completed costing not less than Rs. 10 Crores each. **or** **One Similar work**** completed costing not less than Rs. 16 Crores.

Sr. No.	Description	Clause No. and Page No. of Original Tender Document	Amendment
		Similar Work(s)** is defined as ***"Supply, Testing and Commissioning of EHV/HV Transmission Towers of 110 kV and above voltage level and/or Procurement, Supply, Erection, Testing and commissioning of various Switchyard Equipments like CTs, LAs, CR Panels, SCADA and associated Equipments like ACDB, DCDB, Battery, Battery Chargers etc. for major Transmission utilities, PSUs or Government/Leading Private organisations****." The work also involves, associated Civil Works like EHV Cable Ducts along with HDPE Pipes, Construction of Termination Yard along with Control room, Foundations of Transmission and Switch Yard Towers, Gantry Foundations etc. These Civil Works can be carried out through an *experienced Sub-Contractor.* **In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payments received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.* **(b) For Procurement and Supply of EHV, HV & LV Cables along with Termination / Jointing Kits and other Associated Items.** The Bidder should have achieved the following eligibility criteria of having successfully completed Similar works** during the last 7 years preceding 31st January, 2017: **Three Similar works**** completed, costing not less than Rs. 9 Crores each. **or** **Two Similar works**** completed, costing not less than Rs. 11 Crores each. **or** **One Similar work**** completed, costing not less than Rs. 18 Crores.	**Similar Work(s)**** is defined as ***"Supply, Testing and Commissioning of EHV/HV Transmission Towers of 110 kV and above voltage level and/or Procurement, Supply, Erection, Testing and commissioning of various Switchyard Equipments like CTs, LAs, CR Panels, SCADA and associated Equipments like ACDB, DCDB, Battery, Battery Chargers etc. for major Transmission utilities, PSUs or Government/Leading Private organisations****." The work also involves, associated Civil Works like EHV Cable Ducts along with HDPE Pipes, Construction of Termination Yard along with Control room, Foundations of Transmission and Switch Yard Towers, Gantry Foundations etc. These Civil Works can be carried out through an *experienced Sub-Contractor.* **In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payments received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.* **(b) For Procurement and Supply of EHV, HV & LV Cables along with Termination / Jointing Kits and other Associated Items.** The Bidder should have achieved the following eligibility criteria of having successfully completed Similar works** during the last 7 years preceding 30th April, 2017: **Three Similar works**** completed, costing not less than Rs. 9 Crores each. **or** **Two Similar works**** completed, costing not less than Rs. 11 Crores each. **or** **One Similar work**** completed, costing not less than Rs. 18 Crores.

Sr. No.	Description	Clause No. and Page No. of Original Tender Document	Amendment
		Similar Work(s)** defined as ***Procurement/supply of EHV Cables of 110kV and above voltage level. for major Transmission utilities, PSUs or Government/Private Organisations.*** **In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payments received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.* The bidder shall submit duly attested/notarised performance certificate issued by the utility/end users along with a copy of details work order] **(c) For Laying, Testing and Commissioning EHV, HV & LV Cables along with Making Termination / Joints.** The Bidder should have achieved the following eligibility criteria of having successfully completed Similar works** during the last 7 years preceding 31st January, 2017: **Three Similar works**** completed of not less than 3 kM of cable length. **or** **Two Similar works**** completed of not less than 4 kM of cable length. **or** **One Similar work**** completed of not less than 6 kM of cable length. **Similar Work(s)**** is defined as ***Laying, Testing and Commissioning of EHV Cables of 110kV and above voltage level.*** "The above-mentioned cable laying work can be carried out through a ***Specialized Sub-Contractor*** who is having experience of not less than 5 Years in Cable Laying of 110 kV and above voltage level."	**Similar Work(s)**** defined as ***Procurement/supply of HV/EHV Cables of 33kV and above voltage level. for major Transmission utilities, PSUs or Government/Private Organisations.*** **In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payments received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.* The bidder shall submit duly attested/notarised performance certificate issued by the utility/end users along with a copy of details work order] **(c) For Laying, Testing and Commissioning EHV, HV & LV Cables along with Making Termination / Joints.** The Bidder should have achieved the following eligibility criteria of having successfully completed Similar works** during the last 7 years preceding 30th April, 2017: **Three Similar works**** completed of not less than 3 kM of cable length. **or** **Two Similar works**** completed of not less than 4 kM of cable length. **or** **One Similar work**** completed of not less than 6 kM of cable length. **Similar Work(s)**** is defined as ***Laying, Testing and Commissioning of EHV Cables of 110kV and above voltage level.*** "The above-mentioned cable laying work can be carried out through a ***Specialized Sub-Contractor*** who is having experience of not less than 5 Years in Cable Laying of 110 kV and above voltage level."

ATTACHMENTS OF ADDENDUM NO. 2

Contract No.: MM3-CBS-REL-PYL

"Procurement, Supply, Installation, Testing and Commissioning of various power supply works including associated civil works, required for diversion of 220kv and 33 kv Transmission Lines along with the Transmission towers belonging to M/s Reliance Infrastructure Ltd. In Aarey depot area for Mumbai Metro Line-3"

NOTICE INVITING TENDER (NIT)

1.1 GENERAL

1.1.1 Name of Work:

Mumbai Metro Rail Corporation (MMRC) Ltd invites online open e-tenders from eligible and interested bidders who fulfil qualification criteria as stipulated in Clause 1.1.3 of NIT, for the work ***"Contract -MM3-CBS-REL-PYL-: Procurement, Supply, Installation, Testing and Commissioning of various Power Supply works including associated Civil works, required for diversion of 220 kV and 33 kV Transmission Lines along with the Transmission towers belonging to M/s Reliance Infrastructure Ltd. in Aarey depot area for Mumbai Metro Line -3"***

The brief scope of the work and site information is provided in ITT clause A1 (Section II) & Employer Requirements (Section VII).

1.1.2 Key Details:

Sr No	Name of Work	Estimated Cost (Rs. In Lakhs)	Earnest Money (Rs. In Lakhs)	Security Deposit (Rs. In Lakhs)	Time Period
1	2	3	4	5	6
1.	*Procurement, Supply, Installation, Testing and Commissioning of various Power Supply works including associated Civil works, required for diversion of 220 kV and 33 kV Transmission Lines along with the Transmission towers belonging to M/s Reliance Infrastructure Ltd. in Aarey depot area for Mumbai Metro Line -3"*	4239.43	42.39	10% of the Estimated amount put to Tender or Contract price, whichever is higher	426 Days (Including Monsoon)

Sr. No.	Tender Schedule	Bidder Schedule	Start Date & Time	End Date & Time
1.	Tender Authorization and Publishing	---	---	10/04/2017, 1800 hrs
2.	---	Tender Document Download	11/04/2017, 1000 hrs	**08/06/2017, 1800 hrs**
3.	Pre-bid Meeting	---	21/04/2017, 1100 hrs	---
4.	---	Seeking Clarification	11/04/2017, 1000 hrs	**26/05/2017, 1800 hrs**
5.	Tender Closing	---	**09/06/2017, 1000 hrs**	**09/06/2017, 1800 hrs**

6.	Opening Envelope, A – Tender Fees, EMD	---------	**12/06/2017, 1000 hrs**	**12/06/2017, 1800 hrs**
7.	Opening Envelope B – Technical Bid	---------	**12/06/2017, 1000 hrs**	**12/06/2017, 1800 hrs**
8.	Opening Envelope C – Financial Bid	---------	To be notified later	To be notified later

1.1.2.1 The Project

The Project includes, Procurement, Supply, Installation, Testing and Commissioning of various Power Supply works including Civil, Electrical and Mechanical works, required for diversion of 220 kV and 33 kV Transmission Lines along with the Transmission Towers belonging to M/s Reliance Infrastructure Ltd. located on the proposed land for establishing MML-3 Depot/Yard at Aarey Colony, Goregaon.

1.1.3 Qualification Criteria:

1.1.3.1 Eligible Applicants:

i. Statutory Licenses/Registration

- The bidder should have a valid Electrical Contractor's License.
- The bidder should be registered under Maharashtra Value Added Tax (MVAT) Act / Central Sales Tax Act and Service Tax Act under GOI as well as for other various taxes in force.
- The bidder should be registered under P.F. Act.
- Income Tax Permanent Account No.

Note: Duly attested copies of Certificate should be submitted with bid offer.

ii. The bidders for this contract will be considered only from those bidders (proprietorship firms, partnerships firms, companies, corporations, consortia or joint ventures) who meet requisite eligibility criteria prescribed in the sub-clauses mentioned below. In the case of a JV or Consortium, all members of the Group shall be jointly and severally liable for the performance of whole contract.

iii. Bidder may associate with other firms in the form of Joint Venture with not more than 3 members (including lead member) with condition that the Lead Member must have participation of at least **26%** or their wholly owned Indian subsidiary registered in India under Company Act 1956 or Company Act 2013, with minimum 26% participation.

iv. A Tenderer shall submit only one tender in the same tendering process, either individually as a tenderer or as a partner of a JV. A tenderer who submits or participates in, more than one bid will cause all of the proposals in which the tenderer has participated to be disqualified. No Tenderer can be a subcontractor while submitting a bid individually or as a partner of a JV in the same tendering process. A tenderer, if acting in the capacity of subcontractor in any tender, may participate in more than one tender, but only in that capacity.

v. A bidder shall not have a conflict of interest. All bidders found to have a conflict of interest shall be disqualified. Bidders shall be considered to have a conflict of interest with one or more parties in this tendering process,

(a) A bidder has been engaged by the Employer to provide consulting services for the preparation related to procurement for on implementation of the project;

(b) A bidder is any associates/affiliates (inclusive of parent firms) mentioned in subparagraph (a) above; or\

(c) A bidder lends, or temporarily seconds its personnel to firms or organization's which are engaged in civil construction for the construction for an

implementation of the project, if the personnel would be involved in any capacity on the same project.

vi. A firm, who has purchased the bid document in their name, can submit the tender either as Individual firm or in joint venture/Consortium.

vii. The Central / State government department / public sector undertaking / other government entity, PSUs or Government/Private Organisations* must not have banned business with the bidder (any member in case of JV) as on the date of tender submission. Also, no contract of the bidder should have been rescinded / terminated during last 5 years due to non-performance of the bidder or any of JV /Consortium members. The bidder should submit undertaking to this effect in **Appendix 09 of FOT**

viii. Bidder (any member in case of JV/consortium) must not have suffered bankruptcy/ insolvency during the last 5 years. The bidder should submit undertaking to this effect in Appendix 09 of FOT

ix. Non-Substantial Partners in Case of JV/Consortium

a. Lead partner must have a minimum of 26% participation in the JV/Consortium.

b. Partners having less than 26% participation will be termed as non-substantial partner and will not be considered for evaluation which means that their financial soundness and work experience shall not be considered for evaluation of JV/Consortium.

c. In case of JV/Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as non-responsive.

1.1.1.1 Minimum Eligibility Criteria:

A. The bidders individually or as consortium/ JV should fulfil the following **Eligibility Criteria**:

(a) For Supply, Erection, Testing & Commissioning of EHV/HV Transmission Towers, Termination Yard Equipments & associated Civil Works:

The Bidder should have achieved the following eligibility criteria of having successfully completed **Similar works**** during the last 7 years preceding 31st January 2017:

Three Similar works** completed, costing not less than Rs. 8 Crores each.

or

Two Similar works** completed costing not less than Rs. 10 Crores each.

or

One Similar work** completed costing not less than Rs. 16 Crores.

Similar Work(s)** is defined as ***"Supply, Testing and Commissioning of EHV/HV Transmission Towers of 110 kV and above voltage level and/or Procurement, Supply, Erection, Testing and commissioning of various Switchyard Equipments like CTs, LAs, CR Panels, SCADA and associated Equipments like ACDB, DCDB, Battery, Battery Chargers etc. for major Transmission utilities, PSUs or Government/Leading Private organisations**.*"

b. For the balance Tender Security/Earnest Money, Irrevocable bank guarantee issued by a Scheduled Commercial Bank (including Schedule Commercial Foreign Banks) in India, in the form given in Annexure 6, of the Instruction to Tenderers (ITT), payable at Mumbai shall be submitted before the tender closing date as mentioned in NIT.

(In case of joint venture/consortia, Bank Guarantee for Tender Security shall be in the name of joint venture/consortia) The Tender Security shall remain valid for a period of 56 days beyond the validity period for the tender.The tenderer shall upload the scanned copy of the Bank Guarantee as part of Envelope A on the online MMRC e-tendering portal only. The bidder shall submit the original Bank Guarantee, before the deadline of submission of bid at the office of the Executive Director (Electrical), MMRDA Building, 5th Floor, A-Block, Bandra Kurla Complex, Bandra –East, Mumbai-400051, India

1.1.11 Submission of Tenders shall be closed on e-tendering portal of MMRC on the date & time of submission prescribed in NIT after which no tender shall be accepted. It shall be the responsibility of the bidder / bidder to ensure that his tender is submitted online on e-tendering portal of MMRC before the deadline of submission. MMRC will not be responsible for non-receipt of tender documents due to any delay and/or loss etc.

1.1.12 Tender Document can be downloaded for reference purpose from the e-Tendering Portal of MMRC during the period mentioned in the tender notice. Interested Bidders have to make online payment of Rs. 25,000/- (Rupees Twenty-Five Thousand only) inclusive of MVAT (non-refundable) as Tender Processing Fee using online payment gateway during bid preparation using i.e. Debit Card/Credit Card/Net-Banking. Tender Fee receipt can be system generated during bid preparation by the Bidder.

1.1.13 The lowest tenderer will have to submit the rate analysis of all major items if called for.

1.1.14 Tenders shall be valid for a period of **180 days** (both days inclusive i.e. the date of submission of tender and the last date of period of validity of the tender) from the date of submission of Tenders and shall be accompanied with a tender security of the requisite amount as per **Clause C22 of ITT**.

1.1.15 MMRC reserves the right to accept or reject any or all proposals without assigning any reasons. No tenderer shall have any cause of action or claim against the MMRC for rejection of his proposal**.**

Date: 10th April, 2017
Place: Mumbai
No.: MMRC/MM3/REL-PYL/NIT/18

Executive Director (Electrical)
Mumbai Metro Rail Corporation Ltd.

The Bidder is expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of the Tender documents will be at the bidder's own risk. Bidders that are not substantially responsive to the requirements of the Tender documents will be rejected.

The Tenderer shall not make or cause to be made any alteration, erasure or obliteration to the text of the Tender Documents.

B.2 Content of Supporting Documents

2.1 The Tenderer shall note the existence of over ground, at grade and underground structures, utilities and infrastructure in the near vicinity of the Works to be constructed Deleted.

2.2 The accuracy or reliability of the documents and reports referred to in this Clause B2 and of any other information supplied, prepared or commissioned at any time by the Employer or others in connection with the Contract is not warranted. The Tenderer's attention is drawn to sub-clauses **4.9 and 4.10 of GCC** in this regard. The Tenderer should visit, examine and assess the Site including working conditions and will be deemed to have satisfied himself of the risks and obligations under the Contract.

B.3 Clarification of Tender Documents

The Tenderer shall check the pages of all documents against page numbers given in indexes and summaries and, in the event of discovery of any discrepancy; the Tenderer shall inform Executive Director (Electrical) of MMRC forthwith.

Should the Tenderer for any reason whatsoever, be in doubt about the meaning of anything contained in the Invitation to Tender, Tender documents or the extent of detail in the Employer's Requirements, the Tenderer shall seek clarification from Executive Director (Electrical) of MMRC, no later than fourteen (14) days prior to the Tender Closing date given in the Notice Inviting Tender (NIT). All communications between the Tenderer and Executive Director (Electrical) of MMRC shall be in writing.

Except for any such written clarification by Executive Director (Electrical) of MMRC which is expressly stated to be by way of an addendum to the documents referred to in paragraph B1 above and/or for any other document issued by the Employer which is similarly described, no written or verbal communication, representation or explanation by any employee of the Employer shall be taken to bind or fetter the Employer under the Contract.

B.4 Amendment of Tender Documents

4.1 Tenderer is advised that further Instructions to Tenderer and Addenda to the Tender Documents may be issued during the tender period. These Addenda/Corrigenda shall form the part of Tender documents. Therefore, Tenderer shall confirm receipt of such documents in the **Form of Tender - Appendix 10** and list them in the Tender Submittal.

4.2 The Tenderer should note that there might be aspects of his Tender and/or the evaluation documents submitted with the Tender that will necessitate discussion and clarification. It is intended that any aspect of the said evaluation documents and any amendments or clarification which are to have contractual effect will be incorporated into the Contract either:

(i) By way of Special Conditions of Contract to be prepared on behalf of the Employer and agreed in writing by the Tenderer prior to and conditional upon acceptance of the Tender; or

(ii) By the Tenderer submitting, at the written request of the Employer, documents which are expressly stated to form part of the tender, whether requested before or after submission of the documents forming part of the Tender, identified in paragraph below, and whether as supplements to, or amended versions of such documents. Save as aforesaid, all such amendments or clarifications shall not have contractual effect.

C.15 Pricing Document

The Pricing Document is included in Bill of Quantities; **Section IX**. The Tenderer shall complete the Document in accordance with the instructions given in Bill of Quantity. The completed Pricing Document including price of minor deviations for such deviation as mentioned in Appendix 11 of FOT shall be submitted.

The price of each such minor deviation will be the price which the Tenderer agrees to offer to the employer from his quoted offer, if deviation is agreed by the employer. Any such deviation without a price shall not be considered and will be treated as withdrawn by the tenderer. Any other deviation mentioned anywhere in the submission other than in Appendix-11 of FOT shall be considered as if mentioned inadvertently by the tenderer and shall be considered as withdrawn without any confirmation from the tenderer.

The Tenderer is to note that the completion period must be adhered to strictly failing which Liquidated Damages shall be levied to the contractor.

C.16 Currencies of Tender and Payment

The Tenderer shall quote his price only in INR and the Payment also shall be made in INR only

C.17 Tender Index

The tenderer shall include with his tender an index **Appendix 7 to the FOT** which cross refers all of the Employer's tender requirements elaborated in these documents to all the individual sections within Contract Technical Package and Contract Financial Package which the Tenderer intends to be the responses to each and every one of those requirements.

C.18 Modification, Substitution and Withdrawal of Tenders

Except where expressly permitted by these instructions, the Tenderer shall not make or cause to be made any alteration, erasure or obliteration to the text of the documents prepared by the Employer and submitted by the Tenderer with or as part of his Tender.

The Tenderer's modification or withdrawal notice shall be prepared, sealed, marked and delivered, with the outer and inner envelopes additionally marked "MODIFICATION" or "WITHDRAWAL", as appropriate.

No Tender may be modified by the Tenderer after the deadline for submission of Tenders.

Withdrawal of a tender during the interval between the deadline for submission of bids and the expiration of the period of bid validity specified in the Form of Tender shall result in the forfeiture of the Tender Guarantee.

C.19 Pricing Condition, Qualification, Deviation etc.

Tenderer shall further note that except for deviations listed in Appendix F of ITT, tender shall be deemed to comply with all the requirements in the tender documents including employer's requirements, without any extra cost to the employer irrespective of any mention to contrary, anywhere else in the tender.

C.20 Earnest Money Deposit/ Tender Security: -

Earnest money deposit for this work will be Rs. 42,39,000/- only. The Tenderer shall submit with his Tender a Tender Security for the sum mentioned in NIT in the following forms:
a. An amount of INR 1,00,000 (Rupees One Lakh) Through RTGS/NEFT/Net Banking/Credit card/Debit Card
b. For the balance Tender Security/Earnest Money, Irrevocable bank guarantee issued by a Scheduled Commercial Bank (including Schedule Commercial Foreign Banks) in India, in the form given in Annexure 6, of the Instruction to Tenderers (ITT), payable at Mumbai shall be submitted before the tender closing date as mentioned in NIT.

(In case of joint venture/consortia, Bank Guarantee for Tender Security shall be in the name of joint venture/consortia.) The Tender Security shall remain valid for a period of 56 days

	Make of Compound for Insulation & Inner / outer Semi-conducting *compound*	Borealis / Dow Chemicals. only
6	Inner Longitudinal and radial water seal	Semi conducting water swalleble tapes shall be applied over the insulating screen Selection of Swelling height & time, weight, volume resistivity of tape shall be justified by technical calculation / documents
7	Metal screening (If required, to meet the short circuit rating)	The metallic screen shall consists of concentric layer of annealed copper wires, followed by a copper tape binder applied in helical form
8	Outer Longitudinal and radial water sealing bedding (Applicable only if metallic screening is provided as per Cl 3.7)	Semi-conducting water Swalleble tapes shall be applied over the metallic screening.
9	Metallic sheath	The metallic extruded sheath shall consist of Extruded Corrugated Aluminium sheathing, provided with high-viscosity bitumen-based compound coating The minimum thickness at any point of metallic sheath shall be in line with IEC recommendations, meeting short circuit requirement of REL. ®
10	Outer Sheath	The outer sheath (with termite repellant, anti-rodent, U/V & Free from chlorinated paraffin, resistant to sulphide found in the ground) shall consist of extruded black colored HDPE. Minimum thickness of outer sheath at any point shall be 4.3 mm (mentioned in GTP Sr. No. 38 also) & Nominal thickness shall be in line with IEC standards. Extruded Semi conductive layer on outer sheath shall be considered.
11	Cable Rating	The cable shall be suitable to carry continuously rated load current on 220 KV, single circuit, without exceeding the maximum conductor temperature of 90 deg. C.
		b) The current rating shall be calculated based on the following data unless the same are different from those indicated in Part -B: i) Soil thermal resistivity – 1.40 deg.C Mtr / Watt ii) Ambient temperature – 50 deg C iii) Ground temperature 35 deg C. iv) Trefoil formation v) As per the type of bonding recommended by the vendor vi) depth of laying □ 2000 mm As per the proposed laying methodology (refer Annexure attached in Volume 2) Any other additional requirement for cable laying, if necessary can be recommended for R-Infra-T
12	Drum Length	Economic drum length is to be determined by the contractor. However for bidding purpose the drum length of the cable shall be considered as 500 M. Approximate total requirement shall be as per Part B of this Specification. Exact length shall be confirmed at

		The tolerance in drum length shall be + 2 %. The overall quantity tolerance shall be + 2 %.
13	Short length of cables	Manufacturer shall be required to take prior approval from Engineering and Procurement for any short length supply. Manufacturer shall not be allowed to put two cable pieces of different short lengths in same cable drum.
14	Embossing	The extruded outer sheath shall be embossed with Sequential length marking at interval of every one meter. The 'Start' end meter marking and "Finish" end meter marking and the drum lengths shall be printed on the drum flange along with other markings. The outer sheath shall also be embossed with (min.) a) Voltage designation b) Type of construction / cable code (e.g. 2XLYC2Y) c) Nominal cross sectional area of conductor & material d) Manufacturers name & trade mark e) Name of buyer (RInfra-T, Mumbai) f) Month & year of manufacturing g) P.O. No. & Date h) Batch No. or Lot No. or Drum no. (For traceability purpose, in case of any future issues / problem in cable) ®
15	Cable Accessories	As per IEC standards with latest amendments. Silicon or EPDM rubber based stress cones are acceptable. a) The straight through joints shall be pre-molded type with metal casing (for sheath continuity) and compound filled FRP / HDPE casing. b) Outdoor termination (composite type -with resin-glass fiber tube equipped with silicone sheds (including connectors /clamp). Outdoor type terminations / housing shall be suitable for hot line washing with Insulator creepage distance of 8500 mm minimum

(ix) **Constructional details**

(a) **Conductor**

1. Single core conductor having Milliken construction, shall consist of stranded, Segmental, compacted circular annealed copper wires confirming to IEC -60228 /IS -8130.

2. The wires shall be made of high conductivity copper and shall be stranded and compacted.

3. The copper used for the conductor shall be highest purity. The nominal area of conductor shall be 1600 Sq. mm for 220 KV cable.

4. The minimum number of wires in conductor and DC resistance of conductor shall be as per IEC 60228.

5. The conductor shall be water tight construction with water blocking tape for longitudinal water protection.

6. The maximum conductor temperature shall not exceed 900C during continuous operation at full rated current at 220kV.

7. The temperature after a short circuit for one second shall not exceed 250 deg.C, with initial conductor temperature of 90 deg.C.

8. The BIDDER shall indicate the maximum percentage overload current that the cable can carry and its duration when operating initially at a conductor temperature of 900C and the permissible final conductor temperature after overload.

(b) **Conductor screening:** The Conductor screening shall consist of an extruded layer of thermosetting black semi conducting compound which shall be firmly bonded to the outer surface of the conductor and should cover the whole surface of the conductor and suitable for the operating temperature of the cable and compatible with the insulating material and other requirements shall be as per latest relevant IEC.

(c) **Insulation:** Insulation shall be cross-linked polyethylene (XLPE) and of very high degree of purity and radiant cured (i.e., dry curing and dry cooling process). This XLPE insulation shall be applied by extrusion and vulcanized to form a compact homogenous body free from micro voids and contaminants. The nominal thickness of the insulation between conductor screen & insulation screen shall be as per IEC 62067 clause no. 10.6.2 & all other requirements shall be as per latest relevant IEC.

(d) **Non-metallic part of insulation screening:** The insulation screen shall consist of an extruded layer of thermosetting of semi-conducting compound extruded directly over the insulation and shall be continuous and cover the whole surface are of insulation. It should be firmly bonded to the insulation and suitable for operating temp. of the cable and compatible with the insulating material. The conductor screening, insulation and insulation screening shall be extruded in one operation by single common head process to ensure homogeneity and elimination of voids & all other requirements shall be as per latest relevant IEC.

(e) **Water blocking tape (Longitudinal Water Barrier)**: This shall be Semi-conducting synthetic non-woven tape with suitable swalleble absorbent for longitudinal water sealing covering the whole surface area of the non-metallic part of insulation screening. This barrier shall restrict longitudinal water penetration under the metallic sheath. The nominal thickness of water blocking tape shall be as per latest relevant IEC.

(f) **Metallic screen**: The Metallic screen shall consist of Extruded corrugated Aluminum. The Metallic sheath shall be so selected that aluminum sheath can carry specified fault current (40 kA for one second).

(g) **Outer Jacket:** "The outer jacket shall consist of extruded, black, heavy duty compound conforming to the requirement of type ST-7 for PE/HDPE compound with all other

The closed cans and drums with silicone oil must be protected against rain with a watertight cover by means of a tarpaulin or equivalent.

11. **Deviation**

Deviation from this specification shall be stated in writing in reference to the specification clause / GTP / Drawing & description of alternative offer. In absence of such statements requirements of specifications shall met without exception.

12. **Delivery schedule**

a) Delivery start date ……shall be as per Purchase order
b) Delivery end date ……shall be as per Purchase order
c) Material dispatch clearance date ……shall be as per Purchase order.

13. **Guaranteed Technical data sheets - 220 kV Cables**

Sr no.	Description	Unit	Data specified by the purchaser	Data to be filled by the Bidder
1	Name of manufacturer			
2	Country of manufacturer			
3	Type of cable			
4	Standard according to which cable is manufactured		IEC-62067	
5	Rated voltage	kV	220	
6	Highest system voltage	kV	245	
7	System frequency	Hz	50	
8	No of phases per circuit	Nos	3	
9	System earthing		Solidly grounded	
10	Rated short time current of conductor (1 Second)	kA	40	
11	Rated short time current of metal sheath (alone) 1 Second	kA		
12	Rated short time current of metal screen (if provided)	kA		
13	Rated short time current of metal sheath and screen	kA	40	
14	Duration of short circuit current	Sec	1	
15	Impulse withstand voltage 1.2 / 50 micro sec wave	kVp	1050	
16	Power frequency withstand voltage for 1 Min.	kV (r.m.s)	460	
17	Nominal cross sectional area of conductor & the type of conductor	Sq. mm	1600 Milliken Segmental type	
17A	Tolerance	%	2	
18	Conductor material		Plain Annealed Copper	
19	Minimum no. of strands in each segment, & the diameter before compaction	Nos. / mm		

26	Plastic filling bottles for filling up	2 Nos
27	End terminal plates	As required
28	Insulator, rubber pad etc for rack and cell	As required
29	Cell Tester (-3V -0 – 3V)	1 No
30	Any other accessories not mentioned above but required or usual for the satisfactory operation and maintenance of battery.	As required.

10. Recommendation / Guidance

The following information shall be given on the instruction cards supplied with the battery:

(a) Manufacturer's instruction for filling and initial charging of the battery together with starting and finishing charging rate.
(b) Manual for regular charging, discharging, preventive & breakdown maintenance instructions, trouble shooting, safety precautions etc.
(c) Designation of cell in accordance with IS: 10918.
(d) Storing conditions of electrolyte.
(e) Disposal procedure of battery.

11. Inspection / Testing

(i) **TEST WITNESS**

(a) At least 14 (fourteen) days' advance notice shall be given to the Employer to enable them to witness the test, at their discretion.

12. TEST REPORTS / CERTIFICATES

(a) Certified reports of Routine Tests and Acceptance Tests to be submitted for approval. The battery shall be dispatched from works only after the Employer's written approval is received.

(b) Test reports shall be furnished for the type tests as per IS as specified below.

13. CLASSIFICATION OF TESTS

(a) Type tests reports as per IS 10918, clause no.10.1.1 shall be submitted and not be older than 2 (two) years on the date of submission. Tests shall have been conducted at an accredited laboratory.
(b) Routine test reports as per as per IS 10918, clause no.10.1.3 shall be carried out at the manufacturer's works on each cell.
(c) Acceptance test shall be carried out as per IS 10918, clause no.10.1.2 in the manufacturer's works on samples selected from a lot for the purpose of verifying acceptability of the lot according to standards as specified .
(d) Factory acceptance test (FAT) and site acceptance tests (SAT) shall be conducted as per QAP and pre-commissioning test approved by buyer.

Altitude above mean Sea Level	≤ 1000 Mts
Relative Humidity	≤100 %.
Vibration due to earth	As per IS 1893
Atmosphere	Corrosive, Saline G3 Classification as per ISA standard S71.04 -1985

(iv) Technical Parameters

Requirement	**Parameter**
Application	a. Uninterrupted aux power supply to Substation
Charger	Float cum boost charger
Type	SMPS charger
System Voltage	415V ± 10%, 3P4W System (Three (3) phase four(4) wire)
System Frequency	50 Hz ± 5%
Combined voltage and frequency variation	±10%
System Earthing	i. Input supply will be effectively earthed when fed from normal 415V supply and DG. ii. DC system shall be unearthed
Fault level @ 415V	Max 50kA, 1 sec
DC system voltage	220V, +10% - 15% at DCDB
Details of Battery	100Ah 220V NiCd battery

(v) System Description

1. Configuration	1. Two sets of SMPS type float cum boost chargers. Configuration of battery charger to be supplied is indicated in Annexure -1 ,Single Line Diagram (SLD)
2. Sizing	1. Boost charger is sized to restore the fully discharged battery to full charge condition as per charging hours of respective type of battery with 20% design margin over maximum charging rate. 2. Float charger is sized to cater to continuous DC load and trickle charging current of battery with 20% design margin. 3. FCBC current rating is selected based on boost charge current rating or float charge current rating, whichever is higher. 4. N-1 Redundancy of modules shall be considered in case of charger sizing.
3. Initial charging	1. FCBC shall be capable of providing the initial charging current of 220V DC, 100Ah NiCd battery.
4. Float charging	1. In case of normal operation, both Float-cum-Boost chargers will supply load and trickle charge current of battery.

(vi) Battery charger efficiency shall be greater than 90% at rated load and the power factor at rated load shall be 0.9 minimum

9. Measurement Protection and Controls

(i) Controls

The following controls through control & monitoring unit.

- **a.** Selection of Float / boost charging mode
- **b.** Selection of Float mode voltage and current
- **c.** Selection of Boost mode voltage and current.
- **d.** Auto / manual mode of operation
- **e.** On line testing of battery
- **f.** Others as required for operation of system
- **g.** ON / OFF of isolating switches as per SLD .

(ii) Measurement:

The following measurand shall be displayed on controller through LCD display. If these measurand are not available on controller, digital meters shall be provided on panels.

1. AC input voltage
2. AC input current
3. DC output voltage
4. DC output current
5. Battery voltage
6. Battery current
7. Load voltage
8. Load current
9. DC Leakage current
10. Charger on Float/Boost
11. Charger on Auto / Manual

(iii) Indication lamps

1. DC power ON
2. AC power ON (for each phase)
3. Float / booster Charger ON
4. Charger fault.
5. Charger on Auto/Manual Mode

(iv) Alarms

The signals to be transmitted to SCADA are given below. There shall be provision for data transfer both in hardwired signals and data transmission in soft form. Also the annunciation of all the signals shall be available in controller.

1. DC Under voltage
2. DC over voltage
3. DC over load
4. DC Earth leakage.
5. AC under voltage
6. AC over voltage
7. Load under voltage
8. Load over voltage
9. Over load - load

iii)	20 % spare terminal furnished?	Yes / No
43	Voltage Transducer	0 – Max voltage at battery charger end / 4-20mA
44	Current Transducer	Output 4-20mA
45	Size of ground bus (mm)	
47	Overall dimension (L. x B x H) mm (approx.) of panel	
48	Approx. weight (approx.) Kg of panel	
49	General arrangement drawings furnished	Yes / No
50	Accessories as specified furnished with battery charger.	Yes / No
51	Mandatory spares furnished as per spec	Yes / No
52	Battery charger sizing is done as per Cl 4.3.2 of specification	
53	Supervision of DC Contactor used for connecting battery supply to load shall be provided	
54	Dual terminals to be provided at each cable termination of charger	
55	Provision shall be provided in the charger to protect against phase reversal of supply	
56	Current and voltage of input supply, charger output, load and battery shall be displayed on LCD. In case feature not available, MFM shall be provided for AC and DC metering.	
57	Any other equipment which is usual and required for trouble free and satisfactory operation of the charger to be added with specification by OEM	To be provided by OEM

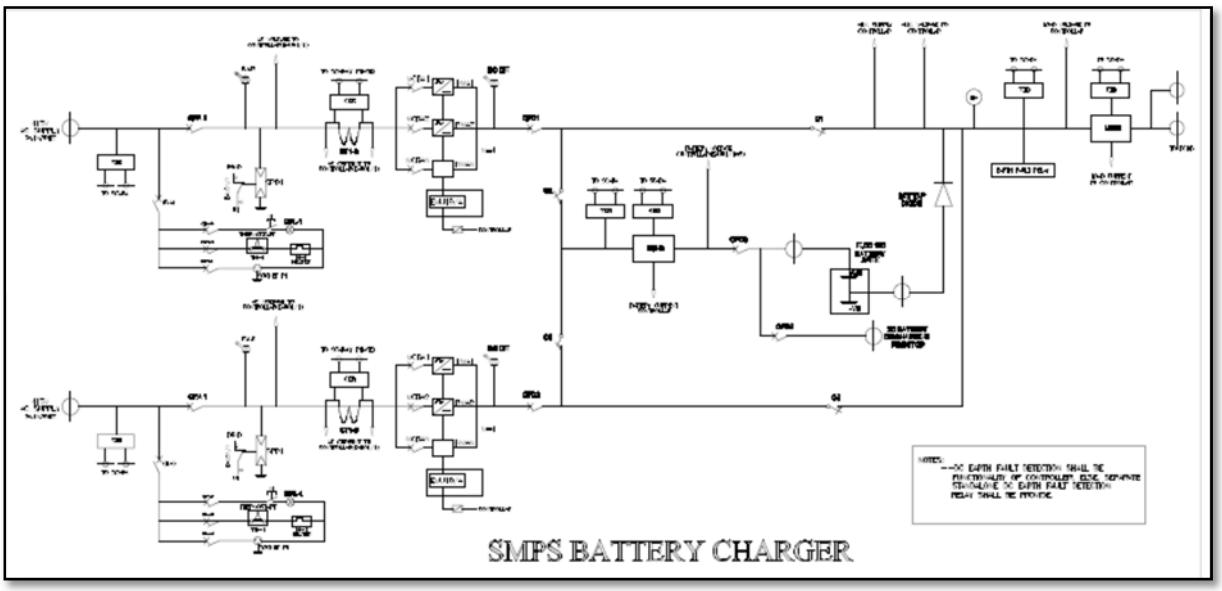
Note # 1: Bidder to provide guaranteed technical particulars (GTP) for each rating of charger.

19. Bill of Material (BOM)

Sl No	Item description	Unit	Quantity
1	Supply of integrated 220V, 30A SMPS type float cum boost battery charger as per single line diagram with following accessories at MMRC Substation Yard a) Software of controller - 2Nos	1 Set (comprises redundant charger for one battery)	2

Note: The above bill of material is indicative to bidder for supply of specified package. Final bill of material (Items and quantity of each item) shall be based on approved scheme drawing. Bidder to consider all the items / equipment required in adequate quantity to meet the Employer's scheme requirement

20. SLD of Battery Charger



SLN	
1	CHARGER ON BOOST
2	DC UNDER VOLTAGE
3	DC OVER VOLTAGE
4	EARTH FAULT
5	COMMON SUMMERY ALARM RELAY

1	LOAD AND BATTERY VOLTAGE (2 NOS)
2	LOAD AND BATTERY CURRENT (2 NOS)
3	AC INPUT VOLTAGE FOR Y PHASE (2 NOS)
4	AC INPUT CURRENT FOR Y PHASE (2 NOS)
5	CHARGER OUTPUT VOLTAGE (2 NOS)
6	CHARGER OUTPUT CURRENT (2 NOS)

SLN	
1	CHARGER DC OVER VOLTAGE
2	CHARGER DC UNDER VOLTAGE
3	BATTERY OVER CURRENT(CHARGE)
4	DC EARTH FAULT
5	AC UNDER VOLTAGE
6	AC OVER VOLTAGE
7	LOAD UNDER VOLTAGE
8	LOAD OVER VOLTAGE
9	BATTERY UNDER VOLTAGE
10	BATTERY OVER VOLTAGE
11	RECTIFIER FAIL
12	AC MAINS FAIL
13	FAN FAIL
14	AC MCCB OFF/TRIP
15	DC MCCB OFF/TRIP
16	BATTERY MCCB OFF/TRIP
17	MODULE OVER TEMPERATURE

SLN	
1	AC INPUT VOLTAGE
2	AC INPUT CURRENT
3	DC OUTPUT VOLTAGE
4	DC OUTPUT CURRENT
5	BATTERY VOLTAGE
6	BATTERY CURRENT
7	DC LEAKAGE CURRENT
8	CHARGER ON FLOAT/BOOST
9	CHARGER ON AUTO/MANUAL
10	LOAD ON BATTERY
11	BATTERY DISCHARGED

		b) Bus insulators shall be flame-retardant, non-hygroscopic, track resistant type with high creepage surface. c) All connections and joints shall have at least twenty-five (25) microns thick silver plating. Necessary silver plated flexible connections with non-ferrous fasteners between bus chambers shall be included. d) The temperature of bus-bar and bus-bar connections when carrying rated current shall not exceed limit as per relevant IS/IEC. e) All vertical and horizontal bus bars shall be sleeved with Raychem make type BPTM or equivalent heat shrinkable sleeves. Bus bar joints shall be covered with moulded PVC shrouds. f) All buses and connections shall be supported and braced to withstand the stresses due to maximum short-circuit current and any thermal expansion. g) Bus bars shall be color-coded and live parts shall be shrouded to ensure complete safety to personnel intending routine inspection by opening the panel doors. h) Bus bar connection shall be fully insulated for working voltage with adequate ground clearance. i) The continuous current rating of the bus bars, their incomers, bus couplers of ACDB, shall be rated for full load current of running loads with 20 % margin rounded off to the next higher standard rating. j) The Bidder shall furnish calculations along with the bid, establishing the adequacy of bus bar sizes for specified current ratings (Horizontal as well as vertical bus bars). k) The main bus bar supports shall be made of SMC (Sheet moulding compound) /DMC (Dough Molding Compound). Each switchgear shall have air insulated heat shrinkable PVC sleeves having flame retardant property shall be provided on each bus bar.
c.	Motorized Moulded Case Circuit Breakers (MCCB)	a) The MCCB shall be current limiting, trip free type with quick make and break design. Operating time shall be coordinated with upstream and downstream equipment. Utilization category shall be suitable for substation application like auxiliary supply to switchgear, power supply to motors etc. b) The MCCB shall be provided with Over current release ,Overload release, short circuit release c) The MCCB shall comprise of double poles in a single construction, with magnetic/ electronic short circuit releases with mechanical position indicator with shrouded terminals. All the parts shall be enclosed in a molded insulating material housing. d) Voltage rating of MCCB shall be 1.1 KV. Minimum breaking capacity shall be 50 kA. Tripping time shall not be more than 10 ms. Three (3) NO & three (3) NC potential free aux contacts shall be provided for monitoring purpose. All contacts shall be wired up to terminal Block. e) Each electrically operated breaker shall be provided with anti-pumping and master trip relay

		b) It shall be possible to report device fail signal on IEC 103 & IEC 61850 to SCADA. In addition to this, any failure detected shall be annunciated through a dedicated output contact (watchdog).
m.	Environmental Conditions	a) Operating temperature – 0 - 50ºC b) Storage temperature - -25 - 70ºC c) Humidity range - 5 - 100% non-condensing d) Degree of protection – IP 51 e) As per The International Society for Automation (ISA) Standard 71.04-1985, our site environmental condition is under G3 (severity level- harsh) classification. Therefore, conformal coating / environmental tests, for corrosive and erosive environment, shall be performed during manufacturing process to guarantee product suitability for harsh environmental condition. f) Vibration / Shock / Temperature / Humidity - The device shall be immune to all type of environment shocks / vibration requirement as per IEC 61000 or IEC 60068 or equivalent standard. It shall comply with operating temperature and humidity as per IEC 60068. g) The instrument shall be suitable for continuous operation at specified ratings. The temperature rise of the components shall be limited to the permissible values stipulated in relevant standards.
n.	Software for all types of Numerical Relays	a. The software shall be original and licensed. Incase higher software version is available at the time of Factory Acceptance Test (FAT), bidder shall supply latest version of software without any extra expenses. The Supplier shall keep Buyer informed of the latest releases of software after the system is shipped. b. Software shall be supplied in CDs along with necessary instruction manual. c. Data cord with end connectors for connecting to Buyer's PC / laptop shall be supplied along with software. Front port for communication with laptop shall necessarily be USB port. In case USB port is not available, hardware (converter) required for converting port available on relay to USB port shall be provided. d. The PC / laptop need not be supplied unless explicitly mentioned in guaranteed technical particulars (GTP).
o.	Accessories for all types of Numerical Relays	a. The accessories necessary for successful operation and maintenance shall be supplied along with the relay. b. These shall include but not limited to battery (if applicable), data cable with end connectors for connecting device to laptop, RS 232 / USB converter (if applicable), technical /operating / maintenance and application manual (both in soft copy & printed copies), software CD with manual, any other accessory required for trouble free operation maintenance and testing of relay. c. Length of data cable for connecting relay to laptop shall be of minimum four (4) meter.

Certified reports of Routine tests and Acceptance tests of all equipments prior to dispatch		**X**	
Instruction manuals of the equipment and various accessories. The manual shall clearly indicate method of installation checkup and tests to be carried out before commissioning of the equipment			**X**

9. Preferred Sub-Vendor list

Sl No	**Equipments / Components**	**Preferred Vendor**
1	Numerical relays	ABB / GE / Siemens
2	DC Supervision relays	ABB / GE
3	Aux relays / Contactors	ABB / GE
4	Ethernet switch	Ruggedcom
5	Control Switches	Switron
6	Push button	Siemens / ABB / GE
7	MCB	ABB / GE / Siemens
8	Heater / Thermostat	APT Control
9	Heater ON/OFF switch, power plug and socket	Anchor
10	Cubicle illumination lamp	Philips
11	TB	Connectwell
12	Test switch	GE
13	Test terminal block	Nelster
14	Multifunction meter	Secure

10. Bill of Material

Sl No	Item description	Unit	Quantity
1	Supply of Integrated 220kV Relay Panel for line feeder with control and protection scheme as per this specification along with following accessories at MMRC Substation Yard e) Relay software - 2Nos per each type of relay f) Relay front communication cord with laptop - 2Nos per each type of relay g) USB Converter (if applicable) – 1 per relay	No of panels	4
	h) Spare Equipments-		
	d.1) Main-I differential protection relay	No	1
	d.2). Main-II differential protection relay	No	1
	d.3) Ethernet Switch	No	1
	d.4). DC Supervision relay	No	2
	d.5) MCB with 1 NO + 1 NC	No	5
	d.6). Switch	No	1
	d.7) Annunciator	No	1
	d.8) TTB	No	1
	d.9) Multifunction meter	No	1
	d.10) Auxiliary Relay	No	1
2	Supply of integrated 220kV Relay Panel for line feeder with control and protection scheme as per this specification along with following accessories at Rinfra Aarey Substation a) Relay software - 2Nos per each type of relay b) Relay front communication cord with laptop - 2Nos per each type of relay c) USB Converter (if applicable) – 1 per relay	No of panels	4
	d) Spare Equipments-		
	d.1) Main-I differential protection relay	No	1
	d.2). Main-II differential protection relay	No	1

	d.3). DC Supervision relay	No	2
	d.4) MCB with two aux contacts	No	5
	d.5). Switch	No	1
	d.6) Annunciator	No	1
	d.7) TTB	No	1
	d.8) Auxiliary Relay	No	1
3	1. Unloading, erection, testing and commissioning of Relay Panel (RP) at MMRC Substation Yard 2. Unloading, erection, testing and commissioning of Relay Panel (RP) at Rinfra Aarey Substation 3. Training of R-infra Personnel (Refer Clause 1.2 of Spec)	LS	1

Note: The above bill of material is indicative to bidder for supply of specified package. Final bill of material (Items and quantity of each item) shall be based on approved scheme drawing. Bidder to consider all the items / equipment required in adequate quantity to meet the Buyer's scheme requirement**.**

11. Guaranteed Technical Particulars (GTP)

1.0	**Panel (Control & Relay Panel)**	**Requirement**	**Data to be filled by Bidder**
1.1	Make	Bidder to specify	
1.2	Type	Bidder to specify	
1.3	Dimension of panel	600 (W) x 800 (D) x 2315 (H) including base frame anti-vibration pad	
1.4	Reference Standard	As per codes standards indicated in specification	
1.5	**Construction**		
a	Degree of protection	IP54	
b	CRCA Sheet metal thickness in mm	a. 3 mm for load bearing members of the panels b.2 mm for non load bearing members	
1.6	**Equipment Mounting**		
a	Relays and switches are flush / semi-flush mounted?	Yes / No	

d	Rated voltage of coil (V)	220V DC	
e	Rated current (A)	Bidder to specify as per application	
f	No of ways / positions	As per application	
g	No of contact	As per scheme requirement	
h	Overall size (mm x mm)	Bidder to provide data	
9	**Multifunction meter**		
a	Make	To be provided by bidder	
b	Type	To be provided by bidder	
c	Reference Standard	IS 13779 / IS 14697	
d	Wiring configuration	3 Phase 4 wire & 3 phase 3 wire	
e	Aux supply voltage range	220V DC	
f	Measurement current range	a. Suitable for 1A and 5A CT. b. CT ratio shall be user configurable c. Bidder to specify range	
g	Measurement voltage range	a. Shall be suitable for 110V PT secondary b. PT ratio shall be user configurable. c. Bidder to specify range	
h	Accuracy class	0.2S and higher accuracy	
i	Communication - Port / Protocol	RS 485 / MODBUS	
j	4-20mA Output	2 Nos	
10	**Annunciator**		
a	Make and Type	Vendor to specify	
b	Aux supply	Universal (220V DC & 240V AC)	
c	Number of windows	12 No	
d	Hooter provided	Yes	
e	Accept & reset button provided	Yes	

w.	Indicating Lamps	a) Indicating lamps shall be provided as per scheme requirement. b) LED type indicating lamps shall be acceptable. c) All lamps shall be rated for -15% to 10% of rated DC and ±10% of rated AC voltage
x.	Guarantee	a) Performance of CRP shall be guaranteed for minimum three (3) years from the date of supply or two (2) years from the date of successful commissioning at site whichever is shorter. b) Within guarantee / warranty period, if the device needs to be shifted to suppliers works for repairs, supplier shall bear the cost of spares, software, transportation, transit insurance (to & fro) etc for repair at works. c) On receipt of complaint from Buyer, Supplier shall ensure to attend the complaint within seven (7) days of reporting. In case GOODS need to be sent back to factory for repair, Supplier shall arrange his representative to collect the material from site within seven (7) days of report of complaint. Transit insurance will be in Supplier's scope. Repaired / replaced GOODS shall be redelivered at site within 21 days after receipt of complaint. While redelivering GOODS, Supplier's reperesentaive shall verify proper functioning of repaired GOODS. d) All the expenses for maintaining supplied instrument "healthy and in working condition" to be borne by Supplier during guarantee period.
y.	Training	a)Supplier shall to ensure the CRP system is made user friendly apart from the detailed demonstrations at site. b) The supplier shall arrange necessary training to R Infra Engineers during commissioning at site.
z.	Documentation	a) Supplier shall note that the drawings, data and manuals listed in Table-1 are minimum requirements only. b) The supplier shall ensure that all other necessary write up, information etc required to fully describe device / system shall be submitted during bidding c) Documents to be submitted during bidding is given in Table -1

5.1	**Distance cum current differential protection relay – Main -I**	Make shall be M/s Siemens, M/s ABB or M/s GE or approved make by M/s TPC	
a	Make / Type of relay	Bidder to provide data	
b	Number of 3 phase CT & PT	1No each	
c	Number of 1 phase CT & PT	1No each	
d	Secondary rating of CT & VT	1A / 110V	
e	Binary input & binary output	16 BI & 16 BO + watch dog	
f	Number of channels for differential protection	Two number (redundant)	
g	Mode of communication of differential protection	Using multiplexer through fiber based protocol IEEE C37.94	
h	Communication protocol	IEC 103	
i	No of ports for SCADA communication	Dual RS 485 port for relays	
j	Aux supply	220V DC	
k	Ordering code of relay Main-I relay	Bidder to provide details	
5.2	**Distance cum current differential protection relay – Main -II**	Make shall be M/s Siemens, M/s ABB or M/s GE or approved make by M/s TPC	
a	Make / Type of relay	Bidder to provide data	
b	Number of 3 phase CT & PT	1No each	
c	Number of 1 phase CT & PT	1No each	
d	Secondary rating of CT/VT	1A / 110V	
e	Binary input & binary output	16 BI & 16 BO + watch dog	
f	Number of channels for differential protection	Two number (redundant)	

(e) The complete structure shall be rigid, self- supporting, free from vibration, twists and bends.

(iii) Constructional Features

(a) The panel shall be

1. Of the metal enclosed indoor, floor mounted, Simplex type, with front and rear opening, front glass door, swing doors with all devices mounted.
2. Made up of the requisite vertical sections.
3. Of dust and vermin proof construction
4. Suitable to provide a degree of protection of not less than IP 54 as per IS: 2147 when control cabinets are specified for indoor use.
5. Of self-cooled design with adequate louvers on sides. The louvers shall have screens and filters on inner side of panel. The screens shall be of fine wire mesh made of brass or GI wire.
6. Provided with labels on the front and rear indicating the panel designation.
7. Provided with cable entry facilities and removable gland plates at required locations.
8. Of uniform height
9. Of Simplex type as specified.
10. Provided with neoprene gaskets all-round the perimeter of covers, gland plates, removable covers and doors.
11. Safety earthing with earth bus of 150 sq.mm copper. Two Nos. earthing terminals shall be provided at each end of panel to suit PURCHASER's earthing conductor

(b) Simplex type panel shall incorporate operating devices only in the front.

(c) The Panel shall be equipped with space heaters which may be located at proper place in protection panel. The panels shall have 240V, single phase, 50 Hz fluorescent lighting fixtures for interior illumination controlled by ON/OFF switches and 240V, 1 phase, 3 pin receptacle. Power source for interior lighting and receptacle shall be completely independent of control power source

(d) Panel shall be designed in such a way that all component/ equipment's operate satisfactorily without exceeding their respective maximum permissible temperature rises under temperature conditions prevailing within the cubicles. Reference ambient temperature outside the switchgear cubicles is specified in the specifications.

(e) Cable entries shall be from bottom unless specified. Suitable removable cable gland plate shall be provided on the cabinet for this purpose. Necessary number of cable glands shall be supplied/fitted on to this gland plate. Cable glands shall be screw-on type and made of brass.

(f) All sheet steel work shall be degreased, pickled, phosphate and then applied with two coats of zinc chromate primer and two coats of finishing synthetic enamel paint, both inside and outside. The paint shade shall be RAL7032, texture finish.

(g) Each panel shall be provided with necessary arrangement for receiving, distributing, isolating and protection of DC and AC supplies for various control, signalling, lighting

signalling, lighting and space heater circuits. The incoming and sub-circuits shall be separately provided with MCBs. Supply monitoring arrangement shall be provided. Potential circuits for relaying and metering shall be protected by MCBs.

xix) ***Cabinet Internal Wiring***

(i) Control cabinets shall be supplied completely wired, ready for PURCHASER's external connections at the terminal blocks. Wiring shall be carried out with multi-stranded FRLS, 1100V grade PVC having oxygen index 29 and temp. index of 250 Deg. Wiring inside the panel shall be kept in plastic trays.

(ii) Following sizes of wires shall be used:-

(a) Color Codes

CT wiring	2.5 sq.mm	R / Y/ B / Black
PT Wiring	1.5 sq.mm	R / Y/ B / Black
DC wiring	1.5 sq.mm	Grey
Annunciation	1.5 sq.mm	Grey
Ground	4.0 sq.mm	Green

(iii) All wires terminated on relays and TBs shall be with sleeved ring type or 'O' type crimped lugs only. Ferrules should be provided for wires

(iv) Engraved core identification ferrules, marked to correspond with the wiring diagram shall be fitted at both ends of each wire. Ferrules shall fit tightly on the wires, and shall not fall off when the wire is removed. Spare auxiliary contacts of the relays etc. shall be wired to terminal blocks. All wiring shall be terminated on terminal blocks using crimping type of tinned copper lugs. Insulated sleeves shall be neatly punched and cleaned without affecting access to equipment mounted within the cabinet. Wiring troughs shall be provided for vertical cabinet wiring and for interconnecting wiring between front and rear section of the cabinet.

(v) One piece moulded, 1.1 kV grade terminal blocks complete with insulated barriers, terminal studs, washers, nuts and locknuts and identification strips shall be used. For Simplex panel they shall be mounted on the sides. All the terminals shall be mounted horizontally (vertical mounting is not acceptable) on anodized channels at an angle to provide easy access at a height of minimum 300mm from the base. All the TBs shall be of disconnecting type. End plates shall be provided. Disconnecting TBs shall be mounted in such a manner that when it is dropped it falls down due to gravity. TBs shall be of Elmex, Connectwell make CDTTS type. Terminals for power connections shall be adequately rated for the circuit current and the rating of other terminal blocks for central indication etc. shall not be less than 15 amps. At least ten percent spare terminal blocks shall be provided. Terminal blocks for control indication etc. shall be suitable for connecting at least two conductors of PURCHASER's cable of following sizes.

(a) Potential and control : 2.5 mm^2 multistrand copper wire.

(b) CT circuits : 6 mm^2 or 4.0 mm^2 multistrand copper wire

(vi) Terminal blocks shall be numbered for identification and grouped according to function. Engraved white on black labels shall be provided on the terminal blocks, describing the function of the circuit. There shall be a minimum clearance of 250 mm between the first row of terminal blocks and the associated gland plate. Also the

clearance between two rows of terminal blocks shall be a minimum of 100 mm. Terminal blocks shall be provided with transparent acrylic covers.

(vii) PURCHASER's external cable connections to the control cabinet will be carried out using 1.1 kV grade, stranded copper conductors, PVC insulated, PVC sheathed, armoured and PVC jacketed cables. All necessary cable terminating accessories such as packing glands, crimp type tinned copper lugs, supporting clamps and brackets, etc. for PURCHASER's cables shall be included in Vendor's scope of supply.

(viii) Separate MCBs shall be considered for the switches. All armoured communication cables shall be terminated on LIUs/Patch Panels. All inter panel communication cabling shall be carried out through separate cable trough/tray.

(ix) All wiring for equipment supplied by the PURCHASER for which vendor has to provide cutouts, shall be provided upto the terminal blocks.

xx) ***Labels***

All door mounted equipment as well as equipment mounted inside the control cabinets shall be provided with individual labels with equipment designation engraved. Also the control cabinet shall be provided on the front with a label engraved with designation of the control cabinet as furnished by PURCHASER. Labels shall be made of non-rusting metal or 3 ply lamicoid. Labels shall have white letters on black or dark blue background. Sizes of labels and lettering are subject to PURCHASER's approval.

xxi) ***Earthing Terminals***

(i) Control cabinet shall be provided with two separate earthing terminals suitable to receive PURCHASER's earthing conductors of size specified.

(ii) Positive connection between all the frames of equipment mounted in the switchboard and earth bus bar shall be provided by using insulated copper wire/bars bus bars of cross section equal to that of the bus bar or equal to half the size of circuit load current carrying conductor, whichever is smaller.

(iii) All instrument and relay case shall be connected to the earth bus bar using 1100 grade PVC insulated 2.5 sq.mm stranded tinned copper earthing conductor.

(iv) All hinged doors shall be positively connected to the earthing bus terminals, with the help of braided copper conductors of adequate size.

xxii) ***Drawings, Data and Bidders services for firmware up gradation:***

As part of the proposal the BIDDER shall furnish the following drawings and data for scrutiny.

(i) Control cabinet drawing showing plan, front view and foundation details, inside view, terminal block location etc.

(ii) Schematic wiring diagram of the protection schemes.

(iii) Bill of Material listing equipment designation, make, type ratings, etc. of the various equipment mounted on the control cabinet.

(iv) Interconnecting schedule (ICS) required for commissioning of line protection panels shall be provided by the bidder

(v) Five Set of drawings (for successful Bidder) and soft copy in AUTOCAD shall be furnished for approval within 2 weeks from placement of order and prior to taking up of manufacturing.

					equipment			date of LOI	

Seal of the Company Signature

Designation

12. Bill of Material

Sr. No	Item Description	Qty.	Unit Price (Rs.)	Item Price (Rs.)
A	Borivli R/S			
1	Completely wired Simplex Relay Panel comprising of all the Protection Schemes & accessories for Line protection system for 220 kV GIS (2 nos. Main IEDS with 87L +21 + A/R+25 + 67 +67N + LBB (50Z) + OLTS 67). The panels shall be Bottom entry panel. Main I & Main II shall be of Different Make.	1 Set		
2	Additional current differential protection relays to enable/disable Auto reclosure of line	2 Nos		
B	Material required (patch cord, switches, data cable, LIUs etc.) for Integration of IEDS mentioned with SCADA system and for retrieving DR and Parameterization from remote location	1 LS		
C	Training			
D	Spares	1 of each type		
E	SERVICES:			
1	Services for Protection, Automation and communication engineers along with Numerical relay testing kit for commissioning and integration of relays with SCADA system and to view disturbance record and Parameterization from remote for following Receiving Station.	Quote lump sum		
2	Services of GE (T & D) for configuration of existing gateway for integration and testing of IEDs.	Quote lump sum		
3	Services of Chemtrols for configuration in existing Unified SCADA system	Quote lump sum		

2. Valid copy of Company Registration Certificate (duly notarized) in case of Public Ltd. Co. / Pvt. Ltd. Co., copy of Partnership deed (duly notarized) in case of partnership firm, Affidavit disclosing sole proprietorship (duly notarized) in case of sole proprietorship business, as the case may be, should be furnished along with the offer.

11. Annexure- I : Bill Of Quantity (BOQ)

1. Supply and Installation of Comm Scope 4 pair CAT 6 UTP Cable 700 Mtrs
2. Supply and Installation of Steel reinforced PVC Conduits for Cat6 cables 550 Mtrs
3. Supply and Installation of PVC Casing for Cat6 cables 150 Mtrs

4. Installation, training, testing, commissioning along with integration of this site setup with existing Rinfra Camera setup Lumpsum

All the required quantity and sizes of Power and Control Cables for commissioning of various equipments like Battery Charger, Control & Relay Panels, Fire Fighting Panels, SCADA etc shall be included in the respective item by the Bidders.

Various Sizes of Power and Control Cables along with Tentative quantities of the same are as below:

Sr. No.	**Cable Size**	**Tentative Quantity in KMs**
1	10C, 2.5 Sqmm	9.24
2	3.5C, 25 Sqmm	1.045
3	3.5C, 70 Sqmm	0.7
4	3.5C, 150 Sqmm	4
5	2C, 4 Sqmm	1.29
6	1C, 150 Sqmm	0.4
7	5C, 1.5 Sqmm	0.12
8	16C, 1.5 Sqmm	0.12
9	4C, 6 Sqmm	6.6
10	2C, 6 Sqmm	1.8
11	7C, 2.5 Sqmm	3.4
12	4C, 2.5 Sqmm	1.6
13	14C, 2.5 Sqmm	2.4
14	4C, 1.5 Sqmm	0.4
15	24C, 1.5 Sqmm	0.4
16	12C, 0.5 Sqmm	0.4
17	8C, MM FO Cable	0.2
18	16C, 1 Sqmm	2
19	10C, 2.5 Sqmm	0.5
20	5C, 1.5 Sqmm	0.5

Any Other Sizes of Power & Control Cables as well as any other material required for commissioning the equipment that are mentioned in the specification shall be provided by the bidder.

implementation of the project, if the personnel would be involved in any capacity on the same project.

vi. A firm, who has purchased the bid document in their name, can submit the tender either as Individual firm or in joint venture/Consortium.

vii. The Central / State government department / public sector undertaking / other government entity, PSUs or Government/Private Organisations* must not have banned business with the bidder (any member in case of JV) as on the date of tender submission. Also, no contract of the bidder should have been rescinded / terminated during last 5 years due to non-performance of the bidder or any of JV /Consortium members. The bidder should submit undertaking to this effect in **Appendix 09 of FOT**

viii. Bidder (any member in case of JV/consortium) must not have suffered bankruptcy/ insolvency during the last 5 years. The bidder should submit undertaking to this effect in Appendix 09 of FOT

ix. Non-Substantial Partners in Case of JV/Consortium

a. Lead partner must have a minimum of 26% participation in the JV/Consortium.

b. Partners having less than 26% participation will be termed as non-substantial partner and will not be considered for evaluation which means that their financial soundness and work experience shall not be considered for evaluation of JV/Consortium.

c. In case of JV/Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as non-responsive.

1.1.1.1 Minimum Eligibility Criteria:

A. The bidders individually or as consortium/ JV should fulfil the following **Eligibility Criteria**:

(a) For Supply, Erection, Testing & Commissioning of EHV/HV Transmission Towers, Termination Yard Equipments & associated Civil Works:

The Bidder should have achieved the following eligibility criteria of having successfully completed **Similar works**** during the last 7 years preceding 30th April 2017:

Three Similar works** completed, costing not less than Rs. 8 Crores each.

or

Two Similar works** completed costing not less than Rs. 10 Crores each.

or

One Similar work** completed costing not less than Rs. 16 Crores.

Similar Work(s)** is defined as ***"Supply, Testing and Commissioning of EHV/HV Transmission Towers of 110 kV and above voltage level and/or Procurement, Supply, Erection, Testing and commissioning of various Switchyard Equipments like CTs, LAs, CR Panels, SCADA and associated Equipments like ACDB, DCDB, Battery, Battery Chargers etc. for major Transmission utilities, PSUs or Government/Leading Private organisations**."

The work also involves, associated Civil Works like EHV Cable Ducts along with HDPE Pipes, Construction of Termination Yard along with Control room, Foundations of Transmission and Switch Yard Towers, Gantry Foundations etc. These Civil Works can be carried out through an *experienced Sub-Contractor.*

**In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payments received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.*

(b) For Procurement and Supply of EHV, HV & LV Cables along with Termination / Jointing Kits and other Associated Items.

The Bidder should have achieved the following eligibility criteria of having successfully completed **Similar works**** during the last 7 years preceding 30th April, 2017:

Three Similar works** completed, costing not less than Rs. 9 Crores each.

or

Two Similar works** completed, costing not less than Rs. 11 Crores each.

o**r**

One Similar work** completed, costing not less than Rs. 18 Crores.

Similar Work(s)** defined as ***Procurement/supply of HV/EHV Cables of 33kV and above voltage level. for major Transmission utilities, PSUs or Government/Private Organisations.***

**In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payments received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.*

The bidder shall submit duly attested/notarised performance certificate issued by the utility/end users along with a copy of details work order]

(c) For Laying, Testing and Commissioning EHV, HV & LV Cables along with Making Termination / Joints.

The Bidder should have achieved the following eligibility criteria of having successfully completed **Similar works**** during the last 7 years preceding 30th April, 2017:

Three Similar works** completed of not less than 3 kM of cable length.

or

Two Similar works** completed of not less than 4 kM of cable length.

o**r**

One Similar work** completed of not less than 6 kM of cable length.

Similar Work(s)** is defined as ***Laying, Testing and Commissioning of EHV Cables of 110kV and above voltage level.***