ADDENDUM TO “INSTRUCTIONS TO TENDERERS”

1.0 MODE OF SUBMISSION

(a) The Envelope-1 shall also contain the documents meeting the qualifying criteria mentioned in “Notice Inviting Tender” Clause No. 1.0 (a) to (f) in addition to Clause No.1.0 (i) to (vi) given in Page No.(1) of “INSTRUCTIONS TO TENDERERS”.

(b) The tenderer who shall download the tender documents directly from EPI’s website they have to submit tender fees of **Rs.5000/- (Rupees Five thousand only)** (Non-Refundable) by Crossed Demand Draft favouring “Engineering Projects (India) Ltd.”, payable at Kolkata along with their bid in Envelope-1.

2.0 CLAUSE NO.1.1 OF INSTRUCTIONS TO TENDERERS as given in Page (2) of INSTRUCTIONS TO TENDERERS stands amended as below:

First the Envelope-1 of the tenderer shall be opened. Tenderers who un-conditionally accept the tender conditions, deposit the required Earnest Money, who meet the qualifying criteria mentioned in clause no. 1.0 (a) to (f) of NIT, deposit tender fees as defined above in Clause 1.0(b) and whose Techno-Commercial Bid along with PQ Documents is found suitable shall be considered for the opening of their Price Bid and Envelope-2 of such tenderers shall only be opened. The Tenders not accompanied by requisite Earnest Money and / or not conveying un-conditional acceptance of tender conditions and / or not meeting the qualifying criteria or whose Techno-Commercial Bid and PQ Documents are not found acceptable, shall be rejected and such tenderer shall not be allowed to attend Price Bid opening i.e. opening of Envelope-2.

3.0 Tenderers are required to quote on % (percentage) above, par or below estimated cost, in the prescribed price schedule.

4.0 Tenderer has to submit the confirmation letter whether they are registered under MSME Act or not, if so, relevant copy of the registration letter is to be attached in Envelope-1.

5.0 All other provisions of “INSTRUCTIONS TO TENDERERS” shall remain unchanged.
MEMORANDUM

(ENCLOSURE TO FORM INTEGRAL PART OF TENDER)

REF.: TENDER FOR CONSTRUCTION OF MULTI PURPOSE CYCLONE SHELTERS AT HARIDASHKATI, SAMSHERNAGAR & KUMIRMARI, NORTH 24 PARGANAS IN WESTBENGAL

NIT No.: ERO /MMD/666/1038 Date: 09.10.2015

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Description</th>
<th>Cl. No.</th>
<th>Values / Description to be applicable for relevant clause(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Name of work</td>
<td></td>
<td>CONSTRUCTION OF MULTI PURPOSE CYCLONE SHELTERS AT HARIDASHKATI, SAMSHERNAGAR &amp; KUMIRMARI, NORTH 24 PARGANAS IN WESTBENGAL.</td>
</tr>
<tr>
<td>ii)</td>
<td>Owner/Client / Employer</td>
<td></td>
<td>National Disaster Management Authority, New Delhi</td>
</tr>
<tr>
<td>iii)</td>
<td>Type of Tender</td>
<td></td>
<td>Percentage Rate (based on market rate analysis).</td>
</tr>
<tr>
<td>iv)</td>
<td>Earnest Money Deposit</td>
<td>NIT 14,48,430.00</td>
<td></td>
</tr>
<tr>
<td>v)</td>
<td>Estimated Cost</td>
<td>NIT 7,24,21,505.00</td>
<td></td>
</tr>
<tr>
<td>vi)</td>
<td>Time for completion of Work</td>
<td>NIT</td>
<td>Total work to be completed in 05 months</td>
</tr>
<tr>
<td>vii)</td>
<td>Mobilization Advance</td>
<td>8.0</td>
<td>10%(Ten Percent) of the contract value</td>
</tr>
<tr>
<td>viii)</td>
<td>Interest Rate on Mobilization Advance</td>
<td>8.0</td>
<td>Interest bearing SBI PLR plus 2%</td>
</tr>
<tr>
<td>ix)</td>
<td>Number of Installments for recovery of Mobilization Advance</td>
<td>8.0</td>
<td>As per GCC</td>
</tr>
<tr>
<td>xi)</td>
<td>Validity of Tender</td>
<td>4.0</td>
<td>90 (Ninety) Days</td>
</tr>
</tbody>
</table>
xii) Security Deposit cum Performance Guarantee 9.0 5.00% (Five Percent only) of Contract Value within 10 days from the date of issue of telegram / letter / telex / FAX of Intent of acceptance of Tender.

xiii) Retention Money 10.0 5.00% (Five Percent only) of Contract amount, which shall be deducted in the manner as per clause 10 of GCC.

xiv) Time allowed for starting the work 43.0 The date of start of contract shall be reckoned 7 days from the date of issue of telegram / letter / telex / FAX of Intent of acceptance of Tender.

xv) Defect Liability Period 74.0 12 (Twelve) Months from the date of taking over of works.

xvi) Arbitration -- As per Clause No. 25.0 of ACC

xvii) Jurisdiction 76.3 Courts in Kolkata.

SIGNATURE OF TENDERER

NAME (CAPITAL LETTERS): ____________________________________________________________

OCCUPATION: ____________________________________________________________

ADDRESS: ____________________________________________________________

____________________________________________________

SEAL OF TENDERER
FORM OF TENDER

To,
Engineering Projects (India) Ltd.
50, Chowringhee road
Kolkata-700071

Ref.: Tender for “CONSTRUCTION OF MULTI PURPOSE CYCLONE SHELTERS AT NORTH 24 PARGANAS IN WEST BENGAL”.

NIT No. : ERO/MMD/666/1038 Date: 09.10.2015

1. I/We hereby tender for execution of work as mentioned in “Memorandum” to this “Form of Tender” as per tender documents within the time schedule of completion of work as per separately signed and accepted rates in the Bill of Quantities quoted by me / us for the whole work in accordance with the Notice Inviting Tender, Conditions of Contract, Specifications of materials and workmanship, Bill of Quantities Drawings, Time Schedule for completion of jobs, and other documents and papers, all as detailed in tender documents.

2. It is agreed that the time stipulated for jobs and completion of works in all respects and in different stages mentioned in the “Time Schedule for completion of jobs” and signed and accepted by me/us is the essence of the contract. I/We agree that in case of failure on my/our part to strictly observe the time of completion mentioned for jobs and the final completion of works in all respects according to the schedule set out in the said “Time Schedule for completion of jobs” and stipulations contained in the contract, the recovery shall be made from me/us as specified therein. In exceptional circumstances extension of time which shall always be in writing may, however be granted by EPI at its entire discretion for some items, and I/We agree that such extension of time will not be counted for the final completion of work as stipulated in the said “Time schedule of completion of jobs”.

3. I/We agree to pay the Earnest Money, Security Deposit cum Performance Guarantee, Retention Money and accept the terms and conditions as laid down in the “Memorandum” to this “Form of Tender”.

4. Should this tender be accepted, I/We agree to abide by and fulfill all terms and conditions referred to above and as contained in tender documents elsewhere and in default thereof, allow EPI to forfeit and pay EPI, or its successors or its authorized nominees such sums of money as are stipulated in the tender documents.

5. I/We hereby pay the earnest money amount as mentioned in the “Memorandum” to this “Form of Tender” in favour of Engineering Projects (India) Limited payable at place as mentioned in the “NIT/ITT”.

Signature of Contractor

Page 8

EPI
6. If I/we fail to commence the work within 10 days of the date of issue of Letter of Intent and / or I/We fail to sign the agreement as per Clause 84 of General Conditions of Contract and/or I/We fail to submit Security Deposit cum Performance Guarantee as per Clause 9.0 & 9.1 of General Conditions of Contract, I/We agree that EPI shall, without prejudice to any other right or remedy, be at liberty to cancel the Letter of Intent and to forfeit the said earnest money as specified above.

7. I/We are also enclosing herewith the Letter of Undertaking on the prescribed proforma as referred to in condition of NIT.

Date the __________________________ day of __________________________

SIGNATURE OF TENDERER __________________________

NAME (CAPITAL LETTERS): __________________________

OCCUPATION __________________________

ADDRESS __________________________

____________________________

SEAL OF TENDERER
LETTER OF UNDERTAKING
(TO BE ENCLOSED IN ENVELOPE-1 ALONGWITH EMD)

To,
Engineering Projects (India) Ltd.
50, Chowringhee road
Kolkata-700071

Ref.: Tender for “CONSTRUCTION OF MULTI PURPOSE CYCLONE SHELTERS AT NORTH 24 PARGANAS IN WEST BENGAL”.

NIT No. : ERO/MMD/666/1038 Date: 09.10.2015

Sir,

UNDERTAKING FOR ACCEPTANCE OF TENDER CONDITIONS

1. The tender documents for the work as mentioned in “Memorandum” to “Form of Tender” have been issued to me / us by ENGINEERING PROJECTS (INDIA) LIMITED and I / We hereby unconditionally accept the tender conditions and tender documents in its entirety for the above work.

2. The contents of clause 1.2 and 1.3 of the Tender documents (Instructions to Tenderers) have been noted wherein it is clarified that after unconditionally accepting the tender conditions in its entirety, it is not permissible to put any remark(s) / condition(s) (except unconditional rebate on price, if any) in the ‘Price-Bid’ enclosed in “Envelope-2” and the same has been followed in the present case. In case this provision of the tender is found violated at any time after opening “Envelope-2”, I / We agree that my/our tender shall be summarily rejected and EPI shall, without prejudice to any other right or remedy be at liberty to forfeit the full said Earnest Money absolutely.

3. The required Earnest Money for this work is enclosed herewith.

Yours faithfully,

(Signature of the Tenderer)

Seal of Tenderer

Dated: ____________________
ADDITIONAL CONDITIONS OF CONTRACT
(Construction of Multi-Purpose Cyclone Shelters)

1.0 The following Additional Conditions of Contract shall be read in conjunction with General Conditions of Contract. If there are any provisions in these Additional Conditions of Contract which are at variance with the provision of General Conditions of Contract, then provisions in this Additional Conditions of Contract shall take precedence over General Conditions of Contract.

2.0 INTRODUCTION

National Disaster Management Authority (NDMA) has appointed Engineering Projects (India) Ltd., as execution agency for Construction of Multi Purpose Cyclone Shelters (MPCS) at North 24 Parganas Districts of West Bengal.

3.0 PREQUALIFICATION CRITERIA

The reputed and financially sound Contractors who fulfil the following qualifying requirements are eligible to participate. The joint ventures are not accepted.

A. Bidder should have completed / substantially completed works during last 7 years ending 31.03.2015.

i) One similar completed works valuing at least 80% of the estimated cost put to tender.

OR

Two similar completed works valuing at least 50% of this estimated cost put to tender.

OR

Three similar completed work valuing at least 40% of this estimated cost put to tender.

a. The “similar works” shall mean “Residential /office complexes/infrastructure buildings on piles. “

b. The substantially completed work shall be the work where at least 80% billing of total awarded value has been achieved. The certificate issued by client with billed value of work shall form the basis of evaluation.

c. For evaluation purpose, the completion cost of works mentioned in the Completion Certificate shall be enhanced by 7% per annum (till 31.03.2015).

d. The cost of free issue materials shall not be included in the completion cost of works.
B. Should have Average Annual Financial Turnover of not less than 30% of the estimated cost in the last three years ending 31.03.2015 duly certified by a Chartered Accountant.

C. Should not have incurred any loss in more than two years during the last five years ending 31.03.2015. Copies of balance sheet / certificate from Chartered Accountant to be submitted.

D. Should have a solvency of 40% of the estimated cost issued by a Bank. The Solvency Certificate should not have been issued earlier than one year of last date of submission of the tender.

E. Should have valid Permanent Account Number of Income Tax.

F. The bidders shall submit all relevant documents duly attested by Gazetted Officer not below the rank of Executive Engineer or equivalent or Notary Public fulfilling the qualifying criteria.

4.0 SUBMITTAL OF DOCUMENTS

The bidder shall also submit the following documents in sealed envelope in addition to documents required as above.

a) List of works executed during the last 7 years indicating name of the Client, value, date of start and completion.

b) List of works under execution indicating name of the Client, Total Contract Value, Value of balance work in hand, date of start and completion.

c) Details of similar works executed.

d) Audited balance sheets and profit and loss accounts alongwith schedules for the last 3 years.

e) Copy of latest income-tax returns filed along with PAN.

f) Details of manpower available.

g) Details of equipments, tools and plant available.

h) Credentials and completion certificates issued by client

i) Registration Certificate/Memorandum and Articles of Association/Partnership Deed/ Affidavit.
j) Copy of Provident Fund Number allotted by PF authorities.
k) Copy of letters of registration with various authorities like CPWD, State PWD and Public Sector Undertakings etc.
l) Latest Solvency Certificate from Nationalized/Scheduled Bank
m) Latest Sales Tax Registration and Clearance Certificate.
n) Whether the party is registered under MSME Act.
o) Any other documents in connection with above.

5.0 SCOPE OF WORK
5.1 The brief scope of work to be executed for Construction of Multipurpose Cyclone Shelters (MPCS) under the present tender shall generally comprise of (but not limited to) the following at each location.

- Civil work including piling
- Plumbing work
- Electrical work
- Site development work
- Deep Tubewell, Pumps & DG sets etc.
- Any other work not specified but required to be executed to complete the MPCS

5.2 The contractor shall also provide all assistance to EPI during handing over of MPCS & allied works after their completion to the designated agency nominated by NDMA/EPI. In case the quality at any point is found not as per specification or deficiencies are found, the contractor will get it rectified at its own cost.

6.0 LOCATION OF SITES
Proposed 03 nos. MPCS are located at the villages/Blocks as detailed herein under. An indicative map of the district showing proposed locations is also appended herewith.

District:  N 24 Parganas, West Bengal

<table>
<thead>
<tr>
<th>Sl. NO</th>
<th>Block</th>
<th>Gram Panchayat</th>
<th>Village/Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hingalgaunge</td>
<td>Kalitala</td>
<td>Samshernagar</td>
</tr>
<tr>
<td>2.</td>
<td>Hingalgaunge</td>
<td>Kalitala</td>
<td>Haridashkati</td>
</tr>
<tr>
<td>3.</td>
<td>Hingalgaunge</td>
<td>Rupmari</td>
<td>Kumirmari</td>
</tr>
</tbody>
</table>
7.0 COMPLETION TIME

7.1 The entire scope of work covered under this contract shall be completed within 05 (five) months which shall be reckon from the 7th day of issue of Letter of Intent (LOI)/Work Order. The completion time includes monsoon/ rainy season coming during the currency of the contract.

8.0 HANDING OVER OF SITE

8.1 As indicated by District Authority, the user of MPCS, the land of all MPCS is available. Therefore, the site at all locations can be handed over immediately to the contractor. The contractor shall take up the construction activities on all fronts simultaneously.

8.2 The contractor shall make his own arrangement for approach to work site including borrow / disposal area and for movement of men, materials, machineries, other equipment etc. required for carrying out the work under this contract.

8.3 The access roads/ path near to the work site may not be available at all places and at all time. The contractor shall plan his works as per the availability of access roads/ path at site. All drainage of works area and all weather truckable/ haulage roads as required by the contractor shall be constructed and maintained during the construction period by the contractor at his own cost.

9.0 PRIORITY OF WORKS

9.1 If during the course of execution of work, EPI / NDMA fixes priority of execution of work / fixes priority of execution of specific MPCS , the contractor has to deploy resources and plan the work accordingly & nothing extra shall be payable to the contractor on this account.

9.2 In case the work fronts of any MPCS is made available at a later date due to any reason whatsoever, the same shall be released to the contractor accordingly. Nothing extra shall be payable to the contractor on account of carrying out the work in phases & sequences decided by Engineer – in-charge.

10.0 MOBILIZATION OF MEN, MATERIAL & MACHINERY

10.1 Further to Clause No. 11.0 for “Mobilization of Men, Material & Machinery” of General Conditions of Contract, it shall be contractor’s responsibility to arrange, operate & maintain the total station digital survey instrument and its accessories at his own cost to carry out levels (including initial & final levels of earth work), dimensions and alignment of all parts of the works.
10.2 Contractor shall provide Bench Marks and other reference points for the proper execution work and these shall be preserved till the end of work.

11.0 EXECUTION PROGRAMME

11.1 The work shall be performed in time and to achieve the targets, the contractor shall have to plan required mobilization of all resources. Within 7 (Seven) days of date of letter of Intent, the contractor shall submit a Time and Progress Chart (CPM/PERT/Quantified Bar Chart) along with a detailed plan and programme of all the input resources commensurating with the various activities to be executed and get it approved by the Engineer-in-charge. The chart shall be prepared in direct relation to the time stated in the contract documents for completion of items / scope of the work. It shall clearly stipulate the forecast milestones of the dates of commencement and completion of various items, sections of the work and may be amended as necessary by agreement between the Engineer-in-charge and the contractor within the limitations of time imposed in the contract documents, to ensure good progress during the execution of the work. The physical report including photographs shall be submitted by the contractor on the prescribed format & at regular intervals (not later than a month) as decided by the Engineer-in-charge. The contractor shall also furnish along with Bar Chart, the methodology of construction,

11.2 Details of all equipment, manpower, machineries etc. required along with the date by which the equipment will be available at the site of work in working condition. All the activities shall be performed and completed strictly in accordance with approved work schedule.

The Engineer-in-charge, shall however, have the right to review the progress and modify the work schedule suiting the site conditions and the contractor shall be required to complete the work in accordance thereof without any extra cost to the NDMA / EPI.

12.0 SITE LABORATORY

12.1 As part of the contract the contractor shall establish and maintain a site laboratory for the testing of construction material under the direction and general supervision of Engineer-in-charge. The laboratory room shall be constructed and installed with the required and appropriate facilities. Temperature and humidity controls shall be made available wherever necessary during the testing of samples.

All equipments as required shall be provided by the contractor so as to be compatible with the testing requirements specified. The contractor shall maintain the equipment in good working conditions for the duration of the contract.

The Contractor shall provide approved qualified personnel to run the laboratory for the duration of the contract. The number of staff and equipment available must at all times be sufficient to keep pace with the sampling and testing programme as required by Engineer-in-charge.
The contractor shall fully service the site laboratory and shall supply every thing necessary for its proper functioning Including all transport needed to move equipment and samples to and from sampling points on the site etc.

The contractor shall re-calibrate all measuring devices whenever so required by the Engineer-in-charge and shall submit the results of such measurements without delay.

13.0 TEMPORARY WORKS

13.1 Further to Clause no. 82.00 for “Approval of temporary / enabling works” of General Condition of contract, as far as possible the labour hutments, bulk storage facilities and vehicle parking shall preferably be located near the proposed MPCS. The area near MPCS locations shall be levelled and developed; supply of water and electricity, construction of approach road to these camps shall be arranged by the contractor at his own cost. In case the land in the vicinity of MPCS is not of Govt., the contractor may have to hire the land from the owner of the land. The rent / lease amount shall be borne by contractor.

14.0 PLANT & MACHINERY

14.1 The contractor at his own cost shall arrange all Plant & machinery required for execution of work. However, in addition to Plant & equipment mentioned in the NIT, the contractor has to deploy the following minimum Plant & machinery at site immediately after award of work: -

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Description</th>
<th>Minimum Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Piling Rig &amp; Winch</td>
<td>three</td>
</tr>
<tr>
<td>2.</td>
<td>Concrete Weigh Batcher</td>
<td>three</td>
</tr>
<tr>
<td>3.</td>
<td>Concrete mixer</td>
<td>three</td>
</tr>
<tr>
<td>4.</td>
<td>DG set(63KVA)</td>
<td>three</td>
</tr>
<tr>
<td>5.</td>
<td>Digital theodolite &amp; auto level / Total Station</td>
<td>three</td>
</tr>
<tr>
<td>6.</td>
<td>Vibratory Roller</td>
<td>three</td>
</tr>
<tr>
<td>7.</td>
<td>Tipper/Truck</td>
<td>two</td>
</tr>
<tr>
<td>8.</td>
<td>Vibrators (Petrol/Diesel)</td>
<td>eight</td>
</tr>
</tbody>
</table>
14.2 Any other equipment for site test as outlined in CPWD/BIS specification and as directed by the Engineer In-charge, shall also be deployed by the contractor.

14.3 The quantities of equipments indicated are tentative and can be increased as per the requirement of work or as per the direction of Engineer-in-charge. The above equipment list is indicative and not complete. The contractor has to deploy all the required equipment to complete all the works within stipulated specifications & time period as per contract documents.

14.4 The contractor will not be allowed to take out equipments from the site without the written permission of Engineer-in-charge.

15.0 PAYMENT ON ACCOUNT

Further to Clause No. 37.00 General Conditions of Contract, the payments shall be released, out of the funds received from NDMA on deposit works basis for the project.

16.0 SECURITY & SAFETY

16.1 The site is located near Bay of Bengal wherein the movement of personnel is limited and regulated by Local Authorities. The contractor has to work as per the permission given by these Local Authorities from time to time and contractor must check before quoting for this job, the working hours, restriction in working and safety of their manpower, plant & equipment. The contractor shall mobilize and organize his resources accordingly to complete the work within stipulated time. The contractor shall have no claim on NDMA/EPI or any other agency/ department for any loss of man hours/ machinery due to these restrictions/ regulations.

16.2 The contractor shall make his own arrangements for Security and safety of his manpower, plant & equipment, materials etc. Nothing extra shall be admissible on account of this and no compensation shall be paid by NDMA/ EPI in case the contractor's personnel suffer body injury, loss of life or any damages caused to the plant and machinery of the contractor, due to any reason, whatsoever.

17.0 DEFECTS LIABILITY PERIOD:

17.1 Further to clause no. 74.0 of General Conditions of contract, contractor shall be responsible for rectification of defects during defect liability period of **12 (twelve) months** after Completion of the project.

In case NDMA appoints an independent and impartial Agency to be called as Third Party Inspection Agency, the contractor shall provide all assistance to the Third Party Inspection Agency to carryout the functions assigned to them & quality at any point is not found as per specification, the contractor will get it rectified at its own cost.
18.0 COMPENSATION FOR DELAY

18.1 The contractor shall ensure adequate progress during the execution of work according to the bar-chart/ work schedule. The contractor shall also maintain monthly progress strictly in accordance with bar chart/ detailed work schedule that will be worked out and mutually agreed upon. If the contractor fails to maintain the above progress or fails to complete the work and clear the site on or before the contract or extended date of completion, he shall without prejudice to any other right or remedy of EPI on account of such breach, pay compensation at the rate of 2 % (Two percent) of the total contract value of work for each month of delay subject to a maximum of 10% (Ten percent) of the total contract value of the work.

19.0 FINAL BILL

The final bill will be submitted by the contractor within 90 (Ninety) days from the date of acceptance of completion of work accompanied by the following documents:

a. Completion of work issued by the Engineer-in-charge specifying the handing over of the work including list of inventories (fittings & fixtures).
b. Computerized stage wise payment schedule.
c. No claim certificate by the contractor.
d. No claim certificate from the sub-agencies / vendors, if any, engaged by the contractor.
e. 'As built' drawing
f. Measurement books./Sheets
g. Drawings for layout of underground cables and details showing location of sluice valves, electric cable joints etc.
h. All operation and maintenance manuals.
i. All statutory approvals from various State / Central Govt. / Local bodies/ NDMA, if required for completion & handing over of the work as included in scope of contractor.
j. Manufacture’s guarantee of various machines / equipments installed as part of works.
20.0 ALTERATION IN SPECIFICATION, DESIGN AND DRAWING

The Engineer-In-Charge shall have power to make any alterations in, omissions from, additions to or substitutions for, the original Specifications, Drawings, Designs and Instructions that may appear to him to be necessary during the progress of the work, and the contractor shall carry out the work in accordance with any instructions which may be given to him in writing signed by the Engineer-In-Charge and such alterations, omissions, additions or substitutions shall not invalidate the contract and any altered, additional or substituted work which the contractor may be directed to do in the manner above specified as part of the work shall be carried out by the contractor on the same conditions in all respects on which he agreed to do the main work.

The rates for such additional, altered or substituted work under this clause shall be worked out in accordance with the provisions stipulated in the clause no. 69.0 of the General Conditions of Contract.

21.0 CONTRACTOR’S ALL RISK(CAR) POLICY

Contractor shall submit within 15 days of commencement of work, Contractor’s All Risk (CAR) Policy as per the provisions of clause no. 17.0 of GCC.

22.0 WORKMEN’S COMPENSATION POLICY

Contractor shall submit within 15 days of commencement of work, workmen’s compensation policy as per the provisions of clause no. 18.0 of GCC.

23.0 ARBITRATION

CLAUSE NO. 76.0 OF GENERAL CONDITIONS OF CONTRACT (GCC) Stands modified as under

24.0 CLAUSE NO. 76.1 OF GCC: DELETED

24.1 CLAUSE NO. 76.2: ARBITRATION BETWEEN CENTRAL PUBLIC SECTOR ENTERPRISES INTERSE / GOVERNMENT OF INDIA DEPARTMENTS / MINISTRIES.

I) In the event of any dispute or difference relating to the interpretation and application of the provisions of the contract, such dispute or difference shall be referred by either party to the arbitration as per the instructions (Office Memorandum / Circulars) issued by Govt. of India from time to time with regard to arbitration between one Government Department and another, one Government Department and a Public Sector Enterprise and Public Sector Enterprise inter se.
II) Subject to any amendment that may be carried out by the Government of India from time to time, the procedure to be followed in the arbitration shall be as is contained in D.O. No. DPE/4/(10/2001-PMA-GL-1 dated 22.01.2004 of Department of Public Enterprises, Ministry of Heavy Industries and Public Enterprises, Government of India or any modification issued in this regard.

25.0 JURISDICTION

The Courts in Kolkata alone will have jurisdiction to deal with matters arising from the Contract, to the exclusion of all other courts.

26.0 FACILITIES TO BE PROVIDED BY PARTY TO EPI

Immediately on placement of LOI/Work order (whichever is earlier) by EPI on the PARTY, the PARTY at its own cost shall provide furnished office, facilities etc. exclusively for the use of personnel of EPI as per details given below as directed by Engineer-in-charge. The PARTY shall make his rates/prices in his offer sufficiently comprehensive to cover the cost of the facilities as per details shown below and the PARTY shall not be entitled for any extra payment for the same.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A) OFFICE ACCOMODATION:</strong></td>
<td></td>
</tr>
<tr>
<td>Furnished office / office cum residential accommodation at one or more locations as per directions of EPIL with basic amenities like toilets, drinking water arrangement, lights, fans etc for exclusive use of EPI's Engineers &amp; Staff and maintenance of the same till Defect Liability Period. The specifications and design of accommodations shall be as approved by EPIL.</td>
<td>1500 Sq. ft</td>
</tr>
<tr>
<td><strong>B) OFFICE CONSUMABLES / STATIONARY / OFFIECE BOY</strong></td>
<td>Rs.5000 per month</td>
</tr>
<tr>
<td><strong>C) ONE VEHICLE (4 WHEELER) WITH FUEL &amp; DRIVER FACILITY</strong></td>
<td>One vehicle.</td>
</tr>
</tbody>
</table>
1 The work shall be executed as per the description of item given in the ‘Bill Of Quantities’, Specifications, Drawings, General Conditions of Contract, Additional Conditions of Contract, CPWD Specifications, New Delhi, for civil works (updated with correction slips issued upto last date of submission of tender) and latest CPWD specification, New Delhi, for electrical works (updated with correction slips issued upto last date of submission of tender), instructions & orders to the contractor from time to time during tendency of work.

2 For items not covered under latest CPWD specification, for (civil works) / latest CPWD specification for Electrical works and in particular specification or nomenclature of the individual item as above, the work shall be done as per latest relevant BIS codes of practice.

3 In case of non availability of any specification in the above paras or any overlapping provisions, non-clarity on any issue, applicability of particular provision out of above, shall be decided by Engineer-in-charge whose decision shall be final & binding on the contractor.

4. CORROSION RESISTANT STEEL

The technical specifications for CRS Fe-500 steel are as under:-

4.1 Chemical composition of CRS, in %

<table>
<thead>
<tr>
<th>C</th>
<th>Mn</th>
<th>S</th>
<th>P</th>
<th>Si</th>
<th>CRE*</th>
<th>CE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15</td>
<td>1.00</td>
<td>0.04</td>
<td>0.10</td>
<td>0.45</td>
<td>0.5</td>
<td>0.42</td>
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<td>max</td>
<td>max</td>
<td>max</td>
<td>max</td>
<td>max</td>
<td>min</td>
<td>max</td>
</tr>
</tbody>
</table>

- Corrosion Resistant Element (Cu+P+Cr )

4.2 Typical Mechanical Properties’ of CRS Rebar

<table>
<thead>
<tr>
<th>Properties</th>
<th>Fe-500</th>
<th>IS : 1786</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Stress</td>
<td>N/sq.mm Min</td>
<td>500</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>N/sq.mm min</td>
<td>10% higher than Y.S.</td>
</tr>
<tr>
<td>Elongation</td>
<td>%</td>
<td>12</td>
</tr>
</tbody>
</table>
5 Resistance Properties

<table>
<thead>
<tr>
<th>Operation</th>
<th>Size</th>
<th>IS : 1786</th>
<th>Fe- 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEND</td>
<td>Upto 22mm</td>
<td>4d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over 22mm</td>
<td>5d</td>
<td></td>
</tr>
<tr>
<td>Rebend</td>
<td>Upto 10mm</td>
<td>5d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over 10mm</td>
<td>7d</td>
<td></td>
</tr>
</tbody>
</table>

5.1 Alternate Immersion Test

Conducted with apparatus that simulates the splash and tidal zone of the coast and areas of heavy rainfall as per ASTM G-44-94. Specimens are dipped alternately in 3.5% NaCL solution for 10 mts. and exposed to air for 50 mts. This 1-h cycle is continued for 720 hrs. Corrosion resistance is measured by the weight loss shown by specimens.

5.2 Salt Spray Test

Effects of marine environment are simulated in salt spray test as per ASTM B – 117. Mild steel CTD rears and CRS samples are suspended from the ceiling and subjected to a fine salt solution (5% NaCl) spray for exactly the same length of time. After the stipulated time period (720 hrs), both samples are cleaned and their rate of corrosion calculated according to a specific formula based on the specimen’s weight loss. CRS is not susceptible to pitting corrosion.

5.3 Atmospheric Exposure Test

Extensive field exposure tests were conducted for two years for CRS and mild steel CTD bars as per ASTM- G-50 in industrial as well as in a saline seaside environment. The results show that CRS bars are at least 1.8 times more corrosion resistant than ordinary (CTD) rears.

5.4 Sulphur Dioxide Test

To simulate the condition of a highly polluted industrial atmosphere, this test is conducted as per ASTM G87-90 for a test duration of 720 hrs.

5.5 Potentio – Dynamic Test

The test is conducted as per ASTM G -5-94 in 0.04 N NaOH + 10,000ppm of chloride solution to have a very close simulation prevailing in concrete under actual condition. After stabilisation of Open Circuit Potential (OCP), 100 mV above and below OCP in Tafel region allows the determination of I corr.
### Corrosion resistance index (CRI)* of CRS – typical values

<table>
<thead>
<tr>
<th>Test</th>
<th>CTD</th>
<th>CRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate Immersion Test</td>
<td>1.00</td>
<td>1.90</td>
</tr>
<tr>
<td>Salt Spray Test</td>
<td>1.00</td>
<td>1.60</td>
</tr>
<tr>
<td>Potentio –Dynamic Test</td>
<td>1.00</td>
<td>2.20</td>
</tr>
<tr>
<td>Sulphur – Dioxide Chamber Test</td>
<td>1.00</td>
<td>1.70</td>
</tr>
<tr>
<td>Atmospheric Exposure Test</td>
<td>1.00</td>
<td>1.80</td>
</tr>
</tbody>
</table>

CRI  =  \[
\text{Corrosion rate of mind steel CTD rebars in the particular test} \\
\text{Corrosion rate of CRS rebars in the same test}
\]

6. **CEMENT:**

The Portland Pozzolona Cement (PCC) as per IS: 1489:1991 or Portland Slag Cement as per IS: 455 shall be used on the works. The other provisions of clause 45.1 of GCC remains unchanged.

7. **CONCRETING**

Concreting shall be Weigh batched & machine mixed with equipment approved by the Engineer-in-charge.

8. **PLASTICIZER**

Plasticizer of required specification and makes shall only be permitted as per approved mix design.

9. **BRICK WORK**

The brick should be minimum class designation 75 conforming to IS 1077: 1992.

The brickwork for all external walls should be done from outside. The contractor shall be responsible for providing and maintaining sufficiently strong scaffolding so as to withstand all loads likely to come upon it. Due care shall be taken by the contractor to ensure the execution of brick masonry walls in plumbs from outside. The contractor shall arrange sufficient quantity of scaffolding for this purpose so as to complete the project within stipulated time.
10. **WATER PROOFING ON TERRACE**

The water proofing for the terraces, underground tanks / toilet floor etc. shall be got executed only through the authorized applicators of the manufacturers and the guarantee for the same shall be in the name of EPI / Owner for a period of ten years after the expiry of defect liability period on the prescribed format given in the GCC.

11. **GENERAL**

11.1 The Materials/Products used on the works shall be one of the preferred Make/Brands/Manufacturers given in the tender documents approved by EPI/NDMA

11.2 Flooring shall be of stone as per drawing / design & specification. The pattern shown in the drawing, if any can be modified as per site requirement by Engineer-in-charge and nothing extra shall be payable over and above the rate quoted.

11.3 Due care shall be given to HFL of the area while fixing plinth level of structures.

11.4 Plumbing & sanitary work to be executed by licensed / expert plumber and the plumbing scheme / drawing to be got approved from Engineer-in-charge.

11.5 The contractor shall be responsible for all protection of sanitary, water supply, electrical fittings & fixture against pilferage, breakage during period of installation until the completion of work and handed over to Authorities.

11.6 The electrical works shall be executed only through licensed electrician and the agency shall have to submit the valid license of electricians before starting the work.

11.7 It will be the sole responsibility of contractor to obtain all statutory approvals / compliance required, if any, for construction / implementation of the project including Forest clearance and completion clearance from the all relevant statutory bodies for plumbing, sewerage, sanitary and PHE work, fire, department for fire protection, fire fighting, electrical works, pollution control authorities etc. and for all other services as included in the scope of contract etc. from the concerned department as required within the stipulated time frame, only statutory charges shall be borne by the NDMA.
11.8 The contractor shall have to execute the work in pace and in such a way to facilitate other agency, if any, engaged simultaneously for execution of other works required for completion.

11.9 Unless otherwise specified in the schedule of quantities, the rates tendered by the contractor shall be all inclusive and shall apply to all heights, leads, depths & nothing extra shall be payable on this account.

11.10 On completion of work, the tenderer shall submit four prints of “As built” drawings to Engineer-in-charge at no extra payment.

12.0 DIESEL GENERATOR SET

Work covered by this contract shall include manufacture, supply, transportation, delivery, installation, testing and commissioning of direct start sound proof diesel generator sets suitable for round the clock operation at up to rated output with permissible overload along with associated works.

The DG set shall be complete with steel base frame, Anti vibration Mounting pads engine mounted radiator, battery & battery charger, day service tank, piping with accessories for water & HSD, exhaust piping, residential silencer, etc. The Generator shall be complete with standard control panel.

Any equipment not specifically mentioned herein but essential for completeness of the DG set shall also be supplied.

The diesel generator shall have the minimum following features as under.

The generator sets should be able to accept rated load in one step at rated pf, a test certificate to this effect on prototype model needs to be furnished.

The minimum rating of the Generator shall be AS PER RATED KVA under standard conditions of BS 5514.

The Generator Set should comply with ISO 8528-5, Class G3 requirements for transient performance.

The vendor shall provide for one source responsibility for the Generating Set and accessories for spares service & warranty.
The vendor shall also provide the reports showing the following.

1. Frequency and Voltage dips under different loading conditions,
2. Cooling air and Combustion air requirements.

The set shall be capable of running at full load for not less than 250 hrs continuously.

The time to Top overhaul should not be less than 15000 hrs, and the time to major overhaul should not less than 25000 hrs.

12.1 RATING

A. The rating (KVA) of the set shall be under the following circumstances:

a. Power Factor The rated power shall be available when the load power factor is 0.8 (lagging) or better.

b. Operating Mode The set shall be used only for the prime power application supplying rated loads for periods of up to 8 hours continuously, followed by a rest period of not less than 30 minutes.

c. Overload Capacity The engine and the alternator shall have an inherent reserve capacity of 10% for 1 hour in any 12 hours (assuming that running before and after the overload period is at rated output).

d. Ambient Conditions Maximum Temperature: 47°C, Maximum Humidity 75%RH.

e. Service Interval The set shall be capable of running at rated load for not less than 250 hours without maintenance adjustments upto at least for 12,000 hours, vendors are required to categorically confirm this
f. Shaft Speed: The rotational speed shall not exceed 1,500 Rev Motor Starting Vendors to confirm The largest motor the Dg set can start with TVD restricted to 20%,

h. Loads: The Generator Set shall be capable of operating in conjunction with non-linear and harmonic generating electric loads including the UPS system. Vendor to confirm the maximum non-linear loads that can be applied on the machine.

B. The DG Set shall be able to start in manual mode even in cold conditions, without any adverse effects on its performance, and shall take full rated load within 10 seconds (wake up time) from the starting signal. For switching in cold conditions, Jacket water heating facility should be provided. Before starting, pre-lubrication arrangement for the engine shall be provided if required.

C. D.G. Set should be designed for low specific fuel consumption. Vendors to confirm the KWH/ lit at 100% rating and part loads.

12.2 HOUSING

A purpose-constructed building shall be provided (by others) for the generator set and its auxiliary plants.

12.3 DIESEL ENGINE

1. The engine shall be a four stroke, multi-cylinder, dynamically balanced, direct injection, turbocharged and intercooled, heavy duty, industrial machine constructed to BS 5514. It shall be fitted with renewable wet cylinder liners and shall be directly coupled to the dynamically balanced alternator with both units mounted on a common grid steel bedplate.

2. The diesel engine shall have a minimum BHP as required as per rating of the set.

3. The diesel engine shall be provided with electronic governing isochronous type with frequency regulation under steady state condition within limits of ± 0.25%.

4. Governor shall be electronic.

5. The critical speeds of the crankshaft shall be min. 20% of the rated speed.
6. The engine shall be capable of sustaining a 10% overload for one hour in a 12-hour running period.

7. The engine shall be complete with cooling system, lubricating oil filters, air cleaners, starter motor/exciter, battery charging regulator, fuel injector, fuel control solenoid for fuel system response, fuel lift pump, engine speed adjustment, other standard/operational accessories and protective devices.

8. The engine shall operate on HSD oil Grade A conforming to IS 1460. The engine shall be fitted with a heavy, dynamically balanced flywheel suitable for constant speed generator duty to meet cyclic variations as per the requirements of BS 5514. The flywheel shall be complete with rigid couplings and guard shall be fitted to give smooth running of the engine.

9. An efficient, electronic, engine speed governor shall maintain engine speed at all conditions of load in lines with the requirements of BS 5514 and this specification.

10. The design shall provide compensation for ingress of dirt, which may clog the fins. Selection shall take into account the place of installation and the flexibility available for locating cooling system, air circulation and smoke exhaust.

11. The DG Set shall also be suitable for continuous operation for at least Eight(8) Hours of operation under specified ambient conditions without any adverse effect on its performance. It may again start working after 30 min. rest for a similar period.

12.4. MOUNTINGS

1. The bedplate shall be of heavy gauge steel construction, stress relieved and free from distortion. Machined Surfaces shall be incorporated for mountings and for leveling.

2. Anti-Vibration mountings should be factory fitted and shall be fitted between the Engine Alternator assembly and the bedplate in order to prevent the vibrations being transmitted. The Level of Vibration Isolation shall be to the extent of 90% or higher.

12.5. GOVERNOR

1. The Governor shall meet the following performance requirements:
   a. Steady state speed band: ±0.25% of nominal speed.
   b. Transient frequency change on application or rejection of 100% load as per ISO.8528-5
c. Recovery time to steady state speed band on application of 100 % Load as per ISO 8528-5

3. The electrical over speed trip provided shall operate at 110% of the rated speed and shall be only be reset by hand.

### 12.6 ENGINE COOLING

1. The engine shall be cooled by means of a RADIATOR as per design.

2. The Diesel engine shall be protected against Low Coolant Level

3. A thermostatically operated by-pass valve shall be fitted in the cooling system to maintain an optimum operating temperature during starting and running conditions. Drain cocks shall be provided so that all the water can be drained from the system.

4. Separate oil cooler shall be used for cooling the engine oil. A thermostatic by-pass valve shall be incorporated.

### 12.7 LUBRICATION SYSTEM

1. Pre-lubrication system for lubrication of engine before starting shall be provided complete with necessary pumps, piping and drilled oil passage strainer, oil cooler, relief valve, etc. Engine lubrication shall be by a closed circuit wet sump, forced feed system supplied by an engine driven pump fitted with pressure regulating and relief valves, sump suction filter and changeover renewable full-flow line filters.

2. The sump shall be fitted with an easily accessible drain point.

### 12.8 STARTING SYSTEM AND BATTERY CHARGING

1. The starting system shall comprise a 24 V heavy duty high lead acid battery, as required, and electric starting motor. The battery shall be sized to give not less than six consecutive starts of the engine at 0°C. The starting system shall be complete with necessary relays, solenoid valves for fuel, control and indicating panels as specified and required. The Engine Shall be provided with an over cranking relay to avoid any over cranking of the engine.

2. An engine driven alternator and charging system shall be provided, with sufficient capacity to maintain the battery in a condition to fulfill the starting requirements. An automatic changeover shall be provided such that battery
charging is carried out by the engine driven alternator at all times when the generator set is running.

3. The mains powered charger shall be suitable for operation on a 240 V single phase supply and shall be complete with the following indications and features:

Battery Charge / Discharge Current, Boost Charge / Trickle Charge Selector, On/Off Switch, Fault Indication.

4. The Battery Charger shall have a selector switch by which the rate of charging the batteries can be selected.

5. If the equipment does not start within three starting cycles with appropriate interval between each attempt, the starting circuit shall be locked out and audio-visual alarm shall be given.

12.9 ALTERNATOR

The alternator shall be 4 pole, 3 phase, salient pole, self / separate (with PMG) excitation, resolving field, brush less type, self-regulating, continuously rated, and manufactured in accordance with BS2613 / BS 5000 and suitable for feeding 415 V, 3 Phase 4 Wire, 50 Hz AC system with neutral point brought out. The alternator shall be screen protected, fan ventilated and confirming to an IP Classification of IP 21/23. The alternator shall be rated for 1500 RPM with KVA rating to produce rated output under site conditions It shall include Digital Voltage Regulator, Voltage adjusting potentiometer and low speed protection.

1. The alternator shall be capable of withstanding a 10% overload for 1 hour in any 12-hour period under the specified conditions of temperature, humidity and atmospheric pressure. The alternator shall be capable of maintaining a short-circuit current of three times the full load current for a period of 10 seconds.

2. The alternator rotor assembly shall comprise exciter rotor, full wave silicon bridge rectifier, surge protection device and salient pole rotating field system. The rotor shall be fitted with interconnected pole face damping windings. A filtration circuit shall be provided to minimize the effect of switching surges generated from electronic loads and eliminate any requirement for an increased rating of the set due to the UPS or such other non-linear loads. The non-linear load handling capacity of the alternator should be minimum 40% of its rated capacity. Suitable type of excitation system shall be provided for this.

3. An automatic Voltage Regulator shall maintain the voltage to within ±0.25% of the rated Voltage for a power factor between 0.8 and unity.
4. The alternator shall be capable of continuous operation with a phase current imbalance of 33% of rated current whilst maintaining the output voltage within ±0.25% of the rated value.

5. The alternator shall have pre-packed grease lubricated ball or roller bearings and provided with facilities for re-greasing whilst in service. The alternator shall be foot mounted on a common bed frame with the prime mover and shall be close-coupled to the engine flywheel housing.

6. Alternator windings shall be Class H insulation for Class H temperature rise (BS 2757) and impregnated with thermosetting varnish suitable for use in tropical climates. Ample Ventilation shall be provided by shaft mounted centrifugal fan. The alternator shall be provided with an anti-condensation heater, which shall be automatically disconnected when the generator set is starting or running.

7. The main exciter shall receive power from a permanent magnet generator through separator auxiliary windings on stator via Digital Voltage Regulator. The Digital Voltage Regulator shall be of solid-state circuitry and shall provide regulated voltage to the exciter compensating for all normal variations. The main exciter output is fed to the main windings via a rotating 3-ph bridge rectifier assembly, which shall be protected from voltage surges, short circuit, overload and diode failures. The DVR and control gear shall be mounted in a component box on the side of the machine.

8. Voltage Regulation shall be within ±0.25% under all conditions of load, power factor and temperature including cold to hot variation. There shall be no radio or television interference. Line Voltage waveform shall be as true as possible with a total harmonic distortion not exceeding 3% on application of 3-Phase loads.

9. The excitation system and engine governor should be such that the alternator is capable of starting up induction motors having a starting KVA of not less than 2 times the alternator rated KVA. Manufacturer should indicate the voltage dip and duration under such conditions as required under equipment data.

12.10 INSTRUMENTATION

1. Instrumentation shall be provided and mounted on the Generator Set to monitor the following:

a. Engine Speed,
b. Oil Pressure,
c. Oil Temperature,
4. Water Temperature.

2. A Gauge Board shall be provided with all the indicators grouped together.

3. The generator shall be provided with a microprocessor-based controller with a facility for remote start, remote annunciation and remote communication capability through the telephone /GSM network. It should be possible to monitor the parameters of the engine and the alternator and display the status of the faults on the Dg set if any and generate a complete report on the PC individually or on a network.

The following minimum monitoring & protection is required

Engine monitoring.

a. Coolant temperature.
b. Coolant level.
c. Fuel level.
d. Battery voltage.
e. RPM.
f. Fault oil pressure
g. Engine start count down.

Alternator Monitoring

b. Frequency
c. Voltage (L-L & L-N)
d. KVA.
e. KVAR
f. Power Factor
g. Percentage alternator duty heavily ie actual load / KW rating.

The engine is required to shut down under the following condition of faults:
High coolant temperature, Low coolant level, Low oil Pressure, Overspeed,
Over Crank (The Dg set shall not take any further attempts to start after it fails to start upon three attempts in the manual mode).

The Generator shall be protected against the following electrical faults:

Overload and short circuit, Ground fault, Over current, Over frequency,
Under frequency, Under Voltage, Over Voltage, Locked Rotor (Failed to Crank)
It should be possible to read the data ie Parameters and Shutdown status locally on the Dg Set. All the above Parameters should be displayed on The Local Control Panel through appropriate meters and status on faults should be indicated through a facia annunciator.
It should be possible to display all the functions as above on a personal computer.

12.11 RADIO INTERFERENCE

All equipments, provided under the scope, shall be so designed that they shall not cause interference with radio equipment. In the event of the inherent characteristics of the equipment being such that radio interference is possible, efficient devices to nullify the same shall be provided.

12.12 CONTROL PANEL

The panel shall be totally enclosed, made of Mild Steel sheet of at least 14 SWG thickness, freestanding, floor mounted and totally enclosed type. The cubicle shall be painted with one coat of red oxide primes and two coats of spray finish super enamel paint. Wiring circuit diagram of the panel should be affixed inside the cubicle so that when front hinged panel door is removed / opened it is clearly visible. All the switchgears, control devices, push buttons, indication lamps should be clearly labeled to indicate their nomenclature and operation. The wiring condition in the control panel shall be ferruled.

The Control panel shall have the following instrumentation

1 No. A.C. square voltmeter suitably scaled (144 sq.mm.)
1 No. Voltmeter selector switch
1 No A.C. Square C.T. operated ammeter suitably scaled to measure current in phases or lines (144 sq.mm.)
1 No. Ammeter selector Switch
3 Nos. Current Transformers of suitable ratio.
1 No. Frequency Meter (144 sq.mm.)
1 No. Power Factor Meter
1 No. 3-Phase 4-Wire suitable energy meter
1 No. running time meter (non-resettable type)
1 No. 4 Pole Air Circuit Breaker (EDO) of suitable rating complete with overload trip, short circuit trip, relays,
12.13 EXHAUST SYSTEM

1. The engine exhaust piping shall be amply sized for minimum back pressure and connected to the engine manifold through flexible connection or an expansion joint on one side and to a silencer on the other side along with pipe. The silencer shall be of package type with adequate attenuation for urban use, constructed from heavy gauge mild steel. The sound absorbent infill shall be non-hygrosopic, vermin proof, non-combustible material. Engine shall be provided with residential type silencers so as to reduce the sound level by 15 dBA at a distance of 1 meter from the DG set as per the norms.

2. The exhaust piping from the silencer onward shall be laid up to the specified / approved level and discharged through a rain cowl. Entire exhaust piping and silencer shall be insulated with 50 mm thick, 64 kg / cum density, fiberglass, white wool. The insulation shall be held in position with 0.63 mm dia, 20 mesh, galvanized steel wire mesh and finished neatly with 26 SWG Aluminium Cladding.

3. Flanged Connections to the silencer and between pipe sections shall be made. Minimum wall thickness of pipes and the silencer shall be 3 mm. A stainless steel bellows unit shall be provided for connection onto the engine.

4. Exhaust pipes within the building shall be lagged and guarded to prevent accidental contact up to a height of 2.5 m. No part of any exhaust system installed outside the building shall be less than 3 m from the ground level. Passage of exhaust pipes through walls or the roof shall be sleeved and shall be shrouded to prevent ingress of rain or vermin. Exhaust emission control shall be as per Pollution Control Board regulations and all other statutory authorities.

5. Exhaust piping shall be fabricated from Class ‘B’ MS pipes conforming to IS 1239 of size suitable to limit backpressure to within permissible limit. The insulation thickness stipulated in the schedule of quantities shall be checked by the tenders to achieve a maximum temperature of 70°C on the outside surface of the insulated pipe and supporting calculation for the backpressure shall be furnished. Flanged joints in the exhaust piping shall be covered with removable insulation at suitable intervals for permitting access to the joint, as and when required. All flanged joints shall have spiraget high temperature gasket. The piping shall be installed with necessary thermal expansion facility
as required. Exhaust piping shall be connected to the engine by means of flexible section or an expansion joint and shall also be graded to a drain pocket inside the building. The pocket shall be fitted with a drain cock.

12.14 FUEL TANKS

1. A Fuel Day Tank of not less than 990 Litres Storage Capacity complete with mechanical fuel oil level indicator to indicate ‘high’ and ‘low’ levels and isolation valves, shall be supplied for pumping and storing fuel oil from barrels to Day Tank as necessary. The Tank shall be complete with a floor stand such that the tank is installed at the optimum height which allows correct suction pressure to the Fuel lift pump of the Generator set when the fuel oil in the tank is at any level between low level and high level.

2. The tank shall be constructed from Mild Steel of not less than 14 SWG Thickness in accordance with relevant IS standards. It shall be complete with filter breather unit and drain plug. The associated fittings shall be constructed from materials which are suitable for long term contact with diesel fuel and shall not include yellow brass, low grade of copper and zinc, lead, and galvanized metals. The fuel piping and tanks shall be designed to free from leakage and airlocks. The fuel tank shall be supplied with a level gauge to indicate the oil level in the tank in litres. The following fitting shall be included:

a) lowest point in tank complete with isolating valve,

b) Outlet pipe complete with manually operated isolation valve and mechanically operated isolation valve (for fire shut-down),

c) Fuel Inlet pipe from the filling point at the top of the tank,

d) Fuel return inlet pipe connection (from the generator set).

12.15 FUEL PIPE WORK AND VALVES

1. The Generator package shall include the supply, installation, connection, testing and commissioning of all pipes and valves for the fuel system including, but not limited to the following

a) Day tank filling pipe

b) Generator fuel supply and return pipes.

c) Bulk oil storage and transfer system piping and accessories.
2. All pipes, valves, fittings and connection materials shall be designed for use in conjunction with diesel fuel oil. All fuel piping shall be suitably corrosion protected.

12.16. FUEL FILTERS

A supply line fuel filter shall be fitted and shall be of the cartridge type.

12.17. TESTING AND COMMISSIONING

1. The Generating Sets shall be tested at the manufacturer’s premises for the guaranteed performance and fuel consumption at various loads for 8 hours, overload capacity and satisfactory operation of the protection systems. All faults, control functions and site load conditions shall be simulated, checked and proved. All the above testing shall be carried out in the presence of or his authorized representative. In addition, tests to prove the transient performance as specified above, on block loading, shall be conducted.

2. After installation at site the set shall be run for a minimum period of 2 hours gradually loaded to 50% load. On satisfactory completion of the load run the test shall be run for a period of 8 hours at 100% full load. All consumables including fuel, lube oil and load banks required for commissioning the set shall be supplied and arranged by the purchaser.

3. The trial shall be conducted in the presence of the authorized representative and the test results shall be recorded in an approved format. Any abnormal condition occurring during the trial run of the DG Set shall also be recorded. Test Results shall be recorded at 30 minutes intervals.

4. Tests proving the satisfactory performance of all operating gear, safety functions and control shall be carried out.

5. Performance test at site shall include (but not limited to) the following test acceptance criteria:

   a) Fuel Consumption at 60%, guaranteed performance. 80%, 100% and 110% load Alternator efficiencies as determined by the tests at the manufacturer’s works shall be used as the basis of calculation of

   b) Voltage variation± 0.25%

12.18. INSTRUCTIONS MANUALS AND CATALOGUES
a). Two copies of operator’s guide, manuals, maintenance schedules, repair / overhaul instructions for the complete equipments shall be supplied by the supplier.

12.19 **OVERLOAD CAPACITY**

The DG Set shall be able to withstand 10% overloading for one hour in twelve hours.

12.20. **GUARANTEE**

The Supplier shall guarantee for satisfactory performance of the DG Set, panel, etc. for a period of 12 calendar months from the date of successful commissioning and handling over of the equipment for the operation against all manufacturing defects.

12.21 **STATUARY REGULATIONS AND APPROVALS**

The Supplier shall be responsible to maintain all STATUARY NORMS prescribed by CPCB (or by any other competent authority) either for noise level or emission level or any other parameter, from time to time. Declaration in this regard shall be submitted by the supplier along with his technical bid. Also all approvals by the CPCB or any other competent authority regarding any parameter directly attributable to the DG sets shall be the sole responsibility of the supplier.

12.22 **DG DRAWINGS**

The Supplier shall be responsible to provide all P&I diagrams for water system, fuel system & also chimney sizes as per back pressure requirements. Typical P&I diagrams for water and fuel systems are given for reference. Any other drawing required for completion of the system is to be furnished for approval by the supplier.

13. **APPROVED LIST OF MATERIALS/MAKES**

<table>
<thead>
<tr>
<th>SL.No</th>
<th>NAME OF ITEMS</th>
<th>LIST OF APPROVED MANUFACTURERS / BRAND / APPLICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cement</td>
<td>ACC / GRASIM / ULTRATECH / LAFARGE /</td>
</tr>
<tr>
<td>2</td>
<td>Reinforcement Bars</td>
<td>TATA(TISCON), SAIL, RINL.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Brand Names</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>White Cement</td>
<td>JK, BIRLA WHITE</td>
</tr>
<tr>
<td>4</td>
<td>Ceramic Floor Tiles</td>
<td>Premium quality NITCO, JOHNSON, VERMORA, Bell</td>
</tr>
<tr>
<td>5</td>
<td>Ceramic Tiles for Dado</td>
<td>Premium NITCO, JOHNSON, VERMORA, KAJARIA</td>
</tr>
<tr>
<td>6</td>
<td>Vitrified/ Rectified Tiles</td>
<td>Premium Quality NITCO, JOHNSON, VERMORA, ORIENT</td>
</tr>
<tr>
<td>7</td>
<td>Glass Mosaic Tiles</td>
<td>Italia, Lamosaic, Littleglass</td>
</tr>
<tr>
<td>8</td>
<td>Float Glass</td>
<td>Modi, Saint Gobin, Indo-Asahi</td>
</tr>
<tr>
<td>9</td>
<td>Concrete Interlocking Pavement Tiles and Concrete Paver Block</td>
<td>Wondercrete, Eurocon, AP Stylish Interlocking Pvt. Ltd.</td>
</tr>
<tr>
<td>10</td>
<td>Flush Door/</td>
<td>Kit ply, Greenply, Century door, Truwood door, Dura door, Sarda</td>
</tr>
<tr>
<td>12</td>
<td>Cylindrical locks/ locks</td>
<td>Godrej/ Foam Industries equivalent</td>
</tr>
<tr>
<td>13</td>
<td>Extruded Aluminium sections</td>
<td>INDAL, JINDAL, HINDALCO</td>
</tr>
<tr>
<td>14</td>
<td>Aluminium Composite Panel</td>
<td>Alstrong, Aluco-bond, Aludecor, Durabuild</td>
</tr>
<tr>
<td>16</td>
<td>Reflective Glass for glazing</td>
<td>AIS, Saint Gobian, Pilkington</td>
</tr>
<tr>
<td>17</td>
<td>Minarel board false ceiling</td>
<td>Armstrong / AMF / OWA</td>
</tr>
<tr>
<td>18</td>
<td>UPVC rain water pipes with fittings</td>
<td>Oriplast, Supreme, Finolex</td>
</tr>
<tr>
<td>19</td>
<td>Polycarbonate Sheet</td>
<td>GE Plastic or Equivalent</td>
</tr>
<tr>
<td>20</td>
<td>Exterior type acrylic based paint</td>
<td>Excel Total of Nerolac, Apex ultima of Asian Paint or equivalent of ICI</td>
</tr>
<tr>
<td>21</td>
<td>Wall Putty</td>
<td>Birla, JK</td>
</tr>
<tr>
<td>22</td>
<td>Distemper</td>
<td>Asian Paint, Berger, ICI, Nerolac</td>
</tr>
<tr>
<td>23</td>
<td>Plastic emulsion Paint</td>
<td>Premium emulsion of Asian Paints, Delux acrylic emulsion of ICI, Rangoli fashion of Berger, Allscape of Nerolac</td>
</tr>
<tr>
<td>24</td>
<td>Synthetic Paint</td>
<td>Asian Paint, Berger, ICI, Nerolac</td>
</tr>
<tr>
<td>25</td>
<td>Zinc Chromate Primers</td>
<td>Shalimar, Asian Paint, Berger, ICI</td>
</tr>
<tr>
<td>27</td>
<td>Chemical / Mechanical Anchor Fasteners</td>
<td>HILTI, FISCHER</td>
</tr>
<tr>
<td>28</td>
<td>Hydraulic door closer</td>
<td>Hardwyn make (Eddy) or equivalent</td>
</tr>
<tr>
<td>29</td>
<td>Floor spring for aluminium door</td>
<td>Hardwyn, Garnish</td>
</tr>
<tr>
<td>30</td>
<td>Fittings for Aluminium doors and windows.</td>
<td>Ebco, Doorline</td>
</tr>
<tr>
<td>31</td>
<td>Water Proofing Compound/ Admixtures</td>
<td>Choksey, Sika Qualcrete, Degussa, Fosroc,</td>
</tr>
<tr>
<td>32</td>
<td>Epoxy Grout for tile fixing</td>
<td>Laticrete, Bal endula or</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Equivalent</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td><strong>SANITARY ITEMS</strong></td>
<td></td>
<td>equivalent.</td>
</tr>
<tr>
<td><strong>Sanitary Fittings and Fixtures:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Vitreous China and Fire Clay Sanitaryware</td>
<td>Parryware, Hindustan Sanitaryware,</td>
</tr>
<tr>
<td>2</td>
<td>PVC Cistern (with all fittings and accessories):</td>
<td>Parryware, Commander</td>
</tr>
<tr>
<td>4</td>
<td>Plastic Seat Covers with frame</td>
<td>Parryware, Commander</td>
</tr>
<tr>
<td>5</td>
<td>CP brass fittings and Accessories</td>
<td>Essco, Jaquar, Mark</td>
</tr>
<tr>
<td>6</td>
<td>Stainless-Steel Sinks (with or without drain-board and having integrated waste fittings)</td>
<td>Nirali, AMC, Parryware,</td>
</tr>
<tr>
<td>7</td>
<td>Soil Pipes and Fittings:</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Centrifugally Cast (spun) Iron Pipes &amp; fittings</td>
<td>NECO or approved equivalent make conforming to IS: 3989</td>
</tr>
<tr>
<td>9</td>
<td>Sand Cast (spun) Iron Pipes &amp; fittings (conforming to IS: 1729)</td>
<td>AMC, ALC, Bengal Iron</td>
</tr>
<tr>
<td>10</td>
<td>Pig Lead (for caulking of joints)</td>
<td>Locally available best quality with minimum 99% purity</td>
</tr>
<tr>
<td><strong>Water Supply Pipes and Fittings:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>G.I. Pipes</td>
<td>TATA, JINDAL,</td>
</tr>
<tr>
<td>12</td>
<td>G.I. Fittings</td>
<td>R, KS, HB, Unix</td>
</tr>
<tr>
<td>13</td>
<td>Centrifugally Cast Iron Pressure Pipes (LA class) and Fittings with connection pieces for flanged connection where required.</td>
<td>Electrosteel, Keshoram, IISCO</td>
</tr>
<tr>
<td>14</td>
<td>UPVC pipes</td>
<td>Oriplast, Supreme, Finolex</td>
</tr>
<tr>
<td>15</td>
<td>Gunmetal Valves</td>
<td>Leader, Zoloto, Annapurna, Sant</td>
</tr>
<tr>
<td>16</td>
<td>Cast Iron Valves</td>
<td>Venus, Upadhyay, Sarkar, Ghosh Engineering, Sant, Castle</td>
</tr>
<tr>
<td>17</td>
<td>Strainers</td>
<td>Locally available best quality material matching with concerned valve</td>
</tr>
<tr>
<td>18</td>
<td>PVC Pipes and strainers for Tubewell (Medium casing pipe</td>
<td>Oriplast, Supreme, Finolex</td>
</tr>
<tr>
<td>SL.No</td>
<td>NAME OF ITEMS</td>
<td>LIST OF APPROVED MANUFACTURERS / BRAND / APPLICATORS</td>
</tr>
<tr>
<td>-------</td>
<td>---------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>ELECTRICALS</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Contactor</td>
<td>Siemens, ABB, L&amp;T, GE, Schneider, BCH</td>
</tr>
<tr>
<td>2</td>
<td>TPN switch fuse unit / switch</td>
<td>Siemens, L &amp; T, GE, C&amp;S,</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Suppliers</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>DP/SPN SFU/ SDFU with HRC fuses</td>
<td>LK, HPL, Standard, L&amp;T, Siemens, Gerard, C&amp;S</td>
</tr>
<tr>
<td>4</td>
<td>All moulded fuse with HRC fuses/Distribution fuse board with HRC fuses</td>
<td>Siemens, Larsen &amp; Toubro, GE, C&amp;S,ECC</td>
</tr>
<tr>
<td>5</td>
<td>KWH Meter</td>
<td>Alstom, HPL-SOCOMEC, Jaipur, L&amp;T</td>
</tr>
<tr>
<td>6</td>
<td>Motor Starter</td>
<td>Siemens, L &amp; T, Schneider (CG), GE, T &amp; C., BCH, ,ECC</td>
</tr>
<tr>
<td>7</td>
<td>Rewireable type porcelain Switchgear, fuse fittings</td>
<td>GE, Standard, Gerard, HPL</td>
</tr>
<tr>
<td>8</td>
<td>Changeover Switch</td>
<td>L &amp; T, ELECON/ Gerard, Havels, Standard</td>
</tr>
<tr>
<td>10</td>
<td>Earth Leakage current circuit breaker</td>
<td>Merlin Gerin, L &amp; T, Hager, Siemens, Gerard,C&amp;S, Legrand, North-West,ECC</td>
</tr>
<tr>
<td>11</td>
<td>1100 Volts grade PVC/ XLPE insulated steel armoured and over all PVC sheathed cables with size in sq.mm embosed on cable surface</td>
<td>NICCO, Fort Gloster, National, CCI, Polycab, Crystal, KEI</td>
</tr>
<tr>
<td>12</td>
<td>PVC insulated stranded/ flexible copper conductor wire with size in sq.mm. embosed on cable surface (for internal wiring)</td>
<td>Finolex, L&amp;T, R.R. Kabel, Polycab, Rajanigandha, Mesacap</td>
</tr>
<tr>
<td>13</td>
<td>Rigid PVC Conduit</td>
<td>B.E.C., AKG, Precision, Gerard, Harsh</td>
</tr>
<tr>
<td>14</td>
<td>Black stove enamelled conduit and galvanised steel conduit with ISI marked embosed on conduit surface</td>
<td>B.E.C., NIC, AKG,</td>
</tr>
<tr>
<td>15</td>
<td>Electrical Switch Board cover with white top Lamination</td>
<td>Hylam or equivalent</td>
</tr>
<tr>
<td>16</td>
<td>Metal clad socket &amp; plug having scraping earth arrangement</td>
<td>Hager, Schneider (CG), L &amp; T, Gerard, C&amp;S, Legrand</td>
</tr>
<tr>
<td>17</td>
<td>250 Volt 6 Amp. Piano reed type switch/ Buzzer Push (Flush type), 250 Volt 16 Amp. 3 Pin socket with switch combined</td>
<td>Anchor, CPL, Precision, SSK, Magic. Color</td>
</tr>
<tr>
<td>18</td>
<td>250 Volt 6 Amp. Ceiling rose, 250 Volt : 16 Amp 3 pin socket with switch combined</td>
<td>Anchor, CPL, Precision, SSK, Magic</td>
</tr>
<tr>
<td>19</td>
<td>Modular type 10 A &amp; 16 A switch. 10</td>
<td>MK blenze, Roma woods,</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Supplier(s)</td>
</tr>
<tr>
<td>-----</td>
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<td>-------------</td>
</tr>
<tr>
<td>20</td>
<td>Modular Electronic</td>
<td>MK blenze, Roma woods,</td>
</tr>
<tr>
<td>21</td>
<td>Regulator/Dimmer (2 module) Clock switch/time switch</td>
<td>Legrand Mosaic L &amp; T, Hager, GIC, Legrand</td>
</tr>
<tr>
<td>22</td>
<td>'CLIP ON' Terminal assembly</td>
<td>Tosha, Elmex</td>
</tr>
<tr>
<td>24</td>
<td>ON/OFF Rotary Switch/ Selector Switch/ programme switch</td>
<td>Siemens, Hager, Larsen &amp; Toubro, Kaycee</td>
</tr>
<tr>
<td>25</td>
<td>Cable Glands</td>
<td>COMIC, Raychem or equiv.</td>
</tr>
<tr>
<td>26</td>
<td>Cable Tray</td>
<td>Pilco, MEK or equiv.</td>
</tr>
<tr>
<td>27</td>
<td>Battery</td>
<td>EXIDE, STANDARD</td>
</tr>
<tr>
<td>28</td>
<td>Fluorescent light fittings (All types) &amp; lamp.</td>
<td>Wipro, Philips,Thorn, K-litr, Bajaj, Pierlite</td>
</tr>
<tr>
<td>29</td>
<td>Decorative wall bracket/ ceiling mounted Luminaire for PL/incandescent lamp</td>
<td>Wipro, Philips,Thorn, K-litr, Metal Coats, Bajaj</td>
</tr>
<tr>
<td>30</td>
<td>Fluorescent Street Light Luminaire &amp; lamp</td>
<td>Wipro, Philips,Thorn, K-litr, Metal Coats, Bajaj, Pierlite</td>
</tr>
<tr>
<td>31</td>
<td>Halogen spot luminaire &amp; lamp.</td>
<td>Wipro, Philips,Thorn, K-litr, Metal Coats, Bajaj, Pierlite</td>
</tr>
<tr>
<td>32</td>
<td>Metal halide luminaire &amp; lamp</td>
<td>Wipro, Philips,Thorn, K-litr, Metal Coats, Bajaj, Pierlite</td>
</tr>
<tr>
<td>No.</td>
<td>Item Description</td>
<td>Manufacture/Brand</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>33</td>
<td>Lamp Holder (Pendent racket or Batten)</td>
<td>Anchor, SSK, Magic</td>
</tr>
<tr>
<td>34</td>
<td>Exhaust Fan</td>
<td>G.E.C., Crompton, Polar, EPC, Usha</td>
</tr>
<tr>
<td>35</td>
<td>Ceiling Fan</td>
<td>Decorative fan of Crompton, Polar, Khaitan</td>
</tr>
<tr>
<td>36</td>
<td>Busbar Trunking/Rising Main</td>
<td>Control &amp; Switchgear (C &amp; S), Zeta, ECC</td>
</tr>
<tr>
<td>37</td>
<td>Ammeter/Voltmeter selector switch</td>
<td>Kaycee, L&amp;T, Switron</td>
</tr>
<tr>
<td>38</td>
<td>Relay</td>
<td>Alsthom, GE, L&amp;T, Syntron, Control Group</td>
</tr>
<tr>
<td>39</td>
<td>Current Transformer</td>
<td>Kappa, L&amp;T, C&amp;S, AE, SIEMENS, ECC</td>
</tr>
<tr>
<td>40</td>
<td>Capacitor</td>
<td>L&amp;T, Manual, EPCOS</td>
</tr>
<tr>
<td>41</td>
<td>Decorative Street Light Poles</td>
<td>Metal Coats, KLITE</td>
</tr>
<tr>
<td>42</td>
<td>Sodium vapour, Murcury vapour MHL fittings and lamps</td>
<td>Philips, Crompton, Wipro</td>
</tr>
<tr>
<td>43</td>
<td>Cable Jointing Kit</td>
<td>Frontec, Ray cham, M-seal, Denson</td>
</tr>
<tr>
<td>44</td>
<td>Passenger Elevator</td>
<td>Otis / Kone/ Thyssenkrupp</td>
</tr>
<tr>
<td>45</td>
<td>Air-Conditioners</td>
<td>Hitachi, Carrier, Voltas, Blue-star</td>
</tr>
<tr>
<td>46</td>
<td>Diesel Generator Set 15/25 KVA</td>
<td>Kirloskar, Cummins, Jackson</td>
</tr>
</tbody>
</table>

Universal Power, Caterpillar, Jackson
| Power, Caterpillar, Jackson |   |
### CONSTRUCTION OF MULTI PURPOSE CYCLONE SHELTERS AT NORTH 24 PARGANAS IN WEST BENGAL

Ref: EPI/MMD/666/1038

**DATE 09.10.2015**

**QUOTING SHEET**

<table>
<thead>
<tr>
<th>SL No.</th>
<th>DESCRIPTION</th>
<th>ESTIMATED COST (IN Rs.)</th>
<th>BIDDER'S PRICE</th>
<th>AMOUNT IN Rs. after adding percentage above, at par or below</th>
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<tbody>
<tr>
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<tr>
<td>1</td>
<td>CONSTRUCTION OF 03 NOS MULTIPURPOSE CYCLONE SHELTERS AT SAMSHERNAGAR, HARIDASHKATI &amp; KUMIRMARI IN N 24 PARGANA, WEST BENGAL</td>
<td>7,24,21,505.00</td>
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**BIDDER’S FINANCIAL OFFER:**

Rs. ___________________________ (In Figure)

Rupees ___________________________ (In Words)

Seal & Signature of Bidder