TENDER DOCUMENT

TENDER No: NERO/CON/457/372                          Date: 06.02.2020

FOR

Plugging Nallah gaps with conventional type fence and road works at GIN No. GIN No. 605 (BP Ref 1987-3S to 1987-4S) at Teliamura sector, GIN No. 608 (BP Ref 1993-59S to 1994-M) at Gokulnagar sector along the Indo Bangladesh Border in Tripura (BRO left out job) - Pkg-N-2.

VOLUME–II

NOTICE INVITING TENDER

ADDITIONAL CONDITIONS OF CONTRACT

TECHNICAL SPECIFICATIONS

DRAWINGS
NOTICE INVITING e-TENDER

Tender for Plugging Nallah gaps with conventional type fence and road works at GIN No. GIN No. 605 (BP Ref 1987-3S to 1987-4S) at Teliamura sector, GIN No. 608 (BP Ref 1993-59S to 1994-M) at Gokulnagar sector along the Indo Bangladesh Border in Tripura (BRO left out job) - Pkg-N-2.

EPI invites E-Tender on behalf of Ministry of Home Affairs on Percentage Rate basis for the following work from the eligible contractors/firms who fulfill the eligibility criteria as per the brief particulars of scope for Plugging Nallah gaps with conventional type fence and road works at GIN No. GIN No. 605 (BP Ref 1987-3S to 1987-4S) at Teliamura sector, GIN No. 608 (BP Ref 1993-59S to 1994-M) at Gokulnagar sector along the Indo Bangladesh Border in Tripura (BRO left out job) - Pkg-N-2. in single stage two bid system (Technical bid & Price bid) for the following works:-

<table>
<thead>
<tr>
<th>NAME OF WORK</th>
<th>Plugging Nallah gaps with conventional type fence and road works at GIN No. GIN No. 605 (BP Ref 1987-3S to 1987-4S) at Teliamura sector, GIN No. 608 (BP Ref 1993-59S to 1994-M) at Gokulnagar sector along the Indo Bangladesh Border in Tripura (BRO left out job) - Pkg-N-2.</th>
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| ESTIMATED COST | Rs. 3,99,24,542.00  
(Rupees Three Crore Ninety Nine Lakhs Twenty Four Thousand Five Hundred and Forty Two Only) |
| EARNEST MONEY DEPOSIT (EMD) | Rs. 3,99,250.00  
(Rupees Three Lakhs Ninety Nine Thousand Two Hundred and Fifty Only) |
| TENDER FEE | Rs.11,800/-  
(Rupees Eleven Thousand Eight Hundred Only)  
(GST @ 18% included) |
| COMPLETION PERIOD | 12 (Twelve) Months |

The work of “Plugging Nallah gaps with conventional type fence and road works at GIN No. GIN No. 605 (BP Ref 1987-3S to 1987-4S) at Teliamura sector, GIN No. 608 (BP Ref 1993-59S to 1994-M) at Gokulnagar sector along the Indo Bangladesh Border in Tripura (BRO left out job) - Pkg-N-2.” shall be carried out on percentage rate Basis as per the scope and conditions mentioned in the tender documents.

The brief scope of work included in this tender shall include providing all labour, materials, tools and plant, transportation to site, storage and safe custody of the materials, earthwork in excavation, earthwork in filling, PCC, RCC, drains etc. as required in Plugging Nallah gaps with conventional type fence and road works and allied works as mentioned in the tender documents.

Apart from above, any other services not covered above but required as per direction of EPI
are deemed to be included in the scope of work. The Detailed scope is given in the tender documents.

Time schedule of Tender activities:

<table>
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<tr>
<th>Event</th>
<th>Date/Time</th>
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<tbody>
<tr>
<td>Last Date &amp; Time for Downloading of tender documents:</td>
<td>27.02.2020 upto 11:00 am.</td>
</tr>
<tr>
<td>Last Date &amp; Time of submission of Tenders (online and physical documents):</td>
<td>27.02.2020 upto 11:00 am.</td>
</tr>
<tr>
<td>Date &amp; Time of online opening of tenders (Techno-Commercial Bid):</td>
<td>27.02.2020 at 03.00 pm.</td>
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<tr>
<td>Pre-Bid Meeting (Offline)</td>
<td>4th Floor, Hindustan Tower Block-A, Jawahar Nagar, N.H.37, Guwahati-781022 Assam</td>
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<tr>
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<td>13.01.2020 at 04.00 pm.</td>
</tr>
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</table>

The tenderers shall submit his query for the pre-bid meeting on or before 13.01.2020 by 10.00 hours to nerocontracts@gmail.com or by post to the address given at sl. No. 14 below.

1.0 Contractors who fulfill the following basic qualifying requirements are eligible to participate in this tender. The joint ventures/Consortium is not accepted.

a) The bidder must have experience of having satisfactorily completed following “similar works” during the last 7(seven) years ending last day of month previous to the one in which applications are invited.

   a) Three similar works each of costing minimum not less than 40% of the estimated cost put to the tender.

   OR

   Two similar works each of costing minimum not less than 60% of the estimated cost put to the tender.

   OR

   One similar work costing minimum not less than 80% of the estimated cost put to the tender.

i) The “Similar works shall mean “Civil Construction works” mainly Road, Fencing, Box Culvert, Drainage, Retaining wall etc.

ii) The cost of free issue materials shall not be included in the completion cost of works.

iii) For evaluation purpose, the completion cost of works mentioned in the completion certificate shall be enhanced by 7% per annum till the end of month prior to date of NIT.

b) Should have had average annual financial turnover amounting at least 50% of the estimated cost of the work during the last three consecutive financial years ending on 31.03.2019 duly certified by Chartered Accountant duly supported with audited copies of financial statements.
c) Should not have incurred any loss in more than two years during the immediate last five consecutive financial years, ending **31.03.2019**, Copies of balance sheet/Certificate from Chartered Accountant duly self attested by the tenderer shall be submitted.

d) Should have a Solvency of 40% of the estimated cost issued by his bankers in the name of the bidder. 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 and GST registration certificate.

f) Should have valid PF Registration number. In case the bidder does not have this registration number, he shall remain bound to obtain them within one month from the date of LOI or before release of 1st R/A bill whichever is earlier.

g) Bid Capacity: The bidding capacity of the tenderer should be equal to or more than the estimated cost of the work put to Tender.

   The Bidding capacity shall be worked out by the following formula:

   \[ \text{Bidding Capacity} = [A \times N \times 2] - B \]

   Where,

   A = Maximum value of construction works executed in any one year during the last five years taking into account the Completed as well as works in progress ending last day of the month previous to the one in which applications invited.

   N = Number of years prescribed for completion of work for which bids have been invited

   B = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited. The Tenderer is requested to furnish the existing commitments of works under execution along with stipulated period for completion of remaining for each of the work should be furnished in an affidavit on non-judicial stamp paper of value of Rs. 100/- duly certified that the particulars furnished are correct as per the Performa in Annexure-A

h) Site visit for the subject tender is mandatory. The bidders shall visit the site to Study/assess the tendered work and also acquaint themselves of the prevailing local conditions & detail requirement of the project work before submitting their bid. Bidder has to enclose a certificate counter signed by EPI official or furnish undertaking for having visited the site.

i) Bidders who intend to get exemption from submission of Tender fee and EMD shall submit confirmation letter whether they are registered under MSME Act or not and if yes, then relevant copies of the registration letter (Registered under single point registration scheme of NSIC, Govt. of India, Ministry of MSME, New Delhi) vide **Gazette Notification dated 26.03.2012 along with the form of Memorandum-2 (with the concerned DIC) certificate** in the appropriate category and limit as applicable under the present tender to be enclosed in Technical Bid and a request letter for exemption from submission of Tender fee and EMD.
j) Even though an applicant may satisfy the eligibility criteria, EPI reserves the right for not issuing the tender document if he has record of poor performance such as abandoning work, not properly completing the work, delay in execution of work, poor quality of work, financial failure / weakness etc.

k) The experience certificates issued by Government Organizations / Semi Government Organizations/ State Government / Public Works Department / Central Government /Public Sector Undertakings/ Autonomous Bodies/Municipal Bodies/Public Limited Companies listed on BSE/NSE shall only be accepted for assessing the eligibility of the tenderer. However, the certificates issued by Public Limited Company and Private Party can be considered only if they are supported by TDS certificates/Turnover Certificate from Chartered Accountant in support of value of work done by the tenderer.

l) Completion certificates from the client shall be in the name of the company who is submitting the tender. The contractor has to produce original documents for their verification as and when demanded by EPI. The tender of any tenderer shall be rejected if on detailed scrutiny; documents submitted along with the tender are found to be unsatisfactory / forged. The decision of EPI in this regard shall be final and the binding on the tenderer.

m) Relevant experience certificates and other documents as mentioned above fulfilling the qualifying criteria duly self-attested by the tenderer shall be enclosed in Envelope-1. Completion Certificates from clients shall be in the name of the Company who is submitting the tender. The bidder has to produce original documents for verification at the time of opening of tender or as and when demanded. The Tender of any tenderer shall be rejected if on detailed scrutiny, documents submitted along with the tender are found to be unsatisfactory. The decision of EPI in this regard shall be final and binding on the tenderer.

n) The tenderers may note that they are liable to be disqualified and not considered for the opening of Price Bid if;
   a) Representation in the forms, statements and attachments submitted in the pre-qualification document are proved to be incorrect, false and misleading.
   b) They have record of poor performance during the past 10 (ten) years such as abandoning the work, rescinding of contract for which the reasons are attributable to the non-performance of the contractor, inordinate delay in completion, consistent history of litigation / arbitration awarded against the contractor or any of its constituents or financial failures due to bankruptcy etc. in their ongoing / past projects.
   c) They have submitted incompletely filled in formats without attaching certified supporting documents and credentials to establish their eligibility to participate in the Tender.
   d) If the tenderers attempt to influence any member of the selection committee.
EPI reserves its right to take appropriate action including disqualification of tenderer(s) as may be deemed fit and proper by EPI at any time without giving any notice to the contractor in this regard. The decision of EPI in the matter of disqualification shall be final and binding on the Tenderers.

The credentials of the Bidders shall be verified and inspection of the works, if required, to be carried out by EPI. If not found satisfactory, their bid will be considered non-responsive.

2.0 Tender documents comprising of the following are available on the website of EPI: www.engineeringprojects.com, CPP-Portal: www.eprocure.gov.in and as well as on MSTC portal https://www.mstcecommerce.com/eprochome/EPIL.

Volume I: Instructions to tenderers, General Conditions of Contract, Addendum to instructions to tenderers, Special instructions to bidders for e-tendering, memorandum, Letter of undertaking, form of tender, Affidavit Performa, Integrity pact, Site visit undertaking format etc.

Volume II: Notice inviting Tender, Additional Conditions of Contract, Technical Specifications, Tender Drawings etc.

Volume III: Bill of Quantity, Format of Price Bid etc.

3.0 In order to participate, the bidder should have Digital Signature Certificate (DSC) from one of the authorized Certifying Authorities.

4.0 Interested bidders have to necessarily register themselves on the portal http://www.mstcecommerce.com/eprochome/EPIL through M/s MSTC Ltd., Kolkata to participate in the bidding under this invitation for bids. It shall be the sole responsibility of the interested bidders to get themselves registered at the aforesaid portal for which they are required to contact M/s MSTC Ltd., Kolkata at following address to complete the registration formalities:

M/s MSTC Limited,
30 / 31A, 1st Floor, Jeevan Vikas Bhawan,
Asaf Ali Rd, New Delhi,
Delhi-110006
Contact No.: 033-22901004, 011-23212357, 011-23215163, 011-23217850

Availability: 10 AM to 5:30 PM on all working days. Email-ID: mstcnro@mstcindia.co.in

Please mention “Helpdesk” as subject while sending emails.

The address of the tender inviting authority is give at 14.0 below.

For proper uploading of the bids on the portal namely http://www.mstcecommerce.com/eprochome/EPIL (hereinafter referred to as the ‘portal’), it shall be the sole responsibility of the bidders to apprise themselves adequately regarding all the relevant procedures and provisions as detailed at the portal as well as by contacting M/s MSTC Ltd., directly, as and when required, for which contact details are mentioned above. The EPI in no case shall be responsible
for any issues related to timely or properly uploading/submission of the bid in accordance with the relevant provisions of Section Instruction to Bidders of the Bidding Documents.

5.0 Bidders can download the bid document from the portal without paying document fees in advance; however interested bidders have to pay tender fees for participating in the tendering and submitting the bid. For this purpose the interested bidders shall be required to pay Rs. 11,800/- (Rupees Eleven Thousand Eight Hundred only) (GST @ 18% included), the GSTIN of EPI for Assam is 18AAACE0061C1ZC as non-refundable document fees in the form of Demand Draft in favour of "Engineering Projects (India) Ltd." payable at Guwahati. The fees to be paid to MSTC are separate.

6.0 E-Bids must be submitted/uploaded along with scanned copies of relevant documents as mentioned at “Addendum to Instructions to Tenderers” on the MSTC portal on or before last date & time of online bid submission. Late bids will not be accepted.

The bid must be accompanied by Earnest Money Deposit (EMD) of Rs. 3,99,250.00 (Rupees Three Lakhs Ninety Nine Thousand Two Hundred and Fifty Only). This shall be in the form of Crossed Demand Draft or Pay Order (in CTS form) of any Nationalized Bank/Scheduled Bank for the full amount of EMD payable favouring “Engineering Projects (India) Ltd.”, payable at Guwahati. The EMD shall be valid for minimum period of 150 days (one hundred fifty days) from the last day of submission of tender. Tenders submitted without EMD or inadequate amount of EMD shall be rejected. The bid shall be valid for 90 days from date of opening of Price Bid.

Tender fee, EMD (In original), Power of Attorney, NSIC/MSME (Registered under single point registration scheme of NSIC, Govt. of India, Ministry of MSME, New Delhi vide Gazette Notification dated 26.03.2012 along with the form of Memorandum-2 with the concerned DIC) certificate as per Clause No.1 (i) if bidder is claiming EMD/Tender fee exemption must be submitted in physical form at the address given at Clause No. 14.0 below as stipulated under Time Schedule of Tender Activities. If the above documents are not received in time then their offer shall not be considered and EPI shall not be responsible for any postal delay in respect of submission of hard copy part of the bids.

7.0 The Terms & Conditions contained in the NIT and tender document shall be applicable.

8.0 The tenderers should note that the credentials such as value and volume of works completed, as submitted by the tenderers along with their offers shall be forwarded by EPI to Client for his opinion. The offer of tenderers against whom client does not give satisfactory remarks shall be rejected by EPI.

9.0 The corrigendum or addendum, extension, cancellation of this NIT, if any, shall be hosted on the EPI’s website/ CPP portal as well as on MSTC portal https://www.mstcecommerce.com/eprochome/EPIL the bidders are required to check these websites regularly for this purpose, to take into account before uploading/submission of tender. All Corrigendum and addendum are to be uploaded duly signed & stamped with tender documents as bid Annexure.
10.0 The tenderers should note that the credential such as value and volume of works completed as submitted by the tenderers along with their offers may be forwarded by EPI to the owner, for their opinion. The offer of the tenderers against whom the Owner does not give satisfactory remarks shall be rejected by EPI.

11.0 The price bid of those bidders who are found to be prima-facie techno-commercially acceptable based on the documents submitted at the time of bid submission and subject to confirmation of authenticity of the PQ documents/ EMD /Tender fee from the concerned department/ bank with prior intimation to them. **Hence the intending bidders must furnish their e-mail id and contact phone number along with the techno-commercial part.** In case the PQ documents such as work experience certificate, bank solvency certificate etc submitted by a bidder is found to be fake the EMD submitted by him shall be forfeited by EPI without making any reference to him. Further such a tenderer shall be at a risk of losing his right to participate in any tender called by EPI for a minimum period of one year.

12.0 EPI reserves the right to accept any tender or reject any or all tenders or split the work of tender or annul this tendering process without assigning any reason and liability whatsoever and to re-invite tender at its sole discretion.

13.0 In case of tie-tender, where two firms are bidding lowest, EPI reserves the right to split the work among these bidders and / or EPI will reserve the right to award the tender to any one of such bidder.

14.0 Tender documents shall be issued by and submitted to:

General Manager  
Engineering Projects (India) Ltd.  
North Eastern Regional Office  
4th Floor, Hindustan Tower,  
Jawahar Nagar, National Highway No.37,  
Guwahati (Assam) -781022  
(Tel No. 8486653300)

15.0 Contact details for site related quarries only:

Shri U. Patowary, AGM  
Mobile No: 9436779102

For more information on EPI, visit our website at: [http:// www.engineeringprojects.com](http:// www.engineeringprojects.com)  
For more information on the e-tender, visit website of M/s MSTC: at [https://www.mstcecommerce.com/eprochome/EPIL](https://www.mstcecommerce.com/eprochome/EPIL)

General Manager  
(Contracts)
BID CAPACITY

Name of the Work: Tender for Plugging Nallah gaps with conventional type fence and road works at GIN No. GIN No. 605 (BP Ref 1987-3S to 1987-4S) at Teliamura sector, GIN No. 608 (BP Ref 1993-59S to 1994-M) at Gokulnagar sector along the Indo Bangladesh Border in Tripura (BRO left out job) - Pkg-N-2

NIT No: NERO/CON/457/372 Dated 06.02.2020

ESTIMATED COST PUT TO TENDER: Rs. 3,99,24,542.00

Bid Capacity: The bidding capacity of the contractor should be equal to or more than the estimated cost of the work put to Tender. The bidding capacity shall be worked out by the following formula:

\[
\text{Bidding Capacity} = \left[ A \times N \times 2 \right] - B
\]

Where,
A = Maximum value of construction works executed in any one year during the last five years taking into account the completed as well as works in progress
N = Number of years prescribed for completion of work for which bids have been invited
B = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited (Format enclosed)

BID CAPACITY CALCULATION BY BIDDER

SIGN & STAMP OF BIDDER
ANNEXURE-A

AFFIDAVIT

(To be typed on Rs. 100/- non-judicial stamp paper)

I/We .......................................aged ..............years son of .......................................do hereby solemnly affirm and declare as follows for and on behalf of the Firm:

LIST OF EXISTING COMMITMENT AND ONGOING WORKS

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Works</th>
<th>Client Name &amp; Address</th>
<th>Work Order Value (in Rs)</th>
<th>Work Executed till Date (Rs)</th>
<th>Balance Amount of work to be completed (Rs)</th>
<th>Balance period to complete the works (Total months)</th>
<th>Work to be completed in 12 months (Rs)</th>
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Balance Commitments during 12 months as per NIT Rs.

It is certified that the above particulars furnished are true and correct. If any information given is found to be concealed at a later date, the Contract will be terminated forthwith without prejudice to the rights thereon consequent on termination and the bidder will be blacklisted. I/We agree for debarring tendering for one year if any facts are suppressed.

SIGN AND STAMP OF BIDDER
ADDITIONAL CONDITIONS OF CONTRACT (ACC)

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

INTRODUCTION:-

“Plugging Nallah gaps with conventional type fence and road works at GIN No. GIN No. 605 (BP Ref 1987-3S to 1987-4S) at Teliamura sector, GIN No. 608 (BP Ref 1993-59S to 1994-M) at Gokulnagar sector along the Indo Bangladesh Border in Tripura (BRO left out job)-Pkg-N-2” is a Project of Ministry of Home Affairs, Govt. of India, and Engineering Projects (India) Limited. (A Govt. of India Enterprise) has been appointed as an “Executing Agency” for this project. BSF is the end user of the project.

1.0 SCOPE OF WORK

1.1 The brief scope of work is to construct conventional type Composite fencing as per tender drawings and allied works.

1.2 The contractor shall also provide all assistance to EPI during handing over the site after their completion to the designated agency nominated by Ministry of Home Affairs or BSF. 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.

2.0 Clause no 3.0 of GCC shall stand amended as below:

The items of work given in the tender documents are for general guidance of the contractors and the works shall be carried out by the contractor on Percentage Rate tender basis in conformity with the detailed drawing, scope of work, technical specifications, additional conditions of contract (including any addition/modification/alteration/deletion made from time to time therein found essential for completion of works). The contractor shall be deemed to have satisfied himself before tendering as to the sufficiency and correctness of his tender for the works and of the rates and prices quoted in the brief specifications, drawings, scope of work and payment (billing) schedule, which rates and prices shall, except as otherwise provided, cover all obligations under the contract and all matters and things found necessary for proper completion and maintenance of the works. It shall be responsibility of the contractor to incorporate the changes that may be in the scope of work envisaged at the time of tendering and as actually required to be executed. The contractor has quoted his rates after clearly studying the scope of work given in Tender Documents availed by him by downloading from the website at the tendering stage itself and getting fully satisfied with the various items and technical intricacies involved in the work under his scope of work as envisaged in the tender.
3.0 HANDING OVER OF SITE

3.1 Handing over of sites for all gaps may not be possible in one go due to deficiencies in total area of land required for construction. Therefore, the site may be handed over in parts progressively in phases to the contractor. The contractor shall take up the construction activities open such released fronts in parts/ phase without any reservation whatsoever. However, in case of any delay in handing over of the site to the contractor, Owner/ EPI shall only consider suitable extension of time for the execution of the work. It should be clearly understood that the Owner/ EPI shall not consider any other compensation whatsoever towards idleness of contractor’s labour, equipment etc.

3.2 The contractor shall make his own arrangement for approach to work site including borrow/ disposal area and for movement of men, carriage of materials, machineries, other equipment etc. required for carrying out the work under this contract. Nothing shall be paid extra on this account.

3.3 The approach roads/ path near to the work site may not to be available at all places. Machinery/Material may have to carry by manpower. The contractor shall plan his works by making approach road site at his own cost. All drainage of works area and all weather truck-able/ haulage roads as required by the contractor shall be constructed and maintained during the construction period by the contractor at his own cost. Nothing extra will be paid on this account.

3.4 Payment for clearance of jungle/ bushes including uprooting of rank vegetation grass, brushwood, felling trees of beyond 30cm girth (measured at a height of 1m above ground level ) including cutting of trunks branches removing the roots and stacking of serviceable material and disposal of unserviceable material with all lead and lift will be done one time as per given BOQ only. Nothing shall be paid extra on this account.

4.0 PRIORITY OF WORKS

4.1 If during the course of execution of work, EPI/ MHA/ BSF fixes priority of execution of work/ fixes priority of execution of specific Gap, the contractor has to deploy resources and the work accordingly & nothing extra shall be payable to the contractor on this account.

4.2 The work fronts may be released in progressive manner in phases. Nothing extra shall be payable to the contractor on account of carrying out the work in phases & sequences decided by Engineer-in-charge.
5.0 MOBILIZATION OF MEN, MATERIAL & MACHINERY

5.1 Clause No. 8 – Mobilization Advance – deleted

5.2 Further to Clause No. 11.0 for “Mobilization of men, Material & Machinery” of General Conditions of Contractor, it shall be contractor’s responsibility to arrange, operate & maintain the total station 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. Contractor shall provide Bench Marks and other reference points for the proper execution work and these shall be preserved till the end of work.

6.0 SAFETY CODE:

General
Contractor shall adhere to safe construction practice and guard against hazardous and unsafe working conditions and shall comply with safety rules as stated forth herein for information and guidance:

First Aid and Industrial Injuries
(1) Contractor shall maintain first aid facilities for his employee and labours.

(2) Contractor shall make out side agreements for ambulance service and for the treatment of industrial injuries. Names of those providing these services shall be furnished to the EIC prior to start of construction and their telephone numbers shall be prominently posted in Contractor’s field office.

(3) All critical industrial injuries shall be reported promptly to the EIC, and a copy of Contractor’s report covering each personal injury requiring the attention of a physician shall be furnished to the EIC.

General Rules
Smoking within the battery area, tank farm or dock limits is strictly prohibited. Violators of the no smoking rules shall be discharged immediately.

Contractors Barricades
(1) Contractor shall erect and maintain barricades required in connection with his Operation to guard or protect.
   (a) Excavations.
   (b) Hoisting areas.
   (c) Areas adjudged hazardous Contractor’s or Owner’s inspectors.
   (d) Owner’s existing property subject to damage by Contractor’s operations.
   (e) Rail road unloading spots.

(2) Contractors employee and these of his sub-contractors shall become acquainted with owner’s barricading practices and shall respect the provisions thereof.

(3) Barricades and hazardous areas adjacent to but not located in normal routes of travel shall be marked by red flasher lanterns at nights.
Scaffolding:

(i) Suitable scaffolding should be provided for workmen for all works that safety be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and handholds shall be provided on the ladder shall be given an inclination not steeper more than 1 in 4 (1 horizontal and 4 vertical)

(ii) Scaffolding or staging than 4 meters above the ground or floor, swing suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise rewarded at least 3 ft.

High above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as maybe necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

(iii) Every opening the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 meter.

(iv) Working platform, gangways and stairways should be so constructed that they should not sag unduly or unequally and if the height of the platform of the gangway or the stairway is more than 4 metres above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in above.

(v) Safe-means of access shall be provided to all working platforms and other working places, every ladder should be securely fixed. No portable single ladder shall be over 9 meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder up to and including 3metres in length. For longer ladder this width should be increased at least 5 mm for each additional foot of length. Uniform steps spacing shall not exceed 30 cms. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the site of work shall be so stacked or placed to caused anger or inconvenience to any person or public. The Contractor shall also provide all necessary fencing and light to protect the workers and staff from accidents, and shall be bound to bear the expenses of defense of every suit, action or other proceedings of law that may be brought by any person for injury sustained owing to neglect of the above precautions and pay any damages and costs which may be awarded in any such suit or action or proceedings to any such person or which may
with the consent of the Contractor be paid to compromise any claim by any such person.

Excavation and Trenching
All trenches 1.2 meters or more in depth, shall at all times be supplied with at least one ladder for each 50 meters length or fraction thereof.

Ladder shall be extended from bottom of the trench to at least 1 meter above the surface of the ground. The sides of the trenches which are 1.5 meters in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides to collapse. The excavated materials shall not be placed within 1.5 metres of the edge of the trench or half of the trench width whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

Demolition:

(i) Before any demolition work is commenced and also during the progress of the work.
   (a) All road and open areas adjacent to the work site shall either be closed or suitably protected
   (b) No electric cable or apparatus which is liable to be a source of danger shall remain electrically charged.
   (c) All practical cares shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so over-loaded with debris or materials as to render it unsafe.

(ii) All necessary personal safety equipment as considered adequate by the Engineer-in-charge (i.e. EIC) should be kept available for the use of the persons employed on the site and maintained in condition suitable for immediate use, and the Contractor shall take adequate steps to ensure proper use of equipment by those concerned.
   (a) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves.
   (b) Those engaged in white washing and mixing or stacking of cement bags or any materials which are injurious to the eyes shall be provided with protective goggles.
   (c) Those engaged in welding and cutting works shall be provided with protective face and eye shields, hand gloves etc.
   (d) Stone breakers shall be provided with protective goggles and protective clothing, and seated at sufficiently safe intervals.
   (e) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are
ventilated at least for an hour before the workers are allowed to gate in to
the manholes, and the manholes so opened shall be cordoned off with
suitable railing and provided with warning signals or board to prevent
accident to the public.

(f) The Contractor shall not employ men below the age of 18 years and
women on the work of painting with products containing lead in any form.
Wherever men above the age of 18 years are employed on the work of
lead painting, the following precautions should be taken,

(1) No paint containing lead or lead product shall be used except in the form
of paste or ready-made paint.

(2) Suitable face masks should be supplied for use by the workers when
Paints are applied in the form of spray or a surface having lead paint dry
rubbed and scrapped.

(3) Overalls shall be supplied by the Contractor to the workmen and
adequate
facilities shall be provided to enable the working painters to wash them
during and on cessation of.

(iii) When the work is done near any place where there is a risk of drowning, all
Necessary safety equipment should be provided and kept ready for use and
all necessary steps taken for prompt rescue of any person in danger and
adequate provision should be made for prompt first aid treatment of all
injuries likely to be sustained during the course of the work.

(iv) Use of hoisting machines and tackles including their attachments, anchorage
and supports shall conform to the following standards or conditions:

(a) These shall be of good mechanical construction, sound materials and
adequate strength and free from patent defect and shall be kept in good
working order.

(b) Every rope used in hoisting or lowering materials or as means of
suspension shall be of durable quality and adequate strength and free
from patent defects.

(c) Every crane driver or hoisting appliance operator shall be properly
qualified and no person under the age of 12 years should be in charge of
any hoisting machine including any scaffolding, which or give signals to
the operator.

(d) In case of every hoisting machine and of every chain ring hook, shackle,
swivel, and pulley block used in hoisting or lowering or as means of
suspension, the safe working load shall be ascertained by adequate
means. Every hoisting machine and all gears referred to above shall be
plainly marked with the safe working load of the conditions under which it is applicable which shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

(e) In case of departmental machine, the safe working load shall be notified by the Engineer-in-charge. As regards Contractor’s machines, the Contractor shall notify the safe working load of the machine to the Engineer-in-charge whenever he brings any machinery to site of work and get it verified by the Engineers concerned.

(v) Motors, gearing transmission, electric wiring and other dangerous part of hoisting appliances should be provided with such means as to reduce to the minimum the accidental descent of the load, adequate precautions should be taken to reduce to the minimum the risk of any part or any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves, and boots as may be necessary should be provided. The workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

(vi) All Scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe conditions and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

(vii) These safety provisions should be brought to the notice of all concerned by the displaying on a notice board at a prominent place at the work-spot. The person responsible for compliance of the safety code shall be named therein by the Contractor.

(viii) To ensure effective enforcement of the rules and regulations relating to safety precautions, the arrangements made by the Contractor shall be open to inspection by the Welfare Officer, Engineer-in-Charge or safety Engineer of the administration or their representatives.

(ix) Notwithstanding the above clauses there is nothing in these to exempt the contractor from the operations of any other Act or rules in force in the Republic of India. The works throughout including any temporary works shall be carried out in such a manner as not to interfere in any way whatsoever with the traffic on any roads or footpaths at the site or in the vicinity thereto or any exiting works whether the property of the Administration or of a third party. In addition to the above, the Contractor shall abide by the safety code provision as per C.P.W.D. Safety Code and Indian standard Safety Code framed from time to time.
(x) The contractor shall keep one earmarked vehicle such as EECO or MAGIC or equivalent with driver, fuel & lubricant for meeting any emergent condition at site till the works under the instant contract are completed and taken over by the Owner.

(xi) The contractor shall also construct a suitable Project Office at site at his cost to ensure safe and proper custody of all drawings, documents, appliances including easy access to them and relief to the staff and other personnel in case of any exigency. The office should be equipped with basic facilities such as telephone, internet, regular electric and water supply, computer/typing with printing facilities, storage of documents and data like almirahs or file cabinets etc.

7.0 THE CLAUSE NO. 10.0 OF GCC SHALL STAND AMENDED AS BELOW:

An amount @5% (Five percent) of the gross value of the running bill shall be deducted from each running bill by way of retention money. In case the EMD has been deposited by the contractor in the form of demand draft, the said amount of EMD shall be adjusted first towards the retention money and further recovery of retention money shall commence when the up to date amount of retention money exceeds the amount of EMD deposited in the form of demand draft. The retention money shall become refundable to the contractor at the end of the defects liability period free of any interest provided always that the contractor has rectified all the defects arising during the defect liability period pertaining to his scope of work, EPI did not have to incur any expenditure in setting right the defects, if any, pertaining to the contractor’s scope of work, the contractor has demolished and removed all structures including foundations and withdrawn fully from the worksite and EPI has received the clearance certificate from the concerned Labour Enforcement Officer/RLC pertaining to the labour etc. deployed by him at the worksite or there is nothing on record against him in the local market affecting functions of EPI. In case EPI has been required to make any expenditure on any of these accounts EPI will keep the retention money till the time all these matters are settled in full including recovery of the expenses, if any, made by EPI from the retention money. Further the contractor has to furnish a ‘No Claim’ certificate to EPI in confirmation of his having no claim on getting refunded the retention money to EPI at the time of claiming refund of retention money.

8.0 SETTING OUT WORKS

The Engineer-in-Charge shall furnish the Contractor with only the four corners of the work site and a level bench mark and the Contractor shall set out the works and shall provide and efficient staff for the purpose and shall be solely responsible for the accuracy of such setting out.

The Contractor shall provide, fix and be responsible for the maintenance of all stakes, templates, level marks, profiles and other similar things and shall take necessary precautions to prevent their removal or disturbance and shall be responsible for the consequence of such removal or disturbance should the same take place and for their efficient and timely reinstatement. The Contractor shall also be responsible for the maintenance of all existing survey marks, boundary marks,
distance marks and centre line marks, either existing or supplied and fixed by the Contractor. The work shall be set out to the satisfaction of the Owner. The approval thereof or joining with the Contractor by the Owner in setting out the work, shall not relieve the Contractor or any of his responsibilities. Before beginning the works, the Contractor shall at his own cost, provide all necessary reference and level posts, pegs, bamboo, flags, ranging rods, strings and other materials for proper layout of the work in accordance with the scheme for bearing marks acceptable to the Owner. The Centre, longitudinal or face lines and cross lines shall be marked by means of small masonry pillars. Each pillar shall have distinct marks at the centre to enable a theodolite to be set over it. No work shall be started until all these points are checked and approved by the Engineer-in-Charge in writing but such approval shall not relieve the Contractor of any of his responsibility. The Contractor shall also provide all labour, material and other facilities, as necessary, for the proper checking of layout and inspection of the points during construction. Pillars bearing geodetic marks located at the sites of units of works under construction should be protected and fenced by the Contractor. On completion of works, the Contractor must submit the geodetic documents according to which the work was carried out.

9.0 RESPONSIBILITY FOR LEVEL AND ALIGNMENT

The Contractor shall be entirely and exclusively responsible for the horizontal and vertical alignment, the levels and correctness of every part of the work and shall rectify effectually any errors or imperfections therein. Such rectifications shall be carried out by the Contractor, at his own cost, when instructions are issued to that effect by the Engineer-in-Charge. It is highly possible that there shall be more than one agency working at the same time at the site. The contractor shall at all times remain bound to co-ordinate with the agencies, deployed by EPI for the above works, including providing free access and making required provisions for them in execution of works pertaining to their portion of works. He shall also remain bound to ensure uninterrupted progress of work by these agencies in a peaceful and smooth manner. He shall also remain bound to make the required changes/additions/alterations in the works done by him to accommodate the items under the scope of work of such other agencies deployed by EPI or the client. The contractor is deemed to have made the estimated allowances in this respect while quoting his rates at the tendering stage.

10.0 THE FOLLOWING SHALL ALSO BE READ WITH CLAUSE NUMBER 13 OF THE GCC:

a) The bidder/contractor must be registered with GST and should have valid GSTIN number

b) The bidder/contractor must submit as an compliance under GST Act, the invoices in GST complaint format failing which the GST amount shall be recovered/adjusted without any prior notice from the next invoices or available dues with EPI.

c) The bidder/contractor are required to update/upload the GST/Taxes data periodically so as to avail ITC credit by EPI failing which it shall be recovered/adjusted by EPI without any prior intimation
d) The rates quoted by the contractor shall be “inclusive of all taxes and duties, cess including GST” which shall be reimbursed to him subject to raising of tax invoice and filing of return and payment of tax as per GST law, failing which EPI shall not be able to honour his claims for any payment. The contractor has quoted his rates knowing fully well that submission of return and display of the same on GSTN portal is mandatory.

e) Incase of any reduction in rate of GST or other taxes in future or the project getting exemption status prior to the last date of Bid submission or afterwards, the subcontractor shall pass on the benefit to EPIL immediately, failing which EPIL shall have the right to recover the differential amount from the amounts due to the subcontractor. Further in case of any increase in rate of GST or other taxes in future or the project losing exemption status prior to last date of bid submission or afterwards, the said increase of taxes shall be paid /reimbursed to the subcontractors, subject to the condition that the client reimburses the said increased taxes to EPIL.

f) If the bidder quotes abnormally low rate/s compared to estimated cost put to tender, in such cases the rate/s of the lowest bidder if found in rate/s of the item/s are abnormally low, then additional bank gurantee/s equivalent to the difference of quoted rate/s and justified rate/s of the item/s shall be required to be furnished by the bidder before issue of LOI of the work. Additional Bank Gurantee/s obtained in these context shall be returned to the bidder after the satisfactory execution (duly certified by Site In-charge) of work at site.

11.0 THE FOLLOWING SHALL STAND ADDED TO THE CLAUSE NO 20 OF GCC:

The contractor shall keep EPI indemnified against all claims, damages, compensation and expenses payable, if any, in consequence of any accident, or injury sustained by any workman or any other person employed by the contractor.

12.0 THE FOLLOWING SHALL STAND ADDED TO THE CLAUSE NO 27.0 INCLUDING ITS SUB CLAUSES OF GCC OF EPI:

The contractor, within 10 days of issuance of LOI (Letter of Intent) to him shall depute at least One Graduate Civil Engineer of min 2 years post qualification experience or One Diploma in Civil Engineering having 5 years post qualification experience. Should the contractor fail to provide them within such period or as directed by the Engineer-in-charge, EPI shall be at liberty to recover an amount @40,000.00 per month person from any amount including the retention money due to the contractor.

13.0 The clause no 28.3 of the GCC shall stand deleted.

14.0 No secured advance shall be paid to the contractor and hence clause no. 35.0 of GCC shall stand deleted.
15.0 The clause no. 43.2 shall stand amended as below:

The contractor shall execute the works so as to complete the works within the stipulated completion time. He shall remain bound to submit a programme of completion of items.

16.0 THE FOLLOWING SHALL STAND ADDED TO CLAUSE NO 45.0 OF THE GCC:

The contractor shall at all-time remain bound to provide the samples in quantity and manner as instructed by EPI to be analyzed or tested in an outside laboratory or in the field laboratory at site. The cost of testing charges is included in the prices of the contractor. EPI shall, however, be at liberty to get the materials tested independent of the contractor and the contractor shall remain bound to render all assistance to EPI in conductance of such tests including making available the materials in sufficient quantity and in time and payment of the testing charges. EPI/client shall at all times have full access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery. The contractor shall afford every facility and assistance and cost in obtaining the right and visit to such access.

EPI shall have full powers to require the removal from the premises of all materials which in their opinion are not in accordance with the specifications and in case of default, EPI shall be at liberty to employ at the expense of the contractor, other persons to remove such materials without being answerable or accountable for any loss or damage that may happen or arise to such materials. EPI shall also have full powers to require other proper materials to be substituted thereof and in case of default by the contractor, may cause the same to be supplied and all costs which may require such removal and substitution shall be to the contractor’s account.

17.0 THE FOLLOWING SHALL BE ADDED TO CLAUSE NO 52.6 OF GCC

The field testing laboratory to be established by the contractor at his cost shall be equipped with the minimum number of testing equipment as per List Given below. In case the contractor fails to provide them EPI shall get them installed/deployed and debit the cost to the contractor. In case EPI asks to get any test done from through any outside laboratory, the cost of such test including Cost of samples, its packing and transportation shall be borne by contractor and his tendered cost is inclusive of such costs.

<table>
<thead>
<tr>
<th>SL. No.</th>
<th>Description</th>
<th>Minimum numbers required</th>
<th>To Be Mobilized within From LOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compressive Testing machine 100 Tonne Capacity</td>
<td>One no</td>
<td>20 days</td>
</tr>
<tr>
<td>2</td>
<td>Electrically operated Digital Weighing Machine (0-5 kg)</td>
<td>One no</td>
<td>10 days</td>
</tr>
<tr>
<td>3</td>
<td>Slump test apparatus</td>
<td>One no</td>
<td>10 days</td>
</tr>
<tr>
<td>4</td>
<td>Set of sieves for grading of coarse aggregates</td>
<td>One set</td>
<td>10 days</td>
</tr>
<tr>
<td>5</td>
<td>Set of sieves for grading fine aggregates</td>
<td>One set</td>
<td>10 days</td>
</tr>
<tr>
<td>6</td>
<td>Cement consistency apparatus</td>
<td>One no</td>
<td>20 days</td>
</tr>
<tr>
<td>No.</td>
<td>Item Description</td>
<td>Quantity</td>
<td>Time Required</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------------------</td>
<td>----------</td>
<td>---------------</td>
</tr>
<tr>
<td>7</td>
<td>Electrically operated oven (300 deg. Centigrade)</td>
<td>One no</td>
<td>10 days</td>
</tr>
<tr>
<td>8</td>
<td>Trays for sampling</td>
<td>One set</td>
<td>10 days</td>
</tr>
<tr>
<td>9</td>
<td>Apparatus for testing of cement</td>
<td>One set</td>
<td>30 days</td>
</tr>
<tr>
<td>10</td>
<td>150X150X150 CI Cube Moulds</td>
<td>12 nos.</td>
<td>10 days</td>
</tr>
<tr>
<td>11</td>
<td>Vicat Apparatus with needles, Test Tubes, breakers, thick glass plates etc.</td>
<td>One set</td>
<td>15 days</td>
</tr>
<tr>
<td>12</td>
<td>Measuring Cylinders, 1000ml,500 ml</td>
<td>01</td>
<td>15 days</td>
</tr>
<tr>
<td>13</td>
<td>Wash Bottles, Capacity 500 ml</td>
<td>02</td>
<td>15 days</td>
</tr>
<tr>
<td>14</td>
<td>Sink</td>
<td>01</td>
<td>15 days</td>
</tr>
<tr>
<td>15</td>
<td>Litre: Measures:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Lit</td>
<td>02</td>
<td>15 days</td>
</tr>
<tr>
<td></td>
<td>04 Lit</td>
<td>01</td>
<td>15 days</td>
</tr>
<tr>
<td></td>
<td>0.5 Lit</td>
<td>01</td>
<td>15 days</td>
</tr>
<tr>
<td>16</td>
<td>Full time Lab Assistant</td>
<td>01</td>
<td>10 Days</td>
</tr>
</tbody>
</table>

18.0 THE FOLLOWING SHALL STAND ADDED TO THE CLAUSE NO 68.0 OF GCC:

All the materials are deemed to be in the scope of contractor and shall be arranged by him, however if any such material is procured with assistance of EPI, any handling charges of 10% plus applicable taxes on actual purchase cost shall be levied and recovered from RA bills of Contractors.

19.0 THE FOLLOWING PROVISIONS SHALL SUPERSEDE THAT OF CLAUSE NO 69 OF GCC WHEREVER APPLICABLE:

The quantities given in the bill of quantities can vary up to (+25%) (Plus/Minus Twenty Five Percent) of contract value without any change in rate. Deviation beyond this limit, if any shall be guided by Clause 69.0 of GCC.

20.0 In case the project execution is delayed beyond the contractual scheduled completion period due to reasons attributable to the contractor, the staff and site expenses of EPI for extended period shall be paid by him to EPI at the rate of Rs. 10,000/- per month. This shall be in addition to the other recoveries, if applicable as per clause no 72 (including its sub clauses) of GCC and Penalties etc. if any, levied by Owner for the works pertaining to the contractor’s scope of work. The decision of EPI in this regard shall be final & binding on the contractor.

21.0 The work executed by the contractor shall be subject to audit and quality control checks from Quality Control Division & Technical Audit of EPI, Client, and Inspecting Agency of the Client and Chief Technical Examiner of Central Vigilance Commission, Govt. of India. In the eventuality of any defect/substandard works as brought out in the report or noticed otherwise at any time during execution, maintenance period etc., the same shall be made good by the contractor without any cost to EPI. In case the contractor fails to rectify the defect/sub-standard work within the time period stipulated by EPI, EPI shall get it rectified at the risk and cost of the contractor and shall recover the amount from the dues of the contractor. Further all works Executed
by the contractor shall be subject to third party testing to be deployed by EPI for which the expenses shall be borne by the contractor within his quoted rates.

22.0 TEMPORARY WORKS

22.1 Further to Clause no. 82.00 for “Approval of temporary/ Enabling works” of General Condition of Contract, as far as possible the labour huts, bulk storage facility and vehicle parking shall preferably be located near the existing Border Out Post of Border Security Force. The area near BOP’s location shall be leveled 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 BOP 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.

23.0 PLANT & MACHINERY

The contractor at his own 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>Sl No.</th>
<th>Description</th>
<th>Minimum Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.</td>
<td>Excavator</td>
<td>One</td>
</tr>
<tr>
<td>02.</td>
<td>Vibrators (Petrol/ Electrical)</td>
<td>One</td>
</tr>
<tr>
<td>03.</td>
<td>Concrete Mixer (10/7) with Hopper</td>
<td>One</td>
</tr>
<tr>
<td>04.</td>
<td>DG Set (63 KVA); DG welding set</td>
<td>One</td>
</tr>
<tr>
<td>05.</td>
<td>Digital Theodolite &amp; Auto Level/ TOTAL STATION</td>
<td>One</td>
</tr>
<tr>
<td>06.</td>
<td>Compactor/roller</td>
<td>one</td>
</tr>
<tr>
<td>07.</td>
<td>Tipper</td>
<td>one</td>
</tr>
<tr>
<td>08.</td>
<td>Bar bending Machine</td>
<td>One</td>
</tr>
<tr>
<td>09.</td>
<td>Bar cutting machine</td>
<td>One</td>
</tr>
<tr>
<td>10.</td>
<td>Utility Vehicle (Bolero Pickup/Bolero or Equivalent)</td>
<td>One</td>
</tr>
</tbody>
</table>

Note

a) Any other equipment for site test as outlined in CPWD/BIS specification and as directed by the Engineer-in-charge.

b) The quantities of equipment 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.
c) The contractor will not be allowed to take out equipments from the site without the written permission of Engineer-in-charge.

d) Incase the contractor fails to deploy any one of the above; EPI shall be at liberty to deploy the same and recover actual cost from Contractor’s bill/Dues.

24.0 PAYMENT ON ACCOUNT

Further to Clause No. 37.0 General Conditions of Contract, the payments shall be released, out of the funds received from Govt. of India on deposit works basis for the project.

Measurements of work carried out by contractors shall be recorded in the measurements books by Site Engineer. The measurements books shall be basis of all accounts of quantities of work done.

25.0 ANTI MALARIA MEASURES

25.1 The contractor shall at his own expenses make necessary arrangement for undertaking anti-malaria measures as prescribed by Local Health Authorities or as directed by Engineer-in-charge.

26.0 SECURITY & SAFETY

26.1 The site is located near Indo- Bangladesh Border (IBB) wherein the movement of personnel is limited and regulated by Security agencies. The contractor has to work as per the permission given by these Security agencies 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 MHA/ EPI or any other agency/ department for any loss of man hours/ machinery due to these restrictions/ regulations.

26.2 A general Security cover shall be provided by BSF/ State Police and payment of Security charges, if any demanded by BSF/ State Police authorities shall be borne by MHA/ EPI. However, 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 MHA/ 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.

27.0 LAND ACQUISITION

27.1 The contractor should note that the working area may fall in agriculture land area/ foresee area/Private Land/Forest Land. The contractor shall be
responsible for obtaining necessary approvals for acquisition of land if required and clearance from Department of Forest/ State Government/ Local Authority for carrying out construction of fencing and road and associated with related work. Any cost of Land acquisition shall be paid to concerned authority by EPI/MHA.

28.0 DEFECTS LIABILITY PERIOD

28.1 Further to Clause No. 74.0 of General Conditions of Contract, in case Ministry of Home Affairs 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 carry out 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.

29.0 FINAL BILL

The final bill will be submitted by the contractor within 90 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 (Fitting & 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) Measurements Books.

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/ BSF, if required for completion & handing over of the work included in scope of contractor.

j) Manufacture’s guarantee of various machines/ equipments installed as part of work.

30.0 No extra or additional amount over and above the total quoted price will be admissible on any account whatsoever in any respect or aspect or else otherwise. Total price quoted will remain firm and fixed and free from any kind of escalation and without any kind of extra or additional amount on any account whatsoever in any respect or aspect or else otherwise during the entire tenure of the contractor and till completion and discharge of all the obligations as per the ambit of the contract in all respect and means.
31.0 ARBITRATION: CLAUSE NO. 76.1 OF GCC SHALL STAND AMENDED AS BELOW:

Before resorting to arbitration as per the clause given below, the parties if they so agree may explore the possibility of conciliation as per the provisions of Part III of the Arbitration and Conciliation Act, 1996 as amended by Arbitration and Conciliation (Amendment) Act, 2015. When such conciliation has failed, the parties shall adopt the following procedure for arbitration:

i) Except where otherwise provided for in the contract, any disputes and differences relating to the meaning of the Specifications, Design, Drawing and Instructions herein before mentioned and as to the quality of workmanship or materials used in the work or as to any other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the Contract, Designs, Drawings, Specifications, Estimates, Instructions, or these conditions or otherwise concerning the works of the execution or failure to execute the same whether arising during the progress of the work or after the completion or abandonment thereof shall be referred to the Sole Arbitrator appointed by the Chairman & Managing Director (CMD) of Engineering Projects (India) Limited (EPI) or any other person discharging the functions of CMD of EPI. The person approached for appointment as Arbitrator shall disclose in writing circumstances, in terms of Sub-Section (1) of Section (12) of the Arbitration and Conciliation Act, 1996 as amended by Arbitration and Conciliation (Amendment) Act, 2015 as follows:

a) Such as the existence either direct or indirect, of any past or present relationship with or interest in any of the parties or in relation to the subject-matter in dispute, whether financial, business, professional or other kind, which is likely to give rise to justifiable doubts as to his independence or impartiality; and

b) Which are likely to affect his ability to devote sufficient time to the arbitration and in particular his ability to complete the entire arbitration within a period of twelve months.

The Arbitrator shall be appointed within 30 days of the receipt of letter of invocation of arbitration duly satisfying the requirements of this clause.

ii) If the arbitrator so appointed resigns or is unable or unwilling to act due to any reason whatsoever, or dies, the Chairman & Managing Director aforesaid or in his absence the person discharging the duties of the CMD of EPI may appoint a new arbitrator in accordance with these terms and conditions of the contract, to act in his place and the new arbitrator so appointed may proceed from the stage at which it was left by his predecessor.

iii) It is a term of the contract that the party invoking the arbitration shall specify the disputes, differences or questions to be referred to the Arbitrator under this clause together with the amounts claimed in respect of each dispute.
iv) The Arbitrator may proceed with the arbitration ex-parte, if either party, in spite of a notice from the arbitrator, fails to take part in the proceedings.

v) The work under the contract shall continue as directed by the Engineer-In-Charge, during the arbitration proceedings.

vi) Unless otherwise agreed, the venue of arbitration proceedings shall be at the venue given in the 'Memorandum' to the 'Form of Tender'.

vii) The award of the Arbitrator shall be final, conclusive and binding on both the parties.

viii) Subject to the aforesaid, the provisions of the Arbitration and Conciliation Act, 1996 as amended by Arbitration and Conciliation (Amendment) Act, 2015 or any statutory modifications or re-enactment thereof and the Rules made thereunder and for the time being in force shall apply to the arbitration proceedings and Arbitrator shall publish his Award accordingly.

31.1 CLAUSE NO 76.2 OF GCC SHALL STAND AMENDED AS UNDER

“In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSE) / Port Trust inter se and also between CPSE and Government Departments / Organisations (excluding disputes concerning Railways, Income Tax, Customs and Excise Departments), such dispute or differences shall be taken up by either party for resolution through AMRCD as mentioned in DPE OM No. 4(1)/2013-DPE(GM)/FTS-1835 dated 22.05.2018”

31.2 Clause 76.3 of GCC shall remain unchanged.
1. The work shall be executed as per the description of item given in the ‘Schedule of Quantities’, General Conditions, Special Conditions, Particulars Specifications and CPWD Specifications 1996 Vol.I to Vol.VI with upto date correction slips upto last date of issue of tenders.

2. The contractor shall provide necessary labour, tools & plants required for making the alignment of fencing on ground as & when the site/ land shall be made available as and when the possession of the same is handed over to the EPI by the state Government.

   The foundation work is in the basin of River/Nala. It is the duty of contractor to encircle the area while digging foundation and dewatering proper laying of foundation and dewatering has to be continue for at least 24 hrs after poring of the concrete as that the concrete is site. The cost of this deemed to be take care in the rates which quoting by the contractor.

   As the bridges/ culverts are not accessible by a proper road, the contractor has to make own arrangement of the transportation material to the site location on his own cost and no separate payment may be paid on this account.

3. Nothing extra shall be payable for bailing out pumping out sub-soil water, if any and for laying concrete in or under water.

4. Bottom most row of the horizontal barbed wire shall be 75 mm to 150 mm above the ground level. To meet this requirement, surface dressing and jungle clearance may have to be done up to a distance of 3 meters on either side of each row of the security fencing. Nothing extra whatsoever, shall be paid on this account.

5. All steel fabrication work shall be done in a workshop well equipped for the required operations. Holes for bolts shall be properly matched and copper enriched M.S. fabricated posts & struts, M.S flats with M.S. spikes duly welded shall be got approved in the workshop itself before taking the fabricated material to the site of work & nothing extra whatsoever, shall be payable on this account.

6. (i) Copper enriched M.S. angle sections shall be procured from the rested lots of copper enriched M.S. angles manufactured by either Steel Authority of India Limited (SAIL) or Indian Iron & Steel Company (IISCO) or Tata Iron & Steel Company (TISCO) or Rastriya Ispat Nigam Limited (RINL). Contractor shall have to produce all the original documents e.g. supply orders, bills, proof of payments, delivery challan, gate passes manufactures test certificate etc. relating to the procurement of each consignment of copper enriched M.S. angle sections & it shall be the responsibility of the contractor to conclusively establish that all the consignments of angle sections brought for use in the work have been procured from the tested lots conforming to I.S 2062 – equivalent 1992 for SAIL, IISCO, TISCO, RINL. Contractor shall commence the fabrication only after the Engineer-in-charge is satisfied that angle sections conforming to the aforesaid specifications have been procured by the contractor from tested lots of SAIL, IISCO, TISCO or RINL.

   (ii) Coefficient and tolerance of angle iron in weight and section shall be as per I.S. 1852 – 1985.

   (iii) If directed by the Engineer-in-charge, the contractor shall at his own cost make all arrangement for conducting test of the supplied copper enriched M.S. angles, M.S. angles, M.S. flats according to norms/direction indicated in the EPI/CPWD/relevant I.S specification from the approved testing laboratory.

7. The ends of copper enriched M.S. angle posts and struts to be embedded in cement concrete blocks shall be fish-tailed by cutting along the corner of the angles upto minimum length of 60 mm and nothing extra shall be paid on this account.

8. In case of struts, foundation pits shall be excavated to suit the inclination of strut so that it is surrounded by concrete by not less than 200mm at any point. Cost of extra excavation that may be required to provide the struts in the inclined position including back filling & disposal of surplus earth is deemed to the included in the rates against item of BOQ and nothing extra whatsoever shall be paid on this account.

9. 2.5mm dia G.I. staple / clip for fixing barbed wire with angle Iron posts shall be as per the drawing.
10. (i) The intermediate copper enriched M.S. angle posts between two adjacent strutted posts shall be serially numbered so as to achieve the arrangement of fixing of tightening bolts shown in the drawings attached with the documents relating bolts shown in the drawings attached with the documents relating to this contract.

At the time of commencement of the work, the Contractor shall erect 30 meters length of fencing & get it approved by the Engineer-in-Charge before large-scale work is carried out.

(ii) Posts and struts shall be fabricated from single piece of copper enriched M.S angles. However, butt-welding will be permitted for not more than one of four posts/struts and only two pieces (smaller pieces to be note less than 600 mm) of copper enriched M.S angles shall be used to form any such posts/struts. Welded joints in the posts/struts shall neither be at the bends nor within a distance of 400 mm from the bend. No welded joints shall be permitted in the slanting portion of the posts. Wherever welding is restored as per the condition of the contract, only visual inspection of welding shall be done as per I.S. code 822 and the decision of the Engineer-in-Charge for acceptance of the weld or otherwise shall be final. For butt welding, the edges of the metal pieces shall be beveled to the required slope and the weld shall be continuous & cover the full cross-section of copper enriched M.S. angles. The welding work will be carried out as per sample approved by Engineer-in-Charge before large scale work is carried out.

11. The diagonals of barbed wire shall be continuous & stretched between adjacent posts from top horizontal row of barbed wire of one of post to the bottom horizontal row of the second post. For fixing diagonals of barbed wire, separate holes shall be drilled in the posts.

12. On Bangladesh side, every diagonal barbed wire of Security fencing shall be adequately tied with minimum six turns of G.I. wire of 16 gauge at least at seven intersections with horizontal rows of barbed wire above the height of seven rows of fencing from ground level in the vertical portion and at least at three places in the slanting portion.

13. On India side, every diagonal barbed wire of security fencing shall be adequately tied with minimum six turns of G.I. wire of 16 gauge at least at five intersections with horizontal rows of barbed wire.

14. G.I. barbed wire at ends and at joints shall be given eight turns & either tied with G.I. wire of not less than 16 gauge at three places with at least six wraps at each place or clamped with two U-Bolts and nothing extra shall be paid on this account.

15. Wherever nuts & bolts are used for the assembly of steel sections, two G.I. washers of 3mm thickness and of appropriate size shall be used with each set of nut & bolt and nothing extra shall be paid on this account.

16. Concertina coil shall be laid only after stretching, tightening & fixing all the barbed wires in all the rows of security fencing and after applying final coat of paint on copper enriched M.S. angle posts & struts, M.S. flats & M.S. spikes etc.

17. The coat of anticorrosive paint over punched tape concertina coil, as specified, shall be applied before stretching the coil to its required length as per the conditions given in this tender document.

18. ‘Goose-neck’ wherever mentioned in the documents relating to the contract shall mean slanting portion of copper enriched M.S. angle posts of size 90 x 90 x 6mm.

19. Mixing of concrete shall be done in mechanical mixers only and under no circumstances hand mixing shall be permitted. For shuttering of concrete work steel shuttering in adequate number of sets are required to be arranged by the contractor.

20. G.I. barbed wire shall conform to IS 278: 1978
21. (i) Before fixing the G.I. barbed wire to copper enriched M.S. angle iron posts for all two rows the rolls of wire shall be duly painted by dipping it in paint twice in four operations (a) Dipping in paint for 12 hours (b) dried for 36 hours & (c) dipping in paint again for 12 hours (d) dried for 36 hours. It shall be ensured that all the surface of the wire is covered by black paint, if not, Engineer-in-charge may at his discretion allow the contractor to brush paint small area which are not painted by dipping to the entire satisfaction of engineer-in-charge with anti-corrosive bitumastic paint IS-158 of approved brand in black shade. Similarly the punched tape concertina coil shall be painted by dipping it in anticrosive bitumastic paint conforming to IS-158. In four operations (a) dipping in paint for 2 hours, (b) dried for minimum 8 hours, (c) dipping in paint again for 2 hours and (d) drying for 24 hours.

(ii) For theoretical consumption of bitumastic paint for Barbed wire & concertina coil, the following co-efficient to be adopted.
(a) Barbed wire (2 coats) @ 0.60 lit/ 100 metre length.
(b) Concertina coil (2 coats) @ 1.5 lit per coil.

22. Application of following primer / paint in the sequence mentioned below shall be made to the M.S./ copper enriched steel angle iron posts/ struts except portion embedded in cement concrete which shall have one coat of Alkyd zinc phosphate primer. The same treatment shall be given to all the accessories of tightening bolts, U-bolts, nuts, clips, hooks, washer & spike plates etc. by dipping them in the following primer and paint. All primer/ paint shall be approved brand & manufacture.

(a) First coat of alkyd zinc phosphate primer
(b) Second coat of red oxide zinc chrome primer.
(c) Third coat of synthetic enamel gray paint.
(d) Fourth & fifth coat of synthetic enamel black paint.

23. The fencing work shall be executed in the following sequence.
(i) Alignment of fencing and earth work in embankment.
(ii) Excavation of foundation holes.
(iii) Fabrication, applying priming coat and erection of angle iron posts/ struts and casting of foundation.
(iv) Laying C.C. pavement.
(v) Priming/ painting of angle iron
(vi) Fixing of barbed wire, tightening / straightening bolts.
(vii) Stretching of barbed wire.
(viii) Laying of concertina coil.
(ix) Fabrication & fixing of gate posts & gates.
(x) Laying of barbed wire inside concertina coil.

24. **ALIGNMENT OF FENCING AND EARTH WORK IN EMBANKMENT:**

Alignment of fencing is to be fixed by consulting the representatives of BSF, District Administration and EPI jointly after observing pros and cons of various problems/ points.

25. **EXCAVATION OF FOUNDATION:**

The foundation of the required dimensions is dug with the help of augers, spatula and jumpers at 3.3 meters center. The foundation shall be dug in such a manner that angle iron posts of all the two rows comes in line perpendicular to the line of fencing. Wherever the depth of earth filling is more than 60cm, extra depth of C.C. block for encasing there of shall be done.

26. **FABRICATION AND ERECTION OF ANGLE IRON POSTS:**

The angle iron post/ struts are to be fabricated in contractor’s work-shop in nearby town areas and are to be got approved by the Engineer-in-charge in the workshop itself before these are carted to site for erection.
Initially cement concrete 1:3:6 is poured to fill-up 550 mm depth of excavated holes as per drawing and left till it attains enough strength for resting of angle iron post without sinking in it. After this foundation concrete gets hardened (in 3 hours or more) the angle iron post is erected vertically in the foundation holes with help of ballies etc. and rest of cement concrete 1:3:6 is poured. These ballies can be removed after three hours or more when the concrete gains enough strength to hold the iron post.

The foundation concrete for struts shall be poured after bolting the struts to the already fixed vertical post so that there is no fixing problem afterwards due to mis-matching of holes.

27. **PRIMING/ PAINTING OF ANGLE IRON POSTS**

Priming the angle iron post/ struts is to be carried out in the work shop after the fabrication is duly inspected & approved by the Engineer-in-charge, however other coats of painting shall be applied, 5/ 6 days after fixing the posts/ struts and laying of C.C. pavement.

28. **FIXING OF TIGHTENING BOLTS/ M.S. HOOKS**

After the posts are primed and painted (one coat) the tightening bolts are properly fixed to the vertical posts of outer rows of fencing in such a way that the vertical distance between two tightening bolts on any post is not less than 1350 mm except the end/ corner posts. The steel hooks are fixed to the starting/ end and corner posts with the help of nuts and bolts.

29. **STRETCHING OF BARBED WIRE**

The barbed wire reels / rolls are placed on a wooden stand is such a fashion that the reels can revolve on a rod placed through the reel axis by just pulling one end of barbed wire. These stands are placed on one end of the panel on which barbed wire to be stretched. The end of barbed wire is pulled to 30 m of the next strutted post and cut to proper size. The Separation is repeated for each row in that panel. For all rows of fencing alternate rows of barbed wire are firstly tied middle of the two strutted posts of the panel to minimize the sagging. All the alternate rows are then stretched with the help of the tightening bolts. The tightening should be preferably done from bottom row to the top where as the stretching should commence to be bottom.

After all the alternate barbed wire rows are sufficiently tight the same are tied up with other intermediate vertical posts with the help of U-pins. After this the diagonals (two on the goose neck and two on the vertical) between each vertical posts are stretched over the already tightened alternate horizontal rows with the help of crowbars and tied with the help of U-pins.

When the diagonal in the panels are complete the remaining alternate rows of horizontal barbed wire are stretched/ tightened over the cross in exactly the similar fashion as already done for the previous alternate rows of horizontal barbed wire.

30. **CONCERTINA COILS**

Brief specifications are given in Bill of Quantities. This shall be punched tape concertina coil-1A specification – IND/Engg/ PROV/1245B (weight not less than 15.2 Kg per coil). Details of the specifications are available with Directorate General of supply and disposal, Govt. of India.

The concertina coil is to be laid only when all the barbed wires are stretched on all the two rows of fencing. Before laying the concertina coils it is to be ensured that a final coat of paint is applied on the angle iron posts.

31. **LAYING OF BARBED WIRE INSIDE CONCERTINA COIL**

Barbed wire is to be placed inside all three- concertina coils in inclined diagonal pattern and stretched and tied with the barbed wires of fencing. There shall be two rows of barbed wires one between India side &
middle row and the other between Bangladesh side and middle row, each row of barbed wire consisting of 2 layer (top and bottom layer) of barbed wire.

For the purpose of measurement of barbed wire inside concertina coils as per item no.5 of schedule of quantity, both top and bottom layers of barbed wire inside one row shall constitute one unit and the total length of barbed wire in one row shall be taken equal to the horizontal length of fencing.

32. Unless otherwise specified, nothing extra shall be payable for executing the work as per the aforesaid conditions & specifications.

33. **RETAILING WALL AND EARTH WORK IN EMBANKMENT :**

   (i) The contractor shall prepare a Bar Chart in consultation with Engineer-in-charge before taking up the construction of retaining wall in low lying areas in descending order of height of retaining wall. i.e. from higher section to lower section.

   (ii) Immediately after construction of retaining wall earthwork in embankment in low-lying areas will be taken up as per item No. of the schedule of quantity, duly compacted and left for maximum available time for further consolidation. The erection of fencing in low-lying section to higher section.

   (iii) Earth work in embankment in non low lying areas shall also be taken up simultaneously with the construction of retaining walls in low lying area as per item no. of the schedule of quantity, duly compacted/ consolidated for erecting of fencing.

34. Properly designed filter media shall be provided as per the direction of the Engineer-in-charge at weep hole locations. Separate payment shall be made wherever such media are provided.

35. **R.C.C Bridge with Pile Foundation**

RCC Bridge with Pile foundation with sluice gate shall be constructed as per MORTH SPECIFICATIONS and BIS Specifications as per design and drawing as directed by EPI.

36. **Longitudinal Drains**

A Trapezoidal longitudinal drain shall be constructed by brick masonry along IBB road on hill side. The construction details are shown in enclosed EPI drawing no. CL-496/C/171.

### LIST OF PREFERED VENDORS/MAKES

<table>
<thead>
<tr>
<th>S.NO</th>
<th>DESCRIPTION OF ITEMS</th>
<th>APPROVED MAKES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CEMENT ( ORDINARY PORTLAND) : minimum 43 grade</td>
<td>ACC/ ULTRATECH / LAFARGE/ CROWN/ DALMIA/TOP CEM/VALLEY STRONG</td>
</tr>
<tr>
<td>2</td>
<td>REINFORCEMENT STEEL (Fe-500D or higher)</td>
<td>SAIL/TATA/RINL/JINDAL/ MEGA TURBO TMT/ SHYAM STEEL/ BALAJI</td>
</tr>
<tr>
<td>3</td>
<td>STRUCTURAL STEEL</td>
<td>SAIL/TATA/RINL/JINDAL or equivalent.</td>
</tr>
</tbody>
</table>

**REMARKS:**

1) The materials of first quality of the above preferred makes are to be used.

2) The material samples shall be got tested by Engineer-in-Charge as per provisions of tender documents for which all costs shall be borne by the contractor.
31.0 I.S. CODE

Some of the important relevant applicable IS codes are mentioned below:

IS: 1200 (Pertaining to respective work): Method of measurement of building and Civil Engineering works.
IS: 1199 Method of sampling and analysis of concrete.
IS: 1838 Preformed fillers for expansion joints in concrete non extruding and resilient type (Bitumen impregnate filler)
IS: 2386 (Part I to IV) Methods of tests for aggregates for concrete.
IS: 2505 General requirements for concrete vibrators, immersion type.
IS: 2506 Screed board concrete vibrators.
IS: 2514 Concrete vibrating tables.
IS: 3025 Code of practice for concrete structure for the storage of liquids.
IS: 3350 Methods of tests for routine control for water used in industry.
IS: 4565 From vibrators for concrete.
IS: 9130 Admixture for concrete.
IS: 516 Method of tests for strength of concrete.
IS: 1786 High strength deformed bars for concrete reinforcement.
IS: 1081 Code of practice for fixing and glazing of metal doors, windows and ventilators.
IS: 2502 Code of practice of bending and fixing bars for concrete reinforcement.
IS: 2571 Code of practice for welding and mild steel bars used for reinforced concrete construction.
IS: 2202 Specification for wooden flush door shutter.
IS: 1661 Code of practice for cement and cement lime plaster finish on walls and ceilings.
IS: 4101 Code of practice for external facing and veneers.
IS: 6248 Metal rolling shutter and rolling grills.
IS: 1081 Code of practice for fixing and glazing metal doors, windows and ventilators.
IS: 1038 Specifications for steel doors, windows and ventilators.
MODIFIED DESIGN—COMPOSITE TYPE FENCING

INDO—BANGLADESH BORDER FENCING

TRIPURA

ENGINEERING PROJECTS (INDIA) LTD.

ALL DIMENSIONS ARE IN MM.

DRG.NO.CI-457/C/051
A) GENERAL
1) All dimensions are in mm & levels are in meters.
2) The design is according to the following codes:
   - IRC 85: 2017
   - IRC 19: 2009
   - IRC 35: 2009
   - IRC 36: 2009
3) The following loads have been considered in the drawing:
   - E. Live Loads Design are to be calculated for two (2) type of class A & B.
4) The design are applicable for flexible to concrete pipe culverts.
5) The curved pipes and protection works are to be reinforced in accordance with the material of the pipe.
6) The level of top surface (bed depth of drain pipe shall be 300 mm) on the lowest level should not exceed 100 cm.
7) The level of top surface (bed depth of drain pipe shall be 300 mm) of the lowest level should not exceed 100 cm.
8) The level of top surface (bed depth of drain pipe shall be 300 mm) of the lowest level should not exceed 100 cm.
9) The level of top surface (bed depth of drain pipe shall be 300 mm) of the lowest level should not exceed 100 cm.

B) MATERIAL
1) The strength of the concrete should be considered to be 28 daysBond Strength of Ordinary Portland Concrete corresponding to 28 days Bond Strength of Ordinary Portland Concrete corresponding to 28 days.
2) The concrete workability required (25% of W/C) or its equivalent.
3) The total cumulative content and the free water ratio (2% of total content) shall be limited to 5%.
4) The slump of concrete shall be observed per knit. Concrete should have the slump of 100 mm.
5) The slump of concrete shall be observed per knit. Concrete should have the slump of 100 mm.
6) Special, natural, raw, or the required soil mixture should not be used.
7) Special, natural, raw, or the required soil mixture should not be used.
8) Special, natural, raw, or the required soil mixture should not be used.
9) Special, natural, raw, or the required soil mixture should not be used.

C) REINFORCEMENT
1) The reinforcement should be chosen per knit. The reinforcement should be chosen per knit.
2) The reinforcement should be chosen per knit. The reinforcement should be chosen per knit.
3) The reinforcement should be chosen per knit. The reinforcement should be chosen per knit.
4) The reinforcement should be chosen per knit. The reinforcement should be chosen per knit.

D) PLACING AND COMPACTING
1) The placing and compacting should be done properly.
2) The placing and compacting should be done properly.
3) The placing and compacting should be done properly.
4) The placing and compacting should be done properly.

E) FINISHING
1) The finishing should be done properly.
2) The finishing should be done properly.
3) The finishing should be done properly.
4) The finishing should be done properly.

F) CURTAIN WALLS
1) The curtain walls shall be constructed in accordance with the specification of the curtain walls.
2) The curtain walls shall be constructed in accordance with the specification of the curtain walls.
3) The curtain walls shall be constructed in accordance with the specification of the curtain walls.
4) The curtain walls shall be constructed in accordance with the specification of the curtain walls.

LEGENDS:
A = TOP SLAB
B = BOTTOM SLAB
C = SIDE WALL
D = INTERNAL WALL
L = CLEAR SPAN
H = CLEAR HEIGHT
D = TOTAL WIDTH OF BOX
L1 = LENGTH OF RETURN WALL

ISO 9001:2015
Municipal Licence:
DRA No. BY
2/15/18
Design by
ER. SUJATA C. BHUMIDE
Design by
P. R. J. P. R. J.
Checked by
Project:
Design Engineering & Consultant works
Construction of new storm water drain system for road A-48 near Roadside Construction

Client:
Design & Security House of India

Engineering Projects (India) Ltd.

Design Consultant:
North East Soil Testing

Drawing No.: 1059

Checked by:

Date: 10/09/2021

Client:
The Ground Head Office, \n50, Sector-11, Rohini, \nNew Delhi, 110085, India

Design:
S. P. S. P. Deshpande

Date: 10/09/2021

Checked by:
S. S. P. P. Deshpande

Date: 10/09/2021
**GENERAL**

1) All dimensions are in mm & levels are in m a.s.l.

2) Design Criteria:
   - IRC: 5-1974
   - IRC: 8-2017
   - Any other relevant codes and standards

3) ** props are to be made as per IRC.**

4) **Structural and geotechnical consultation.**

5) **Outline plan and elevation are to be prepared.**

6) **Slab thickness is to be calculated as per IRC.**

**Material Specifications**

- **Reinforcement:**
  - All reinforcement bars to be supplied by the manufacturer and to be approved by the client.

- **Concrete:**
  - Concrete to be cast in one operation.
  - Concrete to be compacted and cured as per IRC.

- **Slab:**
  - Slab to be cast in one operation.
  - Slab to be compacted and cured as per IRC.

- **Soil:**
  - Soil to be tested as per IRC.

- **Structure:**
  - Structure to be designed as per IRC.

**Section A-A**

- **Barbed Wire**:
  - 100mm Concertina coil

- **Rotary Wheel**:
  - 350mm

- **Slab**:
  - 150mm

- **Longitudinal Bars**:
  - 20mm

**Section 1-1**

- **Barbed Wire**:
  - @ 150x10

- **Rotary Wheel**:
  - 350mm

- **Movements**:
  - Grill: 14mm

**Legend:**

- A = TOP SLAB
- B = BOTTOM SLAB
- C = INTERNAL WALLS
- L = CLEAR SPAN OF BOX
- H = CLEAR HEIGHT OF BOX
- R = REINFORCEMENT
CROSS SECTION OF WEARING COAT

DETAIL AT 'Q'

CROSS SECTION OF APPROACH SLAB

STRIP SEAL TYPE EXPANSION JOINT ARRANGEMENT

EXPANSION JOINT FLUSH WITH SEAL FINISH LEVEL OF THE WEARING COAT SLOPE 2.5 %

DECK PROFILE (INDICATIVE)

ELEVATION

PLAN

CROSS - SECTION AT 'Z-Z'

* V = EXPANSION JOINT TO BE ADJUSTED AT THE TIME OF INSTALLATION DEPENDING ON THE AMBIENT TEMPERATURE (TO BE ADVISED BY THE ENGINEER-IN-CHARGE)

NOTE:-

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. GRADE OF CONCRETE: CRUSHED RABBIT M:40.
3. GRADE OF STEEL: F500.
4. CLEAR WEB 50mm
5. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED.
6. SIZING OF REINFORCEMENT BARS SHALL BE AS PER IS 2062.
7. PROPERLY FLUSHED STEEL PLATES SHALL BE USED AS SHUTTERING.
8. SHARP EDGES OF CONCRETE SHALL BE CHAMFERED.
9. THE WORK SHALL BE EXECUTED IN ACCORDANCE WITH HASTS SPECIFICATION 250-ROAD AND BRIDGE WORKS, EXCEPT WHEREVER OTHERWISE MENTIONED.
1. All dimensions are in millimeters unless otherwise mentioned.
2. The grade of concrete for curtain wall shall be PCC M-15.
3. The flexible apron shall be provided wherever the rigid bed is not available as per the site condition and as decided by the Engineer.

In case of rocky strata, the provision/requirement of rigid apron and curtain wall shall be as decided by the Engineer.
INDIA SIDE

BANGLADESH SIDE

18 NOS HORIZONTAL ROWS OF BARBED WIRE @ 180 C/C INTERWOVEN WITH G.I. BARBED WIRE ROWS

7 NOS HORIZONTAL ROWS OF BARBED WIRE @150 C/C

ANGLE 90X90X6 MM AS PER STRUCTURAL DESIGN

(26 NOS HORIZONTAL ROWS OF BARBED WIRE @ 180 C/C & INNER WOVEN WITH G.I. BARBED WIRE ROWS)

P.T.C.C.

RETAINING WALL

G.L. 1.75

EMBANKMENT

0.75

0.90

1.80

0.90

BRICK WORK 1:6

P.C.C 1:5:10

ALL DIMENSIONS ARE IN METER

INDO-BANGLADESH BORDER FENCING TRIPURA

ENGINEERING PROJECTS (INDIA) LIMITED

CROSS SECTION OF SINGLE ROW FENCING WITH EMBANKMENT & RETAINING WALL
INDIA SIDE

SECTION 'X-X'

(18 NOS HORIZONTAL ROWS OF BARBED WIRE @ 180 C/C INTER WOVEN WITH G.I. BARBED WIRE ROWS)

BANGLADESH SIDE

7 NOS HORIZONTAL ROWS OF BARBED WIRE @ 150 C/C

ANGLE S0X90X6 MM AS PER STRUCTURAL DESIGN

(28 NOS HORIZONTAL ROWS OF BARBED WIRE @ 180 C/C & INNER WOVEN WITH G.I. BARBED WIRE ROWS)

PIPE CULVERT (EXTENSION)

(1X900 DIA HUME PIPE)

ALL DIMENSIONS ARE IN METER

INDO-BANGLADESH BORDER FENCING TRIPURA

ENGINEERING PROJECTS (INDIA) LIMITED
IBB ROAD

915

4270

2440

915

FGL

SUB GRADE

20mm THK. PREMIX CARPET
2 LAYERS—75mm THK. WBM (BRICK AGGREGATE)
1 LAYER—100mm THK. SOILING (BRICK ON EDGE)

TYPICAL CROSS SECTION

TYPICAL CROSS SECTION
(IN EMBANKMENT)

TYPICAL CROSS SECTION
(IN CUTTING)

ALL DIMENSIONS ARE IN MM.

INDO-BANGLADESH BORDER FENCING
TRIPURA

ENGINEERING PROJECTS (INDIA) LTD.
RETAINING WALL

SCALE = 1:20