



Bridge and Roof Co. (India) Limited

(A Government of India Enterprise)

'Kankaria Centre' (4th & 5th Floor),

2/1, Russel Street, Kolkata – 700 071.

CIN No. : U27310WB1920GOI003601

C/o Indian Oil Corporation Ltd. (IOCL)

Piling, UG & Civil / Structural Works U&O-P25 Area Part-B For

Panipat Refinery Expansion Project (P25)

IOCL Panipat Refinery, Panipat, Haryana

Notice Inviting Tender (NIT)

Sealed Tenders are invited from reputed and experienced Agencies for "Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited."

The NIT is being hosted in our Co.'s Website (<https://www.bridgeroof.co.in>) and interested resourceful Agencies may download the Tender Document available at Co.'s website from 19.06.2024 to 02.07.2024.

The last date of submission of the sealed tender is 02.07.2024 up to 3:30 PM at the following address

COURIER ADDRESS	SITE ADDRESS
TO, THE AGM(PROJECTS) PANIPAT M/s BRIDGE AND ROOF CO. (INDIA) LIMITED HOUSE NO-618, HUDA, SECTOR -18, NEAR PANIPAT TOLL PLAZA PANIPAT, HARYANA-132103	TO, THE AGM(PROJECTS) PANIPAT M/s BRIDGE AND ROOF CO. (INDIA) LIMITED C/O INDIAN OIL CORPORATION LTD. (IOCL) PILING, U/G PIPING, CIVIL/STRL. WORK U&O PART-B FOR PANIPAT REFINERY EXPANSION PROJECT(P25), PANIPAT, HARYANA-132140

Addendum/ corrigendum, if any, shall be hosted in our Co.'s Website only.

The Company reserves the absolute right to reject any or all offers or cancel the NIT without assigning any reason whatsoever.

The Due Date of Submission of Tender is 02.07.2024 upto 3:30 PM

To,

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Sub: Notice Inviting Tender

Dear Sirs,

Enclosed please find a set of our Tender Document for the works mentioned hereunder:

- a) Name of Work "Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited."
- b) Place of Work IOCL, Panipat Refinery, Panipat, Haryana.
- c) Owner Indian Oil Corporation Ltd. (IOCL)
- d) Consultant Engineers India Limited (EIL)

You are requested to submit the sealed Tender duly quoting your lowest competitive rates strictly on the basis of the terms and conditions, scope of works, schedule of quantities and rates etc. given in various Annexure and Clauses of the NIT Document as per the "Instructions to the Tenderers".

The sealed Tender completed in all respect and superscribed "Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited." – TO BE OPENED BY THE TENDEREE." shall reach the following address latest by 02.07.2024; 03:30 PM the last date of submission of the tender.

COURIER ADDRESS	SITE ADDRESS
TO, THE AGM(PROJECTS) PANIPAT M/s BRIDGE AND ROOF CO. (INDIA) LIMITED HOUSE NO-618, HUDA, SECTOR -18, NEAR PANIPAT TOLL PLAZA PANIPAT, HARYANA-132103	TO, THE AGM(PROJECTS) PANIPAT M/s BRIDGE AND ROOF CO. (INDIA) LIMITED C/O INDIAN OIL CORPORATION LTD. (IOCL) PILING, U/G PIPING, CIVIL/STRL. WORK U&O PART-B FOR PANIPAT REFINERY EXPANSION PROJECT(P25), PANIPAT, HARYANA-132140

Your tender shall be kept valid initially for next 120 (One Hundred Twenty) days from the last date of submission for our evaluation, review, processing and finalization.

Incomplete tender(s) and/or tender(s) received by us later than the above date are liable to be rejected.

We shall always reserve the right to accept or cancel any or all the tenders without assigning any reasons thereof and also to split the total quantum of work and award in the manner and mode furnished in the NIT Document.

Thanking you,

Yours faithfully,

FOR, M/s BRIDGE AND ROOF CO. (INDIA) LIMITED

(JAYANTA KUMAR DAS)

AGM(PROJECTS) PANIPAT

Encl.: One Set of Tender Document

BRIDGE AND ROOF CO.(INDIA) LIMITED
Kankaria Centre (4th & 5th Floor),
2/1, Russel Street, Kolkata – 700 071
CIN No. : U27310WB1920GOI003601
Detailed Notice Inviting Tender

1. Single percentage (Above/Below/At-Par) bids are invited from reputed and experienced parties meeting prescribed qualifying criteria by B AND R for execution of the following works on Labour-Contract Basis:
2. Brief Details of Work:

Sl. No.	Description of Work	Estimated cost put to Tender	Cost of Tender Document (Non-Refundable)	Earnest money deposit (EMD)	Time of completion
(1)	(2)	(3)	(4)	(5)	(6)
1	Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited.	Rs. 1.34 Crore	Rs. 1,000.00 + 18% GST = Rs. 1,180.00 (Rupees One Thousand One Hundred Eighty Only) payable by DD/ Pay Order / Banker's Cheque (subject to realization) drawn from any Nationalized Bank, in favour of Bridge and Roof Co. (India) Limited, payable at Kolkata, West Bengal shall be submitted along with the Tender documents. (No A/c Payee Cheque shall be considered). The bidder may also make online payment towards the cost of tender document in authorized designated Bank Account and also upload the "Online Payment Receipt" of the same. Details of the designated bank account is furnished below. ➤ Name of the Beneficiary: BRIDGE AND ROOF CO. (INDIA) LIMITED ➤ Name of the Bank: STATE BANK OF INDIA ➤ Account No.: 42526014185 ➤ IFSC Code: SBIN0007502 As per F. No. 190 /MECH /CORRES /VARIOUS ORG/STAKEHOLDER/2021-22 Dtd. 18.04.22 of MSME Development Institute, Govt. of India, Ministry of MSME clarifies that, as per PP Policy 2012, Works Contract are not covered under PP POLICY Any exemption for submission of Tender Fee shall not be applicable for DGS&D/MSME/NSIC/SSIC bidders. Therefore, DGS&D/MSME/NSIC/SSIC registered bidders have to submit Tender Fee as specified in the NIT document along with their offer.	Waived Off	03 (Three) Months from the date of issue of LOI.

CRITICAL DATE SHEET		
Dates & Time For: -	:	Dates and Time
Bid Document Publishing Date	:	19.06.2024
Bid Document Download Start Date	:	19.06.2024
Bid Submission Start Date	:	19.06.2024
Bid Submission End Date	:	02.07.2024
Last date of submitting Tender fee and physical documents as specified in Tender Document.	:	02.07.2024 UPTO 15:30 HR
Date of Opening of Technical Bid	:	03.07.2024 AT 15:30 HR

GENERAL GUIDANCE: -

- (A) Any agencies willing to take part can download the Tender Document from our Co.'s Website([https:// www.bridgeroof.co.in](https://www.bridgeroof.co.in)).
- (B) Bids shall be submitted in Hard Copy only with Seal & stamped as mentioned in the Instruction to Tenderer at mentioned address.
- (C) If any of the intending bidders wishes to withdraw from participation in the bid, he / she can freely withdraw from the participation before scheduled date and time of closure of the bid submission.
- (D) B AND R reserves the right to cancel the bid without assigning any reason thereof.

NOTE: All corrigendum, addendum, amendments and clarifications to this Tender will be hosted in Co.'s Website only. Bidder shall keep themselves updated with all such amendments.

CONTENTS : "Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited."

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ANNEXURE-A

SALIENT INFORMATION

1.	Owner	INDIAN OIL CORPORATION LTD. (IOCL).
2.	Name of the Consultant	ENGINEERS INDIA LIMITED. (EIL)
3.	Tender Fee	Rs. 1,000.00 + 18% GST = Rs. 1,180.00 (Rupees One Thousand One Hundred Eighty Only) payable by DD/ Pay Order / Banker's Cheque (subject to realization) drawn from any Nationalized Bank, in favour of Bridge and Roof Co. (India) Limited, payable at Kolkata, West Bengal shall be submitted along with the Tender documents. (No A/c Payee Cheque shall be considered). The bidder may also make online payment towards the cost of tender document in authorized designated Bank Account and also upload the "Online Payment Receipt" of the same. Details of the designated bank account is furnished below. ➤ Name of the Beneficiary: BRIDGE AND ROOF CO. (INDIA) LIMITED ➤ Name of the Bank: STATE BANK OF INDIA ➤ Account No.: 42526014185 ➤ IFSC Code: SBIN0007502 As per F. No. 190/MECH/CORRES/VARIOUS ORG/ STAKEHOLDER /2021-22 Dtd. 18.04.22 of MSME Development Institute, Govt. of India, Ministry of MSME clarifies that, as per PP Policy 2012, Works Contract are not covered under PP POLICY. Any exemption for submission of Tender Fee shall not be applicable for DGS&D/MSME/NSIC/SSIC bidders. Therefore, DGS&D/MSME/NSIC/SSIC registered bidders have to submit Tender Fee as specified in the NIT document along with their offer.
4.	EMD (Earnest Money Deposit)	Waived Off
5.	Security-Cum Performance Bank Guarantee (SPBG)	N.A.
6.	Last Date of Submission of Tender	02.07.2024 upto 3:30 P.M.
7.	Validity Period of Tender	120 (One Hundred Twenty) days from the date of submission of Tender.
8.	Tender To Be Submitted To	THE AGM(PROJECTS) PANIPAT M/s BRIDGE AND ROOF CO. (INDIA) LIMITED C/O INDIAN OIL CORPORATION LTD. (IOCL) PILING, UG & CIVIL / STRUCTURAL WORKS U&O-P25 AREA PART-B FOR PANIPAT REFINERY EXPANSION PROJECT (P25), PANIPAT, HARYANA-132140.
9.	Date Of Opening of Techno-Commercial Part & Price Part	Part-I (Techno Commercial Part) will be opened by Tender Opening Committee only in the scheduled Date & Time as specified in Instruction to Bidders. Part – II (Price Part) of the Bidders, whose Bids are Techno Commercially accepted, will be opened by the Tender Opening Committee only <u>(in Camera)</u>.
10.	Completion Period	03 (Three) Months from the date of placement of the LOI

 For & on behalf of the Bidder

ANNEXURE-B

INSTRUCTION TO THE BIDDER

1. The cost of one set of tender document and tender processing fee is Rs. 1,000.00 + 18 % GST = Rs. 1,180.00 (Rupees One Thousand One Hundred Eighty Only) (Non-refundable) which the Bidder must pay along with their tenders in the form of Demand Draft (D.D.) / Pay Order / Banker's Cheque (subject to realization) drawn on any Nationalized Bank in favour of Bridge and Roof Co. (India) Limited, payable at Kolkata, West Bengal. (No A/c Payee Cheque shall be considered).

The bidder may also make online payment towards the cost of tender document in authorized designated Bank Account and also upload the "Online Payment Receipt" of the same. Details of the designated bank account is furnished below.

- Name of the Beneficiary: BRIDGE AND ROOF CO. (INDIA) LIMITED
- Name of the Bank: STATE BANK OF INDIA
- Account No.: 42526014185
- IFSC Code: SBIN0007502

As per F. No. 190/MECH/CORRES/VARIOUS ORG/STAKEHOLDER/2021-22 Dtd. 18.04.22 of MSME Development Institute, Govt. of India, Ministry of MSME clarifies that, as per PP Policy 2012, Works Contract are not covered under PP POLICY.

Any exemption for submission of Tender Fee shall not be applicable for DGS&D/MSME/NSIC/SSIC bidders. Therefore, DGS&D/MSME/NSIC/SSIC registered bidders have to submit Tender Fee as specified in the NIT document along with their offer.

- 2.1 Tenders not accompanied with the Tender Fee are liable to be rejected without assigning any reasons thereof.
- 2.2 Under no circumstances the Tenderers should incorporate any changes/ modifications etc., in the Tender Document itself to avoid rejection of their Tenders.
- 2.2 If any tenderer withdraws or make any changes in his offer already submitted before the expiry of the above validity period or any extension thereof without the written consent of the company, the offer may be liable to be cancelled.
- 2.3 B AND R may, in its absolute discretion suspend or disqualify a Bidder / Bidders who, at any time, is considered to have breached any of the qualification conditions or has performed in an unsatisfactory manner without assigning any reason whatsoever.
- 2.4 Bidder automatically be kept under Black Listing/Holiday List from being eligible for bidding in any contract with Bridge and Roof Co. (India) Limited during the period of bid validity of 2 years from the date of occurrence, if they are in breach of their obligation(s) under the bid conditions because they:
 - (a) Have withdrawn our Bid during the period of bid validity specified in the letter of Bid, or
 - (b) Having being notified of the acceptance of our Bid by B AND R during the period of Bid validity,
 - (i) have failed or refused to execute the Contract, if required, or
 - (ii) have failed or refused to furnish the Performance Guarantee within prescribed period in accordance with the clause of Tender.
3. The successful Bidder shall accept the LOI within 03 (Three) days from receipt of the same, failing which the award of work may be liable to be cancelled.
4. The Tender Fee shall be enclosed in a separate covered envelope superscripting thereon "TENDER FEE FOR "Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion

ANNEXURE-B

INSTRUCTION TO THE BIDDER

Project(P25) of M/s Indian Oil Corporation Limited.” which will be then enclosed in the main cover containing the closed envelopes of the Bidder's Technical offer along with the tender document.

5. EACH TENDER SHALL COMPRISE OF THE 2 (TWO) PARTS AS UNDER (No Soft Copy submission will be acceptable):

PART-I : TENDER FEE + TECHNO-COMMERCIAL TERMS AND CONDITIONS.

PART-II : PRICE BID OF THE TENDERER in Annexure – H

Each part shall be inserted in 2 (two) separate covered envelope duly superscripting nomenclature of the respective parts and then all the 2 (two) envelopes shall be inserted in a envelope and shall be submitted after seal as one unit with superscripting “TENDER FOR Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited.”-TO BE OPENED BY THE TENDEREE”

If the Tender shall comprise of single part and not as per Cl. No. 2 (i.e. PART-I: TECHNO-COMMERCIAL TERMS AND CONDITIONS & PART-II: PRICE BID OF THE TENDERER in Annexure-H) mentioned above, then the tenders are liable to be rejected without assigning any reason thereof.

THE BIDDER SHALL SUBMIT FOLLOWING SUPPORTING DOCUMENTS FOR THE BELOW MENTIONED QUALIFICATION CRITERIA

6. BIDDER'S QUALIFICATION CRITERIA:

Only Bidders, who have previous experience in the work of the nature and description detailed in the Notice Inviting NIT and/or NIT specification and fulfilling the following Qualifying Criteria, are expected to quote for this work duly detailing their experience along with their offer.

1. Photocopy of Work Order / Letter of Intent, job Completion Certificate / relevant documents confirming proof of execution of work / executed value of ongoing work of similar in nature, executed during last 07 years ending last day of months previous to the one in bids are invited. The bidder should fulfil either of the following experience criteria.

Bidder should have done the job as an individual agency i.e. not as Joint Venture or Associate/Consortium with other agency and have Executed any one of the following during last 7 years ending on date of submission of bid. Relevant Document in support of above shall be submitted.

Direct or Indirect Joint Venture(s) / Consortium / Special Purpose Vehicle (SPV) / Special Purpose Entity (SPE) are not permitted to participate.

- One Similar Completed Works costing not less than Rs. 0.66 Crore.

OR

- Two Similar Completed Works each costing not less than Rs. 0.41 Crore.

OR

- Three Similar Completed Works each costing not less than Rs. 0.33 Crore.

- (i) “Similar Work” shall mean a project comprising General Civil Works like Excavation, PCC, RCC, Reinforcement, Backfilling in all respect under One Agreement / Contract in any Industrial Project.
- (ii) The value of Executed Works may be brought to current costing level by enhancing the actual value of work at Simple Rate of 7 % per Annum, calculated from the ending last day of the month previous to the one in which the application is invited.

ANNEXURE-B

INSTRUCTION TO THE BIDDER

- (iii) "Completed" means that work of above value (Executed Gross Value) or till Gross Value of Work executed (in case of running work) should have been completed ending last day of the month previous to the one in which bids are invited.
 - (iv) In case of for running works, executed value should not be less than 80% of total work.
 - (v) In case, more than one L.O.I./W.O./P.O. are emanating against one project, these L.O.I./W.O./P.O. are to be considered as single contract for evaluation of credential of a bidder for meeting their experience criteria.
 - (vi) For Demerged Entities (by virtue of a corporate restructuring exercise etc,) shall be permitted to use credentials of original / parent entity to satisfy the eligibility criteria in the tenders, at least, for initial five years from the incorporation of the demerged entities.
 - (vii) Experience should be in the name of the bidding company and not in subsidiary / associate company / group company etc. however, for contracts, under which the applicant participated as a joint venture member, only the applicant's share by value shall be considered to meet this requirement.
2. Photo copy of Average Annual Financial Turnover and Audited Balance Sheet for last 3 (Three) years ending 31.03.2023 should not be less than Rs. 0.25 Crores, are to be submitted. Networth of the Bidder should be positive during the aforesaid Financial Years.
 3. The bidder should submit a Bank Solvency Certificate/Letter from the Bidder's Banker. The Solvency Certificate should not be more than 03 (Three) months old from the last date of bid submission.
 4. Bidder must be PAN holder issued by Income Tax authority and photocopy of PAN Card to be submitted.
 5. The bidder must have GST Registration Certificate issued by Competent Authority. Bidder should submit the copy of latest filed Monthly / Quarterly GSTR-3B return as GST Clearance Certificate along with GST Registration Certificate with offer / bid, failing which their offer will not be considered for further evaluation.
Note: Bidders, having their registration in other state except Haryana, should raise their Tax Invoice by charging IGST only.
 6. Bidders must have PF Registration Certificate and photocopy of said certificate are to be submitted.
 7. Bidders must have ESIC Registration Certificate and photocopy of said certificate are to be submitted.
Note: Bidder, if not registered with the Concerned Department, then they should give a declaration in their Letter head along with Techno Commercial part of their Offer towards submission of the same within one month of award of Work and before releasing any Payment in their favour, whichever is earlier.

7. DETAILS TO BE FURNISHED BY THE BIDDER:

- i. Name, Address, details of the Organization including name(s) of the owner/partners/promoters and directors of the firm/company.
- ii. Copy of Completion Certificate along with corresponding LOI/WO or any other documents mentioned in above duly certified by Client's substantiating the above Nature as well as Executed Value of Work & Completion Date.
- iii. Copy of Audited Balance Sheet(s) / Turnover Certificate duly signed by Chartered Accountant with his / her Seal, Signature & Registration Number for last 03 (Three) financial years ending 31.03.2023. The year in which no Turnover is shown, would also be considered for working out the average.
- iv. Photo Copy of Current Income Tax Deposition Acknowledgement.

ANNEXURE-B

INSTRUCTION TO THE BIDDER

- v. Photo Copy of PAN Card issued by Income Tax Authority.
- vi. Photo Copy of GST Registration Certificate.

Bidders should submit the copy of latest filed Monthly / Quarterly GSTR-3B Return as GST Clearance Certificate along with GST Registration Certificate with Offer / Bid. Failing which, their offer will not be considered for further evaluation. Bidders, having their registration in other state except Haryana, should raise their Tax Invoice by charging IGST only.

- vii. Photo Copy of P. F. Registration Certificate.
- viii. Photo Copy of ESIC Registration Certificate.

If the Bidder is not registered with the Concerned Department, then they should give a declaration in their Letter head along with Techno Commercial part of their Offer towards submission of the same within one month of award of Work and before releasing any Payment in their favour].

- ix. Information on Litigation History, Liquidated Damage, Disqualification etc. Declaration in Bidder's Letter Head
Bidder(s), who had a record of Court Case / Litigation History with B AND R /our Client against previous Tender / Contracts, shall not be considered for these Tenders.
- x. Constitution and Legal Status along with attested copies of Deeds/Articles and Memorandum of Association etc. as applicable.
- xi. Name(s) of the Owner/Partners/Promoters and Directors of the Firm/Company.
- xii. The bidder should submit a Bank Solvency Certificate/Letter from the Banker. The Solvency Certificate should not be more than 3(Three) months old from the last date of bid submission.
- xiii. "Purchase preference to Make in India" regarding minimum local content is applicable for the "Local Supplier" for the items/services covered in the Tender.

- 8 The Bidders should quote their price as Single Percentage (Above/Below/At-Par) basis in the prescribed format furnished in ANNEXURE-H (Price Bid) both in figure and words and in case of inconsistency, the lower ones will be taken as correct.
- 9 The Tender Document duly completed in all respect shall be signed and stamped by the Bidder on each page and shall be forwarded under cover of a letter on their Letter-head duly sealed.
- 10 The completed NIT document will be submitted in a sealed cover on or before 02.07.2024, i.e. the last date of submission.
- 11 The Tenderer's offers should be kept valid for acceptance for a period of 120 days from the last date of submission of the tender or such extended period as the Tenderers may agree as per the Company's request.
- 12 THE COMPANY RESERVES ABSOLUTE RIGHTS TO ACCEPT OR CANCEL ANY OR ALL THE TENDERS WITHOUT ASSIGNING ANY REASONS THEREOF AND MODE AS SHALL BE DEEMED FIT AND NECESSARY BY US. BIDDER TO ACCEPT THE SAME WITHOUT ANY DEVIATION.

13 **Bid Opening & Evaluation**

- 13.1 Opening of Techno-Commercial (Un-priced) Bid (Part-I):- 03.07.2024 at 03:30 P.M. at B AND R Site Office or any extension thereof as per Corrigendum / Addendum.
- 13.2 Part-I Technical and Un- Priced Commercial part will be opened by the Tender Opening Committee only (in Camera).
- 13.3 Part-II Price Commercial part of only those bidders, whose bids are considered Technically & Commercially acceptable, shall be opened by the Tender Opening

ANNEXURE-B

INSTRUCTION TO THE BIDDER

Committee only (in Camera).

- 14 Company (B AND R) reserves the right to split the total quality work amongst Two Bidders according to its own convenience and suitability. Under such eventuality the following shall be affected unconditionally: -
- a) Completion Time shall be suitably reduced.
 - b) The Quoted Prices/rates for each item shall remain firm & fixed and valid till the completion of the contract and shall not attract any escalation for any reason whatsoever.
- 15 Authorization letter for signing of the tender documents related with this tender shall be submitted.
- 16 'No Deviation Certificate' in Bidder's Letter Head shall be furnished by the Bidder and submit the same as per format enclosed in Annexure – L duly signed & stamped along with Techno-commercial documents.
- 17 'Certificate of declaration for confirming the knowledge of site condition' in Bidder's Letter Head shall be furnished by the Bidder and submit the same as per format enclosed in Annexure-N with duly signed & stamped along with Techno-commercial documents.
- 18 'Certificate of declaration against Technical Specifications' in Bidder's Letter Head shall be furnished by the Bidder and submit the same as per format enclosed in Annexure-O with duly signed & stamped along with Techno-commercial documents.
- 19 Bidder is liable to be disqualified, even though they meet the qualifying criteria, if they.
- Made misleading or false representations, statements and attachments submitted in proof of the qualification requirements, and / or
 - Record of poor performance such as abandoning the works, not properly completing the supply order, inordinate delays in completion or supply, litigation history, or financial failures etc.
 - If the tenderer deliberately gives wrong information / submit fake, false, fabricated, forged documents in his tender, B AND R reserves the right to reject such tender at any stage or to cancel the contract if awarded and forfeit the Earnest Money / Security Deposit / any other money due.
- 20 Bidders shall, on request, provide any necessary authority and assistance to enable relevant enquiries to be carried out.
- 21 After submission of their Offer, Bidder must notify B AND R promptly, if there is any:
- Substantial change in their financial or technical capacity.
 - Change in their business (such as Company name, address)
 - Change of ownership or holding, including any transfer of key personnel.
 - Any other significant change in information provided in the Offer.
- 22 The Bidder must provide any further details required for the review upon request from B AND R. Failure to comply with any request by B AND R for such information will result in rejection of their Offer.
- 23 B AND R may, in its absolute discretion suspend or disqualify a Bidder / Bidders who, at any time, is considered to have breached any of the qualification conditions or has performed in an unsatisfactory manner without assigning any reason whatsoever.
- 24 B AND R will not be liable for any loss or damages incurred by the Bidder/ Bidders in the above exercise.

ANNEXURE-B

INSTRUCTION TO THE BIDDER

- 25 Purchaser (B AND R) reserves the right to disqualify such bidders who had a record of not meeting the contractual obligations against earlier contracts entered into with the Purchaser (B AND R)

26 **Tender Validity**

Tender submitted by tenderer shall remain valid for acceptance for a period of 120 days from the date set for submission of the tender. The tenderer shall not be entitled within the said period of 120 (One Hundred Twenty) days to revoke or cancel or vary the tender given or any item thereof, without the consent of B AND R. In case tenderer revokes or cancels or varies his tender in any manner without the consent of B AND R, within this period, his earnest money will be forfeited.

- 27 Price Bids of those Bidders who will be Techno- commercially qualified for the subject job on the basis of evaluation of Techno Commercial Bids, will be opened on specified date.

- 28 The complete signed and stamped Tender Document and all other required documents pertaining to this tender shall be submitted by the Tenderers as a token of Tenderer's acceptance.

29 **EVALUATION OF BIDS**

Technical Bids submitted by the tenderer will be opened first and evaluated based on documentary evidences submitted along with the offer.

30 **LANGUAGE**

The tenderer shall quote the rates in English language.

- 31 The successful Tenderer shall accept the LOI within 03 (Three) days from receipt of the same, failing which the award of work may be liable to be cancelled.

- 32 Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders about the nature of the work and site situation, environments, facilities available, position of material and labour, means of transport and access to Site (so far as is practicable), the form and nature of the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. No claim will be entertained later on the grounds of lack of knowledge of any of these conditions.

A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity, access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract document. Submission of a tender by tenderer implies that he has read these instructions and all other contract documents and has made himself aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.

33 **REJECTION OF TENDER AND OTHER CONDITIONS**

The Competent Authority on behalf of the B AND R does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without assigning any reason. Tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be liable for rejection.

Bidders will automatically be kept under Black Listing/Holiday List from being eligible for bidding in any contract with Bridge and Roof Co.(India) Limited during the period of bid validity of 2 years from the date of occurrence, if they are in breach of our obligation(s)

ANNEXURE-B

INSTRUCTION TO THE BIDDER

under the bid conditions because they:

Have withdrawn our Bid during the period of bid validity specified in the letter of Bid, or

Having being notified of the acceptance of our Bid by B AND R during the period of Bid validity, (i) have failed or refused to execute the Contract, if required, or

(ii) have failed or refused to furnish the Performance Guarantee within prescribed period in accordance with the clause of Tender

Further if they fail to commence work as specified, they agree that Bridge and Roof Co. (India) Limited or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance guarantee absolutely.

Tenders are liable to be rejected in case of unsatisfactory performance of the tenderer with B AND R, or tenderer under suspension (hold / banning / delisted) by B AND R. B AND R reserves the right to reject a bidder in case it is observed that they are overloaded and may not be in a position to execute this job as per the required schedule. The decision of B AND R will be final in this regard.

If a tenderer who is a proprietor expires after the submission of his tender or after the acceptance of his tender, B AND R may at their discretion, cancel such tender. If a partner of a firm expires after the submission of tender or after the acceptance of the tender, B AND R may then cancel such tender at their discretion, unless the firm retains its character.

If the tenderer deliberately gives wrong information in his tender, B AND R reserves the right to reject such tender at any stage or to cancel the contract if awarded and forfeit the Earnest Money / Security Deposit / any other money due.

Canvassing in any form in connection with the tenders submitted by the Tenderer shall make his offer liable to rejection.

In case the Proprietor, Partner or Director of the Company / Firm submitting the Tender, has any relative or relation employed in B AND R, the authority inviting the Tender shall be informed of the fact as per specified format, along with the Offer. Failing to do so, B AND R may, at its sole discretion, reject the tender or cancel the contract and forfeit the Earnest Money / Security Deposit.

- 34 The successful tenderer should not sub-contract part or complete work detailed in the tender specification undertaken by him without written permission of B AND R. The tenderer is solely responsible to B AND R for the work awarded to him.
- 35 The Tender submitted by a techno commercially qualified tenderer shall become the property of B AND R who shall be under no obligation to return the same to the bidder.
- 36 Unsolicited discount received after the due date and time of Bid Submission shall not be considered for evaluation. However, if the party who has submitted the unsolicited discount/rebate becomes the L-1 party, then the awarded price i.e contract value shall be worked out after considering the discount so offered.
- 37 B AND R shall not be liable for any expenses incurred by the bidder in the preparation of the tender irrespective of whether the tender is accepted or not.
- 38 The Bidder must provide any further details required for the review upon request from B AND R. Failure to comply with any request by B AND R for such information will result in rejection of their Offer.

B AND R may, in its absolute discretion suspend or disqualify a Bidder / Bidders who, at any time, is considered to have breached any of the qualification conditions or has performed in an unsatisfactory manner without assigning any reason whatsoever.

For & on behalf of the Bidder

Detail of information to be furnished by the Bidder

Bridge and Roof Co. (India) Limited
(A Government of India Enterprise)
2/1, Russel Street, Kolkata – 700 071

Bidder / Tenderer must fill up the following information and submit with the NIT

Name of the Bidder :

Address :

Contract Person :

Telephone/Mobile No. :

Email Id :

(Signature with Seal)

Date :

ANNEXURE - D

GENERAL CONDITIONS OF CONTRACT**Definition of Terms:**

The various terms appearing in the Tender Document shall have the following meaning unless they are repugnant to the context otherwise.

- a) **COMPANY** : Bridge and Roof Co. (India) Limited having its Registered Office at Kankaria Centre, 5th Floor, 2/1, Russel Street, Kolkata -700071.
- b) **OWNER** : M/s Indian Oil Corporation limited (IOCL).
- c) **CONSULTANT** : M/s Engineers India Limited (EIL)
- d) **BIDDER/TENDERER** : The firm/party who shall tender quotation to the Company.
- e) **CONTRACTOR** : The Bidder whose quoted offer will be accepted, either in full or in part, by the Company.
- f) **WORK(s)** : Jobs that are to be executed by the Contractor as awarded to him by the Company.
- g) **WORK ORDER / CONTRACT** : The formal letter/notification issued to the Contractor awarding the work(s) in full or in part by the Company together with the applicable terms and conditions etc. as are finally and mutually agreed to between the Company and the Contractor.
- h) **SITE/WORK SITE** : The premises where the work will be executed by the Contractor and shall include the lands, buildings, structures etc. erected thereupon.
- i) **ENGINEER-IN-CHARGE** : The Officer/Engineer nominated and authorized by the Company for the time being for the purpose of operating the Contract or any work covered there under.
- j) **ACCEPTING AUTHORITY** : The Chairman and Managing Director of the company

1 SCOPE OF WORK:

The work to be carried out under this contract shall, except as otherwise provided anywhere in the condition, include all labour, materials, tools, plants, equipments and transport which may be required in preparation of and for and in the full and entire execution and completion of the works.

2 SCHEDULE OF RATES & QUANTITIES:

The quantum of work given in the Schedule of Rates & Quantities are only indicative and are subject to variation either individually or conjointly for which no revision in Contractor's quoted rate shall be admissible i.e. quoted rates/prices shall remain valid irrespective of actual quantities to be executed.

3 INSPECTION OF SITES:

The Bidder shall visit and inspect the site and its surroundings and shall satisfy himself before submitting his quotation as to the nature of the ground and sub soil (so far as is practicable) the form and nature of the site and nature of work and materials necessary for the execution of the work, and the means of access to the site, the accommodation he may require and in general shall himself obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect his quotation. No extra charges consequent on any misunderstanding or otherwise shall be allowed.

4 SUFFICIENCY OF QUOTATION

The Bidder shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his quotation for the works and of the rates and prices quoted in the

ANNEXURE - D

GENERAL CONDITIONS OF CONTRACT

Schedule of Quantities which rates and prices shall, except as otherwise provided, cover all his obligations and liabilities under the Contract and all matters and things necessary for the proper completion and maintenance of the Works.

5 SECURITY DEPOSIT

5 % (Five Percent) of Gross value of each R.A. Bill & Final Bill will be deducted by cash and retained with the company towards Security Deposit / Retention Money for the due and faithful performance of the Contractor's obligations under the Contract. The accumulated Security Amount less the recoveries, if any, will be refunded and released to the Contractor after expiry of the Maintenance/ Guarantee/ Defect Liability Period of the Contract defined elsewhere in the Tender. No interest shall be paid on Security Deposit / Retention Money.

6 DEVIATION/VARIATIONS

The Engineer-in-Charge shall have power (i) to make alterations in, omissions from, additions to or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work and (ii) to omit a part of the works in case of non-availability of portion of the site or for any other reasons, and the Contractor shall be bound to carry out the works in accordance with any instructions given to him by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall form part of the Contract as if originally provided therein and any altered, additional or substituted work which the Contractor may be directed to do in the manner above specified as part of the works, shall be carried out by the Contractor on the same conditions in all respects including price on which he agreed to do the main work.

7 SUSPENSION OF WORK

The Contractor shall, on receipt of the order in writing of the Engineer-in-Charge, suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider for any of the following reasons:

- i. on account of any default on part of the Contractor, or
- ii. for proper execution of the works or part thereof for reasons other than the default of the Contractor, or
- iii. For safety of the works or part thereof.

The Contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

8 COMPLETION TIME

Time of completion of the works is the essence of the contract and Contractor shall strictly follow and adhere to the completion schedule as specified or as to be prepared and handed over to the Contractor by the Engineer-in-Charge after notification of acceptance of tender. The execution of the works shall commence within a reasonable period as to be decided by the Engineer-in-Charge from the date of issue of instruction to commence the work or from the date of handing over of the site whichever is later but not exceeding 10 (ten) days. If the Contractor commits default in commencing the execution of work as aforesaid, Company shall without prejudice to any other right or remedy be at liberty to take any actions which it shall deem fit and proper against the Contractor.

9 DELAY IN EXECUTION OF WORKS

If the Works be delayed by:

- (a) Force majeure, or
- (b) abnormally bad weather, or
- (c) serious loss or damage by fire, or

ANNEXURE - D

GENERAL CONDITIONS OF CONTRACT

- (d) civil commotion, local combination of workmen, strike or lockout, affecting any of the trades employed on the work, or
- (e) delay on the part of other Contractors engaged by Company in executing work not forming part of the Contract, or
- (f) non-availability of stores, which are the responsibility of Company to supply, or
- (g) non-availability or break-down of tools & plants to be supplied or supplied by Company, or
- (h) any other cause which, in the absolute discretion of Engineer-in-Charge, is found as beyond the Contractor's control; then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

10 TOOLS, PLANTS & EQUIPMENTS:

The Contractor shall arrange at his own expense all tools, plant and equipment (hereinafter referred to as T&P) required for execution of the work other than those which are to be supplied by the company and specifically mentioned elsewhere in the Tender Document.

- 10.1 If the Contractor requires any item of T&P on hire from the company, the Company will, if such item is available, hire it to the Contractor at a rate to be fixed by the Engineer-in-Charge.
- 10.2 If at any time Company's T&P has not worked at all during a day except for a breakdown or has worked for less than eight hours during a day, the Contractor shall be charged for one working day.
- 10.3 If any item of Company's T&P has stopped working on account of break-down before it has worked for four hours in a day, the Contractor will be charged for half a working day. If the item has stopped working after it has worked for more than four hours but less than eight hours, the Contractor will be charged for a full working day.
- 10.4 The Contractor shall be responsible for care and custody of Company's T&P (including employment of guards) during the period Company's T&P remain with him and any damage (fair wear and tear excepted) to any of the equipment (except for Excepted Risks provided always the Contractor has taken precautions necessary to protect it from such risks) shall be made good at the Contractor's expense to the satisfaction of the Engineer-in-Charge unless such damage is caused because of negligence of crew provided by the Company.
- 10.5 Company's T&P hired to the Contractor shall be returned at the place of issue (unless otherwise directed) by the Contractor to the Engineer-in-Charge on completion of the work or section of the work or earlier on termination of the hire by the Company as hereinafter provided on a written notice by the Engineer-in-Charge. The Company shall be entitled to terminate the hire on two days' notice without assigning any reason whatsoever and the Contractor shall have no claim to any payment of compensation or otherwise whatsoever on account of termination of hire of Company's T&P by the Company.
- 10.6 If Owner's/Client's T&P are given to the Contractor on hire for execution of the work through the Company, the same charges/rents as would be levied on the Company shall be charged for hiring of T&P from Owner/Client will also apply in the case of the Contractor without any alteration.

11 MATERIALS

The Contractor shall at his own expense, provide all materials required for the work other than those which are to be supplied by the Company and specifically mentioned elsewhere in this Tender Documents.

- 11.1 All materials to be provided by the Contractor shall be in conformity with the specifications

ANNEXURE - D

GENERAL CONDITIONS OF CONTRACT

laid down in the contract and the Contractor shall, if requested by the Engineer-in-Charge, furnish proof to the satisfaction of him that the materials so comply.

- 11.2 The Contractor shall, at his own expense and without delay, supply to the Engineer-in-Charge samples of materials proposed to be used in the works. The Engineer-in-Charge shall within seven days of supply of samples or within such further period as he may require intimate to the Contractor in writing/inform the Contractor whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval fresh samples complying with the specification laid down in the Contract.
- 11.3 The Engineer-in-Charge shall have full powers to require removal of any or all the materials brought to site by the Contractor which are not in accordance with the Contract specifications or do not conform in character or quality to samples approved by him. In case of default on the part of the Contractor in removing rejected materials the Engineer-in-Charge shall be at liberty to have them removed by other means. The Engineer-in-Charge shall have full powers to procure other proper materials to be substituted for rejected materials and in the event of the Contractor refusing to comply, he may arrange to supply by other means. All costs, which may attend upon such removal and/or substitution, shall be borne by the Contractor.
- 11.4 All charges on account of transportation, octroi, terminal or sales tax and other duties on materials obtained for the works from any source (including materials supplied by the Company) shall be borne by the Contractor.

12 MATERIALS SUPPLIED BY COMPANY:

- 12.1 Contractor shall submit to the Company from time to time as directed by Engineer-in-Charge or on completion, the reconciliation statement in the proforma and manner to be specified by Engineer-in-Charge, showing thereon the consumption of materials issued to the Contractor by the Company for incorporation and fixing in the works including preparatory work. Permissible wastage allowance for material appropriation shall be same as to be approved by Engineer-in-Charge. Cost of any wastage beyond permissible limit shall be charged to the Contractor at the rates as to be decided by the Engineer-in-Charge. In all cases, however, the Contractor shall, at his expenses, return the wastage/surplus materials to the Company at the place of issue.
- 12.2 In case, any materials are supplied by the Company to the Contractor on chargeable basis/issue rates, the following provisions will apply:
- i. For the materials which the Company has agreed to supply to the Contractor, he shall give a reasonable notice in writing of his requirements to the Engineer-in-Charge in accordance with the agreed phased programme. Such materials shall be supplied for the purposes of the contract only and the value of materials so supplied at the rates specified shall be set off or deducted, as and when materials are consumed in items of work for which payment is being made to the Contractor, under the Contract. At the time of submission of bills the Contractor shall properly account for the materials issued to him to the satisfaction of the Engineer-in-Charge, certify that balance of materials supplied are available at site.
 - ii. The Contractor shall bear the cost of loading, transporting to site, unloading, storing under cover as required, assembling and joining the several parts together as necessary and incorporating of fixing materials in the works including all preparatory work of whatever description as may be required.
 - iii. All materials issued to the Contractor by the Company for incorporation or fixing in the works (including preparatory work) shall, on completion or on foreclosure of the works, be returned by the Contractor at his expense, at the place of issue, after making due allowance for actual consumption, reasonable wear and tear and/or waste.
 - iv. Surplus materials in acceptable sizes returned by the Contractor shall be credited to him by the Engineer-in-Charge at rates not exceeding those at which rates these were

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GENERAL CONDITIONS OF CONTRACT

originally issued to him after taking into consideration any deterioration or damage which may have been caused to the said materials whilst in custody of the Contractor.

- v. If on completion of works the Contractor fails to return surplus materials out of those supplied by the Company, then in addition to any other liability which the Contractor would incur, the Engineer-in-Charge may, by a written notice to the Contractor, require him to pay within a fortnight of receipt of the notice, for such unreturned surplus materials at double the issue rates.

- 12.3 Materials required for the works, whether brought by the Contractor or supplied by the Company, shall be stored by the Contractor only at places approved by the Engineer-in-Charge, storage and safe custody of materials shall be the responsibility of the Contractor.
- 12.4 Company's officials concerned with the contract shall be entitled at any time to inspect and examine any materials intended to be in or on the works, either on the site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or at any place(s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be required for such inspection and examination.
- 12.5 All materials brought to the site shall become and remain the properties of the Company and shall not be removed off the site without the prior written approval of the Engineer-in-Charge. But wherever the works are finally completed and advance if any, in respect of any such materials is fully recovered, the Contractor shall at his own expense forthwith remove from the site all surplus materials originally supplied by him and upon such removal, the same shall remain in and become the property of the Contractor.

13 LABOUR

The Contractor shall employ labour in sufficient numbers to maintain the required rate of progress and quality to ensure workmanship of the degree specified in the Contract and to the satisfaction of the Engineer-in-Charge. The Contractor shall not employ in connection with the works any person who has not completed his fifteen years of age.

- 13.1 The Contractor shall furnish to the Engineer-in-Charge at the regular intervals, a distribution return of the number and description by trades of the work people employed on the works. The Contractor shall also submit on the 4th and 19th of every month to the Engineer-in-Charge a true statement showing in respect of the second half of the current month (i) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them and (ii) the number of female workers who have been allowed Maternity Benefit as provided in the Maternity Benefit Act, 1961 of Rules made thereunder and the amount paid to them.
- 13.2 The Contractor shall pay to labour employed by him wages not less than fair wages as defined in the Contract Labour Regulation & Abolition Act.
- 13.3 The Contractor shall in respect of labour employed by him comply with or cause to be complied with the Contract Labour Regulation Act in regard to all matters provided therein.
- 13.4 The Contractor shall comply with the provisions of the payment of Wages Act, 1936, Minimum Wages Act, 1948, Employer's Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefit Act, 1961 and Mines Act, 1952 or any modifications thereof or any other law relating thereto and rules made thereunder from time to time.
- 13.5
 - a) The Contractor shall be liable to pay his contribution and the Employee's contribution to the State Insurance Scheme in respect of all labour employed by him for the execution of the Contract, in accordance with the provision of "The Employee's State Insurance Act, 1948" as amended from time to time. In case the Contractor fails to submit full details of his account of labour employed and the contribution payable, the Engineer-in-Charge shall recover from the running bills of Contractor and amount of contribution as assessed by him. The amount

ANNEXURE - D

GENERAL CONDITIONS OF CONTRACT

so recovered shall be adjusted against the actual contribution payable for Employees State Insurance.

- b) The Contractor must obtain, within the quoted rates, individual codes in respect of Employees Provident Fund (EPF). Details of individual codes obtained by Contractor are to be submitted to the company for entry pass for his workers & Employees and shall deposit the EPF amount deducted from his workers & employees along with employer's contribution the Provident Fund and Challans to be submitted along with Running Account Bill to facilitate release of payment.
- 13.6 The Engineer-in-Charge shall on a report having made by an Inspecting Officer as defined in the Contract Labour Regulation Act have the power to deduct from the money due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reasons of non-fulfilment of the Conditions of Contract for the benefit of workers, non-payment of wages or of deduction made from his or their wages which are not justified by the terms of the Contract or non-observance of the said Contract Labour Regulation Act and Rules framed there under.
- 13.7 In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid Contract Labour Regulation Act, as amended from time to time or furnishing any information of submitting or filling any Form/Register/Slip under the provisions of these Regulations which is materially incorrect then on the report of the Inspecting Officer as defined in the Contract Labour Regulation Act, the Contractor shall without prejudice to any other liability pay to the Company a sum as applicable as per prevailing rules as liquidated damages for every default, breach or furnishing, making, submitting, filling materially incorrect statement as may be fixed by the Engineer-in-Charge and in the event of the Contractor's default continuing in this respect, the liquidated damages may be enhanced for each day of default subject to a maximum percent of the estimated cost of the works put to tender. The Engineer-in-Charge shall deduct such amount from bills or security deposit of the Contractor and credit the same to the Welfare Fund constituted under Regulations. The decision of the Engineer-in-Charge in this respect shall be final and binding.
- 13.8 The Contractor shall at his own expense with or cause to be complied with Model Rules for Labour Welfare framed by Government from time to time for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the Contractor fails to make arrangement as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the Contractor.
- 13.9 The Contractor shall at his own expense arrange for the safety provisions as required by the Engineer-in-Charge, in respect of all labour directly or indirectly employed for performance of the works and shall provide all facilities in connection therewith. In case the Contractor fails to make arrangements and provide necessary facilities as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the Contractor.
- 13.10 Failure to comply with Model Rules for Labour Welfare, Safety Code or the provisions relating to report on accidents and to grant of maternity benefits to female workers shall make the Contractor liable to pay to the Company as liquidated damages as applicable as per prevailing rules for each default or materially incorrect statement. The decision of the Engineer-in-Charge in such matters based on reports from the Inspecting Officers as defined in the Contract Labour Regulation Act as appended to these conditions shall be final and binding and deductions for recovery of such liquidated damages may be made from any amount payable to the Contractor.
- 14 POSSESSION OF SITE BY CONTRACTOR
- The Contractor shall not be permitted to enter on (other than for inspection purposes) or take possession of the site until instructed to do so by the Engineer-in-Charge in writing. The portion of the site to be occupied by the Contractor shall be defined and/or marked on the site plan, failing which these shall be indicated by the Engineer-in-Charge at site and the Contractor shall on no account be allowed to extend his operations beyond these areas. In

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GENERAL CONDITIONS OF CONTRACT

respect of any land allotted to the Contractor for purposes of or in connection with the Contract the Contractor shall be a licensee subject to the following and such other terms and conditions as may be imposed by the licensor:

- i. That he shall pay a nominal license fee per year or part of a year for use and occupation, in respect of each and every separate area or land allotted to him.
- ii. That such use or occupation shall not confer any right of tenancy of the land to the Contractor.
- iii. That the Contractor shall be liable to vacate the land on demand by the Engineer-in-Charge.
- iv. That the Contractor shall have no right to any construction over this land without the written permission of the Engineer-in-Charge. In case, he is allowed to construct any structure he shall have to demolish and clear the same before handing over the completed work unless agreed to the contrary.

- 14.1 The Contractor shall provide, if necessary or if required on the site, all temporary access thereto and shall alter, adopt and maintain the same as required from time to time and shall take up and clear them away as and when no longer required and as and when ordered by the Engineer-in-Charge and make good all damages done to the site.

15 SETTING OUT WORKS

The Engineer-in-Charge shall supply drawings, levels and other information necessary to enable the Contractor to set out the works and be responsible for the accuracy of the same. He shall amend at his own cost and to the satisfaction of the Engineer-in-Charge any error found at any stage which arise through inaccurate setting out unless such error is based on incorrect data furnished in writing by the Engineer-in-Charge, in which case the cost of rectification shall be borne by the Company. The Contractor shall protect and preserve all benchmarks used in setting out the works till end of the Defects Liability period unless the Engineer-in-Charge directs their removal.

16 MATERIALS OBTAINED FROM EXCAVATION

Materials of any kind obtained from excavation on the site shall remain the property of the Company and shall be disposed of as the Engineer-in-Charge may direct.

All fossils, coins, articles of value of antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the absolute property of the Company and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such article or thing shall immediately upon discovery thereof and before removal acquaint the Engineer-in-Charge with such discovery and carry out the Engineer-in-Charge's directions as to the disposal of the same at the expense of the Company.

17 WATCHING & LIGHTING

The Contractor shall provide and maintain at his own expense all lights, guards fencing and watching when and where necessary or required by the Engineer-in-Charge for the protection of the works or for the safety and convenience of those employed on the works or the public.

18 CONTRACTOR'S SUPERVISION

The Contractor shall either himself supervise the execution of the works or shall appoint a competent agent approved by the Engineer-in-Charge, if the Contractor has himself not sufficient knowledge and experience to be capable of receiving instructions or cannot give his full attention to the works, then the Contractor shall at his own expense employ as his accredited agent an engineer approved by the Engineer-in-Charge. Orders given to the Contractor's agent to the Contractor himself. If the Contractor fails to appoint a suitable agent as directed by the Engineer-in-Charge, the Engineer-in-Charge shall have full powers to suspend the execution of the works until such date as suitable agent is appointed and the

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GENERAL CONDITIONS OF CONTRACT

Contractor shall be held responsible for the delay so caused to the works.

19 INSPECTION & APPROVAL

All works embracing more than one process shall be subject to examine & approval at each stage thereof and the Contractor shall give due notice to the Engineer-in-Charge or his authorized representative when each stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quality and extent thereof.

- 19.1 No work shall be covered up or put out of view without the approval of the Engineer-in-Charge or his authorized representative and the Contractor shall afford full opportunity for examination of foundations before permanent work is placed thereon. The Contractor shall give due notice to the Engineer-in-Charge or his authorized representative whenever any such work or foundation is ready for examination and the Engineer-in-Charge or his representative shall without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such work or of examining such foundations. In the event of the failure of the Contractor to give such notice he shall, if required by the Engineer-in-Charge, uncover such work at the Contractor's expense.

- 19.2 Company's/Owner's representatives concerned with the Contract shall have powers at any time to inspect and examine any part of the works and the Contractor shall give such facilities as may be required for such inspection and examination.

20 POWERS OF ENGINEER-IN-CHARGE'S REPRESENTATIVE

The duties of the representatives of the Engineer-in-Charge, are to watch and supervise the works and to test and examine any materials to be used or workmanship employed in connection with the works. He shall have no authority to order any work involving any extra payment by the Company nor to make any variation in the works.

- 20.1 The Engineer-in-Charge may from time to time delegate to his representative any of the powers and authorities vested in the Engineer-in-Charge and shall furnish to the Contractor a copy of all such written delegation of powers and authorities. Any written instruction or written approval given by the Representative of the Engineer-in-Charge to the Contractor within the terms of such delegation shall bind the Contractor and the Company as through it had been given by the Engineer-in-Charge.
- 20.2 Failure of the Representative of the Engineer-in-Charge to disapprove any work or materials shall not prejudice the power of the Engineer-in-Charge thereafter to disapprove such work or materials & to order the pulling down, removal or breaking up thereof.
- 20.3 If the Contractor shall be dissatisfied with any decision of the Representative of the Engineer-in-Charge he shall be entitled to refer the matter to the Engineer-in-Charge who shall thereupon confirm, reverse or vary such decision.

21 REMOVAL OF WORKMEN

The Contractor shall employ in and about the execution of the works only such persons as are skilled and experienced in their several trades and the Engineer-in-Charge shall be at liberty to object to and require the Contractor to remove from the works any persons employed by the Contractor in or about the execution of the works who in the opinion of the Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties and such person shall not be again employed upon the works without permission of the Engineer-in-Charge.

22 WORK DURING NIGHT OR ON SUNDAYS & HOLIDAYS

Subject to any provisions to the contrary contained in the Contract, none of the permanent works shall be carried out during night or on Sundays or on authorized Holidays without the permission in writing of the Engineer-in-Charge except when the work is unavoidable or absolutely necessary for the safety of life, property of works in which case the Contractor shall immediately advise the Engineer-in-Charge accordingly.

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As soon as the work is completed, the Contractor shall give notice of such completion to the Engineer-in-Charge and within a reasonable period of receipt of such notice the Engineer-in-Charge shall inspect the work and shall furnish the Contractor with a certificate of completion indicating (a) the date of completion (b) defects to be rectified by the Contractor and/or (c) items for which payment shall be made at reduced rates. When separate periods of completion have been specified for items or groups of items, the Engineer-in-Charge shall issue separate completion certificates for such item or groups of items. No certificate of completion shall be issued, nor shall the work be considered to be complete till the Contractor shall have removed from the premises on which the work has been executed all scaffolding, sheds and surplus materials, except such as are required for rectification of defects, rubbish and all huts and sanitary arrangements required for his workmen in the site in connection with the execution of the work, as shall have been erected by the Contractor or the workmen and cleaned all dirt from the parts of building(s) in upon or about which the work has been executed or of which he may had possession for the purpose of the execution thereof and cleaned floors, gutters and drains, eased doors and sashes, oiled locks fastening labelled keys clearly and handed them over to the Engineer-in-Charge or his Representative and made the whole premises fit for immediate occupation or use to the satisfaction of the Engineer-in-Charge. If the Contractor shall fail to comply with any of the requirements of this conditions as aforesaid, on or before the date of completion of the works, the Engineer-in-Charge may at the expense of the Contractor fulfil such requirements and dispose of the scaffoldings, surplus materials and rubbish etc. as he thinks fit and the Contractor shall have no claim in respect of any such scaffolding or surplus materials except for any sum actually realised by the sale thereof less the cost of fulfilling the requirements and any other amount that may be due from the Contractor. If the expense of fulfilling such requirements is more than the amount realised on such disposal as aforesaid, the Contractor shall forthwith on demand pay such excess to the Company.

23.1 If at any time before completion of the entire work, items or groups of items for which periods of completion have been specified, have been completed, the Engineer-in-Charge with the consent of the Contractor takes possession of any part or parts of the same then notwithstanding anything expressed or implied elsewhere in this Contract:

- a. Within ten/thirty days of the date of completion of such items or groups of items or possession of the relevant part the Engineer-in-Charge shall issue completion certificate for the relevant part as in condition above provided the Contractor fulfils his obligations under that condition for the relevant part.
- b. The Defects Liability Period in respect of such items and the relevant part shall be deemed to have commenced from the certified date of completion of such items or the relevant part as the case may be.

24 COMPENSATION FOR DELAY

If the Contractor fails to maintain the required progress or to complete the work and clear the site on or before the contract or extended date/period of completion he shall, without prejudice to any other right or remedy of the Company on account of such breach, pay as agreed compensation amount calculated as to be stipulated or such smaller amount as be fixed by the authority on the contract value of the work for every week that the progress remains below that specified or that the work remains incomplete.

This will also apply to items or group of items for which separate period of completion has been specified.

For this purpose the term 'Contract Value' shall be the value at contract rates of the work as ordered.

24.1 Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed the specified limit of the Contract value or of the Contract value of the item or group of items of work for which a separate period of completion is given.

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- 24.2 The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Company.
- 25 **DEFECTS LIABILITY PERIOD**
The Contractor shall guarantee and maintain the works for a period of 12 months or specifically mentioned elsewhere in the Tender, after the date of issue of completion certificate by the Engineer-in-Charge which will be reckoned as Defect Liability/Maintenance period of the works. The Contractor shall be responsible to make good and remedy at his own expenses within such period as may be stipulated by the Engineer-in-Charge, any defect which may develop or may be noticed before the expiry of Defect Liability/Maintenance Period.
- 26 **CONTRACTOR'S LIABILITY & INSURANCE**
From commencement to completion of the works, the Contractor shall take full responsibility for the case thereof & for taking precautions to prevent loss or damage & to minimize loss or damage to the greatest extent possible and shall be liable for any damage or loss that may happen to the works or any part thereof and all Company's T&P from any cause whatsoever (save and except the Excepted Risks) and shall at his own cost repair and make good the same so that at completion, the works and all company's T&P shall be in good order and condition and in conformity in every respect with requirements of the Contract and instructions of the Engineer-in-Charge.
- 27 **FACILITIES TO OTHER CONTRACTOR**
The Contractor shall, in accordance with the requirements of the Engineer-in-Charge, afford all reasonable facilities to other Contractor engaged contemporaneously on separate contracts in connection with the works and for departmental labour and labour of any other property authorized authority or statutory body which may be employed at the site on execution of any work not included in the Contract or of any contract which the Company may enter into in connection with or ancillary to the works.
- 28 **NOTICES TO LOCAL BODIES:**
i. The Contractor shall comply with and give all notice required under any Governmental authority, instrument, rule or order made under any Act of Parliament, State laws or any regulation of bye laws of any local authority relating to the works. He shall before making any variation from the Contract drawing necessitated by such compliance give to the Engineer-in-Charge a written notice giving reasons for the proposed variation and obtain the Engineer-in-charge's instruction therein.
ii. The Contractor shall pay and indemnify the Company against any liability in respect of any fees or charges payable under any Act of Parliament, State laws or any Government instrument, rule or order and any regulations or bye-laws of any local authority in respect of works.
- 29 **SUB-CONTRACT:**
The Contractor shall not sublet any portion of the contract without the prior written approval of the Accepting Authority.
- 30 **INSTRUCTIONS & NOTICES**
i. Subject or otherwise provided in this Contract, all notices to be given on behalf of the Company and all other actions to be taken on its behalf may be given or taken by the Engineer-in-Charge or any officer for the time being entrusted with the functions, duties and powers of the Engineer-in-Charge.
ii. All instructions, notice and communications etc. under the Contract shall be given in writing and if sent by registered post to the last known place of above business of the Contractor shall be deemed to have been served on the date when in the ordinary course of post these would have been delivered to him.

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- iii. The Contractor or his Agent shall in attendance at the Site(s) during all working hours and shall superintend the execution of the works with such additional assistance in each trade as the Engineer-in-Charge may consider necessary. Orders given to the Contractor's Agent shall be considered to have the same force as if they had been given to the Contractor himself.

31 FORECLOSURE

If at any time after acceptance of the tender the Company shall decide to abandon or reduce the scope of the works for any reason whatsoever & hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice to that effect to the Contractor & the Contractor shall have no claim to any payment of compensation or otherwise, whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

- 31.1 The Contractor shall be paid at Contract rates full amount for works executed at site & in addition, a reasonable amount as certified by the Engineer-in-Charge for the item hereunder mentioned which could not be utilized on the work to the full extent because of the foreclosure:

- a. Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters & site office, storage accommodation and water storage tanks.
 - (i) The Company shall have the option to take over Contractor's materials or any part thereof either brought to site or of which the Contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work), provided, however, the Company shall be bound to take over the materials or such portions thereof as the Contractor does not desire to retain. For materials taken over or to be taken over by the Company, cost of such materials. The cost shall, however, take into account purchase, price, transportation & deterioration or damage which may have been caused to materials whilst in the custody of the Contractor.
 - (ii) For Contractor's materials not retained by the Company reasonable cost of transporting such materials from site to Contractor's permanent stores or to his other works, whichever is less. If materials are not transported to either of the said places, no cost of transportation shall be payable.
- b. If any materials supplied by the Company are rendered surplus, the same except normal wastage shall be returned by the Contractor to the Company at rates not exceeding those at which these were originally issued less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the Contractor. In addition, cost of transporting such materials from site to the Company stores, if so required by the Company.
- c. Reasonable compensation for transfer of T&P from site to Contractor's permanent stores or to his other works, whichever is less. If T&P are not transported to either of the said places, no cost of transportation shall be payable.

- 31.2 The Contractor shall, if required by the Engineer-in-Charge, furnish to him books of account, wage books, time sheets and other relevant documents as may be necessary to enable him to certify the reasonable amount payable under this Condition.

32 TERMINATION OF CONTRACT FOR DEATH

If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the Contractor is a partnership concern and one of the partners does then unless the Accepting Authority is satisfied that the legal representatives of the individual Contractor or of the proprietor of the Proprietary concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the Contract, the Accepting Authority shall be entitled to cancel the Contract as to its incomplete part without the Company being

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in any way liable to payment of any compensation to the estate of the deceased Contractor and/or to the surviving partners of the Contractor's firm on account of the cancellation of the Contract. The decision of the Accepting Authority that the legal representatives of the deceased to the surviving partners of the Contractor's firm cannot carry out and complete the Contract shall be final and binding on the Parties. In the event of such cancellation the Company shall not hold the estate of the deceased Contractor and/or the surviving partners of the Contractors firm liable in damaged for not completing the Contract.

33 CANCELLATION OF CONTRACT:

- i. If the Contractor:
 - a. At any time makes default in proceeding with the works with due diligence and continues to do so after a notice in writing of 7 days from the Engineer-in-Charge, or
 - b. Commits default in completing with any of the terms and conditions of the Contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge, or
 - c. Fails to complete the works or items of work with individual dates of completion, on or before the date(s) of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge, or
 - d. Shall offer to give or agree to give to any person in Company's service or to any other person on his behalf any gift of consideration of any kind as an inducement or reward for doing or for bearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other Contract for the Company, or
 - e. Shall enter into a Contract with the Company in connection with which omission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed in writing to the Accepting Authority/Engineer-in-Charge.
 - f. Shall obtain a contract with the Company as a result or ring tendering or other non-bonafied methods of competitive tendering, or
 - g. Being an individual, or if firm, any partner thereof, shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction under any Insolvency Act for the time being in force or make any conveyance or assignment of his effective or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors, or
 - h. Being a, Company, shall pass a resolution or the Court shall make an order the liquidation of his affairs, or a receiver or manager on behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the court or debenture holders to appoint a receiver or manager, or
 - i. Shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days, or
 - j. Assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or attempts to assign, transfer or sublet the entire works or any portion thereof without the prior written approval of the Accepting Authority, the Accepting Authority may, without prejudice to any other right to remedy which shall have accrued or shall accrue thereafter; the Company by written notice cancel the Contract as a whole or only such items or work in default from the Contract.

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- ii. The Accepting Authority shall on such cancellation have powers to :

Being an individual, or if firm, any partner thereof, shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction under any Insolvency Act for the time being in force or make any conveyance or assignment of his effective or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors, or

- a. Take possession of the site and any materials constructional plant, implements, stores, etc., thereon and/or
 - b. Carry out the incomplete work by any means at the risk and cost of the Contractor.
- iii. On cancellation of the Contract in full or in part the Engineer-in-Charge shall determine what amount, if any, is recoverable from the Contractor for completion of the works or part of the works or in case the works or part of the works is not to be completed, the loss or damage suffered by the Company. In determining the amount, credit shall be given to the Contractor for the value of the work executed by him up to the time of cancellation, the value of Contractor's materials taken over and incorporated in the work, and use of tackle and machinery belonging to the Contractor.
- iv. Any excess expenditure incurred or to be incurred by the Company in completing the works or part of the works or the excess loss or damages suffered or may be suffered by the Company as aforesaid after allowing such credit shall be recovered from any money due to the Contractor on any account, and if such money are not sufficient the Contractor shall be called upon in writing to pay the same within 30 days.
- v. If the Contractor shall fail to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sale any or all of the Contractor's unused materials, constructional plant implements, temporary buildings etc. and apply the proceeds of sale thereof towards the satisfaction of any sums due from the Contractor under the Contract and if thereafter there be any balance outstanding from the Contractor, it shall be recovered in accordance with the provisions of the Contract.
- vi. Any sums in excess of the amounts due to the Company and unsold materials, constructional plant, etc. shall be returned to the Contractor, provided always that if cost or anticipated cost of completion by the Company of the works or part of the works is less than the amount which the Contractor would have been paid had been completed the works or part of the works, such benefit shall not accrue to the Contractor.

34 **LIABILITY FOR DAMAGE, DEFECTS OR IMPERFECTIONS & RECTIFICATION THEREOF :**

If the Contractor or his workmen or employees shall injure or destroy any part of the building in which they may be working or any building, road, fence etc. contiguous to the premises on which the work or any part of it is being executed, or if any damage shall happen to the work while in progress the Contractor shall upon receipt of a notice in writing in that behalf make the same good at his own expenses. If it shall appear to the Engineer-in-Charge or his Representative at any time during construction or reconstruction or prior to the expiration of the Defects Liability period, that any work has been executed with unsound, imperfect or unskilled workmanship or that any materials or articles provided by the Contractor for execution of the work are unsound or of a quality inferior to that contract for, or otherwise not in accordance with the Contract, or that any defect, shrinkage or other faults have appeared in the work arising out of defective or improper materials or workmanship, the Contractor shall, upon receipt of a notice in writing in that behalf from the Engineer-in-

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Charge forthwith rectify or remove and re-construct the work so specified in whole or part as the case may be and/or remove the materials or articles so specified and provide other proper and suitable materials or articles at his own expense, notwithstanding that the same may have been inadvertently passed, certified and paid for and in the event of his failing to do so within the period to be specified by the Engineer-in-Charge in his notice aforesaid, the Engineer-in-Charge may rectify or remove and re-execute the work and/or remove and replace with other materials or articles so specified and provide other proper and suitable materials or articles at his own expense, notwithstanding that the same may have been inadvertently passed, certified and paid for and in the event of his failing to do so within the period to be specified by the Engineer-in-Charge in his notice aforesaid, the Engineer-in-Charge may rectify or remove and re-execute the work and/or remove and replace with other materials or articles complained of, as the case may be, by other means at the risk and expense of the Contractor.

35 URGENT WORKS

If any urgent work (in respect whereof the decision of the Engineer-in-Charge shall be final and binding) becomes necessary and the Contractor is unable or unwilling at once to carry it out, the Engineer-in-Charge may by his own or other work people, carry it out as he may consider necessary. If the urgent work shall be such as the Contractor is liable under the Contract to carry out at his expense, all expenses incurred on it by the Company shall be recoverable from the Contractor and be adjusted or set off against any such payable to him.

36 RECORDS & MEASUREMENT

- i. The Engineer-in-Charge shall except as otherwise stated ascertain and determine by measurement the value in accordance with the Contract or work done in accordance therewith.
- ii. All items having a financial value shall be entered in Measurement Book, level book etc. prescribed by the Company so that a complete record is obtained of all work performed under the Contract.
- iii. Measurement shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the Contractor or his authorized representative.
- iv. Before taking measurements of any work the Engineer-in-Charge or the person deputed by him for the purpose shall give a reasonable notice to the Contractor. If the Contractor fails to attend or send an authorized representative for measurement after such a notice or fails to countersign or to record the objection within a week from the date of measurement, then in any such event measurement taken by the Engineer-in-Charge or by the person deputed by him shall be taken to be correct measurements of the work.
- v. The Contractor shall, without extra charge provide assistance with every appliance labour, and other things necessary for measurement.
- vi. Measurements shall be signed and dated by both parties each day on the site on completion of measurement. If the Contractor objects to any of the measurement recorded on behalf of the Company a note to that effect shall be made in the Measurement Book against the item objected to and such note shall be signed and dated by both parties engaged in taking the measurement.

37 METHODS OF MEASUREMENT

Except where any general or detailed description of the work in quantities expressly those to the contrary, Schedule of Quantities shall be deemed to have been prepared and measurements shall be taken in accordance with the procedure set forth in the Schedule of Rates/Specification notwithstanding any provision in the relevant standard method of Measurement or any general or local custom. In the case of items which are not covered by the Schedule of Rates/Specification measurements shall be taken in accordance with the relevant Standard Method of Measurement issued by the Indian Standard Institution.

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- i. Interim bills shall be submitted by the Contractor at intervals as to be specified on or before the date fixed by the EIC for the work executed. The EIC shall then arrange to have the bill certified by taking or causing to be taken, where necessary, the requisite measurements of the work.
- ii. Payment on account for amount admissible shall be made on the Engineer-in-Charge certifying the sum to which the Contractor is considered entitled by way of interim payment.
- iii. Any interim certificate given relating to work done or materials delivered may be modified or corrected by any subsequent interim certificate or by the final certificate. No certificate of the EIC supporting an interim payment shall itself be of conclusive evidence that any work or materials to which it relates is/are in accordance with the Contract.
- iv. Pending consideration of extension of date of completion interim payments shall continue to be made as herein provided.

39 FINAL BILL PAYMENT:

- i. The final bill shall be submitted by the Contractor within three months of physical completion of the works. No further claims shall be made by the Contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payment of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and at rates as approved by Engineer-in-Charge, shall be made within the period specified.
- ii. After payment of the amount of the final bill payable as aforesaid has been made, the Contractor may, if he so desires, reconsider his position in respect of the disputed portion of the final bill and if he fails to do so within 90 days, his disputed claim shall be dealt with as provided in the Contract.

40 INCOME TAX:

Income Tax will be deducted by cash at source from Contractor's all bills as per Income Tax Act & Rules framed there under at such rates as may be applicable from time to time.

41 ARBITRATION:

B AND R confidently feel that there shall not arise any disputes or differences during execution and completion of the order I Contract by the Contractors).

However, in the event of any dispute arising between the Company and the Contractor (hereinafter referred individually as "the Party" and collectively as "the Parties"), concerning the interpretations of any terms and conditions of the Contract and I or contractual Obligations / performance I liabilities I responsibilities of the Parties to the said. Contract, the disputing Party shall refer the matter to the other Party for holding a mutual discussion for resolving the dispute: In case the Parties fail to arrive to any settlement through mutual discussion, either of the Parties may avail the following remedies:

Resolution of Dispute through Conciliation: -

- i) Any party may refer the dispute for Conciliation under Rules of Conciliation and Arbitration under SCOPE Forum of Conciliation and Arbitration (SFCA), 2003 and amendments made thereto from time to time. (hereinafter referred as "the Rules") by making application to the Secretariat of the SCOPE Forum.

The Party initiating conciliation shall send to the other. party a written invitation to conciliate under the Rules, briefly identifying the subject matter of the dispute.

The settlement so rendered between the Parties in pursuance thereof shall be final and binding on the Parties.

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If the other party rejects the invitation, there will be no conciliation proceedings at all.

Resolution of Dispute through Arbitration: -

- ii) In case the dispute is not settled by conciliation within 30 days of the initiation of conciliation or such further period as the parties shall agree in writing, the dispute shall be referred to and finally resolved by Arbitration, in accordance with the Rules of Arbitration of SCOPE Forum of Conciliation and Arbitration, 2003 and amendments made thereto from time to time.

The entire proceedings of Arbitration shall be governed under the Arbitration and Conciliation Act, 1996.

The venue of Arbitration shall be mutually decided by the Parties. In case the Parties do not agree for resolution of dispute through Conciliation and Arbitration by the above-mentioned SCOPE Forum, the disputing party shall opt for stipulated rules laid down under the Arbitration and Conciliation Act, 1996.

The Contract and the Parties therein shall be governed under the jurisdiction of Haryana High Court.

In the event of any dispute or difference relating to the interpretation and application of the provisions of the contracts and commercial agreements (except Income Tax, Customs, Excise duty and also concerning Railways) between company (B AND R) and any other Public Sector Undertaking/Government Department/Bank/Port Trust etc., such dispute or difference shall be referred by either party for Arbitration to the sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary of the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may take a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India.

Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary/ Additional Secretary, when so authorized by the Law Secretary, whose decision shall bind the Parties finally and conclusively. The parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.

Subject to any amendment that may be carried out by the Government of India from time to time, the procedure to be followed in the arbitration shall be as mentioned above, which is as per C.M. No. 4(1)/2011-DPE(PMA)GL dated 12.06.2013. of Department of Public Enterprises, Ministry of Heavy Industries and Public Enterprises, Govt of India or any modification issued in this regard.

42 ACCEPTANCE OF BID:

Acceptance of Client/Owner of the project is a pre-requisite for consideration of Bidder's offer by B AND R for these Tender/Commercial Agreements etc. Accordingly, Bidder(s) not acceptable to B AND R's Client / Owner shall not be considered their offer shall be rejected by B AND R. No correspondence & claim etc. from the Bidder in pursuant to the Tender/Commercial Agreements shall be entertained by B AND R under any circumstances what so ever.

43 EXTRA CLAIMS:

Notwithstanding anything contained in the contract, it should be clearly noted that no extra claim lodged/to be lodged by the Contractor shall be entertained by the Company in pursuant to this Contract. Nevertheless, if the Contractor insists and raises any extra claim bills, the Company shall pursue with the Owner in good faith, settlement of rates for Extra Items and claims, if raised by the Contractor on the Company and the decision taken by the Owner and the Company shall be binding upon and acceptable to the Contractor corresponding to and relevant with his part of the work. It should also be clearly understood

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GENERAL CONDITIONS OF CONTRACT

that the pursuing of the Contractor's claim on the Company in good faith with the Owner shall not mean under any circumstances, Company's acceptance of the rates of extra items and claims raised by the Contractor on the Company and at no point of time, Contractor's plea that irrespective of the decision taken by the Owner, the rates of extra items and claims shall have to be paid to the Contractor based on his claim stating that the Contract is between the Company and the Contractor having no relationship with the Owner, shall contractually hold good because the Company have pursued Contractor's bills with the Client in good faith only without going through the merit of the same.

44 TAXES & DUTIES:

The Contractor shall be exclusively responsible for payment of all Taxes, Duties, like GST that may be levied from time to time according to the Laws & Regulation now in force and also hereafter to be imposed, increased or modified from time to time. Nothing will be payable extra by the company in respect of any duties/taxes to be imposed on procurement of materials for execution of works contract.

For and on behalf of tenderer

SPECIAL CONDITIONS OF CONTRACT (SCC)

1.0 INTRODUCTION

THESE 'TECHNICAL SPECIFICATION AND SPECIAL CONDITIONS' SHALL BE READ IN CONJUNCTION WITH OTHER PROVISION INCLUDING GENERAL CONDITIONS OF THE CONTRACT AND ARE SUPPLEMENTARY TO & COMPLEMENTARY WITH EACH OTHER. HOWEVER, IN THE EVENT OF ANY PROVISIONS OF GENERAL CONDITIONS ARE REPUGNANT TO OR AT VARIANCE WITH ANY PROVISIONS OF SPECIAL CONDITIONS OF CONTRACT', THEN UNLESS A DIFFERENT INTENTION APPEARS BETWEEN THE TWO, THE PROVISION GIVEN IN SPECIAL CONDITIONS OF CONTRACT' SHALL BE DEEMED TO OVER-RIDE THAT PROVISION OF GENERAL CONDITIONS AND SHALL TO THE EXTENT OF SUCH REPUGNANCY OR VARIATION PREVAIL & GOVERN THE CONTRACT. CONDITIONS OF SCC SHALL OVERRIDE THE TECHNICAL SPECIFICATION.

WHERE ANY PORTION OF THE GCC IS REPUGNANT TO OR AT VARIANCE WITH ANY PROVISIONS OF THE SPECIAL CONDITIONS OF CONTRACT, THEN UNLESS A DIFFERENT INTENTION APPEARS, THE PROVISION(S) OF THE SPECIAL CONDITIONS OF CONTRACT SHALL BE DEEMED TO OVERRIDE THE PROVISION(S) OF GCC ONLY TO THE EXTENT THAT SUCH REPUGNANCIES OF VARIATIONS IN THE SPECIAL CONDITIONS OF CONTRACT ARE NOT POSSIBLE OF BEING RECONCILED WITH THE PROVISIONS OF GCC.

WITHOUT PREJUDICE TO THE PROVISIONS OF THE GENERAL CONDITIONS OF CONTRACT, WHENEVER IN THE BIDDING DOCUMENTS IT IS MENTIONED OR STATED THAT THE CONTRACTOR SHALL PERFORM CERTAIN WORK OR PROVIDE CERTAIN FACILITIES IT IS UNDERSTOOD THAT THE CONTRACTOR SHALL DO SO AT HIS OWN COST AND THE CONTRACT PRICE SHALL BE DEEMED TO HAVE INCLUDED COST OF SUCH PERFORMANCE AND/OR PROVISION, AS THE CASE MAY BE.

IN CASE OF AN IRRECONCILABLE CONFLICT BETWEEN INDIAN OR OTHER APPLICABLE STANDARDS, GENERAL CONDITIONS OF CONTRACT, SPECIAL CONDITIONS OF CONTRACT, SPECIFICATIONS, DRAWINGS AND/OR SCHEDULE OF RATES, THE FOLLOWING SHALL PREVAIL TO THE EXTENT OF SUCH IRRECONCILABLE CONFLICT IN DESCENDING ORDER OF PRECEDENCE.

- i. FORMAL CONTRACT.
- ii. DETAILED LETTER OF ACCEPTANCE.
- iii. FAX OF ACCEPTANCE.
- iv. SCHEDULE OF PRICE / RATES.
- v. JOB/PARTICULAR SPECIFICATION.
- vi. DRAWINGS.
- vii. TECHNICAL/ MATERIAL SPECIFICATIONS.
- viii. SPECIAL CONDITIONS OF CONTRACT.
- ix. SPECIAL INSTRUCTIONS TO BIDDERS
- x. GENERAL CONDITIONS OF CONTRACT.
- xi. STANDARD SPECIFICATIONS.
- xii. INDIAN STANDARDS.
- xiii. OTHER APPLICABLE STANDARDS

2.0 LOCATION AND ACCESS OF SITE

THE PROJECT SITE IS LOCATED AT IOCL PANIPAT REFINERY AT PANIPAT IN THE INDIAN STATE OF HARYANA. IOCL REFINERY IS WELL CONNECTED BY ROAD/TRAIN TO DELHI AND IS APPROXIMATELY 100 KMS FROM DELHI, A DRIVE OF APPROXIMATELY 2.5 HOURS.

3.0 QUOTATION / PREPARATION OF BID

BIDDER SHALL PREPARE THE BID IN ACCORDANCE WITH THE CONDITIONS MENTIONED IN THE COMPLETE TENDER DOCUMENT.

4.0 SUFFICIENCY OF BID

THE BIDDER SHALL BE DEEMED TO HAVE SATISFIED HIMSELF BEFORE BIDDING TO THE CORRECTNESS OR SUFFICIENCY OF HIS BID FOR THE WORK AND OF THE RATES AND PRICES QUOTED BY HIM WHICH SHALL COVER ALL HIS OBLIGATIONS UNDER THE CONTRACT NECESSARY FOR CONSTRUCTION OF WORK. NO EXTRA CHARGES WHATSOEVER CONSEQUENT OR ANY MISINTERPRETATION OR OTHERWISE SHALL BE ALLOWED.

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SPECIAL CONDITIONS OF CONTRACT (SCC)5.0 SITE VISIT

BY SUBMITTING THE BID, BIDDERS SHALL BE DEEMED TO HAVE INSPECTED AND EXAMINED THE WORK SITE, ITS SURROUNDINGS, LOCALITY, NATURE OF THE GROUND AND SUBSOIL, THE SCOPE AND NATURE OF WORK, MATERIALS NECESSARY FOR THE COMPLETION OF WORK, SAFETY REQUIREMENTS, QUALITY REQUIREMENTS, ENVIRONMENTAL REQUIREMENTS, STATUTORY REQUIREMENTS AND OTHER REQUIREMENT OF BANDR. BIDDERS WILL ALSO BE DEEMED TO HAVE OBTAINED ALL INFORMATION TO THE RISKS AND CONTINGENCIES, RESPONSIBILITIES AND OTHER CIRCUMSTANCES WHICH MIGHT INFLUENCE/ AFFECT ON HIS BID AND TO HAVE TAKEN INTO ACCOUNT ALL CONDITIONS AND DIFFICULTIES THAT MAY BE ENCOUNTERED DURING THE PROGRESS OF WORK. THE RATES QUOTED IN THE BID SHALL BE DEEMED ADEQUATE TO COMPLETE THE WORKS ACCORDING TO THE AGREEMENT AND TO COVER THE ENTIRE RESPONSIBILITY INVOLVED IN THE EXECUTION, COMPLETION AND MAINTENANCE OF THE WORK. BIDDER SHALL FURTHER BE DEEMED TO HAVE INCLUDED ALL LABOUR, LEAD, LIFTS, LOADING AND UNLOADING, TRANSPORTATION, STORAGE, COST TOWARDS COMPLIANCE TO STATUTORY RULES AND ALL OTHER CHARGES NECESSARY FOR COMPLETION OF THE WORK.

WORK UNDER THE CONTRACT SHALL BE EXECUTED AS GIVEN IN THIS TENDER DOCUMENT AND AS REQUIRED AT SITE WHETHER SPECIFICALLY MENTIONED OR NOT. THE BIDDER SHALL CARRY OUT AND COMPLETE THE WORK UNDER THE CONTRACT IN EVERY RESPECT IN CONFORMITY WITH THE CONTRACT DOCUMENTS/ WORK ORDER AND AS PER DIRECTION AND TO THE SATISFACTION OF THE ENGINEER-IN-CHARGE.

6.0 QUOTATION

THE BIDDER SHALL INDICATE HIS PRICE AS PER SCOPE OF WORK AND SOQR GIVEN IN TENDER DOCUMENT.

THE ENCLOSED BID DOCUMENTS ARE DEEMED TO BE SUFFICIENT FOR THE BIDDER TO ASSESS THE NATURE AND QUANTITY OF WORK INVOLVED AND TO QUOTE HIS PRICES FOR THE ABOVE JOB. NO PAYMENT ON ACCOUNT OF DEVIATIONS FROM THE BID DOCUMENTS WILL BE ADMISSIBLE.

7.0 COMMENCEMENT OF WORK

COMMENCE DATE OF WORK SHALL BE THE DATE OF ISSUANCE OF LETTER OF INTENT. (LOI)

8.0 BANDR'S SCOPE OF SUPPLY:

- ALL NECESSARY CONSTRUCTION DRAWINGS, CODE, STANDARD, SPECIFICATION ETC.
- BOUGHT OUT MATERIAL LIKE TMT BAR, RMC & MS PLATE ON FREE ISSUE BASIS.
- NECESSARY INSURANCE FOR THE WORKMEN COMPENSATION.
- NECESSARY LABOUR LICENSE SHALL BE ARRANGED BY CONTRACTOR.
- LAND FOR INSTALLATION OF AGENCY'S INFRASTRUCTURE LIKE SITE OFFICE, STORE ETC. SHALL BE PROVIDED SUBJECT TO AVAILABILITY FROM CLIENT.

9.0 BIDDER'S SCOPE OF SUPPLY:

- ALL REQUIRED MAN POWER OF VARIOUS CATEGORIES, EXPERIENCED & QUALIFIED STAFF/ SUPERVISORS INCLUDING THEIR ACCOMMODATION & TRANSPORTATION.
- ARRANGEMENT OF CONSTRUCTION POWER BY PROVIDING D.G INCLUDING P.O.L & OPERATOR.
- ARRANGEMENT OF CONSTRUCTION WATER.
- AREA LIGHTING ARRANGEMENT AT SITE INCLUDING DISTRIBUTION OF CONSTRUCTION POWER AND WATER.
- ALL TYPES OF EQUIPMENT'S & MACHINERIES LIKE HYDRAULIC CRANE WITH ALL LIFTING ACCESSORIES WITH VALID TPI CERTIFICATE, EXCAVATOR, DUMPER, ROLLER, VIBRATOR, TOOL & TACKLES ETC. INCLUDING P.O.L & OPERATOR.
- ALL OTHER BOUGHT OUT MATERIALS (EXCEPT THOSE WHICH WILL BE ISSUED BY B&R ON FREE ISSUE BASIS) LIKE SAND, CEMENT, BRICKS, ANCHOR BOLT ETC. AS PER TECHNICAL SPECIFICATIONS INCLUDING ALL NECESSARY CONSUMABLE MATERIALS REQUIRED TO COMPLETE THE WORK IN ALL RESPECT.
- ALL REQUIRED SHUTTERING & SCAFFOLDING MATERIAL INCLUDING INSTALLATION OF TEMPORARY STAGING IN LINE WITH THE SAFETY GUIDELINE OF IOCL / EIL & REMOVAL OF THE SAME AFTER COMPLETION & ACCEPTANCE OF WORK IN ALL RESPECT.

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SPECIAL CONDITIONS OF CONTRACT (SCC)

- ALL TYPES OF MACHINERIES LIKE BAR CUTTING M/C, BAR BENDING M/C, WELDING M/C, DE-WATERING PUMPS AND OTHER TOOLS TACKLES ETC.
- ALL REQUIRED CONSUMABLES MATERIAL E.G OXYGEN, LPG / DA, CUTTING WHEEL, GRINDING WHEEL, POWER CABLES, WELDING CABLE, GAS CUTTING HOSE PIPE, PPES INCLUDING SAFETY SHOE, GUMBOOTS, COVER ALL, HELMET, SAFETY GOGGLES, HAND GLOVES ETC.
- ALL NECESSARY INFRASTRUCTURES E.G. SITE OFFICE, STORE ETC.
- COMPLIANCE OF ALL STATUTORY OBLIGATIONS PERTAINING TO THE WORKMEN ENGAGED BY THE AGENCY E.G. PF & ESI ETC.
- TRANSPORTATION, LOADING & UNLOADING OF ALL MATERIALS WITHIN PROJECT PREMISES.
- CARRY OUT ANY OTHER INCIDENTAL/ INTERMEDIATE /ANCILLARY OR ANY ENABLING WORKS NOT SPECIFICALLY MENTIONED IN SPECIFICATION BUT REQUIRED TO COMPLETE THE WORKS.
- WATCH & WARD OF ALL MATERIALS OWNED BY BOTH THE AGENCY AND B&R.
- LIAISON WITH LOCAL AUTHORITIES AND CO-ORDINATION WITH OTHER AGENCIES & ADMINISTRATION.
- COVID TEST REPORT/ VACCINATION CERTIFICATE, POLICE VERIFICATION CERTIFICATE, INSURANCE (PMJJBY & PMSBY) ETC. & ANY OTHER DOCUMENTS REQUIRED OF ALL STAFF/ WORKERS FOR PREPARATION OF GATE PASSES.
- AGENCY HAS TO SUPPLY THE FOLLOWING MANPOWER DURING THE ENTIRE CONTRACTUAL PERIOD FOR PROVIDING EXCLUSIVE SERVICE TO B&R, WHICH SHOULD BE CONSIDERED WITHIN THEIR QUOTED RATES AND FAILING WHICH, B&R WILL DEDUCT THE AMOUNT, AS MENTIONED IN THE TABLE BELOW FROM THEIR MONTHLY R.A. BILLS.

SL NO	CATEGORY/GRADE	QTY IN NOS	AMOUNT TO BE DEDUCTED PER MONTH PER PERSON IN CASE OF NON-SUPPLY
1	DISCIPLINE ENGINEER (5YR. EXP. FOR DEGREE & 8 YRS EXP. FOR DIPLOMA)	1	45,000.00
2	SITE SUPERVISOR	1	25,000.00

10.0 SCOPE OF WORK

THE SCOPE OF WORK IN GENERAL INCLUDES SCOPE OF WORK SPECIFIED IN VARIOUS TECHNICAL SPECIFICATIONS/ SECTIONS PROVIDED IN PART-I (TECHNICAL) AND SCHEDULE OF RATES (SOR) ENCLOSED IN THE BIDDING DOCUMENT. FURTHER, IT INCLUDES ANY OTHER WORK NOT SPECIFICALLY MENTIONED BUT REQUIRED TO COMPLETE THE WORK AS PER SPECIFICATIONS, DRAWINGS AND INSTRUCTIONS OF ENGINEER-IN-CHARGE.

SCOPE OF WORK SHALL BE READ IN CONJUNCTION WITH ITEM DESCRIPTION OF SCHEDULE OF RATES AND BIDDER'S SCOPE SHALL INCLUDE ALL ACTIVITIES OF WORK SPECIFIED IN THE ITEM DESCRIPTION OF SCHEDULE OF RATES.

RATES SHALL INCLUDE ALL COST FOR THE PERFORMANCE OF THE ITEM CONSIDERING ALL PARTS OF THE BIDDING DOCUMENT. IN CASE ANY ACTIVITY THOUGH SPECIFICALLY NOT COVERED IN DESCRIPTION OF ITEM UNDER 'SCHEDULE OF RATES' BUT IS REQUIRED TO COMPLETE THE WORK WHICH COULD BE REASONABLY IMPLIED/ INFORMED FROM THE CONTENT OF BIDDING DOCUMENT, THE COST FOR CARRYING OUT SUCH ACTIVITY OF WORK SHALL BE DEEMED TO BE INCLUDED IN THE ITEM RATE.

THIS IS A PROJECT INSIDE THE RUNNING REFINERY AND THE SITE IS FAIRLY LEVELLED AND GRADED.

THE SCOPE OF WORK UNDER GENENARAL CIVIL WORK LIKE EXCAVATION, PCC, REINFORCEMENT, SHUTTERING, RCC, BACKFILLING, FINISHING WORKS ETC SHALL BE AS PER THE EIL STANDARD SPECIFICATION(S) ATTACHED ELSEWHERE IN THE TENDER DOCUMENT.

THE ENTIRE WORK UNDER THIS SPECIFICATION SHALL BE COMPLETED WITHIN STIPULATED PERIOD FROM THE DATE OF PLACEMENT OF ORDER. AFTER AWARD OF CONTRACT, A FINAL PROGRAM SHALL BE PREPARED WELL IN ADVANCE FOR ERECTION.

THE BIDDER SHALL NOTE THAT NO SUBCONTRACTOR SHALL BE ENGAGED BY THEM FOR THE ABOVE WORK.

IF DUE TO A PARTICULAR DESIGN OR SPECIFICATION OR AVAILABILITY OF MATERIALS OR ANY OTHER REASON, A

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SPECIAL CONDITIONS OF CONTRACT (SCC)

PARTICULAR SEQUENCE OF OPERATION IS DEMANDED BY THE ENGINEER DUE TO WHICH SOME INTERRUPTIONS ARE INHERENT TO ANY ONE OR MORE TYPES OF WORK OR ITEMS OF EXECUTION, THEN NO CLAIM FOR SUCH INTERRUPTION SHALL BE ENTERTAINED AND BIDDER SHALL HAVE TO FOLLOW THE SEQUENCE AS INSTRUCTED BY THE ENGINEER

THE BIDDER MAY WORK BEYOND NORMAL WORKING HOUR AND ALSO ON SUNDAY AND HOLIDAY (WITH PRIOR APPROVAL FROM BANDR) AS DESIRED BY BANDR TO MAINTAIN PROGRESS OF WORK AS PER SCHEDULE WITHOUT ANY ADDITIONAL LIABILITY TO BANDR. THE BIDDER SHALL GIVE PRIORITY OR REDEPLOY THE WORK FORCE FOR A PARTICULAR WORK AS INSTRUCTED BY BANDR.

THE BIDDER SHALL SUBMIT MONTHLY ACCOUNT OF STRUCTURAL MATERIALS MADE AVAILABLE BY THE BANDR AND BANDR MAY INSPECT SUCH MATERIALS IN BIDDER'S STOCK YARD.

ALL MATERIALS SHALL BE STORED AND STACKED PROPERLY ENSURING THAT PLACE IS PROPERLY DRAINED AND IS FREE FROM DIRT. IT SHALL BE ENSURED THAT NO DAMAGE IS CAUSED DUE TO IMPROPER STACKING.

ERECTION OF STRUCTURAL COMPONENTS SHALL PREFERABLY BE TAKEN UP AS PER THE SEQUENCE OF ERECTION.

THE BANDR/ EIL/IOCL SHALL HAVE THE POWER:

- TO REJECT ANY MATERIAL AS NOT BEING IN ACCORDANCE WITH SPECIFICATIONS & DRAWINGS.
- IF, ON REJECTION OF MATERIAL BY THE BANDR/EIL/IOCL THE BIDDER FAILS TO MAKE SATISFACTORY PROGRESS WITHIN THE STIPULATED PERIOD, THE BANDR/EIL/IOCL SHALL BE AT LIBERTY TO CANCEL THE CONTRACT AND SUPPLY OR AUTHORISE THE SUPPLY OF OTHER BOUGHT OUT MATERIALS (EXCEPT THOSE WHICH WILL BE ISSUED BY B&R ON FREE ISSUE BASIS) LIKE SAND, CEMENT, BRICKS, ANCHOR BOLT ETC. MATERIAL, AT THE RISK AND COST OF THE BIDDER, WITHOUT PREJUDICE TO ANY ACTION BEING TAKEN IN ADDITION TO TERMS OF GENERAL CONDITIONS OF CONTRACT.

CARRYING OUT REQUIRED SCAFFOLDING WORKS: WHEREVER REQUIRED AND AS PER EIL/IOCL SPECIFICATION AT ALL LEVEL AND HEIGHT FOR EXECUTION OF THE ABOVE WORKS.

RETURNING OF ALL MATERIALS TO IOCL/BANDR'S DESIGNATED STORAGE POINT AS PER THE INSTRUCTIONS OF ENGINEER-IN-CHARGE.

TO CARRY OUT ALL REPAIRS ARISING OUT OF DEFECTIVE WORKS DONE BY THE BIDDER.

CLEANING OF JOB SITES AND TRANSPORTING ALL SURPLUS MATERIAL, DEBRIS, SCRAP, CONSTRUCTION EQUIPMENT ETC. AS PER DIRECTION OF ENGINEER-IN-CHARGE.

RECONCILIATION & RETURNING OF ALL MATERIALS, HAND TOOLS & TACKLES ISSUED TO THE BIDDER BY THE COMPANY.

TO DEPLOY SUITABLY QUALIFIED SUPERVISORS IN REQUIRED NUMBERS TO ASSURE QUALITY OF WORK TO THE FULL SATISFACTION OF M/S. IOCL / EIL / BANDR.

BIDDER SHALL BE RESPONSIBLE FOR PROPER COORDINATION WITH OTHER AGENCIES OPERATING AT THE SITE OF WORK SO THAT WORK MAY BE CARRIED OUT CONCURRENTLY, WITHOUT ANY HINDRANCE TO OTHERS. THE ENGINEER-IN-CHARGE SHALL RESOLVE DISPUTES, IF ANY, IN THIS REGARD, DECISION OF THE ENGINEER IN CHARGE SHALL BE FINAL AND BINDING ON THE BIDDER.

ALL WORKS SHALL BE DONE TO THE ENTIRE SATISFACTION OF THE ENGINEER-IN-CHARGE. ANY WORK NOT CARRIED OUT IN ACCORDANCE WITH THE INSTRUCTIONS SHALL BE DISMANTLED AND MADE GOOD WITHOUT ANY EXTRA COST AND TIME IMPLICATION TO THE IOCL.

IF AND WHEN REQUIRED FOR THE COORDINATION OF THE WORKS WITH OTHER AGENCIES INVOLVED AT SITE, THE BIDDER SHALL WITHIN THE SCOPE OF WORK, RE-ROUTE AND/OR PREPARE APPROACHES AND WORKING AREAS AS MAY BE NECESSARY.

THE BIDDER SHALL WITHIN THE SCOPE OF WORK OBSERVE IN ADDITION TO SPECIFICATIONS, ALL NATIONAL AND LOCAL LAWS, ORDINANCES, RULES AND REGULATION AND REQUIREMENTS PERTAINING TO THE WORK

THE ENTIRE WORK UNDER THIS SPECIFICATION SHALL BE COMPLETED WITHIN STIPULATED PERIOD FROM THE DATE OF PLACEMENT OF ORDER. AFTER AWARD OF CONTRACT, A FINAL PROGRAM SHALL BE PREPARED WELL IN ADVANCE FOR ENTIRE WORK.

SPECIAL CONDITIONS OF CONTRACT (SCC)

11.0 TESTS AND INSPECTION OF WORKS

- ❖ THE BIDDER SHALL CARRY OUT THE VARIOUS TESTS AS ENUMERATED IN THE BIDDING DOCUMENT AND AS PER DIRECTION OF ENGINEER-IN-CHARGE EITHER ON FIELD OR OUTSIDE LABORATORIES CONCERNING THE EXECUTION OF WORK AND SUPPLY OF THE MATERIAL BY THE BIDDER. ALL THE EXPENSES SHALL BE BORNE BY THE BIDDER AND SHALL BE CONSIDERED AS INCLUDED IN THE QUOTED PRICE. THE INSPECTION SHALL BE DONE BY FOLLOWING AGENCIES/REPRESENTATIVES AS APPLICABLE:
 - THIRD PARTY INSPECTION AGENCY NOMINATED BY THE OWNER FOR ALL SUPPLY ITEMS AMONG THE FOLLOWING:
 - M/S TUV SUD SOUTH ASIA PVT. LTD.
 - M/S ABS INDUSTRIAL VERIFICATION (INDIA) PVT. LTD.
 - M/S VCS QUALITY SERVICES PRIVATE LIMITED
 - M/S PROJECTS AND DEVELOPMENT INDIA LTD. (PDIL)
 - M/S TATA PROJECTS LIMITED
 - M/S CERTIFICATION ENGINEERS INTERNATIONAL LIMITED
 - M/S BUREAU VERITAS (INDIA) PVT. LTD.
 - M/S INTERNATIONAL CERTIFICATION SERVICES PVT. LTD.
 - M/S SGS INDIA PVT. LTD.
- ❖ ALL THE TESTS EITHER ON THE FIELD OR AT OUTSIDE LABORATORY OR AT ANY OTHER PLACE, CONCERNING THE EXECUTION OF THE WORK AND SUPPLY OF MATERIALS BY THE BIDDER SHALL BE CARRIED OUT BY THE BIDDER AT HIS OWN COST.
- ❖ THE WORK IS SUBJECT TO INSPECTION AT ALL TIMES BY THE ENGINEER-IN-CHARGE. THE BIDDER SHALL CARRY OUT ALL INSTRUCTIONS GIVEN DURING INSPECTION AND SHALL ENSURE THAT THE WORK IS BEING CARRIED OUT ACCORDING TO THE TECHNICAL SPECIFICATIONS OF THIS BIDDING DOCUMENT, THE TECHNICAL DOCUMENTS THAT WILL BE FURNISHED TO HIM DURING PERFORMANCE OF WORK AND THE RELEVANT CODES OF PRACTICE FURNISHED TO HIM DURING THE PERFORMANCE OF THE WORK.
- ❖ THE BIDDER SHALL PROVIDE, FOR PURPOSES OF INSPECTION, ACCESS LADDERS, LIGHTING AND NECESSARY INSTRUMENTS AT HIS OWN COST INCLUDING LOW VOLTAGE (24V) LIGHTING EQUIPMENT FOR INSPECTION OF WORK. COMPRESSED AIR FOR CARRYING OUT WORKS SHALL BE ARRANGED BY THE BIDDER AT HIS OWN COST.
- ❖ ANY WORK NOT CONFORMING TO THE EXECUTION DRAWINGS, SPECIFICATIONS OR CODES SHALL BE REJECTED FORTHWITH AND THE BIDDER SHALL CARRY OUT THE RECTIFICATIONS AT HIS OWN COST.
- ❖ ALL RESULTS OF INSPECTION AND TEST WILL BE RECORDED IN THE INSPECTION REPORTS, PROFORMA OF WHICH WILL BE APPROVED BY THE ENGINEER-IN-CHARGE. THESE REPORTS SHALL FORM PART OF THE COMPLETION DOCUMENTS.
- ❖ FOR MATERIALS SUPPLIED BY OWNER, BIDDER SHALL CARRYOUT THE TESTS, IF REQUIRED BY THE ENGINEER-IN-CHARGE, AND THE COST OF SUCH TESTS SHALL BE REIMBURSED BY THE OWNER AT ACTUAL TO THE BIDDER ON PRODUCTION OF DOCUMENTARY EVIDENCE.
- ❖ INSPECTION AND ACCEPTANCE OF THE WORK SHALL NOT RELIEVE THE BIDDER FROM ANY OF HIS RESPONSIBILITIES UNDER THIS CONTRACT.
- ❖ COST TOWARDS REPEAT TESTS AND INSPECTION DUE TO FAILURES, REPAIRS ETC. FOR REASONS ATTRIBUTABLE TO THE BIDDER SHALL BE BORNE BY THE BIDDER.
- ❖ VARIOUS TESTS AS SPECIFIED IN SPECIFICATIONS SHALL BE CARRIED OUT TO THE ENTIRE SATISFACTION OF OWNER/ CONSULTANT.

12.0 MECHANIZATION OF CONSTRUCTION ACTIVITIES AND MOBILIZATION OF CONSTRUCTION EQUIPMENT

12.1 MECHANIZATION OF CONSTRUCTION ACTIVITIES

- ❖ THE BIDDER SHALL MECHANIZE THE CONSTRUCTION ACTIVITIES TO THE MAXIMUM EXTENT BY DEPLOYING ALL NECESSARY CONSTRUCTION EQUIPMENT/MACHINERY IN ADEQUATE NUMBERS AND CAPACITIES.
- ❖ WHEREVER STRUCTURAL/ PIPING WORKS ARE INCLUDED IN THE SCOPE, THE RESPONSIBILITIES OF BIDDER SHALL INCLUDE ESTABLISHING AND MAINTAINING OF A PROPER FABRICATION WORKSHOP WITH

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SPECIAL CONDITIONS OF CONTRACT (SCC)

TRANSPORTATION FACILITIES TO SITE TO CARRYOUT FABRICATION OF STEEL STRUCTURES, PIPING SPECIALS ETC., PREPARING APPROACHES WORKING AREAS FOR THE MOVEMENT/OPERATION OF CRANES AND LEVELLING THE AREAS FOR ASSEMBLY / ERECTION TO ENSURE EFFECTIVE MECHANISATION ON THE WORKS. IT SHALL BE THE RESPONSIBILITY OF THE BIDDER TO CARRY OUT LEVELLING / DRESSING / GRADING WITH A PROPER APPROACH FOR THE MOVEMENT OF EQUIPMENT AND MACHINERY, AT HIS OWN COST. NO EXTRA PAYMENT SHALL BE MADE BY THE OWNER FOR LEVELLING / DRESSING / GRADING. THE BIDDER SHALL ACQUAINT HIMSELF WITH AVAILABILITY OF ACCESS, FACILITIES SUCH AS RAILWAY SIDING, LOCAL LABOUR ETC. AND THE BIDDER MAY HAVE TO BUILD TEMPORARY ACCESS ROADS TO AID HIS WORK AND THE QUOTED AND AGREED RATES SHALL BE DEEMED TO INCLUDE THE SAME

- ❖ FOR SPEEDY EXECUTION OF WORK, BIDDER SHALL ALSO ENSURE USE OF COMPUTER SOFTWARE FOR AT LEAST THE FOLLOWING:
 - BILLING
 - PLANNING & SCHEDULING
 - PROGRESS REPORTING
 - MATERIAL CONTROL & WAREHOUSING
 - SAFETY RECORDS
 - RESOURCE DEPLOYMENT
 - COMMUNICATION
- ❖ BIDDER FURTHER AGREES THAT CONTRACT PRICE IS INCLUSIVE OF ALL THE ASSOCIATED COSTS, WHICH HE MAY INCURRED FOR ACTUAL MOBILIZATION, DEMOBILIZATION REQUIRED IN RESPECT OF USE OF MECHANIZED CONSTRUCTION TECHNIQUES AND THAT THE OWNER/ CONSULTANT IN THIS REGARD SHALL ENTERTAIN NO CLAIM WHATSOEVER.

12.2 MOBILIZATION OF CONSTRUCTION EQUIPMENT

THE BIDDER SHALL WITHOUT PREJUDICE TO HIS RESPONSIBILITIES TO EXECUTE AND COMPLETE THE WORK AS PER THE SPECIFICATIONS AND TIME SCHEDULE, PROGRESSIVELY DEPLOY MINIMUM CONSTRUCTION EQUIPMENT, TOOLS AND TACKLES AND FURTHER AUGMENT THE SAME DEPENDING ON THE EXIGENCIES OF WORK AND AS DECIDED BY THE ENGINEER-IN-CHARGE SO AS TO SUIT THE CONSTRUCTION SCHEDULE WITHIN SCHEDULED COMPLETION DATE WITHOUT ANY ADDITIONAL COST TO OWNER/BANDR. THE BIDDER SHALL SUBMIT A LIST OF CONSTRUCTION EQUIPMENTS HE PROPOSES TO DEPLOY FOR THE SUBJECT WORK ALONG WITH DEPLOYMENT SCHEDULE. NO CONSTRUCTION EQUIPMENT SHALL BE SUPPLIED BY THE OWNER, UNLESS SPECIFIED BY OWNER SPECIFICALLY IN THE BIDDING DOCUMENT.

13.0 SITE CLEANING

- A. THE BIDDER SHALL CLEAN AND KEEP CLEAN THE WORK SITE FROM TIME TO TIME TO THE SATISFACTION OF THE ENGINEER- IN-CHARGE FOR EASY ACCESS TO WORK SITE AND TO ENSURE SAFE PASSAGE, MOVEMENT AND WORKING.
- B. IF THE WORK INVOLVES DISMANTLING OF ANY EXISTING STRUCTURE IN WHOLE OR PART, CARE SHALL BE TAKEN TO LIMIT THE DISMANTLING UP TO THE EXACT POINT AND/OR LINES AS DIRECTED BY THE ENGINEER-IN-CHARGE AND ANY DAMAGE CAUSED TO THE EXISTING STRUCTURE BEYOND THE SAID LINE OR POINT SHALL BE REPAIRED AND RESTORED TO THE ORIGINAL CONDITION AT THE BIDDER'S COST AND RISKS TO THE SATISFACTION OF THE ENGINEER-IN-CHARGE, WHOSE DECISION SHALL BE FINAL AND BINDING UPON THE BIDDER.
- C. THE BIDDER SHALL BE THE CUSTODIAN OF THE DISMANTLED MATERIALS TILL THE ENGINEER-IN-CHARGE TAKES CHARGE THEREOF.
- D. THE BIDDER SHALL DISPOSE OFF THE UNSERVICEABLE MATERIALS, DEBRIS ETC. TO AREA WITHIN IOCL PLANT PREMISES/ OTHER AREA AS DIRECTED BY THE ENGINEER-IN-CHARGE.
- E. THE BIDDER SHALL SORT OUT, CLEAR AND STACK THE SERVICEABLE MATERIALS OBTAINED FROM THE DISMANTLING/ RENEWAL AT PLACES AS DIRECTED BY THE ENGINEER-IN-CHARGE.
- F. NO EXTRA PAYMENT SHALL BE PAID ON THIS ACCOUNT. THE RATES QUOTED IN SOR ARE DEEMED TO BE INCLUSIVE OF ALL THE COSTS TOWARDS ALL THE ABOVE ACTIVITIES AS WELL.

14.0 THE BIDDER SHALL NOTE THAT NO LABOUR-CONTRACTOR SHALL BE ENGAGED BY THEM FOR THE ABOVE WORK.

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SPECIAL CONDITIONS OF CONTRACT (SCC)

IF DUE TO A PARTICULAR DESIGN OR SPECIFICATION OR AVAILABILITY OF MATERIALS OR ANY OTHER REASON, A PARTICULAR SEQUENCE OF OPERATION IS DEMANDED BY THE ENGINEER DUE TO WHICH SOME INTERRUPTIONS ARE INHERENT TO ANY ONE OR MORE TYPE OF WORK OR ITEMS OF EXECUTION, THEN NO CLAIM FOR SUCH INTERRUPTION SHALL BE ENTERTAINED AND BIDDER SHALL HAVE TO FOLLOW THE SEQUENCE AS INSTRUCTED BY THE ENGINEER-IN-CHARGE.

THE BIDDER MAY WORK BEYOND NORMAL WORKING HOUR, AND ALSO ON SUNDAY AND HOLIDAYS (WITH PRIOR APPROVAL FROM BANDR/IOCL/EIL AS DESIRED BY BANDR TO MAINTAIN PROGRESS OF WORK AS PER SCHEDULE WITHOUT ANY ADDITIONAL LIABILITY TO BANDR. THE BIDDER SHALL GIVE PRIORITY OR REDEPLOY THE WORK FORCE FOR A PARTICULAR WORK AS INSTRUCTED BY BANDR.

ALL MATERIALS SHALL BE STORED AND STACKED PROPERLY ENSURING THAT PLACE IS PROPERLY DRAINED AND IS FREE FROM DIRT. IT SHALL BE ENSURED THAT NO DAMAGE IS CAUSED DUE TO IMPROPER STACKING.

THE IOCL / EIL / BANDR SHALL HAVE FREE ACCESS AT ALL TIMES TO THOSE PARTS OF BIDDER'S AREA OF WORK WHICH ARE CONCERNED WITH THE FABRICATION OF STRUCTURAL WORKS. ALSO, HE SHALL BE AFFORDED ALL REASONABLE FACILITIES AT ALL STAGES OF PREPARATION, FABRICATION FOR SATISFYING HIMSELF THAT THE FABRICATION IS BEING UNDERTAKEN IN ACCORDANCE WITH THE PROVISIONS OF RELEVANT SPECIFICATION.

THE IOCL / EIL / BANDR SHALL HAVE THE POWER:

TO REJECT ANY STRUCTURAL COMPONENTS AS NOT BEING IN ACCORDANCE WITH SPECIFICATIONS & DRAWINGS.

IF, ON REJECTION OF STRUCTURAL COMPONENTS BY THE IOCL / EIL / BANDR THE BIDDER FAILS TO MAKE SATISFACTORY PROGRESS WITHIN THE STIPULATED PERIOD, THE IOCL / EIL / BANDR SHALL BE AT LIBERTY TO CANCEL THE CONTRACT AND FABRICATE OR AUTHORIZE THE FABRICATION OF THE STRUCTURAL COMPONENTS, AT THE RISK AND COST OF THE BIDDER, WITHOUT PREJUDICE TO ANY ACTION BEING TAKEN IN ADDITION TO TERMS OF GENERAL CONDITIONS OF CONTRACT.

15.0 RETENTION MONEY:

5.0% VALUE FROM EACH R.A. BILL AS WELL AS FROM FINAL BILL OF THE AGENCY WILL BE DEDUCTED AND THE SAME WILL BE RETURNED AFTER EXPIRY OF DEFECT LIABILITY PERIOD, WHICH IS 12 MONTHS FROM THE DATE OF FINAL COMPLETION.

NO INTEREST WILL BE PAID TOWARDS THE SAME.

16.0 CODE & SPECIFICATIONS

THE ENTIRE WORKS ENTRUSTED TO THE BIDDER SHALL BE EXECUTED BY HIM STRICTLY IN ACCORDANCE WITH APPROVED DRAWINGS, SPECIFICATIONS & PROCEDURES ETC. OF THE OWNER, AS STIPULATED IN THE RELEVANT CONTRACT BETWEEN THE COMPANY AND THE OWNER, ALSO AS PER THE RELEVANT I.S. SPECIFICATIONS, STANDARD ENGINEERING CODE AND PRACTICE ETC. AS APPLICABLE TO THIS CASE. HOWEVER, IN THE EVENT OF ANY CONTRADICTION BETWEEN THE SPECIFICATIONS APPROVED BY THE OWNER AND I.S. SPECIFICATIONS, THE FORMER SHALL PREVAIL AND GOVERN.

17.0 GENERAL INSTRUCTION FOR WELDING

THE BIDDER SHALL PERFORM WELDING BASED ON BANDR/EIL/IOCL APPROVED QAP/ITP/JOB PROCEDURE/ SPECIFICATION.

18.0 MATERIALS

THE BIDDER SHALL AT HIS OWN EXPENSE, PROVIDE ALL MATERIALS REQUIRED FOR THE WORK.

ALL MATERIALS TO BE PROVIDED BY THE BIDDER SHALL BE IN CONFORMITY WITH THE SPECIFICATIONS LAID DOWN IN THE CONTRACT AND THE BIDDER SHALL, IF REQUESTED BY THE ENGINEER-IN-CHARGE, FURNISH PROOF TO THE SATISFACTION OF HIM THAT THE MATERIALS SO COMPLY.

THE BIDDER SHALL ARRANGE AND PROCURE ALL THE MATERIALS ETC. FOR COMPLETING THE WORK SATISFACTORILY AND THE COST OF THE SAME SHALL BE DEEMED TO HAVE BEEN COVERED IN HIS QUOTED PRICE.

ALL CHARGES ON ACCOUNT OF TRANSPORTATION, OCTROI, TERMINAL AND OTHER DUTIES ON MATERIALS OBTAINED FOR THE WORKS FROM ANY SOURCE (INCLUDING MATERIALS SUPPLIED BY THE COMPANY) SHALL BE BORNE BY THE BIDDER.

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SPECIAL CONDITIONS OF CONTRACT (SCC)**19.0 REJECTION OF MATERIALS**

ALL MATERIALS BROUGHT TO THE SITE FOR USE IN THE WORK SHALL BE AS PER THE SPECIFICATION OF RELEVANT ITEM OF WORK. ALL MATERIALS BROUGHT TO THE SITE MUST BE APPROVED BY THE BANDR/EIL/IOCL PRIOR TO USE IN THE WORK. REJECTED MATERIALS MUST BE REMOVED BY THE BIDDER FROM THE SITE WITHIN 24 HOURS OF THE ISSUE OF ORDER TO THAT EFFECT. IN CASE OF NON-COMPLIANCE OF SUCH ORDER, THE ENGINEER-IN-CHARGE SHALL HAVE THE AUTHORITY TO CAUSE SUCH REMOVAL AT THE COST AND EXPENSE OF THE BIDDER AND THE BIDDER SHALL NOT BE ENTITLED TO CLAIM FOR ANY LOSS OR DAMAGE OF THAT ACCOUNT.

20.0 MAKE OF MATERIALS

BIDDER TO NOTE THAT THE BIDDER TO OBTAIN NECESSARY APPROVAL FROM BANDR/EIL/IOCL BEFORE PROCUREMENT OF MATERIALS FAILING WHICH BANDR'S RESERVE RIGHTS TO REJECT THE MATERIALS.

21.0 APPROVAL OF SAMPLE

SAMPLES OF ALL MATERIALS TO BE SUPPLIED BY THE BIDDER AND TO BE USED IN THE WORK SHALL HAVE TO BE APPROVED BY THE ENGINEER-IN-CHARGE AND CHECKING THE QUALITY OF SUCH MATERIALS SHALL HAVE TO BE DONE AS DIRECTED BY ENGINEER-IN-CHARGE PRIOR TO UTILIZATION IN THE WORK.

22.0 CONDITIONS FOR ISSUE OF MATERIALS

WHENEVER ANY MATERIAL IS ISSUED BY IOCL, FOLLOWING CONDITIONS FOR ISSUE OF MATERIAL IN ADDITION TO OTHER CONDITIONS SPECIFIED IN THE CONTRACT SHALL BE APPLICABLE:

NECESSARY INDENTS SHALL BE RAISED BY THE BIDDER AS PER PROCEDURE LAID DOWN BY THE ENGINEER-IN-CHARGE FROM TIME TO TIME, WHEN THE MATERIALS ARE REQUIRED FOR INCORPORATION IN PERMANENT WORKS.

MATERIALS SHALL BE ISSUED ONLY FOR PERMANENT WORKS AND NOT FOR TEMPORARY WORKS, ENABLING WORKS ETC. UNLESS SPECIFICALLY APPROVED BY THE ENGINEER-IN-CHARGE.

THE BIDDER SHALL RETURN OF SURPLUS/SERVICEABLE SCRAP MATERIALS TO BANDR/EIL/IOCL 'S STORAGE POINTS TO BE DESIGNATED BY THE ENGINEER-IN-CHARGE. NO SEPARATE PAYMENT FOR SUCH EXPENDITURE SHALL BE MADE.

NO MATERIAL SHALL BE ALLOWED TO BE TAKEN OUTSIDE THE PLANT WITHOUT A GATE PASS.

23.0 TRANSPORTATION:

TRANSPORTATION OF ALL MATERIALS IS IN THE SCOPE OF THE BIDDER.

24.0 PROGRAMME

THE BIDDER SHALL ALSO FURNISH HIS OVERALL PLANNING OF PROGRAMME, EQUIPMENT DEPLOYMENT SCHEDULE AGAINST OUR MINIMUM EQUIPMENT MENTIONED ELSEWHERE THE TENDER DOCUMENT.

THE BANDR/EIL/IOCL MAY CHANGE OR ALTER THE DETAILED WORKING PROGRAMME FOR THE SEQUENCE OF WORK, WITHIN THE FRAME WORK OF THE AGREED SCHEDULE, WHICH WILL BE BINDING ON THE BIDDER.

A MONTHLY TIME BAR CHART FOR VARIOUS ACTIVITIES LIKE STARTING AND COMPLETION DATES OF ALL ACTIVITIES, SHALL BE SUBMITTED.

BIDDER SHALL FURNISH A DAILY REPORT ON CATEGORY WISE LABOUR DEPLOYED ALONG WITH THE PROGRESS OF WORK DONE ON PREVIOUS DAY IN THE PROFORMA PRESCRIBED BY THE ENGINEER-IN-CHARGE.

25.0 RESPONSIBILITY OF THE BIDDER

IT SHALL BE THE RESPONSIBILITY OF THE BIDDER TO OBTAIN THE APPROVAL FOR ANY REVISION AND/OR MODIFICATIONS DECIDED BY THE BIDDER FROM BANDR/EIL/IOCL ENGINEER-IN-CHARGE BEFORE IMPLEMENTATION. ALSO, SUCH REVISIONS AND/OR MODIFICATIONS IF ACCEPTED/ APPROVED BY BANDR/EIL/IOCL ENGINEER-IN-CHARGE SHALL BE CARRIED OUT AT NO EXTRA COST TO BANDR/EIL/IOCL. ANY CHANGE REQUIRED DURING FUNCTIONAL REQUIREMENTS OR FOR EFFICIENT RUNNING OF SYSTEM, KEEPING THE BASIC PARAMETERS UNCHANGED AND WHICH HAS NOT BEEN INDICATED BY THE BIDDER IN THE DATA/DRAWINGS FURNISHED ALONG WITH THE OFFER WILL BE CARRIED OUT BY THE BIDDER AT NO EXTRA COST TO

SPECIAL CONDITIONS OF CONTRACT (SCC)

BANDR/EIL/IOCL.

26.0 SEQUENCE OF WORK

BIDDER SHALL PLAN THE SEQUENCE OF ALL WORKS SO AS TO ACHIEVE THE DESIRED PROGRESS KEEPING IN MIND OVERALL SAFETY AND STABILITY AT ALL POINTS OF TIME.

IF DUE TO A PARTICULAR DESIGN OR SPECIFICATION OR AVAILABILITY OF MACHINES OR ANY OTHER REASON, A PARTICULAR SEQUENCE OF OPERATION IS DEMANDED BY THE ENGINEER DUE TO WHICH SOME INTERRUPTIONS ARE INHERENT TO ANY ONE OR MORE TYPE OF WORK OR ITEMS OF EXECUTION, THEN NO CLAIM FOR SUCH INTERRUPTION SHALL BE ENTERTAINED AND BIDDER SHALL HAVE TO FOLLOW THE SEQUENCE AS INSTRUCTED BY THE ENGINEER.

27.0 CONSTRUCTION

THE BIDDER SHALL WITHIN THE SCOPE OF WORK OBSERVE IN ADDITION TO SPECIFICATIONS, ALL NATIONAL AND LOCAL LAWS, ORDINANCES, RULES AND REGULATION AND REQUIREMENTS PERTAINING TO THE WORK.

VARIOUS PROCEDURES AND METHODS TO BE ADOPTED BY THE BIDDER DURING THE CONSTRUCTION AS REQUIRED IN THE RESPECTIVE SPECIFICATIONS SHALL BE SUBMITTED TO BANDR/EIL/IOCL IN DUE TIME AND WELL IN ADVANCE OF THE SPECIFIC WORK FOR APPROVAL.

THE BIDDER SHALL CARRY OUT REQUIRED SUPERVISION AS PER QUALITY ASSURANCE PLAN AND FURNISH ALL ASSISTANCE REQUIRED BY BANDR/EIL/IOCL IN CARRYING OUT INSPECTION WORK. BANDR/EIL/IOCL WILL HAVE AUTHORIZED REPRESENTATIVES PRESENT WHO SHALL HAVE FREE ACCESS TO THE WORK AT ALL TIMES. IF AN BANDR/EIL/IOCL REPRESENTATIVE NOTIFIES THE BIDDER'S REPRESENTATIVE OF ANY DEFICIENCY IN ANY WORK OR IN THE SUPERVISION THEREOF, THE BIDDER SHALL MAKE EVERY EFFORT TO CARRY OUT SUCH INSTRUCTIONS CONSISTENT WITH BEST INDUSTRY PRACTICE.

28.0 GENERAL GUIDELINES DURING AND BEFORE ERECTION

THE BIDDER SHALL BE RESPONSIBLE FOR ORGANIZING THE LIFTING OF THE EQUIPMENT IN THE PROPER SEQUENCE FOR ORDERLY PROGRESS OF THE WORK AND TO ENSURE THAT ACCESS ROUTES FOR ERECTING THE OTHER EQUIPMENTS ARE KEPT OPEN.

ORIENTATION OF ALL FOUNDATIONS, ELEVATIONS, LENGTHS AND DISPOSITION OF ANCHOR BOLTS AND DIAMETER OF HOLES IN THE SUPPORTS AND SADDLES SHALL BE CHECKED BY THE BIDDER WELL IN ADVANCE OF THE INSTALLATION. RECTIFICATIONS, INCLUDING CHIPPING OF FOUNDATIONS, SHALL BE CARRIED OUT WHERE NECESSARY IN CONSULTATION WITH THE ENGINEER-IN-CHARGE. IF A STRUCTURAL MEMBER NEEDS TO BE DISMANTLED TO FACILITATE THE EQUIPMENT ERECTION, THIS SHALL BE DONE BY THE BIDDER AFTER ENSURING PROPER STABILITY OF THE MAIN STRUCTURE IN CONSULTATION WITH THE ENGINEER-IN-CHARGE. ALL SUCH DISMANTLED MEMBERS SHALL BE PUT BACK IN POSITION TO THE SATISFACTION OF ENGINEER-IN-CHARGE AFTER THE COMPLETION OF THE EQUIPMENT ERECTION.

DURING THE PERFORMANCE OF THE WORK THE BIDDER SHALL KEEP STRUCTURES, MATERIALS AND EQUIPMENT ADEQUATELY BRACED BY GUYS, STRUTS OR OTHER APPROVED MEANS WHICH SHALL BE INSTALLED BY THE CONTRACT AS REQUIRED TILL THE INSTALLATION WORK IS SATISFACTORY COMPLETED. SUCH GUYS, SHORING, BRACING, STRUTTING, PACKING SUPPORT. SHALL NOT INTERFERE WITH THE OTHER AGENCIES AND SHALL NOT DAMAGE OR CAUSE DISTORTION TO OTHER WORKS EXECUTED BY THE CONTACTOR.

THE BIDDER SHALL DULY COMPLY WITH MANUFACTURER(S) RECOMMENDATION AND DETAILED SPECIFICATIONS FOR THE INSTALLATION OF THE VARIOUS EQUIPMENT AND MACHINERIES

VARIOUS TOLERANCES REQUIRED AS MARKED ON THE DRAWINGS AND /OR IN ACCORDANCE WITH THE SPECIFICATIONS AND/OR INSTRUCTIONS OF THE ENGINEER-IN -CHARGE SHALL BE MAINTAINED VERTICALITY SHALL BE VERIFIED WITH THE THEODOLITE AND SHALL BE MAINTAINED.

29.0 RECONCILIATION & PENAL RATE FOR FREE ISSUE MATERIALS:

TENDERER HAS TO CARRY OUT RECONCILIATION OF MATERIALS COLLECTED BY HIM FROM THE OWNER/CLIENT/BANDR IF ANY, SHALL SUBMIT THE RECONCILIATION STATEMENT ON MONTHLY BASIS ALONG WITH RUNNING ACCOUNT BILLS.

II)	SL. NO.	MATERIAL	PENAL RATES
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ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

I.	A)	PENAL RATE FOR NON-RETURN OF ACCOUNTABLE SCRAP	ISSUE RATE + 25% OR
	B)	PENAL RATE FOR RETURN OF SERVICEABLE MATERIALS IN EXCESS OF PERMITTED % ALLOWANCES	LANDED RATE + 25% (IN CASE ISSUE RATE ARE NOT INDICATED IN THE CONTRACT)
II.	A)	PENAL RATES FOR NON-RETURN OF UNUSED MATERIAL AND OR PENAL RATE FOR GENERATING SCRAP IN EXCESS OF PERMITTED % ALLOWANCES.	TWICE THE ISSUE RATES OR TWICE THE LANDED RATES (IN CASE ISSUE RATES ARE NOT INDICATED IN THE CONTRACT.)

30.0 SITE FACILITIES**30.1 LAND**

THE LAND FOR BIDDER'S SITE OFFICE (PORTA CABIN), FABRICATION YARD SHALL BE PROVIDED BY B AND R/IOCL/EIL INSIDE PLANT BOUNDARY SUBJECT TO AVAILABILITY FROM CLIENT.

30.2 BIDDER'S SITE OFFICES

THE BIDDER SHALL CONSTRUCT HIS OWN TEMPORARY OFFICES, STORES, FABRICATION SHEDS ETC. BY PROVIDING ALL LABOUR, MATERIALS ETC. AT HIS OWN COST AND SHALL ALSO DEMOLISH AND REMOVE THESE STRUCTURES MAKING THE AREA PERFECTLY CLEAN AS PER DIRECTION OF THE ENGINEER-IN-CHARGE AT HIS OWN COST.

30.3 LABOUR HUTMENT

LABOUR HUTMENT INSIDE THE PROJECT PREMISES WILL NOT BE ALLOWED AND SHALL BE ARRANGED BY THE BIDDER OUTSIDE THE PROJECT PREMISES. THE BIDDER'S RATES SHALL BE INCLUSIVE OF THAT.

30.4 EQUIPMENT & MACHINERY

THE BIDDER SHALL MOBILIZE ALL EQUIPMENTS / MACHINERIES ALONG WITH ALL ACCESSORIES, REQUIRED FOR MECHANICAL WORK AS PER SCOPE MATRIX WITHIN THE FINALLY ACCEPTED RATE / PRICE FOR THE WORK.

30.5 WATER SUPPLY

WITHIN THEIR QUOTED RATES, BIDDER HAS TO ARRANGE FOR CONSTRUCTION WATER AND FURTHER DISTRIBUTION OF CONSTRUCTION WATER.

THE BIDDER MAY BE PERMITTED TO TAP WATER REQUIRED FOR THE WORK BY MAKING CAVITY WELLS OR TUBE WELLS AT HIS OWN COST WITHIN THE STATION, SUBJECT TO ITS BEING SUITABLE FOR THE WORK AND FURTHER SUBJECT TO THE CONVENIENCE AND OTHER REQUIREMENTS OF THE IOCL /EIL /B AND R. THE CAVITY WELLS/TUBE WELLS UPON COMPLETION OF WORK SHALL NOT BE FILLED BACK BUT SHALL BE LEFT BEHOLD & PROPERLY COVERED/CAPPED IN THE EXISTING OPERATING CONDITIONS WITHOUT THE EQUIPMENTS FOR FUTURE USE BY THE CORPORATION.

30.6 POWER SUPPLY

THE BIDDER SHALL MAKE HIS OWN ARRANGEMENT FOR POWER REQUIRED FOR THE WORK AT HIS COST. DG SET OF SUITABLE CAPACITY MAY BE INSTALLED AND OPERATED BY THE BIDDER AT HIS OWN COST.

THE ELECTRICAL WORKS SHALL BE CARRIED OUT THROUGH LICENSED ELECTRICAL PERSONAL ONLY.

AT ALL TIMES, IEA REGULATIONS SHALL BE FOLLOWED FAILING WHICH THE OWNER HAS A RIGHT TO DISCONNECT THE POWER SUPPLY WITHOUT ANY REFERENCE TO THE CONTRACTOR. NO CLAIM SHALL BE ENTERTAINED FOR SUCH DISCONNECTION BY THE ENGINEER-IN-CHARGE. POWER SUPPLY WILL BE RECONNECTED ONLY AFTER PRODUCTION OF FRESH CERTIFICATE FROM AUTHORISED ELECTRICAL SUPERVISORS.

THE OWNER IS NOT LIABLE FOR ANY LOSS OR DAMAGE TO THE CONTRACTOR'S EQUIPMENT AS A RESULT OF VARIATION IN VOLTAGE OR FREQUENCY OR INTERRUPTION IN POWER SUPPLY OR OTHER LOSS TO THE CONTRACTOR ARISING THERE FROM.

THE CONTRACTOR SHALL ENSURE THAT THE ELECTRICAL EQUIPMENT INSTALLED BY HIM ARE SUCH THAT AVERAGE POWER FACTOR DOES NOT FALL BELOW 0.90 AT HIS PREMISES. IN CASE POWER FACTOR FALLS BELOW

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

0.90 IN ANY MONTH, HE WILL REIMBURSE TO THE OWNER AT THE PENAL RATE DETERMINED BY THE OWNER FOR ALL UNITS CONSUMED DURING THE MONTH.

THE CONTRACTOR WILL HAVE TO PROVIDE AND INSTALL HIS OWN LIGHT AND POWER METERS, WHICH WILL BE GOVERNED AS PER CENTRAL/ STATE GOVERNMENT ELECTRICITY RULES. THE METERS SHALL BE SEALED BY THE OWNER.

IN CASE OF DAMAGE TO ANY OF THE OWNER'S EQUIPMENT ON ACCOUNT OF FAULT, INTENTIONAL OR UNINTENTIONAL ON THE PART OF THE CONTRACTOR THE OWNER RESERVES THE RIGHT TO RECOVER THE COST OF SUCH DAMAGE FROM THE CONTRACTOR'S BILL. COST OF HRC FUSES REPLACED AT THE OWNER'S TERMINALS DUE TO ANY FAULT IN THE CONTRACTOR'S INSTALLATION SHALL BE TO CONTRACTOR'S

ACCOUNT AT THE RATES DECIDED BY THE ENGINEER-IN-CHARGE.

THE TOTAL REQUIREMENT OF POWER SHALL BE INDICATED BY THE BIDDER IN HIS BID.

31.0 SITE ORGANISATION

THE BIDDER SHALL WITHOUT PREJUDICE TO HIS OVERALL RESPONSIBILITIES AND LIABILITIES TO PROVIDE ADEQUATE QUALIFIED AND SKILLED PERSONNEL ON THE WORK. FOR SITE ORGANIZATION AND AUGMENT, THE SAME AS DECIDED BY THE ENGINEER-IN-CHARGE DEPENDING ON THE EXIGENCIES OF WORK. IN ADDITION TO THIS, BIDDER SHALL DEPLOY SAFETY SUPERVISORS TO ENSURE SAFE WORKING CONDITIONS AT SITE.

32.0 WELDER'S QUALIFICATION / IDENTIFICATION CARD:

BANDR/IOCL/EIL INSPECTION DEPARTMENT SHALL WITNESS THE TEST CERTIFY THE QUALIFICATION OF EACH WELDER AS PER ASME BOILER AND PRESSURE VESSELS CODE SECTION (IS). WELDERS, APPROVED BY THE INSPECTION DEPARTMENT ONLY SHALL BE EMPLOYED. AGENCY SHALL SUBMIT THE WELDER QUALIFICATION REPORT AND IDENTIFICATION CARD DULY CERTIFIED BY THE INSPECTION DEPARTMENT, BEFORE COMMENCEMENT OF WORK

33.0 DEPLOYMENT OF LABOUR & SUPERVISORY PERSONNEL

THE QUOTED RATES GIVEN IN THE SCHEDULE OF QUANTITIES & RATES ARE INCLUSIVE OF THE BIDDER'S RATE TO PROVIDE ALL LABOURS, MANPOWER AND SUPERVISION ETC. AND HE SHALL THEREOF, DEPLOY AND ENGAGE, WITHIN THE QUOTED RATES, ALL TECHNICAL PERSONNEL, ALL CATEGORIES OF SKILLED/SEMI-SKILLED/UN-SKILLED WORKMEN, TECHNICIANS, OPERATORS, MECHANICS, ELECTRICIANS AND SUPERVISING STAFF AS REQUIRED, DIRECTLY OR INDIRECTLY FOR THE EXECUTION OR COMPLETION OF THE WORKS IN ALL RESPECT IN A PERFECTLY WORKMANSHIP LIKE MANNER AS PER APPROVED SPECIFICATIONS, DRAWINGS AND THE TIME SCHEDULE/PROGRAMME OF COMPLETION.

34.0 SUPERVISORY PERSONNEL

THE AGENCY SHALL DEPUTE ADEQUATE NUMBER OF EXPERIENCED ENGINEERS/SUPERVISORS NECESSARY FOR CARRYING OUT OF THE WORK MAINTAINING GOOD QUALITY AND SATISFACTION OF ENGINEER IN CHARGE.

IF AT ANY POINT, IT IS OBSERVED BY THE COMPANY THAT, DEPLOYMENT OF SUPERVISORY PERSONNEL IS INADEQUATE AND THE PROGRESS OF WORK IS AFFECTED, THE COMPANY SHALL ENGAGE SUPERVISORS/ENGINEER FOR THE AGENCY'S WORK AT AGENCY'S RISK AND COST. THE COST INCURRED BY THE COMPANY SHALL BE RECOVERED FROM THE AGENCY'S RUNNING ACCOUNT BILLS.

35.0 ACCOMMODATION AND TRANSPORTATION

THE AGENCY SHALL ARRANGE, WITHIN HIS QUOTED RATES, ACCOMMODATIONS FOR HIS ALL WORKMEN, TECHNICIANS & SUPERVISORS. ALSO, THE AGENCY WITHIN HIS QUOTED RATES SHALL ARRANGE THEIR TRANSPORT TO THE SITE AND BACK.

36.0 INSPECTION OF WORK

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

THE OWNER'S, ENGINEER'S AND COMPANY'S REPRESENTATIVES WILL HAVE FULL POWER AND AUTHORITY TO INSPECT THE WORKS AT ANY TIME WHENEVER IN PROGRESS WITHIN AT SITE OR AT BIDDER'S STORE / PREMISES AND THE BIDDER SHALL AFFORD AND PROCURE FOR THEM EVERY FACILITY AND ASSISTANCE REQUIRED TO CARRY-OUT SUCH INSPECTION AND SHALL MAKE AVAILABLE TO THEM FREE OF COST, ALL NECESSARY INSTRUMENTS AND DEVICE IN CHECKING OF SETTING OUT WORKS AND IN CHECKING OF ANY WORKS DONE BY THE BIDDERS FOR THE PURPOSE OF SETTING OUT AND TAKING MEASUREMENTS OF WORKS.

ALL THE WORKS COVERED IN THIS TENDER ARE SUBJECTED TO STAGE WISE INSPECTION & CLEARANCE BY BANDR /EIL/IOCL).

37.0 OFF-LOADING RIGHT TO BANDR / IOCL /EIL

AT ANY STAGE OF PERFORMANCE EVALUATION, IN THE EVENT BIDDER'S PERFORMANCE IS RATED AS FAIR OR UNSATISFACTORY, BANDR/IOCL/EIL WITHOUT PREJUDICE TO ANY OR ALL OTHER RIGHTS & REMEDIES AVAILABLE TO IT UNDER THE CONTRACT SHALL BE ENTITLED TO OFFLOAD PART OF THE WORK WITH ALL CONSEQUENCES THERETO AND/OR WITHOUT PREJUDICE TO ANY OTHER RIGHTS AND REMEDIES AVAILABLE TO BANDR/IOCL/EIL. IN TERMS OF THE CONTRACT, BANDR/IOCL/EIL SHALL BE ENTITLED TO TERMINATE THE CONTRACT WITH ALL CONSEQUENCES THERETO.

38.0 REPORTS AND RECORDS

- ❖ THE BIDDER SHALL, FROM TIME TO TIME, MAINTAIN AT EACH JOB SITE (IN ADDITION TO ANY RECORDS OR REGISTERS REQUIRED TO BE MAINTAINED BY THE BIDDER UNDER ANY LAW, RULE OR REGULATION HAVING THE FORCE OF LAW) SUCH RECORDS AND REGISTERS AS THE ENGINEER-IN-CHARGE OR SITE ENGINEER SHALL OR MAY REQUIRE THE SUB-BIDDER TO KEEP AND /OR MAINTAIN FROM TIME TO TIME.
- ❖ IN ADDITION TO ANY OTHER RECORDS OR REGISTERS REQUIRED TO BE MAINTAINED BY THE BIDDER FROM TIME TO TIME AND / OR TO THE REPORTS REQUIRED TO BE FURNISHED BY THE BIDDER, THE BIDDER SHALL DAILY OR OTHERWISE AS MAY BE PRESCRIBED BY ENGINEER-IN-CHARGE OR SITE ENGINEER, SUBMIT TO THE SITE ENGINEER A PROGRESS REPORT OF ALL WORK DONE AND / OR PROGRESS ACHIEVED BY THE BIDDER AT EACH JOB SITE WITHIN THE PRECEDING DAY OR THE PERIOD OF LAST REPORT, AS THE CASE MAY BE.
- ❖ THE RECEIPT AND /OR ACCEPTANCE OF ANY SUCH REPORT BY THE SITE ENGINEER SHALL BE WITHOUT PREJUDICE TO THE FULL RIGHTS AND REMEDIES OF BANDR/IOCL/EIL AND OBLIGATIONS / LIABILITIES OF THE BIDDER UNDER THE CONTRACT, AND SHALL NOT ANYWISE OPERATE AS AN ESTOPPEL AGAINST THE BANDR/IOCL/EIL BY REASON OF THE FACT THAT NO NOTICE OR OBJECTION WAS TAKEN OF OR TO ANY INFORMATION CONTAINED IN ANY SUCH REPORT; NOR SHALL ANY STATEMENT IN ANY SUCH REPORT BE DEEMED TO BE CORRECT MERELY BY VIRTUE OF THE EXISTENCE OF SUCH STATEMENT, AND ITS BEING UNCONTROVERSIAL BY ANY OFFICER OF BANDR/IOCL/EIL.
- ❖ THE BIDDER SHALL ALSO MAINTAIN AT EACH JOB SITE A SITE ORDER / SITE INSTRUCTIONS BOOK, IN WHICH THE DAY-TO-DAY INSTRUCTIONS OF THE SITE ENGINEER / ENGINEER-IN-CHARGE OTHER INSPECTING OFFICERS OF BANDR/IOCL/EIL SHALL BE RECORDED. EACH SUCH ORDER / INSTRUCTION SHALL BE DULY ACKNOWLEDGED AND COMPLIANCE WITH TIME SAME SHALL ALSO BE RECORDED IN THE APPROPRIATE COLUMNS OF TIME SITE ORDER / SITE INSTRUCTIONS BOOK. THIS BOOK SHALL BE KEPT AVAILABLE FOR INSPECTION BY THE OFFICERS OF BANDR/IOCL/EIL. TIME SITE ORDER / SITE INSTRUCTION BOOK SHALL BE LODGED WITH THE ENGINEER- IN-CHARGE ON COMPLETION OF THE WORK OR SOONER DETERMINATION OF THE CONTRACT FOR ANY CAUSE.

39.0 MISCONDUCT

- ❖ IF AND WHENEVER ANY OF BIDDER'S EMPLOYEE(S) SHALL IN THE OPINION OF THE
- ❖ ENGINEER-IN-CHARGE OR SITE ENGINEER (WHOSE OPINION IN THIS BEHALF SHALL BE FINAL) BE GUILTY OF MISCONDUCT OR BE INCOMPETENT OR INSUFFICIENTLY QUALIFIED OR NEGLIGENT IN THE PERFORMANCE OF HIS / THEIR DUTIES, OR IF IN THE OPINION OF THE ENGINEER-IN-CHARGE (WHICH SHALL BE FINAL) IT IS UNDESIRABLE FOR ANY REASON (WHICH NEED NOT BE DISCLOSED TO THE BIDDER) FOR SUCH PERSON(S) TO BE EMPLOYED IN THE WORK, THE BIDDER, IF SO DIRECTED BY THE SITE ENGINEER, SHALL FORTHWITH REMOVE OR CAUSE TO BE REMOVED SUCH PERSON(S) FROM EMPLOYMENT THEREON, AND ANY PERSON(S) SO REMOVED SHALL NOT BE RE- EMPLOYED IN THE WORK EXCEPT WITH THE PRIOR PERMISSION IN WRITING OF THE ENGINEER-IN- CHARGE. ANY PERSON(S) SO REMOVED FROM THE WORKS SHALL BE IMMEDIATELY REPLACED AT THE EXPENSE OF THE BIDDER BY A QUALIFIED AND COMPETENT SUBSTITUTE.

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

- ❖ IF, AT ANY TIME, IN THE COURSE OF EXECUTION OF THE CONTRACT, BANDR/IOCL/EIL/ENGINEER-IN-CHARGE FINDS THAT ANY PERSON EMPLOYED BY THE BIDDER IS NOT OBSERVING AND/OR IS WILL FULLY FLOUTING THE OPERATING SECURITY AND SAFETY PRECAUTIONS OF THE AREA IN WHICH HE IS WORKING AND / OR ARE FOUND TO BE INDULGING IN ACTIVITIES PREJUDICIAL TO THE INTEREST OF BANDR/IOCL/EIL, THE BIDDER SHALL FORTHWITH ,ON BEING DIRECTED BY BANDR/IOCL/EIL / ENGINEER-IN-CHARGE IN THIS BEHALF REMOVE OR CAUSE TO BE REMOVED SUCH PERSON(S), AS MAY BE NAMED BY BANDR /IOCL /EIL / ENGINEER-IN- CHARGE IN THIS BEHALF, FROM THE SITE, WITHIN 24 HOURS OF SUCH INTIMATION AND SUCH PERSON(S) SHALL NOT BE RE-EMPLOYED IN THIS WORK OR ANY OTHER WORK UNDER BANDR/IOCL/EIL, WITHOUT THE PRIOR WRITTEN PERMISSION OF BANDR/IOCL/EIL. ALL REPATRIATIONS OF ANY PERSON(S) REMOVED FROM THE SITE SHALL BE DONE BY THE BIDDER AT HIS OWN COST AND THE VACANCY(IES) SO CAUSED SO CAUSED SHALL BE FILLED BY THE BIDDER AT HIS OWN EXPENSES BY COMPETENT SUBSTITUTES.
- ❖ IF ANY ACTIVITIES OF ANY SUCH PERSON ARE CONSIDERED BY BANDR/IOCL/EIL OR ENGINEER- IN- CHARGE TO BE CRIMINAL IN CHARACTER AND/OR PREJUDICIAL TO THE PUBLIC OR NATIONAL INTEREST, THE BIDDER SHALL, IN ADDITION TO REMOVING SUCH PERSON(S) AS STIPULATED IN 14.2 ABOVE, ALSO CO-OPERATE WITH BANDR/IOCL/EIL ENGINEER-IN-CHARGE IN LODGING SUCH COMPLAINTS WITH THE POLICE OR OTHER AUTHORITIES AS BANDR/IOCL/EIL OR ENGINEER-IN-CHARGE CONSIDERS NECESSARY, AND SHALL CO-OPERATE WITH BANDR/IOCL/EIL, IN HANDING OVER SUCH PERSON(S) TO THE CONCERNED AUTHOR TIES AS DECIDED BY BANDR/IOCL/EIL.
- ❖ THE BIDDER SHALL KEPT BANDR/IOCL/EIL INDEMNIFIED FROM AND AGAINST ALL PERSONNEL AND THIRD-PARTY CLAIMS WHATSOEVER (INCLUSIVE OF ALL COSTS INCURRED BETWEEN ATTORNEY AND CLIENT) ARISING OUT OF ANY ACT OR OMISSION OR INTERMISSION ON PART OF EMPLOYEE OF THE BIDDER, WHETHER COMMITTED, OMITTED OR ARISING WITH OR WITHOUT THE SCOPE OF THE CONTRACT OR OTHERWISE.

40.0 CHANGE IN CONSTITUTION OF THE BIDDER

THE BIDDER, WHETHER AN INDIVIDUAL, PROPRIETARY CONCERN, PARTNERSHIP FIRM, PRIVATE LIMITED COMPANY OR PUBLIC LIMITED COMPANY, SHALL NOT MAKE ANY-CHANGE(S) IN ITS CONSTITUTION, BY TRANSFER OF SUBSTANTIAL SHAREHOLDING OR OF MANAGEMENT (IN THE CASE OF A COMPANY) OR BY ADDITION OR DELETION OF PARTNERS, CHANGE IN THE TERMS OF PARTNERSHIP, OR MAKE ANY OTHER MATERIAL CHANGE(S) WITHOUT PRIOR INTIMATION TO AND APPROVAL OF BANDR/IOCL/EIL. ANY SUCH UNAUTHORIZED CHANGE SHALL ATTRACT THE PROVISIONS OF CLAUSE

41.0 TIME SCHEDULE

THE WORK SHALL BE EXECUTED STRICTLY AS PER TIME SCHEDULE PROVIDED IN 'ANNEXURE-J'

42.0 FIRM RATE

THE RATES QUOTED BY THE AGENCY SHALL ALWAYS REMAIN FIRM AND SHALL NOT ATTRACT ANY ESCALATION DUE TO INCREASE IN LABOUR WAGES OR MATERIAL PRICES ETC. WITHIN THE STIPULATED TIME OF COMPLETION AND EXTENDED COMPLETION PERIOD ALSO.

43.0 ESCALATION

BIDDER'S OFFERED PRICES ARE FIRM AND ESCALATION SHALL NOT BE PAYABLE WHATSOEVER THE REASON DURING TENURE OF THE CONTRACT / EXTENDED DURATION OF THE CONTRACT.

44.0 SECURITY CUM PERFORMANCE BANK GUARANTEE (SPBG)

N.A.

45.0 QUANTITY VARIATION

THE QUANTITIES INDICATED IN THE SCHEDULE ARE EXCLUSIVELY MEANT FOR GIVING AN IDEA OF THE NATURE AND GRAVITY OF THE WORK AND MAY VARY UPTO AND INCLUSIVE OF (+) 20 %(TWENTY PERCENT). THE BIDDER SHALL HAVE TO ASSESS THE SITE CONDITION, NATURE OF THE WORK ETC. OF THEIR OWN AND QUOTE THEIR RATES ACCORDINGLY. IGNORANCE TO THE ABOVE AND VARIATION IN QUANTITIES SHALL NOT BE IN ANY WAY BE BASIS TO CLAIM ANY COMPENSATION AND/OR ANY REVISION TO ANY RATE AS AWARDED AT ANY STAGE OF THE WORK.

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SPECIAL CONDITIONS OF CONTRACT (SCC)

ANY COMPENSATION AND/OR REVISION IN RATES SHALL NOT BE CONSIDERED OR PAID TO THE BIDDER ON THIS ACCOUNT. THE AGENCY'S QUOTED RATES SHALL REMAIN FIRM FOR ANY SORT OF DEVIATION IN QUANTITIES.

HOWEVER, RELEASE OF PAYMENT TO THE AGENCY BEYOND THE AWARDED VALUE, HAS TO BE MADE AFTER ISSUANCE OF AMENDED ORDER.

46.0 SPECIAL CLAUSES

IN CASE OF REQUIREMENT OF ANY STATUTORY APPROVAL, NOC FROM AUTHORITIES RELATED TO USE OF MEN, CONSTRUCTION MATERIALS & MACHINERY RELATED TO THE WORK, THE SAME INCLUDING ALL RELATED WORKS, COST, FEE, COORDINATION JOBS ETC SHALL BE IN THE SCOPE OF SUCCESSFUL BIDDER. FURTHER BIDDERS SHALL BE REQUIRED TO COMPLY WITH ANY/ALL THE PROVISIONS OF LABOUR LAWS (STATE & CENTRAL), PF/ ESI AS PER THE LAW OF THE LAND. BIDDERS TO TAKE NOTE OF THE SAME & QUOTE THEIR RATES ACCORDINGLY.

BIDDERS SHALL BE REQUIRED TO UNDERTAKE ALL THE WORKS WITHIN THE TIMEFRAME & CONSTRUCTION PLAN AGREED FOR SUB ACTIVITIES AS PART OF THE KICK OFF MEETING WITH TECHNICAL REQUIREMENTS IRRESPECTIVE OF THE DISTANCE OF THE QUARRY, APPROVALS REQUIRED SUCH AS MINING CLEARANCE, NOC FROM CONCERNED STATE GOVT. DEPT(S) OR USAGE OF STACKED EARTH MEETING TECHNICAL REQUIREMENTS FROM APPROVED PARTIES. BIDDERS ARE ADVISED TO CONDUCT SITE SURVEY TO ASCERTAIN LOCAL CONDITIONS, REGULATIONS & QUOTE THEIR RATES ACCORDINGLY

47.0 LIQUIDATED DAMAGES DUE TO DELAY IN COMPLETION

IF THE BIDDER FAILS TO COMPLETE THE WORK WITHIN THE TIME FOR COMPLETION, BANDR SHALL RECOVER THE AMOUNT OF LIQUIDATED DAMAGES, BUT NOT BY WAY OF PENALTY, BY MAKING DEDUCTIONS FROM THE BIDDER'S ACCOUNT OR BY ENCASHMENT OF BIDDER'S BANK GUARANTEES @1% (ONE PERCENT) OF THE TOTAL CONTRACT VALUE PER WEEK OF DELAY OR PART THEREOF SUBJECT TO A MAXIMUM OF @5% (FIVE PERCENT) OF THE CONTRACT VALUE.

48.0 MAINTENANCE & GUARANTEE

COMMENCING FROM THE DATE OF ISSUE OF FINAL ACCEPTANCE CERTIFICATE TO THE BIDDER SHALL STAND GUARANTEE FOR A PERIOD OF 12 (TWELVE) CALENDAR MONTHS, FROM THE DATE OF COMPLETION OF WORK/HANDING OVER THE TOTAL JOB IN ALL RESPECT TO CLIENT/ EIL. THE BIDDER SHALL REPLACE/RECTIFY ALL PARTS/COMPONENTS WHICH BECOME DEFECTIVE DUE TO POOR QUALITY OF WORKMANSHIP OR DUE TO ANY ACT OF OVERSIGHT OR OMISSION.

ALL SUCH RECTIFICATION OR REPLACEMENTS OF DEFECTIVE WORKMANSHIP SHALL BE DONE FREE OF COST BY THE BIDDER.

49.0 SPLIT UP OF WORK

CONSIDERING THE VOLUME OF WORK AND OUTLOOK OF RELEASE OF WORK FRONT, 2 (TWO) BIDDERS WILL BE DEPUTED AS PER FOLLOWING MANNER:

- a. 55% VOLUME OF THE COMPLETE WORK WILL BE AWARDED TO THE "L-1 BIDDER.
- b. REMAINING 45% VOLUME OF THE COMPLETE WORK WILL BE AWARDED TO OTHER 1 NO. BIDDER, WHO WILL AGREE TO CARRY OUT THE WORK WITH THE RECOMMENDED RATES AND TERMS & CONDITIONS OF THE "L-1 BIDDER.

NOTE :

- ❖ IF, "L-2 BIDDER" DOES NOT AGREE TO MATCH WITH THE RECOMMENDED RATES OF THE "L-1 BIDDER", THEN NEXT BIDDERS WILL BE CALLED CHRONOLOGICALLY FOR MATCHING THEIR RATES.
- ❖ IN CASE OF "TIE" AMONG BIDDERS FOR ANY PARTICULAR RANK, THEN BIDDERS RANKING WILL BE DETERMINED BASED ON THEIR SUBMITTED AVERAGE ANNUAL FINANCIAL TURNOVER FOR LAST 3 (THREE) YEARS.
- ❖ IF ANY OF THE ABOVE BIDDER REGRET TO MATCH THEIR QUOTED RATE WITH THE RECOMMENDED RATE OF THE "L-1 BIDDER", BALANCE JOB WILL BE DISTRIBUTED AMONG THE BIDDERS (WHO WILL BE AWARDED THE JOBS) BASED ON THEIR PERFORMANCE & QUALIFICATION CRITERIA. OTHERWISE, SEPARATE ENQUIRY WILL BE FLOATED.
- ❖ FOR EACH CASE SEPARATE PROPOSAL WILL BE MADE FOR OBTAINING APPROVAL FROM COMPETENT AUTHORITY.

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

- ❖ MSME BIDDERS WILL NOT GET PURCHASE PREFERENCE AS PER MSME POLICY

50.0 PURCHASE PREFERENCE TO MAKE IN INDIA AS MENTIONED IN GM(COMM)'S MEMO DTD. 19.10.2020 AND AS PER OFFICE MEMORANDUM DTD. 19.10.2020 15.05.2023 & 18.05.2023 WILL BE INCORPORATED IN NIT DOCUMENT.

THE BIDDER SHALL NOTE THAT NO LABOUR-CONTRACTOR SHALL BE ENGAGED BY THEM FOR THE ABOVE WORK. IF DUE TO A PARTICULAR DESIGN OR SPECIFICATION OR AVAILABILITY OF MACHINES OR ANY OTHER REASON, A PARTICULAR SEQUENCE OF OPERATION IS DEMANDED BY THE ENGINEER DUE TO WHICH SOME INTERRUPTIONS ARE INHERENT TO ANY ONE OR MORE TYPE OF WORK OR ITEMS OF EXECUTION, THEN NO CLAIM FOR SUCH INTERRUPTION SHALL BE ENTERTAINED AND BIDDER SHALL HAVE TO FOLLOW THE SEQUENCE AS INSTRUCTED BY THE ENGINEER.

THE BIDDER MAY WORK BEYOND NORMAL WORKING HOUR AND ALSO ON SUNDAY AND HOLIDAY (WITH PRIOR APPROVAL FROM BANDR) AS DESIRED BY BANDR TO MAINTAIN PROGRESS OF WORK AS PER SCHEDULE WITHOUT ANY ADDITIONAL LIABILITY TO BANDR. THE BIDDER SHALL GIVE PRIORITY OR REDEPLOY THE WORK FORCE FOR A PARTICULAR WORK AS INSTRUCTED BY BANDR.

51.0 TAXES & DUTIES

51.1 GOODS AND SERVICE TAX (GST):

- ❖ "GST-TDS @ 2% (TWO PERCENT) WILL BE DEDUCTED FROM BASIC INVOICE VALUE (I.E. VALUE BEFORE GST) UNDER GST LAW
- ❖ W.E.F. 01.10.2018 AS PER GOVT. NOTIFICATION NO. 50/2018 - CENTRAL TAX DATED 13.09.2018 FOR TAXABLE SERVICES. TDS @ 1% EACH FOR CGST & SGST OR 2% FOR IGST WILL BE APPLICABLE EXCEPT THE EXEMPTION PROVISION AS STIPULATED IN GST LAW. TAX DEDUCTED AT SOURCE WILL BE DEPOSITED TO THE GOVT. AND TDS CERTIFICATE WILL BE ISSUED TO THE BIDDER AS PER THE RULES. THE BIDDER SHOULD BE REGISTERED WITH GST AUTHORITIES AND THE COPY OF REGISTRATION CERTIFICATE AND LATEST FILED MONTHLY / QUARTERLY GSTR-3B RETURN AS GST CLEARANCE CERTIFICATE SHALL BE SUBMITTED ALONG WITH BID DOCUMENTS (TECHNO COMMERCIAL). BID WITHOUT ABOVE DOCUMENTS SHALL BE TREATED AS CANCELLED.
- ❖ ALL BIDDERS(S), HAVING REGISTRATION IN OTHER STATE (EXCEPT HARYANA), SHALL RAISED THEIR TAX INVOICE BY CHARGING IGST ONLY. OTHERWISE, THEIR PRICE SHALL BE EVALUATED BY LOADING GST AMOUNT AS APPLICABLE RATE SPECIFIED BY BIDDER(S).
- ❖ THE QUOTED PRICE SHALL BE DEEMED TO BE INCLUSIVE OF ALL TAXES AND DUTIES EXCEPT "GOODS AND SERVICES TAX" (HEREINAFTER CALLED GST) (I.E. IGST OR CGST AND SGST/UTGST APPLICABLE IN CASE OF INTERSTATE SUPPLY OR INTRA STATE SUPPLY RESPECTIVELY AND GST COMPENSATION CESS IF APPLICABLE).

BIDDER/VENDOR SHALL BE REQUIRED TO ISSUE TAX INVOICE IN ACCORDANCE WITH GST ACT AND/OR RULES ALONG WITH PAYMENT PROOF SO THAT INPUT CREDIT CAN BE AVAILED BY BANDR. IN THE EVENT THAT THE BIDDER / VENDOR FAILS TO PROVIDE THE INVOICE IN THE FORM AND MANNER PRESCRIBED UNDER THE GST ACT READ WITH GST INVOICING RULES THERE UNDER, BANDR SHALL NOT BE LIABLE TO MAKE ANY PAYMENT ON ACCOUNT OF GST AGAINST SUCH INVOICE.

BIDDER SHALL RAISE THEIR TAX INVOICE IN REGULAR INTERVAL AS PER CONTRACT CONDITION AND UPLOADED THEIR SUPPLY INVOICE IN GSTN PORTAL THROUGH GSTR-1.

MISMATCH IN RETURN OF BANDR DUE TO ANY REASON ATTRIBUTABLE TO BIDDER, THE SAME SHALL BE RECOVERED FROM BIDDER'S BILL.

GST PAYABLE UNDER REVERSE CHARGE FOR SPECIFIED SERVICES OR GOODS UNDER GST ACT OR RULES, IF ANY, SHALL NOT BE PAID TO THE BIDDER/VENDOR BUT WILL BE DIRECTLY DEPOSITED TO THE GOVERNMENT BY BANDR.

THE AGENCY SHALL ALWAYS COMPLY WITH THE REQUIREMENTS OF APPLICABLE LAWS AND PROVIDE NECESSARY DOCUMENTS AS PRESCRIBED UNDER THE RULES & REGULATIONS, AS APPLICABLE FROM TIME TO TIME. IN PARTICULAR, IF ANY TAX CREDIT, REFUND OR OTHER BENEFIT IS DENIED OR DELAYED TO BANDR DUE TO ANY NON-COMPLIANCE / DELAYED COMPLIANCE BY THE SUPPLIER UNDER THE GOODS & SERVICE TAX ACT (SUCH AS FAILURE TO UPLOAD THE DETAILS OF THE SALE ON THE GSTN PORTAL, FAILURE TO PAY GST TO THE GOVERNMENT) OR DUE TO NON-FURNISHING OR FURNISHING OF INCORRECT OR INCOMPLETE DOCUMENTS BY

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

THE SUPPLIER, THE SUPPLIER SHALL BE LIABLE TO REIMBURSE BANDR FOR ALL SUCH LOSSES AND OTHER CONSEQUENCES INCLUDING, BUT NOT LIMITED TO THE TAX LOSS, INTEREST AND PENALTY.

NOTWITHSTANDING ANYTHING CONTAINED ANYWHERE IN THE AGREEMENT, IN THE EVENT THAT THE INPUT TAX CREDIT OF THE GST CHARGED BY THE BIDDER / VENDOR IS DENIED BY THE TAX AUTHORITIES TO BANDR FOR REASONS ATTRIBUTABLE TO THE BIDDER / VENDOR, BANDR SHALL BE ENTITLED TO RECOVER SUCH AMOUNT FROM THE BIDDER / VENDOR BY WAY OF ADJUSTMENT FROM THE NEXT INVOICE. IN ADDITION TO THE AMOUNT OF GST, BANDR SHALL ALSO BE ENTITLED TO RECOVER INTEREST AT THE RATE PRESCRIBED UNDER GST ACT AND PENALTY, IN CASE ANY PENALTY IS IMPOSED BY THE TAX AUTHORITIES ON BANDR.

TDS UNDER GST, IF APPLICABLE, SHALL BE DEDUCTED FROM BIDDER'S/VENDOR'S BILL AT APPLICABLE RATE AND A CERTIFICATE AS PER RULES FOR TAX SO DEDUCTED SHALL BE PROVIDED TO THE BIDDER/VENDOR.

THE BIDDER WILL BE UNDER OBLIGATION FOR CHARGING CORRECT RATE OF TAX AS PRESCRIBED UNDER THE RESPECTIVE TAX LAWS. FURTHER THE BIDDER SHALL AVAIL AND PASS ON BENEFITS OF ALL EXEMPTIONS/ CONCESSIONS AVAILABLE UNDER TAXLAWS.

NO VARIATION ON ACCOUNT OF TAXES AND DUTIES, STATUTORY OR OTHERWISE, SHALL BE PAYABLE BY BANDR TO BIDDER/VENDOR EXCEPT FOR GST. ANY STATUTORY VARIATION FOR GST SHALL BE PAYABLE UP TO CONTRACTUAL DATE OF COMPLETION AGAINST DOCUMENTARY EVIDENCE. IN CASE, INPUT TAX CREDIT OF GST IS AVAILABLE TO BANDR BEYOND CONTRACTUAL COMPLETION DATE, THE SAME MAY BE REIMBURSED BY BANDR. ANY REDUCTION IN TAXES AND DUTIES INCLUDED IN THE PRICE SHALL BE PASSED ON TO BANDR.

ANY NEW TAXES, DUTIES, CESS, LEVIES NOTIFIED OR IMPOSED AFTER THE SUBMISSION OF LAST /FINAL PRICE BID BUT BEFORE THE CONTRACTUAL DATE OF COMPLETION OF WORK SHALL BE TO BANDR ACCOUNT.

THE BIDDER WILL BE LIABLE TO ENSURE TO HAVE REGISTERED WITH THE RESPECTIVE TAX AUTHORITIES AND TO SUBMIT SELF- ATTESTED COPY OF SUCH REGISTRATION CERTIFICATE(S) AND THE BIDDER WILL BE RESPONSIBLE FOR PROCUREMENT OF MATERIAL IN ITS OWN REGISTRATION (GSTIN) AND ALSO TO ISSUE ITS OWN ROAD PERMIT/ E-WAY BILL, IF APPLICABLE ETC.

IN CASE THE BIDDER IS COVERED UNDER COMPOSITION SCHEME UNDER GST LAWS, THEN BIDDER SHOULD QUOTE THE PRICE INCLUSIVE OF THE GST (CGST & SGST/UTGST OR IGST). FURTHER, SUCH BIDDER SHOULD MENTION "COVER UNDER COMPOSITION SYSTEM" IN COLUMN FOR GST (CGST & SGST/UTGST OR IGST) OF PRICE SCHEDULE.

BANDR WILL PREFER TO DEAL WITH REGISTERED SUPPLIER OF GOODS/ SERVICES UNDER GST. THEREFORE, BIDDERS ARE REQUESTED TO GET THEMSELVES REGISTERED UNDER GST, IF NOT REGISTERED YET. HOWEVER, IN CASE ANY UNREGISTERED BIDDER IS SUBMITTING THEIR BID, THEIR PRICES WILL BE LOADED WITH APPLICABLE GST WHILE EVALUATION OF BID. WHERE BANDR IS ENTITLED FOR INPUT CREDIT OF GST, THE SAME WILL BE CONSIDERED FOR EVALUATION OF BID AS PER EVALUATION METHODOLOGY OF TENDER DOCUMENT.

THE BIDDER WILL BE UNDER THE OBLIGATION FOR BILLING CORRECT RATE OF TAX/DUTIES AS PRESCRIBED UNDER THE TAX LAWS ON THE INVOICE TO OWNER, AFTER AVAILING INPUT TAX CREDIT AND PASS ON THE BENEFIT,

ANY INVOICE ISSUE ON INTRODUCTION OF GST LAW SHALL CONTAIN THE FOLLOWING PARTICULARS-

1. NAME, ADDRESS AND GSTIN OF THE SUPPLIER OF SERVICE;
2. SERIAL NUMBER OF THE INVOICE;
3. DATE OF ISSUE;
4. NAME, ADDRESS AND GSTIN OR UIN, IF REGISTERED OF THE RECIPIENT;
5. NAME AND ADDRESS OF THE RECIPIENT AND THE ADDRESS OF THE DELIVERY, ALONG WITH THE STATE AND ITS CODE,
6. ACCOUNTING CODE OF SERVICES;
7. DESCRIPTION OF GOODS OR SERVICES;
8. TOTAL VALUE OF SUPPLY OF GOODS OR SERVICES;
9. TAXABLE VALUE OF SUPPLY OF GOODS OR SERVICES TAKING INTO DISCOUNT OR ABATEMENT IF ANY;
10. RATE OF TAX (CENTRAL TAX, STATE TAX, INTEGRATED TAX (FOR INTER-STATE SUPPLY), UNION TERRITORY TAX OR CESS);
11. AMOUNT OF TAX CHARGED IN RESPECT OF TAXABLE SERVICES (CENTRAL TAX, STATE TAX, INTEGRATED

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SPECIAL CONDITIONS OF CONTRACT (SCC)

TAX (FOR INTER-STATE SUPPLY), UNION TERRITORY TAX OR CESS);

12. PLACE OF SUPPLY ALONG WITH THE NAME OF STATE, IN CASE OF SUPPLY IN THE COURSE OF INTER-STATE TRADE OR COMMERCE;

13. ADDRESS OF THE DELIVERY WHERE THE SAME IS DIFFERENT FROM THE PLACE OF SUPPLY AND

14. SIGNATURE OR DIGITAL SIGNATURE OF THE SUPPLIER OR HIS AUTHORIZED REPRESENTATIVE.

BANDR GSTIN NO. 06AABC3166E3Z1

BANDR C.I.N NO. U23710WB1920GOI003601,

STATE CODE. 06 BANDR PAN NO. AABC3166E

GST-TDS @ 2% (TWO PERCENT) WILL BE DEDUCTED FROM BASIC INVOICE VALUE (I.E. VALUE BEFORE GST) UNDER GST LAW W.E.F. 01.10.2018 FOR TAXABLE SERVICES. TDS @ 1% EACH FOR CGST & SGST OR 2% FOR IGST WILL BE APPLICABLE EXCEPT THE EXEMPTION PROVISION AS STIPULATED IN GST LAW. TAX DEDUCTED AT SOURCE WILL BE DEPOSITED TO THE GOVT. AND TDS CERTIFICATE WILL BE ISSUED TO THE BIDDER AS PER THE RULES.

GST INVOICE: IF THE AGENCY IS HAVING REGISTRATION IN OTHER STATE (EXCEPT HARYANA) SHALL RAISE THEIR TAX INVOICE BY CHARGING IGST ONLY.

51.2 OTHER TAXES & LEVIES

ANY OTHER CHARGES (EXCEPT GST) IF ANY, AS APPLICABLE, VIZ. LICENSE, DEPOSITS, ROYALTY, STAMP DUTY, OTHER CHARGES / LEVIES ETC. PREVAILING / APPLICABLE ON THE DATE OF OPENING OF TECHNICAL BIDS AND ANY VARIATIONS THEREOF DURING THE TENURE OF THE CONTRACT ARE IN THE SCOPE OF BIDDER. IN CASE BANDR IS FORCED TO PAY ANY SUCH FOR THE ABOVE, BANDR SHALL HAVE THE RIGHT TO RECOVER THE SAME FROM THE BIDDER EITHER FROM RUNNING BILLS OR OTHERWISE AS DEEMED FIT.

51.3 DIRECT TAX

BANDR SHALL NOT BE LIABLE TOWARDS INCOME TAX OF WHATEVER NATURE INCLUDING VARIATIONS THEREOF ARISING OUT OF THIS CONTRACT AS WELL AS TAX LIABILITY OF THE BIDDER AND THEIR PERSONNEL. DEDUCTION OF TAX AT SOURCE AT THE PREVAILING RATES SHALL BE EFFECTED BY BANDR BEFORE RELEASE OF PAYMENT AS A STATUTORY OBLIGATION, UNLESS EXEMPTION CERTIFICATE IS PRODUCED BY THE BIDDER. TDS CERTIFICATE WILL BE ISSUED BY BANDR AS PER THE PROVISIONS OF INCOME TAX ACT.

51.4 PROFESSIONAL TAX

PROFESSIONAL TAX ON ACCOUNT OF LABOURS IF APPLICABLE

51.5 NEW TAXES, DUTIES & LEVIES: -

ANY NEW TAXES/DUTIES/CESS/LEVIS NOTIFIED/IMPOSED AFTER THE SUBMISSION OF LAST/FINAL PRICE BID BUT BEFORE THE CONTRACTUAL DATE OF COMPLETION OF WORK SHALL BE TO BANDR'S ACCOUNT.

51.6 BOCW CESS

QUOTED PRICE SHALL BE INCLUSIVE OF BOCW CESS (IF APPLICABLE).

IN ORDER TO GOVERN WELFARE AND WORKING CONDITIONS OF LABOURERS ENGAGED IN CONSTRUCTION ACTIVITIES, THE BUILDING AND OTHER CONSTRUCTION WORKERS' (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE ACT, 1996, HEREINAFTER REFERRED TO AS THE "RE & CS") CAME INTO FORCE. THE RE&CS ACT IS APPLICABLE IN RESPECT OF BUILDING AND OTHER CONSTRUCTION WORK. WHEREVER APPLICABLE, THE BIDDER SHALL STRICTLY COMPLY WITH THE PROVISIONS PERTAINING TO RE&CS ACT. THE BIDDER MUST BE REGISTERED WITH THE CONCERNED AUTHORITIES UNDER THE RE&CS ACT, OR IN CASE OF NON-REGISTRATION THE BIDDER SHOULD OBTAIN REGISTRATION WITHIN ONE MONTH OF THE AWARD OF THE CONTRACT. CESS AS PER THE PREVAILING RATE, SHALL BE DEDUCTED AT SOURCE FROM BILLS OF THE BIDDER BY THE ENGINEER-IN-CHARGE OF THE CONTRACT AND REMITTED TO THE "SECRETARY, BUILDING AND OTHER CONSTRUCTION WORKERS WELFARE BOARD" OF THE CONCERNED STATE. THE BIDDER SHALL BE RESPONSIBLE TO SUBMIT FINAL ASSESSMENT RETURN OF THE CESS AMOUNT TO THE ASSESSING OFFICER AFTER ADJUSTING THE CESS DEDUCTED AT SOURCE.

52.0 EMPLOYEES PROVIDENT FUND

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SPECIAL CONDITIONS OF CONTRACT (SCC)

THE BIDDER UNDERTAKES TO DISCHARGE HIS RESPONSIBILITY UNDER THE EMPLOYEES PROVIDENT FUND SCHEME AS AN IMMEDIATE EMPLOYER, FOR EMPLOYEES ENGAGED OR EMPLOYED BY HIM FOR EXECUTION OF CONTRACTED WORK.

THE BIDDER UNDERTAKES THAT ALL EMPLOYEES, EITHER EMPLOYED BY HIM, OR PERMITTED ASSIGNS, WOULD BE COVERED UNDER THE ABOVE SCHEME FROM THE DATE OF COMMENCEMENT OF WORK. THE BIDDER FURTHER UNDERTAKES TO PAY EMPLOYEE'S CONTRIBUTION AS WELL AS EMPLOYER'S CONTRIBUTION AT APPROPRIATE RATE TO THE OFFICE OF REGIONAL PROVIDENT FUND COMMISSIONER WITHIN THE STIPULATED TIME PERIOD FOR THE SAME.

THE BIDDER ACKNOWLEDGES THE RIGHT OF THE COMPANY TO RECOVER DEDUCTS OR CLAIMS ANY AMOUNT, WHICH THE COMPANY IS REQUIRED TO PAY.

ALL CONTINGENCY WORK IS WITHIN THE QUOTED RATE OF BIDDER.

ALL ADDITIONAL MOBILIZATION & EXTENDED HOUR DUTY IS WITHIN THE QUOTED RATE OF THE BIDDER.

53.0 EMPLOYEES STATE INSURANCE (ESI):

EMPLOYEES STATE INSURANCE SCHEME IS APPLICABLE. AGENCY HAS TO MAINTAIN ALL THE STATUTORY NORMS IMPLEMENTED IN ACCORDANCE WITH THE ESI SCHEME

54.0 LABOUR RELATIONS

IN CASE OF LABOUR UNREST / LABOUR DISPUTE ARISING OUT OF NON-IMPLEMENTATIONS OF ANY LAW THE RESPONSIBILITY SHALL SOLELY LIE WITH THE BIDDER AND HE SHALL REMOVE/ RESOLVE THE SAME SATISFACTORILY AT HIS COST AND RISK.

55.0 REGISTRATION WITH THE LABOUR COMMISSIONER

THE SUCCESSFUL BIDDER SHALL REGISTER THEMSELVES WITH THE REGIONAL LABOUR COMMISSIONER - CENTRAL / STATE, AS APPLICABLE AND OR/IF REQUIRED AS REGISTERED BIDDER AND OBSERVE ALL RULES AND REGULATIONS AS REQUIRED BY THIS AUTHORITY. BIDDER SHOULD OBTAIN LABOUR LICENCE UNDER CONTRACT LABOUR (R&A) ACT & RULES FROM THE COMPETENT DEPT. IF FORM V IS ISSUED TO THEM.

56.0 COMPLIANCE OF EMPLOYEES PROVIDENT FUND SCHEME 1952 / EMPLOYEES FAMILY PENSION SCHEME 1995

EMPLOYEES PROVIDENT FUND SCHEME IS APPLICABLE. AGENCY HAS TO MAINTAIN ALL THE STATUTORY NORMS IMPLEMENTED IN ACCORDANCE WITH THE EPF SCHEME.

THE BIDDER(S) MUST OBTAIN, WITHIN THE QUOTED RATES, INDIVIDUAL CODES IN RESPECT OF EMPLOYEES' PROVIDENT FUND & E.S.I.

THEY MUST DEPOSIT THE EMPLOYEES' & EMPLOYERS' CONTRIBUTIONS TOWARDS PF & E.S.I. REGULARLY AS PER GOVT. RULES, TO THE STATUTORY BODIES AGAINST THEIR EMPLOYEES AND OTHER AND RELEVANT PAPERS/DOCUMENTS ETC. TO BE SUBMITTED TO THE COMPANY BANDR/IOCL FOR VERIFICATION BEFORE RELEASING THEIR RUNNING ACCOUNT BILLS.

DETAILS OF INDIVIDUAL CODE TOWARDS P.F. & E.S.I. OBTAINED BY THE BIDDER SHALL BE SUBMITTED TO BANDR/IOCL FOR OBTAINING ENTRY PASSES FOR BIDDER'S WORKERS ETC

57.0 WORKMEN COMPENSATION INSURANCE**57.1 COMPOSITE WORKMEN COMPENSATION INSURANCE AT SITE, SHALL BE TAKEN CARE OF BY BANDR.****COMPLIANCE WITH LAWS**

THE AGENCY SHALL ABIDE BY ALL APPLICABLE RULES, REGULATIONS, STATUTES, LAWS GOVERNING THE PERFORMANCE OFWORKS IN INDIA, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- A. CONTRACT LABOUR (REGULATION & ABOLITION) ACT 1970 & THE CENTRE RULES 1971 FRAMED THERE UNDER.
- B. PAYMENT OF WAGES ACT.
- C. MINIMUM WAGES ACT.
- D. INDUSTRIAL DISPUTE ACT.
- E. ENVIRONMENT PROTECTION ACT.

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SPECIAL CONDITIONS OF CONTRACT (SCC)

F. WILD LIFE ACT.

G. BUILDING AND OTHER WORKS CONTRACT ACT 1996

H. ANY OTHER STATUTE, ACT, LAW AS MAY BE APPLICABLE.

57.2 RULES & REGULATIONS OF SAFETY, ELECTRICITY BOARDS, FACTORY ETC.

THE BIDDER SHALL AT ALL TIMES COMPLY WITH ALL RELEVANT FACTORY ACTS, ELECTRICITY RULES, SAFETY REGULATIONS ETC. AS PER STATUTORY REGULATIONS OF CENTRAL / STATE GOVERNMENT & PLANT AUTHORITIES.

57.3 WORK BEYOND NORMAL WORKING HOUR

THE BIDDER MAY WORK BEYOND NORMAL WORKING HOUR AND ALSO ON SUNDAY AND HOLIDAY (WITH PRIOR APPROVAL FROM BANDR) AS DESIRED BY BANDR TO MAINTAIN PROGRESS OF WORK AS PER SCHEDULE WITHOUT ANY ADDITIONAL LIABILITY TO BANDR AT SITE. THE BIDDER SHALL GIVE PRIORITY OR REDEPLOY THE WORK FORCE FOR A PARTICULAR WORK AS INSTRUCTED BY BANDR.

58.0 EXTRA ITEMS

WORKS WHICH ARE NOT INCLUDED IN THE SCHEDULE OF ITEMS BUT WHICH ARE REQUIRED TO BE CARRIED OUT FOR COMPLETION OF THE PROJECT, SHALL BE CARRIED OUT AS PER SPECIFICATIONS, DRAWINGS, AND /OR SKETCHES TO BE ISSUED BY THE BANDR/EIL/IOCL. THE PAYMENT FOR SUCH ITEMS SHALL BE BASED ON RATES TO BE DERIVED WHEREVER POSSIBLE FROM AVAILABLE AGREED RATES. IF SUCH DERIVATION OF RATES IS NOT POSSIBLE, THE RATES FOR SUCH ITEMS SHALL BE DERIVED ON THE BASIS OF ACTUAL COST OF CONSUMABLE, LABOR AND TRANSPORTATION, WHICH SHALL BE SUBSTANTIATED WITH RELEVANT DOCUMENTS AND RECORDS BY THE BIDDER AND VERIFIED BY THE BANDR OR HIS AUTHORIZED REPRESENTATIVES. AN OVERALL MARGIN OF 5 % TOWARDS COST OF OVERHEAD AND PROFIT WILL BE ALLOWED. HOWEVER, THE PAYMENT OF SUCH EXTRA WORK(S) SHALL ONLY BE EFFECTIVE AFTER RECEIVING BANDR'S PAYMENT FROM EIL/OWNER.

59.0 FOLLOWING POINTS TO BE CONSIDERED BY THE BIDDER WHILE COATING HIS OFFER

- ANY ADDITIONAL WORK, IF REQUIRED, WILL BE UNDERTAKEN BY THEM AFTER GETTING INSTRUCTION IN WRITING FROM THE EXECUTING AUTHORITY. FOR SETTLEMENT OF THEIR CLAIMS ON ANY ADDITIONAL WORK, THE BIDDER WILL KEPT JOINT RECORD OF THE MEASUREMENTS OF SUCH WORK DULY CERTIFIED BY THE EXECUTING AUTHORITY.

60.0 WATCH AND WARD.

IT IS THE SOLE RESPONSIBILITY OF THE BIDDER FOR WATCH AND WARD OF EVERY MATERIALS INCLUDING FREE ISSUED MATERIALS AT FABRICATION AREA AS WELL AS ERECTION SITE. FOR THIS, BIDDER SHALL ENGAGE SUFFICIENT SECURITY GUARDS FOR THE ENTIRE DURATION OF CONTRACT PERIOD AT FABRICATION AREA AND ALSO ERECTION SITE BASED ON PERMISSION LIMIT OF CLIENT.

61.0 COMPLETION DOCUMENTS

ON COMPLETION OF WORK, THE BIDDER SHALL SUBMIT TO THE BANDR THE FOLLOWING DOCUMENTS.

- THE TECHNICAL DOCUMENTS ACCORDING TO WHICH THE WORK WAS CARRIED OUT.
- CERTIFICATES/DOCUMENTS ON CONTROL CHECKING.

62.0 MOBILISATION ADVANCE / SECURED ADVANCE

NO MOBILIZATION ADVANCE / SECURED ADVANCE SHALL BE ADMISSIBLE FOR CARRYING OUT THE WORK.

63.0 PRICE VARIATION COMPENSATION

NOT APPLICABLE

64.0 OVERRUN COMPENSATION

NOT APPLICABLE

65.0 RUNNING ACCOUNT BILLS (RA BILLS)

THESE ARE FOR INTERIM PAYMENTS WHEN THE CONTRACTS ARE IN PROGRESS. THE BILLS FOR SUCH INTERIM PAYMENTS ARE TO BE PREPARED BY THE BIDDER IN PRESCRIBED FORMATS (RA BILL FORMS).

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

PAYMENTS SHALL BE MADE ACCORDING TO THE EXTENT OF WORK DONE AS PER MEASUREMENTS TAKEN UP TO THE END OF THE CALENDAR MONTH AND IN LINE WITH THE TERMS OF PAYMENTS DESCRIBED IN THE TENDER DOCUMENTS.

RECOVERIES ON ACCOUNT OF ELECTRICITY, WATER, STATUTORY DEDUCTIONS, ETC ARE MADE AS PER TERMS OF CONTRACT.

66.0 FINAL BILL

FINAL BILL" IS USED FOR FINAL PAYMENT ON CLOSING OF RUNNING ACCOUNT FOR WORKS OR FOR SINGLE PAYMENT AFTER COMPLETION OF WORKS. "FINAL BILL" SHALL BE SUBMITTED AS PER PRESCRIBED FORMAT AFTER COMPLETION OF WORKS AS PER SCOPE AND UPON MATERIAL RECONCILIATION.

67.1 MEASUREMENT OF WORK AND ON ACCOUNT PAYMENT

- THE MODE OF MEASUREMENT SHALL BE AS MENTIONED IN RELEVANT STANDARD SPECIFICATION INCORPORATED IN THE BIDDING DOCUMENT. ANY OTHER MODE OF MEASUREMENTS NOT COVERED IN ABOVE SPECIFICATIONS SHALL BE FOLLOWED IN ACCORDANCE WITH RELEVANT BIS CODES /SCHEDULE OF RATES/ SPECIFICATIONS ETC. AND/OR AS DECIDED BY ENGINEER-IN-CHARGE. ONLY THE RELEVANT MODE(S) OF MEASUREMENT AS DETAILED IN THIS SECTION SHALL BE APPLICABLE FOR THE ITEMS COVERED IN THE SCOPE OF WORK / SCHEDULE OF RATES OF THE BIDDING DOCUMENT.
- PAYMENT WILL BE MADE ON THE BASIS OF JOINT MEASUREMENTS TAKEN BY THE BIDDER AND CERTIFIED BY ENGINEER-IN-CHARGE. MEASUREMENT SHALL BE BASED ON "APPROVED FOR CONSTRUCTION" DRAWINGS, TO THE EXTENT THAT THE WORK CONFORMS TO THE DRAWINGS AND DETAILS ARE ADEQUATE.
- WHEREVER WORK IS EXECUTED BASED ON INSTRUCTIONS OF ENGINEER-IN-CHARGE OR DETAILS ARE NOT ADEQUATE IN THE DRAWINGS, PHYSICAL MEASUREMENTS SHALL BE TAKEN BY THE BIDDER IN THE PRESENCE OF ENGINEER-IN-CHARGE.
- MEASUREMENTS OF WEIGHTS SHALL BE IN METRIC TONS CORRECTED TO THE NEAREST KILOGRAM. LINEAR MEASUREMENTS SHALL BE IN METERS CORRECTED TO THE NEAREST CENTIMETERS.
- THE WEIGHTS MENTIONED IN THE DRAWING OR SHIPPING LIST SHALL BE THE BASIS FOR PAYMENT. IF MOUNTINGS FOR PANELS ETC. ARE PACKED SEPARATELY, THEIR ERECTION WEIGHTS SHALL INCLUDE ALL MOUNTINGS.
- NO OTHER PAYMENT EITHER FOR TEMPORARY WORKS CONNECTED WITH THIS CONTRACT OR FOR ANY OTHER ITEM SUCH AS WELD, SHIMS, PACKING PLATES ETC. SHALL BE MADE. SUCH ITEMS SHALL BE DEEMED TO HAVE BEEN INCLUDED FOR IN THE RATES QUOTED.
- MEASUREMENTS WILL BE MADE FOR VARIOUS ITEMS UNDER SCHEDULE OF RATES ON THE FOLLOWING BASIS AS INDICATED IN THE UNIT COLUMN.
 - ❖ WEIGHTS: MT OR KG
 - ❖ LENGTH: M (METER)
 - ❖ NUMBER: NO.
 - ❖ VOLUME: CU.M
 - ❖ AREA: SQ.M
- WHEREVER THE UNIT OF ITEMS HAS BEEN INDICATED AS LUMP SUM, THE PAYMENT SHALL BE MADE ON LUMP SUM BASIS ON COMPLETION & NO MODE OF MEASUREMENT SHALL BE APPLICABLE.
- THE MEASUREMENT OF CABLE LAYING SHALL BE MADE ON THE BASIS OF LENGTH ACTUALLY LAID FROM LUG TO LUG INCLUDING LENGTH OF LOOPS PROVIDED.
- IN CASE OF CONFLICT BETWEEN THE UNIT OF MEASUREMENT GIVEN IN THE PRICE SCHEDULE/ SCHEDULE OF RATES AND ANY OTHER DOCUMENT IN THE TENDER DOCUMENT, THE UNIT MENTIONED IN THE FORMER SHALL PREVAIL.
- MEASUREMENT OF WORK WILL BE DONE AS PER SPEC OF CLIENT.

67.2 MEASUREMENT OF WORK AND MODE OF PAYMENT

ALL PAYMENTS DUE TO THE BIDDERS SHALL BE MADE BY E MODE ONLY, UNLESS OTHERWISE FOUND

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

OPERATIONALLY DIFFICULT FOR REASONS TO BE RECORDED IN WRITING.

68.0 PERFORMANCE OF WORKS, INSPECTION AND TESTING

- ❖ THE BIDDER SHALL WITHOUT ENTITLEMENT TO ANY ADDITIONAL COMPENSATION OR REMUNERATION AT HIS OWN COST AND INITIATIVE, SHALL TAKE ALL STEPS NECESSARY TO PROTECT THE TRENCHES ALREADY DUG, AND/OR THE PIPES AND OTHER MATERIALS, EQUIPMENT AND MACHINERY AT SITE DURING THE RAIN AND FROM THE EFFECTS THEREOF, AND THE BIDDER SHALL, AT HIS OWN COST AND INITIATIVE, DO AND PERFORM ALL SUCH RECTIFICATION, REPAIRS AND/OR RE-WORKINGS AS SHALL BE NECESSARY.
- ❖ THE BIDDER SHALL CARRY OUT THE VARIOUS TESTS AS ENUMERATED IN THE TECHNICAL SPECIFICATIONS OF THIS TENDER DOCUMENT AND THE TECHNICAL DOCUMENTS THAT WILL BE FURNISHED TO HIM DURING THE PERFORMANCE OF THE WORK AND NO SEPARATE PAYMENT SHALL BE MADE UNLESS OTHERWISE STIPULATED.
- ❖ ALL THE TESTS EITHER ON THE FIELD OR AT OUTSIDE LABORATORIES CONCERNING THE EXECUTION OF THE WORK AND SUPPLY OF MATERIALS BY THE BIDDER SHALL BE CARRIED OUT BY BIDDER AT HIS OWN COST. ALL TEST EQUIPMENT INCLUDING ALL RECORDING/ MEASURING GAUGES/ INSTRUMENTS SHALL BE CALIBRATED AND NECESSARY CERTIFICATE OF COMPLIANCE ISSUED BY THE STATUTORY AGENCY/BODY TO THE EFFECT THAT THE TEST EQUIPMENT'S / INSTRUMENTS HAVE BEEN CALIBRATED AS PER STANDARD PRACTICES AND FOUND MEETING THE NORMS SHALL HAVE TO BE FURNISHED BY THE BIDDER. THE ENTIRE COST OF CARRYING OUT SUCH CALIBRATION AND FURNISHING OF THE COMPLIANCE CERTIFICATE FROM A STATUTORY AUTHORITY/ BODY SHALL BE AT THE EXPENSE OF THE BIDDER.
- ❖ THE WORK IS SUBJECT TO INSPECTION AT ALL TIMES BY THE ENGINEER-IN-CHARGE. THE BIDDER SHALL CARRYOUT ALL INSTRUCTIONS GIVEN DURING INSPECTION AND SHALL ENSURE THAT THE WORK IS BEING CARRIED OUT ACCORDING TO THE TECHNICAL SPECIFICATIONS, THE TECHNICAL DOCUMENTS AND THE RELEVANT CODES OF PRACTICE FURNISHED TO HIM DURING THE PERFORMANCE FOR THE WORK. BIDDER SHALL DISCUSS HIS DAILY WORK PROGRAMME WITH ENGINEER-IN-CHARGE BEFORE STARTING THE SAME EVERY DAY.
- ❖ ANY WORK NOT CONFORMING TO THE EXECUTION DRAWINGS, SPECIFICATIONS OR CODES SHALL BE REJECTED FORTHWITH AND THE BIDDER SHALL CARRY OUT THE RECTIFICATION AT HIS OWN COST.
- ❖ ALL RESULTS OF INSPECTION AND TESTS WILL BE RECORDED IN THE INSPECTION REPORTS, PROFORMA OF WHICH WILL BE APPROVED BY THE ENGINEER-IN-CHARGE. THESE REPORTS SHALL FORM PART OF THE COMPLETION DOCUMENTS.

69.0 TESTING, PERFORMANCE RUN, COMMISSIONING AND HANDING OVER:

- ❖ AS A TOTAL SYSTEM, FUNCTIONAL TESTING SHALL BE CARRIED OUT AT SITE AFTER INSTALLATION AND COMMISSIONING OF INDIVIDUAL UNITS.
- ❖ BIDDER SHALL CONDUCT THE LOAD TEST OF HOT CRANE IN PRESENCE OF COMPETENT AUTHORITY AND SUBMIT THE LOAD TEST CERTIFICATE ISSUED BY COMPETENT AUTHORITY.
- ❖ THE BIDDER SHALL HAVE TO TEST EACH EQUIPMENT USED FOR THE NEW FACILITIES AS PER RESPECTIVE IS CODES/ RELEVANT INTERNATIONAL CODES AND TO THE FULL SATISFACTION OF THE IOCL/EIL/BANDR. AFTER TESTING THE INDIVIDUAL EQUIPMENT, THE BIDDER SHALL RUN THE COMPLETE FACILITIES AS DIRECTED BY THE IOCL/EIL/BANDR AT NO EXTRA COST TO IOCL /EIL/BANDR. ANY DEFECTS FOUND IN DESIGN, WORKMANSHIP OR IN ANY OF THE EQUIPMENT (SUPPLIED BY BIDDER) SHALL BE RECTIFIED BY THE BIDDER AT HIS OWN COST WITHIN A REASONABLE TIME TO BE DECIDED BY THE IOCL /EIL / BANDR AND BEYOND THIS PERIOD SUITABLE PENALTY SHALL BE LEVIED AND THE EQUIPMENT SHALL BE TESTED AGAIN FOR FAULTLESS RUNNING TO THE ENTIRE SATISFACTION OF THE IOCL/EIL/BANDR.
- ❖ THE LUMP SUM PRICE QUOTED FOR CARRYING OUT THE WORKS OF EACH ITEM OF SOR SHALL DEEM TO INCLUDE ALL MATERIAL SUPPLY, NECESSARY INSTRUMENTS, SKILLED AND UNSKILLED LABOR, SUPERVISORY PERSONNEL, MACHINERY, SPARES, WIRES, CABLES WITH PROTECTION PIPES ETC. TO BE FURNISHED/ PROVIDED BY THE BIDDER, FOR CONDUCTING THE TEST AND COMMISSIONING. HOWEVER, POWER, REQUIRED FOR FINAL TESTING, COMMISSIONING SHALL BE ARRANGED/ SUPPLIED BY THE IOCL/EIL/BANDR FREE OF COST. THE RECORDING OF TEST RESULTS SHALL BE DONE JOINTLY WITH THE IOCL/EIL/BANDR'S REPRESENTATIVES AND IN THE PROFORMA TO BE APPROVED BY THE ENGINEER-IN-CHARGE/ IOCL/EIL/BANDR AND WHICH SHALL FORM PART OF THE COMPLETION DOCUMENTS.
- ❖ IN CASE, OWNER/EIL/BANDR IS NOT IN A POSITION TO SUPPLY UTILITIES, SPARE, ETC., REQUIRED FOR

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TESTING AND COMMISSIONING OF THE NEW FACILITIES, IT WILL BE THE RESPONSIBILITY OF THE BIDDER ON RECEIPT OF INTIMATION FROM THE OWNER/EIL/BANDR TO CONDUCT PERFORMANCE RUN AND COMMISSION THE NEW FACILITIES AS MENTIONED ANY TIME DURING THE DEFECT LIABILITY PERIOD WITHOUT ANY EXTRA COST TO THE OWNER/EIL/BANDR. FOR THIS PURPOSE, IOCL/EIL/BANDR WILL GIVE TWO WEEKS' NOTICE TO THE BIDDER.

- ❖ THOUGH IT IS THE ENTIRE RESPONSIBILITY OF THE IOCL/EIL/BANDR TO COMMISSION THE COMPLETE SYSTEM BUT IN CASE WHEREVER REQUIRED TO RENDER ASSISTANCE IN THIS BEHALF TO THE IOCL /EIL/BANDR, THE BIDDER SHALL PROVIDE, WITHOUT ANY COST TO THE IOCL/EIL/BANDR, ALL NECESSARY INPUTS INCLUDING LABOUR AND EQUIPMENT/ MACHINERY TO THE IOCL /EIL /BANDR'S ENGINEERS AS WELL AS TO THE SUPPLIER'S COMMISSIONING ENGINEERS TO ENABLE THEM TO COMMISSION THE ENTIRE SYSTEM INCLUDING EQUIPMENT AND THEIR AUXILIARIES.
- ❖ IT SHALL BE THE RESPONSIBILITY OF THE BIDDER TO ARRANGE THE SERVICES OF THE EQUIPMENT MANUFACTURER DURING THE COMMISSIONING OF MACHINERY /EQUIPMENT /SYSTEM WHICH ARE SUPPLIED BY THE BIDDER.
- ❖ THE BIDDER AT HIS OWN COST AND INITIATIVE SHALL CARRY OUT RECTIFICATION OF DEFECT IN ANY WORK DONE BY THEM WITHOUT DELAY TO SUIT AND MATCH THE COMMISSIONING PROGRAMME.

70.0 GUARANTEE**70.1 MANUFACTURER'S GUARANTEE**

- ❖ THE MANUFACTURER'S GUARANTEE FOR ALL BOUGHT-OUT ITEMS SHALL BE MADE AVAILABLE TO THE IOCL/EIL/BANDR AND SHALL BE VALID FOR THE ENTIRE DEFECT LIABILITY PERIOD. HOWEVER, THIS DOES NOT ABSOLVE THE BIDDER OF HIS RESPONSIBILITIES UNDER DEFECT LIABILITY CLAUSE TO PERFORM IN ATTENDING TO THE DEFECTS NOTICED AND RECTIFYING THESE WITHOUT ANY DELAY.
- ❖ MANUFACTURER'S/ BIDDERS GUARANTEE, FOR ANY REPLACED EQUIPMENT SHALL ALSO BE MADE AVAILABLE TO THE IOCL/EIL/BANDR AND SHALL BE KEPT VALID AT LEAST FOR ONE YEAR FROM THE DATE OF LAST REPLACEMENT.
- ❖ THE MANUFACTURER'S GUARANTEES FOR ALL BOUGHT-OUT ITEMS SHALL BE VALID FOR THE ENTIRE DEFECT LIABILITY PERIOD. GUARANTEE CERTIFICATES OF ALL BOUGHT-OUT ITEMS AS MENTIONED SHALL BE SUBMITTED TO THE IOCL/EIL/BANDR BY THE BIDDER.

71.0 CONSTRUCTION**71.1 RULES AND REGULATIONS**

BIDDER SHALL OBSERVE, IN ADDITION TO CODES SPECIFIED IN RESPECTIVE SPECIFICATIONS, ALL NATIONAL AND LOCAL LAWS, RULES AND REGULATIONS AND REQUIREMENTS PERTAINING TO THE WORK. THE WORK AT MANY STATION LOCATIONS IS TO BE EXECUTED WITHIN OPERATION INSTALLATIONS.

71.2 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

THE BIDDER SHALL SUBMIT, A DETAILED QUALITY ASSURANCE PROCEDURE (QAP) TO THE IOCL/EIL/BANDR FOR APPROVAL. THE QAP SHOULD INDICATE THE ORGANIZATIONAL APPROACH FOR QUALITY CONTROL AND QUALITY ASSURANCE PLAN FOR THE JOB AND ALSO PROVIDE OBJECTIVE, VERIFIABLE EVIDENCE THAT THEY HAVE CARRIED OUT ALL ACTIVITIES FOR THE PURPOSE AND FOLLOWED THE SPECIFICATIONS, AS LAID DOWN IN THE TENDER DOCUMENTS AND PROCEDURE. THE QAP WILL INCLUDE THE FOLLOWING

71.3 FIELD INSPECTION

BIDDER SHALL HAVE A COMPETENT SUPERINTENDENT ON THE PREMISES, AT ALL THE TIMES DURING PERFORMANCE OF THE WORK. ANY INSTRUCTION GIVEN TO THE SUPERINTENDENT SHALL BE CONSTRUED AS HAVING BEEN GIVEN TO THE BIDDER.

71.4 ERECTION AND INSTALLATION

THE BIDDER SHALL CARRY OUT REQUIRED SUPERVISION AND INSPECTION AS PER THE QUALITY ASSURANCE PLAN AND FURNISH ALL ASSISTANCE REQUIRED BY THE IOCL /EIL /BANDR IN CARRYING OUT INSPECTION WORK DURING THIS PHASE. THE IOCL/EIL/BANDR SHALL HAVE ENGINEERS, INSPECTORS OR OTHER AUTHORIZED REPRESENTATIVES, WHO SHALL HAVE FREE ACCESS TO THE WORK, AT ALL THE TIMES. IF REPRESENTATIVE OF THE IOCL/EIL/BANDR NOTIFIES THE BIDDER'S AUTHORIZED REPRESENTATIVE, OF ANY DEFICIENCY, OR

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RECOMMENDS ACTION REGARDING COMPLIANCE WITH THE SPECIFICATIONS, THE BIDDER SHALL MAKE EVERY EFFORT TO CARRY OUT SUCH INSTRUCTIONS TO COMPLETE THE WORK CONFORMING TO THE SPECIFICATIONS AND APPROVED DRAWINGS IN THE FULLEST DEGREE CONSISTENT WITH THE BEST ENGINEERING PRACTICE.

71.5 EXISTING SERVICES

EXISTING DRAINS, PIPES, PETROLEUM PIPELINES, CABLES, OVERHEAD WIRES AND SIMILAR SERVICES ENCOUNTERED IN THE COURSE OF THE WORK SHALL BE PROTECTED AGAINST DAMAGE BY THE BIDDER AT HIS OWN COST, SO THAT THEY MAY CONTINUE IN FULL AND UNINTERRUPTED USE TO THE SATISFACTION OF THE IOCL/EIL/BANDR THEREOF, OR OTHERWISE OCCUPY A PART OF THE SITE IN A MANNER, NOT LIKELY TO HINDER THE OPERATION OF SUCH SERVICES.

ANY DAMAGE AFFECTING THE EXISTING FACILITIES / STRUCTURES DUE TO THE BIDDER'S FAULT SHALL BE REPAIRED BY THE BIDDER AT HIS OWN COST TO THE SATISFACTION OF ENGINEER- IN-CHARGE/ CONCERNED AUTHORITY.

71.6 CONSTRUCTION EQUIPMENT

BIDDER SHALL ENSURE ALL CONSTRUCTION EQUIPMENT TO BE IN SOUND OPERATING CONDITION, SAFE AND FIT FOR THE PURPOSE AND USE INTENDED FOR AND TO HAVE A SUFFICIENT SUPPLY OF SPARE PARTS TO AVOID DELAYS IN THE PERFORMANCE OF THE WORK RESULTING FROM LOSS OF USE. LATEST TEST CERTIFICATES WHEREVER REQUIRED SHALL BE MADE AVAILABLE FOR REFERENCE TO THE SITE ENGINEER/ ENGINEER-IN-CHARGE. ALL CONSTRUCTION EQUIPMENT SHALL BE SUBJECT TO INSPECTION AND APPROVAL FROM TIME TO TIME BY THE IOCL/EIL/BANDR FOR THE PURPOSE OF ENSURING CONFORMITY WITH THE FOREGOING STANDARD. ANY SUCH EQUIPMENT WHICH IS REJECTED OR NOT CONFORMING WITH THE FOREGOING SHALL BE PROMPTLY REPAIRED OR REMOVED BY BIDDER AND IF REMOVED SHALL BE REPLACED AS SOON AS PRACTICABLE AT BIDDER'S EXPENSE WITH SUITABLE EQUIPMENT.

72.0 CLEAN UP

THE TRENCHING AND CUTTING INVOLVED IN INSTALLATION AND REMOVAL OF ANODES AND ASSOCIATED CABLING SHALL BE RESTORED TO ORIGINAL CONDITION AFTER INSTALLATIONS.

BIDDER SHALL CLEAR THE JOB SITE OF ALL PIPES, SURPLUS MATERIALS, BIDDER'S LABOUR, EQUIPMENT AND MACHINERY AND SHALL DEMOLISH, DISMANTLE AND REMOVE ALL TEMPORARY WORK STRUCTURES, AND CONSTRUCTION AND OTHER ITEMS AND THINGS WHATSOEVER BROUGHT UPON, ERECTED UPON THE JOB SITE AND NOT INCORPORATED IN THE PERMANENT WORKS AND SHALL REMOVE ALL RUBBISH FROM THE JOB SITE AND SHALL CLEAR, DRESS AND RESTORE THE JOB SITE TO THE SATISFACTION OF THE SITE ENGINEER AND SHALL COMPLETELY VACATE THE JOB SITE.

73.0 INDEMNITY AND INSURANCE

THE BIDDER SHALL UNDERTAKE TO PROVIDE COMPREHENSIVE ACCIDENT INSURANCE COVERAGE IN RESPECT OF EVERY EMPLOYEE EMPLOYED BY HIM FOR CARRYING OUT BANDR/OWNER'S JOB. BIDDER SHALL SATISFY THE BANDR/OWNER OF THE SAME WITHIN THE TIME PRESCRIBED BY THE BANDR/OWNER BUT BEFORE THE ACTUAL COMMENCEMENT OF THE JOB AWARDED TO HIM.

INSURANCE OF ALL THE EQUIPMENT, MACHINERY, PLANT, TOOLS & TACKLES, VESSELS AND ANY OTHER EQUIPMENT BROUGHT TO SITE FOR COMPLETION OF WORK AND WHICH ARE NOT MEANT FOR PERMANENT INCORPORATION IN THE WORK SHALL BE TO THE BIDDERS ACCOUNT AND SUITABLE INSURANCE COVER SHOULD BE TAKEN ON HIS OWN.

74.0 TRIAL RUN/COMMISSIONING OF ENTIRE SYSTEM

- ❖ DURING THE TRIAL RUN /COMMISSIONING THE BIDDER SHALL SATISFY THE OWNER/EIL/BANDR IN ALL RESPECT REGARDING THE SATISFACTORY PERFORMANCE OF THE MATERIALS & WORKMANSHIP USED IN THE SYSTEM. UPON SUCCESSFUL COMMISSIONING OF THE SYSTEM AND ACCEPTANCE OF THE SAME, THE OWNER/EIL/BANDR SHALL TAKE OVER BY WRITTEN COMMUNICATION AND SUCH DATE OF TAKING OVER SHALL BE DEEMED AS THE DATE OF SUCCESSFUL COMMISSIONING AND A COMPLETION CERTIFICATE TO THAT EFFECT SHALL BE ISSUED.
- ❖ NECESSARY INSTRUMENTS, SKILLED AND UNSKILLED LABOUR, CONSUMABLES AND SUPERVISORY PERSONNEL SHALL BE FURNISHED/ PROVIDED BY THE BIDDER, FREE OF COST, FOR CONDUCTING THE TESTS, TRIAL RUN AND COMMISSIONING. THE RECORDING OF THE TEST RESULTS SHALL BE DONE JOINTLY WITH THE

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OWNER'S/EIL'S/BANDR'S REPRESENTATIVES AND IN THE PROFORMA TO BE APPROVED BY THE ENGINEER-IN-CHARGE.

- ❖ THE BIDDER SHALL PROVIDE LABOUR & EQUIPMENT/MACHINERY FOR TESTING AND COMMISSIONING OF THE ENTIRE SYSTEM.
- ❖ RECTIFICATION OF DEFECT IN ANY WORK DONE BY THE BIDDER SHALL BE CARRIED OUT BY THE BIDDER AT HIS OWN COST AND WITHOUT DELAY TO SUIT THE COMMISSIONING PROGRAMME.

75.0 OTHER STATUTORY REQUIREMENTS

- ❖ THE CONTACTOR SHALL SUBMIT MONTHLY RUNNING BILLS ALONG WITH THE COPIES OF MONTHLY WAGES (OF THE PRECEDING MONTH) U/S 78(1)(A)(1) OF CONTRACT LABOUR RULES, COPIES OF MONTHLY RETURN OF PF CONTRIBUTION WITH REMITTANCE CHALLANS UNDER EMPLOYEES PROVIDENT FUND ACT 1952 AND COPY OF RENEWED WC INSURANCE POLICY OR COPIES OF MONTHLY RETURN OF ESI CONTRIBUTION WITH CHALLANS UNDER ESI ACT 1948 (IF APPLICABLE) IN RESPECT OF THE WORKMEN ENGAGED BY THEM.
- ❖ THE BIDDER SHOULD ENSURE COMPLIANCE OF SEC 21 OF CONTRACT LABOUR (R&A) ACT 1970 REGARDING RESPONSIBILITY FOR PAYMENT OF WAGES. INCASE OF "NON-COMPLIANCE OF SEC 21 OR NON-PAYMENT OF WAGES" TO THE WORKMEN BEFORE THE EXPIRY OF WAGE PERIOD BY THE CONTACTOR, BANDR WILL RESERVE ITS RIGHT TO PAY THE WORKMEN UNDER THE ORDERS OF APPROPRIATE AUTHORITY AT THE RISK AND COST OF THE BIDDER.
- ❖ THE BIDDER SHALL SUBMIT COPIES OF FINAL SETTLEMENT STATEMENT OF DISBURSAL OF RETRENCHMENT BENEFITS ON RETRENCHMENT OF EACH WORKMEN UNDER I D ACT 1948, COPIES OF FORM 6-A (ANNUAL RETURN OF PF CONTRIBUTION) ALONG WITH COPIES OF PF CONTRIBUTION CARD OF EACH MEMBER UNDER PF ACT AND COPIES OF MONTHLY RETURN ON ESI CONTRIBUTION - FORM 6 UNDER ESI ACT 1948 (IF APPLICABLE) TO BANDR ALONG WITH THE FINAL BILL.
- ❖ IN CASE OF ANY DISPUTE PENDING BEFORE THE APPROPRIATE AUTHORITY UNDER I D ACT 1948, WC ACT 1923 OR ESI ACT 1948 AND PF ACT 1952, BANDR RESERVE THE RIGHT TO HOLD SUCH AMOUNTS FROM THE FINAL BILLS OF THE BIDDER WHICH WILL BE RELEASED ON SUBMISSION OF PROOF OF SETTLEMENT OF ISSUES FROM THE APPROPRIATE AUTHORITY UNDER THE ACT.

ALL PROGRESS PAYMENTS MADE SHALL BE REGARDED AS PAYMENT BY WAY OF ADVANCE AGAINST FINAL PAYMENTS ONLY AND NOT AS PAYMENT FOR THE WORK COMPLETED. THE PROGRESS PAYMENT MADE SHALL NOT EXONERATE THE BIDDER FROM LIABILITY TO FINALLY COMPLETE THE WORK STRICTLY IN ACCORDANCE WITH THE SPECIFICATION AND DRAWINGS, IF REQUIRED, BY RECONSTRUCTING OR RE-ERECTING FAULTY WORK.

WHILE CLAIMING PROGRESS PAYMENT, BIDDER SHALL SUBMIT DOCUMENTARY EVIDENCE TO THE EFFECT THAT HE HAS DEPOSITED EPF/ EPS/ LABOUR CESS FOR HIS WORKERS ALONG WITH CERTIFICATE INDICATING PAYMENT OF MINIMUM WAGES TO THE WORKMEN AT PREVAILING RATES AT PROJECT SITE AS PER STATUTE. BIDDER SHALL ALSO SUBMIT AN UNDERTAKING THAT THEY HAVE COMPLIED WITH ALL STATUTORY REQUIREMENT AS PER CONTRACT.

IN CASE ANY OR ONE OF THESE DOCUMENTS IS NOT SUBMITTED ALONG WITH PROGRESS BILLS, PAYMENT AGAINST THESE BILLS MAY BE KEPT IN ABEYANCE. IN SUCH AN EVENT BIDDER SHALL ENSURE PAYMENT OF DUE WAGES TO HIS WORKMEN AS WELL AS PAYMENT TO STATUTORY AUTHORITIES KEEPING EMPLOYER COMPLETELY INDEMNIFIED.

ON COMPLETION OF THE WORK, BIDDER SHALL GIVE NOTICE OF SUCH COMPLETION TO BANDR FOR INSPECTION OF WORKS. BANDR SHALL INSPECT THE WORK AND AFTER SATISFYING HIMSELF WITH TESTS THAT MAY BE PRESCRIBED IN THE CONTRACT, IF THERE IS NO DEFECT, IMPERFECTION OR SHORT FALL IN THE WORK, BANDR SHALL ISSUE A COMPLETION CERTIFICATE TO THE BIDDER.

BANDR SHALL ENDEAVOUR TO MAKE THE PAYMENT WITHIN 30 (THIRTY) DAYS FROM THE DATE OF SUBMISSION OF CERTIFIED INVOICE COMPLETE IN ALL RESPECT TO THE SATISFACTION OF ENGINEERS-IN-CHARGE. ANY INTEREST SHALL NOT BE PAID IN CASE OF DELAY IN PAYMENT.

THE ABOVE PROGRESSIVE PAYMENTS ARE SUBJECT TO DEDUCTION TOWARDS INCOME TAX AND OTHER RECOVERIES AS APPLICABLE AS PER THE TERMS OF CONTRACT.

AGENCY SHALL ENSURE ESIC & PF REGISTRATION TO COMPLAIN ALL THE STATUTORY RULES OF ESIC & PF.

76.0 CLEARING OF SITE:

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SPECIAL CONDITIONS OF CONTRACT (SCC)

BEFORE STARTING ANY WORK, WORK SITE, WHERE NECESSARY, MUST BE PROPERLY DRESSED AFTER CUTTING CLEARING ALL VARIETIES OF JUNGLES SHRUBS, BAMBOO CLUSTERS OR ANY UNDESIRABLE VEGETATION FROM THE ALIGNMENT OR SITE OF WORKS ON COMPLETION OF WORKS ALL TEMPORARY STRUCTURE OR OBSTRUCTION, MUST ALSO BE REMOVED. ALL SCARS OF CONSTRUCTION SHALL BE OBLITERATED AND THE WHOLE SITE SHALL BE LEFT IN A CLEAR AND NEAT MANNER TO THE SATISFACTION OF THE ENGINEER-IN-CHARGE. NO SEPARATE PAYMENT SHALL BE MADE FOR ALL THESE WORKS, THE COST THEREOF BEING DEEMED TO HAVE BEEN INCLUDED IN THE RATES OF VARIOUS ITEMS OF WORKS QUOTED BY THE BIDDER IN THE SCHEDULE OF PROBABLE ITEMS OF WORKS.

77.0 ADDITIONAL MOBILIZATION

AT ANY TIME OF EXECUTION OF WORK ADDITIONAL MANPOWER, EQUIPMENT MAY BE TO CATCH THE REVISED SCHEDULE / PROGRAMME WITHIN THEIR QUOTED PRICE.

78.0 IDLING OF MANPOWER & RESOURCES:

NO PAYMENT / CLAIM AGAINST IDLING OF MANPOWER, EQUIPMENT, RESOURCES WILL BE PAID TO THE BIDDER WHAT SO EVER THE REASON.

79.0 HEALTH, SAFETY, SECURITY AND ENVIRONMENT (HSSE) MANAGEMENT / SAFETY NORMS

THE BIDDER SHALL ABIDE BY THE SAFETY STANDARD REQUIREMENTS OF THE CLIENT AS STIPULATED FROM TIME TO TIME AND SHALL TAKE NECESSARY CLEARANCE FROM THE CLIENT'S SAFETY DEPARTMENT BEFORE INITIATING ANY INSTALLATION WORK. ALL PERSONAL SAFETY EQUIPMENT REQUIRED FOR THE SUBJECT JOB SUCH AS SAFETY HELMET, GLOVES, SHOES, JACKETS, BELT ETC. AND ANY OTHER SAFETY RELATED ITEMS AS REQUIRED SHALL BE PROVIDED BY THE BIDDER TO ITS EMPLOYEE/WORKERS. THE BIDDER SHALL PUT-UP NECESSARY SAFETY RELATED SIGNS BOARDS, BARRICADE, SAFETY NETS/COVERS ETC. AS NECESSARY FOR SAFE AND SOUND EXECUTION OF ITS PERFORMANCE UNDER THE SUBJECT CONTRACT.

THE BIDDER SHALL DEPLOY ITS OWN SAFETY OFFICER (WITH ADEQUATE QUALIFICATIONS AND EXPERIENCE) WHO SHALL BE PRESENT AT THE SITE DURING ANY KIND OF SITE ACTIVITIES. HE SHALL CONDUCT SAFETY AUDIT ON REGULAR INTERVAL IN CO-ORDINATION WITH BANDR/EIL/IOCL'S SAFETY DEPARTMENT AND SHALL MAINTAIN A LOG SHEET AND SAFETY REPORTS ACCORDINGLY. THE SAFETY OFFICER SHALL CONDUCT DAILY SAFETY MEETINGS AND KEEP THE WORKFORCE ALERT TO AVOID ANY SAFETY RELATED HAZARDS. THE BIDDER SHOULD KEEP SUFFICIENT NUMBER OF SUPERVISORS.

THE BIDDER SHALL ALSO ARRANGE GATE PASSES FOR THEIR VEHICLES AND PERSONNEL FROM THE SECURITY DEPARTMENT OF AS PER PREVAILING REGULATIONS FOR THE CURRENCY OF THE CONTRACT, WHICH SHOULD BE GIVEN BACK TO THE SECURITY AFTER THE COMPLETION OF THE PERIOD OF THE CONTRACT. CLEARANCE CERTIFICATE FROM GATE PASS ISSUING AUTHORITY CONFIRMING ALL GATE PASSES HAVE BEEN RETURNED IS REQUIRED TO BE SUBMITTED ALONG WITH THE BILL.

DEVICE APPROPRIATE SAFETY METHODOLOGIES FOR FOLLOW UP BY ALL CONCERNED WITH REGARD TO BANDR/EIL/IOCL SAFETY STANDARDS / NATIONAL CODES/ STATUTORY REGULATIONS.

BIDDER WILL DEPUTE SAFETY OFFICER TO TAKE CARE OF SAFETY ASPECT OF DAILY ACTIVITIES. ALL THE PERSONAL PROTECTIVE EQUIPMENTS LIKE HELMET, SAFETY BELT, SHOES, WILL BE OF ISO APPROVED AND ALSO APPROVED BY EIL/IOCL SAFETY DEPARTMENT.

IN CASE OF IGNORING SAFETY CASE, PENALTY WILL BE IMPOSED AS PER EIL/IOCL SAFETY NORMS.

NOTE:

- BANDR/EIL SAFETY/ IOCL SAFETY RECOMMENDATIONS ARE TO BE FOLLOWED.
- USE OF FLORESCENT JACKETS IN CONSTRUCTION SITE IS MANDATORY.
- THE "EIL/IOCL SAFETY STANDARDS AND PROCEDURES" ARE TO BE FOLLOWED.

APART FROM THE ABOVE NORMS THE FOLLOWING SAFETY PRECAUTIONS ARE TO BE OBSERVED BY THE BIDDER.

BIDDER SHOULD TAKE WORK PERMIT FROM THE USER DEPARTMENT AND FILL THE FORM AND TO AVOID ANY COMMUNICATION GAP WHEN THE WORK IS TO BE CARRIED OUT NEAR THE EXISTING FACILITIES AND WHILE CARRYING OUT INTERFACING WORKS.

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SPECIAL CONDITIONS OF CONTRACT (SCC)

THE BIDDER SHOULD DEPLOY ALL HIS WORKMEN HAVING PROPER SAFETY INDUCTION TRAINING AND THE NEW CONTRACT WORKMEN SHOULD BE DEPLOYED AT SITE ONLY AFTER THE NECESSARY SAFETY TRAINING AND GETTING THE TRAINING CERTIFICATE.

BIDDER SHOULD DEPLOY WORKMEN OF AGE 18 YEARS OR ABOVE.

THE BIDDER SHOULD APPOINT WORK SUPERVISORS AT EACH LOCATION WHILE PERFORMING THE JOB AT PLANT PREMISES.

BIDDER SHOULD ENSURE USE OF FULL BODY HARNESS AND SAFETY LIFE LINE AS PER JOB REQUIREMENT, WHILE WORKING AT HEIGHT.

NO WORK IS TO BE CARRIED OUT WHILE OTHERS WORKING BELOW OR OVER GANGWAYS & ROADS UNLESS ALL PRECAUTIONS ARE TAKEN TO ENSURE THE SAFETY OF PERSON AND PROPERTY.

WHILE HANDLING CHEMICALS, THE BIDDER, ITS SUPERVISOR AND/OR WORKMEN MUST READ & STRICTLY FOLLOW THE SAFETY INSTRUCTIONS AS WRITTEN IN MATERIAL SAFETY DATA SHEET.

ALL TRANSPORT VEHICLES INCLUDING GOODS CARRIERS SHOULD HAVE A VALID REGISTRATION, INSURANCE & PUC (POLLUTION UNDER CONTROL) CERTIFICATE AND THE DRIVER MUST HAVE THE VALID DRIVING LICENSE.

THE TRANSPORT VEHICLE SHOULD BE IN GOOD CONDITION AND SPEED OF THE VEHICLE SHOULD BE MAINTAINED AS PER COMPANY NORMS.

EVERY DRIVER OF A GOODS CARRIAGE TRANSPORTING ANY DANGEROUS OR HAZARDOUS GOODS SHALL OBSERVE AT ALL TIMES ALL THE PRECAUTION NECESSARY, FOR PREVENTING FIRE, EXPLOSION OR ESCAPE OF DANGEROUS OR HAZARDOUS GOODS CARRIED BY HIM WHILE THE GOODS CARRIAGE IS IN MOTION AND WHEN IT IS NOT BEING DRIVEN, HE SHALL ENSURE THAT THE GOODS CARRIAGE IS PARKED IN A PLACE WHICH IS SAFE FROM FIRE EXPLOSION AND ANY OTHER RISK AND IS AT ALL TIMES UNDER THE CONTROL AND SUPERVISION OF HIMSELF OR SOME OTHER COMPETENT PERSON ABOVE THE AGE OF EIGHTEEN YEARS. AT THE PARKING, THE DRIVER MUST ENSURE THAT PARKING BRAKE HAS BEEN APPLIED

NO PERSON SHALL CARRY MATCHES, FUSES OR OTHER APPLIANCES CAPABLE OF PRODUCING IGNITION OR EXPLOSION IN ANY INSTALLATION OR STORAGE SHED WHICH IS USED FOR THE STORAGE OF PETROLEUM.

NO BIDDER AND HIS SUPERVISOR OR HIS WORKMEN IS TO USE ANY CHEMICAL DRUM, PAINTS, THINNER OR ANY EXPLOSIVE CHEMICALS AND MATERIALS TO AVOID ANY FIRE & EXPLOSION FOR ANY WORK INSIDE EIL/IOCL PREMISES.

THE BIDDER HAS TO ENSURE THAT HIS WORKMEN SHALL ONLY USE COMPANY'S ELECTRICAL POWER AND COMPRESSED AIR FOR ANY PURPOSE WITH CONSENT OF COMPETENT AUTHORITIES FROM EIL/IOCL.

TO ENSURE EFFECTIVE ENFORCEMENT OF THE RULES AND REGULATIONS RELATING TO SAFETY PRECAUTIONS, THE ARRANGEMENTS MADE BY THE BIDDER SHALL BE OPEN TO INSPECTION BY THE FIRE & SAFETY PROFESSIONAL, ENGINEER-IN-CHARGE OF THE DEPARTMENT OF THEIR REPRESENTATIVES.

THE BIDDER SHALL TAKE ALL SAFETY PRECAUTIONS AND PROVIDE ADEQUATE SUPERVISION IN ORDER TO DO THE JOB SAFELY AND WITHOUT DAMAGE TO ANY EQUIPMENT.

THE CONTRACTING DEPARTMENT WOULD TAKE NECESSARY SHUTDOWNS WHEREVER THERE ARE HAZARDS OF GASES, ELECTRICITY, MOVING MACHINERY ETC. THE BIDDER SHALL ENSURE THAT THE SHUTDOWN/CLEARANCE ARE TAKEN BEFORE SENDING WORKERS IN SUCH LOCATIONS.

OPERATION INSIDE THE FACTORY WILL BE SUBJECT TO MONITORING BY THE SAFETY COMMITTEE COORDINATOR AND FIRE & SAFETY TEAM. THEY ARE EMPOWERED TO STOP ANY WORK OR PROCESS IF FOUND BEING UNDERTAKEN IN HAZARDOUS MANNER.

IN CASE OF ANY ACCIDENT OCCURRED AT THE SITE, THE BIDDER MUST PROVIDE ALL THE INFORMATION ABOUT THE ACCIDENT TO THE CONCERNED AUTHORITIES.

WHILE CLIMBING COLUMNS THE WORKMEN MUST HAVE SAFETY BELT FIXED TO FALL ARRESTOR TO PREVENT FALLING.

THE BIDDER MUST STRICTLY OBSERVE ALL SAFETY RULES AND REGULATIONS ISSUED BY THE COMPANY FROM TIME TO TIME AND ENFORCE SUCH OBSERVANCE ON THE PART OF EMPLOYEES. NON OBSERVATION OF ANY SUCH SAFETY RULES AND REGULATIONS BY THE BIDDER OR HIS EMPLOYEE SHALL RENDER THE BIDDER LIABLE

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IRRESPECTIVE OF ANY OTHER LAW AND RULES FOR THE TIME BEING IN FORCE TO PENALTY.

BIDDER SHALL STRICTLY FOLLOW OWNER / EIL SAFETY NORMS AT ALL THE TIME.

80.0 TEMPORARY WORKS

ALL TEMPORARY AND ANCILLARY WORKS INCLUDING ENABLING WORKS CONNECTED WITH THE WORK SHALL BE RESPONSIBILITY OF THE BIDDER AND THE PRICE QUOTED BY THEM FOR ERECTION SHALL BE DEEMED TO HAVE INCLUDED THE COST OF SUCH WORKS, WHICH SHALL BE REMOVED BY THE BIDDER AT HIS COST, IMMEDIATELY AFTER COMPLETION OF HIS WORK.

81.0 SAFETY REGULATIONS

THE WORKS UNDER THIS CONTRACT ARE TO BE CARRIED OUT IN AREAS WITHIN THE NEAR VICINITY OF OPERATING PLANT. AS SUCH, BIDDER IS REQUIRED TO ABIDE BY SAFETY AND SECURITY REGULATIONS OF BANDR/EIL/IOCL ENFORCED FROM TIME TO TIME.

82.0 ENTRY PASSES

THE BIDDER HAS TO APPLY FOR PHOTO ENTRY PASSES FOR HIS WORKERS & STAFF IN A PRESCRIBED PROFORMA AVAILABLE WITH BANDR/EIL/IOCL. THE PHOTO ENTRY PASSES SHALL BE ISSUED BY IOCL FOR A MAXIMUM PERIOD OF 1 MONTH AND IF EXTENSION IS REQUIRED BY THE BIDDER, HE HAS TO APPLY SEPARATELY FOR EXTENSION.

UNUTILIZED/ EXPIRED ENTRY PASSES SHALL HAVE TO BE SUBMITTED IMMEDIATELY TO BANDR/IOCL

IN CASE OF LOSS OF ANY ENTRY PASS, THE BIDDER HAS TO LODGE FIR WITH LOCAL POLICE STATION AND INFORM THE ENGINEER-IN-CHARGE AND SHALL HAVE TO PAY REQUIRED AMOUNT AS FINE AGAINST EACH ENTRY PASS. THE BIDDER IS REQUIRED TO KEEP TRACK OF ALL ENTRY PASSES ISSUED AND RETURNED.

IDENTITY CARD ISSUED BY THE SECURITY SECTION SHOULD ALWAYS BE CARRIED/ DISPLAYED BY THE BIDDER'S EMPLOYEE OR PERSON WHILE WORKING INSIDE THE PLANT.

83.0 GATE PASSES

TO BRING MATERIALS/ EQUIPMENTS/ TOOLS/ TACKLES ETC. INSIDE THE PLANT FOR CONSTRUCTION WORK, THE BIDDER HAS TO PRODUCE CHALLANS/ PROPER DOCUMENTS TO BANDR/EIL/IOCL PERSONNEL AT GATE. THE MATERIALS SHALL BE CHECKED THOROUGHLY BY BANDR/EIL/IOCL PERSONNEL AT GATE AND RECORDED IN THEIR REGISTER BEFORE ALLOWING ANY MATERIAL TO BRING INSIDE THE PLANT BY THE BIDDER. IT IS BIDDER'S RESPONSIBILITY TO SEE THAT THE RECORDED ENTRY NO., DATE, SIGNATURE OF IOCL/ EIL AUTHORIZED REPRESENTATIVE WITH STAMP CHALLANS/ SUPPORTING DOCUMENTS SIGNED BY COMPANY'S PERSONNEL AT GATE DURING ENTRY.

84.0 WORK PERMIT

WHEN THE WORK IS TO BE CARRIED OUT IN HAZARDOUS AREAS, HOT WORK PERMIT ARE TO BE OBTAINED BEFORE START OF WORK FOR ALL THE JOBS WHICH ARE CAPABLE OF GENERATING FLAME, SPARK, HEAT ETC. NAMELY, GAS CUTTING, GRINDING, WELDING, USE OF ANY ELECTRICAL/ DIESEL/ PETROL/ BATTERY OPERATED PRIME MOVER/ MACHINE/ TOOLS/ EQUIPMENT/ GENERATOR SETS/ MIXER MACHINE/ DRILLING MACHINE/ PUMPS/CRANE, FORK LIFTER/ HAND TRUCK/ TRAILER, CHIPPING/ BREAKING OF ROCKS/CONCRETE, HACKSAW CUTTING AND DRILLING, ETC.

COLD WORK PERMITS ARE TO BE OBTAINED FOR THE JOBS WHICH ARE NOT COMING UNDER THE CATEGORY OF HOT WORK AND WHERE THERE IS NO RISK OF FIRE, VIZ, TRANSPORTATION/ BACKFILLING OF ORDINARY SOIL IN MANUAL PROCESS, PILING TESTING, HYDRO TESTING, SHUTTERING, FIXING OF REINFORCEMENT, HAND MIX CONCRETING, PLASTERING, BRICK WORK ETC.

ACCORDING TO NATURE OF WORK AND USE OF VARIOUS TYPES OF EQUIPMENTS & TOOLS THE BIDDER HAS TO APPLY FOR COLD/HOT PERMITS IN A PRESCRIBED FORMAT AT LEAST 2 DAYS BEFORE THE WORK IS PLANNED TO START. NO WORK PERMIT SHALL BE ISSUED BY IOCL/ EIL UNLESS PROPER ARRANGEMENT IS MADE BY THE BIDDER TO ENSURE SAFE PERFORMANCE OF WORK INSIDE THE PLANT. JOB WISE AND AREA WISE PERMITS SHALL BE ISSUED TO THE BIDDER AND AGAINST EACH PERMIT AT LEAST ONE CONSTRUCTION SUPERVISOR AND ONE SAFETY SUPERVISOR OF REQUIRED LEVEL SHALL ALWAYS BE MADE AVAILABLE AT SITE BY THE BIDDER. THIS SAFETY PERMIT SHALL BE ISSUED AT ONE POINT CONTACT BY IOCL/ EIL.

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)85.0 VEHICLE PERMIT

PERMITS ARE TO BE OBTAINED SEPARATELY FOR ENTRY/USE OF VEHICLES/ TRAILERS ETC. INSIDE THE PLANT. THE FOLLOWING REQUIREMENTS ARE TO BE MET TO OBTAIN VEHICLE PERMIT:

VEHICLE/EQUIPMENT ETC. SHOULD BE BROUGHT TO SITE IN GOOD CONDITIONS.

VALID ROAD TAX CERTIFICATE, FITNESS CERTIFICATE AND INSURANCE POLICY FROM COMPETENT AUTHORITY.

VALID OPERATING/ DRIVING LICENCE OF DRIVER/OPERATOR

86.0 VALIDITY OF THE WORK PERMIT

PERMIT IS VALID FOR 24 HOURS.

NO PERMIT IS VALID IF IT IS NOT RENEWED BY THE SHIFT IN CHARGE/ SHIFT REPRESENTATIVE IN SHIFTS (MORNING & EVENING).

THE PERMIT SHALL BE ISSUED FOR A MAXIMUM PERIOD OF ONE MONTH AND IF EXTENSION IS REQUIRED, THE BIDDER HAS TO APPLY FOR FRESH PERMIT.

NO PERMIT IS VALID ON HOLIDAYS UNLESS SPECIAL PERMISSION IS OBTAINED FROM THE COMPETENT AUTHORITY.

87.0 SAFETY REGULATION88.0 REGARDING WORK PERMIT

- I) THE WORK SHALL BE CARRIED OUT INSIDE THE PLANT AS PER SAFETY PRACTICES ENFORCED BY IOCL / EIL SAFETY SECTION AND INSTRUCTIONS OF ENGINEER-IN-CHARGE ISSUED FROM TIME TO TIME. MANY TIMES IT MAY HAPPEN THAT THE WORKING HOURS SHALL BE DRASTICALLY REDUCED OR INCREASED TO MEET CERTAIN SAFETY REQUIREMENTS AND THE BIDDER SHALL MEET THESE REQUIREMENTS WITHOUT ANY ARGUMENT FOR TIME AND FINANCIAL IMPLICATIONS. TO OBTAIN WORK PERMIT AND TO SATISFY ALL CONDITIONS LAID DOWN THEREIN, SHALL BE THE RESPONSIBILITY OF THE BIDDER. NO CLAIM FOR IDLING OF MACHINERY, PLANT, MANPOWER ETC. FOR SAFETY REASONS OR NON-ISSUANCE OF WORK PERMIT BY IN-CHARGE, SAFETY SECTION SHALL BE CONSIDERED.
- II) THE WORK SHALL BE CARRIED OUT INSIDE THE PLANT AS PER SAFETY PRACTICES ENFORCED BY IOCL / EIL SAFETY SECTION AND INSTRUCTIONS OF ENGINEER-IN-CHARGE ISSUED FROM TIME TO TIME. MANY TIMES IT MAY HAPPEN THAT THE WORKING HOURS SHALL BE DRASTICALLY REDUCED OR INCREASED TO MEET CERTAIN SAFETY REQUIREMENTS AND THE BIDDER SHALL MEET THESE REQUIREMENTS WITHOUT ANY ARGUMENT FOR TIME AND FINANCIAL IMPLICATIONS. TO OBTAIN WORK PERMIT AND TO SATISFY ALL CONDITIONS LAID DOWN THEREIN, SHALL BE THE RESPONSIBILITY OF THE BIDDER. NO CLAIM FOR IDLING OF MACHINERY, PLANT, MANPOWER ETC. FOR SAFETY REASONS OR NON-ISSUANCE OF WORK PERMIT BY IN-CHARGE, SAFETY SECTION SHALL BE CONSIDERED.

IOCL / EIL SHALL PERMIT CONSULTANT AND HIS AUTHORIZED CONSTRUCTION PERSONNEL TO FREELY MOVE, IN AND OUT OF THE SITE, SUBJECT TO THE OBSERVANCE OF SECURITY AND SAFETY REGULATIONS OF IOCL / EIL. IN VIEW OF SPECIFIC SECURITY REQUIREMENT FOR THE PLANT INSTALLATION AND ITS STRICTEST OBSERVANCE, ALL PERSONAL OF CONSULTANT OR HIS AUTHORIZED CONSTRUCTION PERSONNEL (SKILLED/ UNSKILLED) ARE REQUIRED TO HAVE DETAIL POLICE VERIFICATION FOR THE PURPOSE OF ISSUE OF PHOTO PASS REQUIRED FOR ENTRY AND FREE MOVEMENT AT WORK SITE. THEY WILL ALSO HAVE TO BEAR WITH THE RESTRICTION AND LIMITATION OF ENTRY/EXIT TO WORK SITE AS PER THE SECURITY REQUIREMENT.

89.0 REGARDING HOT WORK

- I WHEN DOING HOT WORK INSIDE THE PLANT THE BIDDER MUST ENSURE THAT THE FIRE HOSE IS HOOKED UP WITH THE FIRE WATER SYSTEM AND EXTENDED TO THE WORK SPOT. FIRE EXTINGUISHER MUST BE KEPT NEAR THE WORKING SPOT. AREA AROUND AND BELOW THE HOT WORKING PLACE MUST BE ADEQUATELY PROTECTED FROM FALLING/ COMING OUT OF SPARKS/HOT METALS FROM THE BOOTH MADE OF ASBESTOS CLOTH/SHEET AND WETTING THEM WITH WATER. THE BIDDER MUST ARRANGE SUFFICIENT NUMBER OF FIRE HOSES AND FIREFIGHTING EQUIPMENT OF APPROVED QUALITY TO CARRY OUT HOT JOB INSIDE THE PLANT.
- II WELDING & ELECTRICAL CABLES SHOULD BE OF APPROVED QUALITY, AND NO JOINTING AND LOOSE

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

CONNECTION SHALL BE PERMITTED.

- III AT THE END OF THE WORKING DAY THE BIDDER MUST INFORM ELECTRICAL SECTION TO SWITCH OFF POWER AT SUB-STATION END.
- IV THE BIDDER MUST PROVIDE COTTON DRESS, SAFETY SHOE, SAFETY HELMET, SAFETY BELT, HAND GLOVES OF APPROVED QUALITY TO HIS WORKERS TO MEET THE SAFETY REQUIREMENT OF VARIOUS JOBS TO BE CARRIED OUT INSIDE THE PLANT.

90.0 REGARDING USE OF VEHICLE

- I VEHICLE MUST NOT PLY ON ANY ROAD WITHIN THE PLANT AT SPEED EXCEEDING 20KM/HR.
- II MOBILE CRANE / LOADED TRUCKS/TRAILERS MUST NOT EXCEED SPEED LIMIT OF 15KM/HR INSIDE THE PLANT.
- III NO CRANE IS ALLOWED TO MOVE INSIDE THE PLANT WITH LOAD.
- IV NO VEHICLE IS ALLOWED TO PARK INSIDE THE PLANT.

91.0 CORRUPT AND FRAUDULENT PRACTICES

BIDDERS ARE REQUIRED TO FURNISH THE COMPLETE AND CORRECT INFORMATION/ DOCUMENTS REQUIRED FOR EVALUATION OF THEIR BIDS. IF THE INFORMATION/ DOCUMENTS FORMING BASIS OF EVALUATION IS FOUND TO BE FALSE/ FAKE/ FORGED, THE SAME SHALL BE CONSIDERED ADEQUATE GROUND FOR REJECTION OF THE BIDS.

IOCL REQUIRES THAT THE BIDDER OBSERVES THE HIGHEST STANDARD OF ETHICS DURING THE EXECUTION OF CONTRACT. IN PURSUANCE OF THIS POLICY, IOCL DEFINES, FOR THE PURPOSES OF THIS PROVISION, THE TERMS SET FORTH BELOW AS FOLLOWS:

- A "CORRUPT PRACTICE" MEANS THE OFFERING, GIVING, RECEIVING, OR SOLICITING OF ANYTHING OF VALUE TO INFLUENCE THE ACTION OF PUBLIC OFFICIAL IN CONTRACT EXECUTION; AND
- B FRAUDULENT PRACTICE" MEANS A MISREPRESENTATION OF FACTS IN ORDER TO INFLUENCE THE EXECUTION OF A CONTRACT TO THE DETRIMENT OF IOCL AND INCLUDES COLLUSIVE PRACTICE AMONG BIDDERS (PRIOR TO OR AFTER BID SUBMISSION) DESIGNED TO ESTABLISH BID PRICES AT ARTIFICIAL NON-COMPETITIVE LEVELS AND TO DEPRIVE IOCL OF THE BENEFITS OF FREE AND OPEN COMPETITION
- C FORGERY" MEANS THE FALSE MAKING OR THE MATERIAL ALTERING OF A DOCUMENT WITH THE INTENT TO DEFRAUD. A SIGNATURE OF A PERSON THAT IS MADE WITHOUT THE PERSON'S CONSENT AND WITHOUT THE PERSON OTHERWISE AUTHORIZING IT. A PERSON IS GUILTY OF FORGERY IF, WITH THE PURPOSE TO DEFRAUD OR INJURE ANYONE OR WITH KNOWLEDGE THAT HE IS FACILITATING A FRAUD OR INJURY TO BE PERPETRATED BY ANYONE, THE ACTOR (I) ALTERS ANY WRITING OF ANOTHER WITHOUT HIS AUTHORITY (II) MAKES, COMPLETES, AUTHENTICATES, EXECUTES, ISSUES OR TRANSFERS ANY WRITING, SO THAT IT PURPORTS TO BE THE ACT OF ANOTHER WHO DID NOT AUTHORIZE THAT ACT OR TO HAVE BEEN EXECUTED AT A TIME OR PLACE OR IN A NUMBERED SEQUENCE OTHER THAN WAS IN FACT THE CASE, OR TO, BE A COPY OF AN ORIGINAL WHEN NO SUCH ORIGINAL EXISTS. UTTERS ANY WRITING WHICH HE KNOWS TO BE FALSE IN A MANNER SPECIFIED IN (I) & (II) ABOVE.

IOCL MAY TERMINATE THE CONTRACT IF IT DISCOVERS SUBSEQUENTLY THAT THE BIDDER HAD ENGAGED IN CORRUPT PRACTICES OR FRAUDULENT PRACTICES IN COMPETING FOR THE CONTRACT.

IN CASE, THE INFORMATION/ DOCUMENT FURNISHED BY THE BIDDER FORMING BASIS OF EVALUATION OF ITS BID IS FOUND TO BE FALSE / FAKE/ FORGED AFTER THE AWARD OF THE CONTRACT, IOCL/BANDR SHALL HAVE THE RIGHT TO TERMINATE THE CONTRACT AND GET THE REMAINING WORKS EXECUTED BY A THIRD PARTY AT THE RISK & COST OF THE BIDDER AND WITHOUT ANY PREJUDICE TO OTHER RIGHTS AVAILABLE TO IOCL UNDER THE CONTRACT SUCH AS FORFEITURE OF THE CONTRACT PERFORMANCE BANK GUARANTEE, WITHHOLDING OF PAYMENT ETC.

IN CASE, THIS ISSUE OF SUBMISSION OF FALSE/FAKE DOCUMENTS COMES TO THE NOTICE AFTER EXECUTION OF THE WORKS, IOCL SHALL HAVE FULL RIGHT TO FORFEIT ANY AMOUNT DUE TO THE BIDDER ALONG WITH FORFEITURE OF THE CONTRACT PERFORMANCE BANK GUARANTEE FURNISHED BY THE BIDDER.

FURTHER, ANY BIDDER WHICH IS FOUND GUILTY OF ANY CORRUPT OR FRAUDULENT PRACTICE OR SUBMISSION OF FALSE/FAKE /FORGED DOCUMENTS, SHALL BE PUT ON THE NEGATIVE/ HOLIDAY LIST OF IOCL DEBARRING

SPECIAL CONDITIONS OF CONTRACT (SCC)

THEM FROM FUTURE BUSINESS WITH IOCL.

92.0 VIOLATION OF SAFETY NORMS.

THE BIDDER SHALL ADHERE CONSISTENTLY TO ALL PROVISIONS OF HSE REQUIREMENTS. IN CASE OF NON-COMPLIANCES AND ALSO FOR REPEATED FAILURE IN IMPLEMENTATION OF ANY OF THE HSE PROVISIONS, BANDR/EIL/IOCL MAY IMPOSE STOPPAGE OF WORK WITHOUT ANY COST & TIME IMPLICATION TO THE IOCL AND/OR IMPOSE A SUITABLE PENALTY.

93.0 MATERIAL RECONCILIATION

AGENCY HAS TO COMPLETE THE RECONCILIATION & RETURNING OF ALL MATERIALS ISSUED TO THE AGENCY BY THE COMPANY, IF ANY ON MONTHLY BASIS. IN CASE OF FAILING TO DO MATERIAL RECONCILIATION AS PER BANDR/EIL/IOCL 'S NORMS, RECOVERY FROM THE AGENCY SHALL BE DONE AS PER THE EIL/ IOCL'S PENAL RATE AND OR AS PER DIRECTION OF THE ENGINEER IN CHARGE.

94.0 CO-ORDINATION WITH OTHER AGENCIES

WORK SHALL BE CARRIED OUT IN SUCH A MANNER THAT THE WORK OF OTHER AGENCIES OPERATING AT THE SITE IS NOT HAMPERED DUE TO ANY ACTION OF THE AGENCY. PROPER CO-ORDINATION WITH OTHER AGENCIES WILL BE AGENCY'S RESPONSIBILITY. IN CASE OF ANY DISPUTE, THE DECISION OF ENGINEER-IN-CHARGE SHALL BE FINAL AND BINDING ON THE AGENCY.

95.0 WORK IN MONSOON

WORK SHALL NOT GET SUFFERED IN MONSOON. NECESSARY PRECAUTIONARY LIKE ARRANGEMENT OF SHEDS, ENCLOSURES ETC SHALL BE MADE BY THE AGENCY TO CONTINUE THE WORK IN MONSOON.

96.0 LABOUR AT SITE

NO LABOUR SHALL BE ALLOWED TO STAY AT SITE. THE BIDDER SHALL OBTAIN PRIOR PERMISSION OF THE OWNER FOR THE WATCHMAN WHO WILL BE REQUIRED TO STAY AT THE SITE. THE BIDDER SHALL ARRANGE TO PROVIDE DUE FACILITIES TO HIS LABOUR AT SITE. HE WILL KEEP HIS TEMPORARY OFFICE, SHED, ETC. REASONABLY CLEAN AT ALL TIMES.

97.0 PROHIBITION OF ENGAGEMENT OF CHILD LABOUR

THE AGENCY SHALL STATE THAT THEY ARE NOT ENGAGING CHILD LABOUR AS PER VARIOUS LABOUR LAWS APPLICABLE TO THEM. MAKING A FAKE CLAIM WOULD HAVE ITS CONTRACT TERMINATED FORTHWITH, IF DETECTED LATER. IT IS MANDATORY FOR THE AGENCY TO SUBMIT AN UNDERTAKING FOR NON-ENGAGEMENT OF CHILD LABOUR.

98.0 RESTRICTION OF VISITORS

THE AGENCY SHALL NOT ALLOW ANY VISITORS ON THE WORK OR PREMISES OF THE SITES WITHOUT APPROVAL OF THE ENGINEER-IN-CHARGE AND/OR SITE ENGINEER.

99.0 PERSONAL ACTS AND LIABILITIES

ANY MONEY PAID TO ANY DIRECTOR, ATTORNEY, AGENT, OFFICER OR EMPLOYEE OF THE AGENCY AND ANY RECEIPT, SETTLEMENT, ACKNOWLEDGEMENT OF LIABILITY OR OTHER ARRANGEMENT, AGREEMENT OR DOCUMENT WHATSOEVER SIGNED BY ANY SUCH DIRECTOR, ATTORNEY, AGENT, OFFICER, OR EMPLOYEE OF THE AGENCY OR ERSTWHILE DIRECTOR, ATTORNEY, AGENT, OFFICER OR EMPLOYEE OF THE AGENCY (WITHOUT NOTICE OF HIS CESSATION OF INTEREST) OR BY ANY PERSON HELD OUT TO BE A DIRECTOR, ATTORNEY, AGENT, OFFICER OR EMPLOYEE OF THE AGENCY AUTHORISED TO ACT ON BEHALF OF AND/OR TO BIND THE AGENCY, BE BINDING UPON THE AGENCY AND SHALL CONSTITUTE A FULL RELEASE AND DISCHARGE TO THE OWNER AND/OR SETTLEMENT, ACKNOWLEDGEMENT OR OBLIGATION OF, UPON OR WITH THE AGENCY, AS THE CASE MAY BE, AND THE OWNER SHALL NOT BE CONCERNED WITH THE ACTUAL APPLICATION OF ANY MONEY SO PAID OR OF THE ACTUAL AUTHORITY OF SUCH DIRECTOR, ATTORNEY, AGENT, OFFICER OR EMPLOYEE (ACTUAL, ERSTWHILE OR PURPORTED AS THE CASE MAY BE) VIS-À-VIS THE COMPANY TO MAKE THE SETTLEMENT, RECEIPT, ACKNOWLEDGEMENT, AGREEMENT OR OTHER DOCUMENT CONCERNED.

100.0 THE BIDDER SHALL PURCHASE BOUGHT OUT MATERIAL (OTHER THEN THE MATERIALS SUPPLIED BY B AND R ON FREE ISSUE BASIS) OF APPROVED MANUFACTURERS OR THEIR STOCKIST FOR EXECUTING GENERAL CIVIL WORKS.

SPECIAL CONDITIONS OF CONTRACT (SCC)**NOTE:**

- ❖ BIDDER SHALL SUBMIT MATERIAL TEST CERTIFICATE FOR BATCHES PROCURED AND DELIVERED AT SITE.
- ❖ FOR PROCUREMENT OF ITEMS FROM VENDORS OTHER THAN THOSE LISTED ABOVE, BIDDER SHALL OBTAIN PRIOR SPECIFIC APPROVAL FROM CONSULTANT / OWNER BY SUBMITTING ALL DOCUMENTARY EVIDENCES. HOWEVER, DELAY IF ANY, BY OWNER/CONSULTANT IN APPROVING ANY VENDORS PROPOSED BY THE BIDDER, OR REJECTION, IF ANY BY OWNER/CONSULTANT OF ANY VENDOR (S) PROPOSED BY BIDDER, SHALL NOT ENTITLE THE BIDDER FOR ANY TIME EXTENSION OR COST IMPLICATION

101.0 PROCUREMENT FROM A BIDDER FROM A COUNTRY SHARING LAND BORDER WITH INDIA

ANY BIDDER FROM A COUNTRY WHICH SHARES A LAND BORDER WITH INDIA WILL BE ELIGIBLE TO BID IN THIS TENDER ONLY IF BIDDER IS REGISTERED WITH COMPETENT AUTHORITY. THE COMPETENT AUTHORITY FOR THE PURPOSE OF REGISTRATION SHALL BE THE REGISTRATION COMMITTEE CONSTITUTED BY THE DEPARTMENT OF PROMOTION OF INTERNAL TRADE (DPIIT) OF GOVT. OF INDIA. THE REGISTRATION SHOULD BE VALID AT THE TIME OF SUBMISSION OF BIDS AND AT THE TIME OF ACCEPTANCE OF BIDS.

ANY BIDDER FROM A COUNTRY WHICH SHARES A LAND BORDER WITH INDIA WILL BE ELIGIBLE TO BID IN ANY PROCUREMENT WHETHER OF GOODS, SERVICES (INCLUDING CONSULTANCY SERVICES / NON-CONSULTANCY SERVICES) OR WORKS (INCLUDING TURNKEY PROJECTS) ONLY IF THE BIDDER IS REGISTERED WITH THE COMPETENT AUTHORITY (AS PER PM DATED 20.03.2023 ISSUED BY THE MINISTRY OF FINANCE).

102.0 'MAKE IN INDIA'

PREFERENCE TO 'MAKE IN INDIA' :

AS PER OFFICE MEMORANDUM DTD. 19.10.2020 15.05.2023 & 18.05.2023 WILL BE INCORPORATED IN NIT DOCUMENT.

IN LINE TO PUBLIC PROCUREMENT POLICY, GOVT. OF INDIA (REFER ORDER 2017 DTD. 16. SEPT.-2020 ISSUED BY THE DPIIT) BANDR HAS IMPLEMENTED "PURCHASE PREFERENCE POLICY" FOR THE CLASS-I LOCAL SUPPLIER(S) FOR THE ITEM /SERVICE COVERED IN THE TENDER. BANDR SHALL RESERVE THE RIGHT TO CONSIDER PREFERENCE OF THE LOCAL SUPPLIER(S) SUBJECT TO FOLLOWING CONDITIONS:

IF QTY. OF GOODS / SERVICE UNDER PROCUREMENT IS DIVISIBLE AND EMERGED L-1 BIDDER IS A 'NON-LOCAL SUPPLIER' OR 'CLASS-II LOCAL SUPPLIER' THEN 50% OF TENDER QTY. SHALL BE AWARDED TO L-1 BIDDER. THEREAFTER THE LOWEST BIDDER AMONG THE 'CLASS-I LOCAL SUPPLIERS' SHALL BE INVITED TO MATCH THE PRICE WITH L-1 BIDDER TO AWARD THE REMAINING 50% QTY. SUBJECT TO QUOTED PRICES OF THE 'CLASS-I LOCAL SUPPLIER' FALLS WITHIN THE BRACKET OF (L-1 + 20%) AND AGREES TO MATCH THE PRICE WITH L-1 BIDDER.

IF LOWEST ELIGIBLE CLASS-I LOCAL SUPPLIER FAILS TO MATCH WITH L-1'S PRICE OR ACCEPTS LESS THAN THE QTY. OFFERED THEN NEXT HIGHER CLASS-I LOCAL SUPPLIER WITHIN THE MARGIN OF PURCHASE PREFERENCE (L-1+ 20%), SHALL BE INVITED TO MATCH THE PRICE WITH L-1 FOR REMAINING QTY. AND SO ON.

IN CASE NONE OF CLASS-I LOCAL SUPPLIER WITHIN THE MARGIN OF PURCHASE PREFERENCE MATCH THE PRICE WITH L- 1 THEN TOTAL QTY. SHALL BE AWARDED TO L-1 BIDDER.

IN CASE OF AWARD CRITERIA ARE STIPULATED IN A TENDER AND IT IS FOUND THAT CLASS-I LOCAL SUPPLIER(S) QUALIFIED FOR AWARD OF AT LEAST 50% OF TENDER QTY. THEN CONTRACT SHALL BE AWARDED AMONG ALL QUALIFIED BIDDERS AS PER PRE- AWARD CRITERIA STIPULATED IN TENDER, OTHERWISE CLASS-I LOCAL SUPPLIER(S) QUOTED WITHIN THE 20% MARGIN, SHALL BE INVITED TO MATCH THE PRICE WITH L-1 FOR AWARD OF AT LEAST 50% OF TENDER QTY.

IN CASE THE GOODS / SERVICES UNDER PROCUREMENT ARE NOT DIVISIBLE IN NATURE, THEN CLASS-I LOCAL SUPPLIER SHALL GET PURCHASE PREFERENCE OVER CLASS-II LOCAL SUPPLIER & NON-LOCAL SUPPLIER AND CONTRACT SHALL BE AWARDED TO 'CLASS-I LOCAL SUPPLIER' SUBJECT TO MATCHING THE PRICE WITH L-1.

IN SUCH CASE THE LOWEST BIDDER AMONG THE 'CLASS-I LOCAL SUPPLIERS' SHALL BE INVITED TO MATCH THE PRICE WITH L-1 BIDDER SUBJECT TO QUOTED PRICES OF THE 'CLASS-I LOCAL SUPPLIER' FALLS WITHIN THE BRACKET OF (L-1 + 20%) AND AGREES TO MATCH THE PRICE WITH L-1 BIDDER.

IF LOWEST ELIGIBLE CLASS-I LOCAL SUPPLIER FAILS TO MATCH THE PRICE WITH L-1 BIDDER THEN NEXT HIGHER CLASS-I LOCAL SUPPLIER WITHIN THE MARGIN OF PURCHASE PREFERENCE (L-1+ 20%) SHALL BE INVITED TO MATCH THE PRICE WITH L-1 AND SO ON.

ANNEXURE-E

SPECIAL CONDITIONS OF CONTRACT (SCC)

IN CASE NONE OF CLASS-I LOCAL SUPPLIER WITHIN THE MARGIN OF PURCHASE PREFERENCE MATCH THE PRICE WITH L- 1 THEN CONTRACT SHALL BE AWARDED TO L-1 BIDDER.

HOWEVER, IF L-1 BIDDER IS A 'CLASS-I LOCAL SUPPLIER' THEN THE CONTRACT FOR FULL QTY. SHALL BE AWARDED TO L-1 BIDDER ONLY AND NO OTHER CLASS-I SUPPLIER(S) SHALL BE INVITED TO MATCH THE PRICE. CLASS-II LOCAL SUPPLIER IS NOT ELIGIBLE TO GET THE PURCHASE PREFERENCE.

BIDDERS WILLING TO AVAIL THE PURCHASE PREFERENCE AS PER GOVT. POLICY ARE REQUESTED TO SUBMIT A DECLARATION IN A NON-JUDICIAL STAMP PAPER OF RS. 100 AS PER OUR PRESCRIBED FORMAT ENCLOSED WITH NIT, DULY INDICATING THE PERCENTAGE OF 'LOCAL CONTENT' AND SHALL PROVIDE A SELF CERTIFICATION THAT THE ITEM(S) OFFERED ARE MEETING THE REQUIREMENTS OF LOCAL CONTENT FOR CLASS-I LOCAL SUPPLIER/CLASS-II LOCAL SUPPLIER, AS THE CASE MAY BE.

IN CASE OFFERED VALUE EXCEEDS RS. 10 (TEN) CORES, THEN BIDDER SHALL SUBMIT A CERTIFICATE FROM THE STATUTORY AUDITOR/COST AUDITOR GIVING THE PERCENTAGE OF LOCAL CONTENT.

DETAILS OF THE LOCATION (S) AT WHICH THE LOCAL VALUE ADDITION WAS MADE SHALL ALSO BE MENTIONED IN THE CERTIFICATE.

IMPORTANT DEFINITIONS W.R.T. 'MAKE IN INDIA POLICY' :-

'LOCAL CONTENT' MEANS THE AMOUNT OF VALUE ADDED IN INDIA (UNLESS OTHERWISE PRESCRIBED) BE THE TOTAL VALUE OF ITEM(S) OFFERED (EXCLUDING NET DOMESTIC INDIRECT TAX) MINUS THE VALUE OF IMPORTED CONTENT IN THE IN THE ITEM(S) INCLUDING ALL CUSTOM DUTIES AS A PROPORTION OF TOTAL VALUE, IN PERCENTAGE.

'CLASS-I LOCAL SUPPLIER' MEANS A SUPPLIER OR SERVICE PROVIDER, WHOSE GOODS, SERVICES OR WORKS OFFERED FOR PROCUREMENT HAS LOCAL CONTENT EQUAL TO OR MORE THAN 50% (FIFTY PERCENT).

'CLASS-II LOCAL SUPPLIER' MEANS A SUPPLIER OR SERVICE PROVIDER, WHOSE GOODS, SERVICES OR WORKS OFFERED FOR PROCUREMENT HAS LOCAL CONTENT EQUAL TO OR MORE THAN 20% (TWENTY PERCENT) BUT LESS THAN 50% (FIFTY PERCENT).

'NON-LOCAL SUPPLIER' MEANS A SUPPLIER OR SERVICE PROVIDER WHOSE GOODS, SERVICES OR WORKS OFFERED FOR PROCUREMENT HAS LOCAL CONTENT LESS THAN OR EQUAL TO 20% (TWENTY PERCENT)

For and on behalf of tenderer

LETTER OF SUBMISSION

[TO BE SUBMITTED IN BIDDERS LETTER HEAD]

NIT FOR “Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited.”

T E N D E R

I/ We have read and examined the Instructions to Bidders, General Conditions of Contract (GCC), Special Condition of Contract (SCC), Technical Specification, Schedule of Quantities & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the B AND R /EIL/IOCL within the time specified in tender viz., schedule of quantities and in accordance in all respects with the specifications and the Conditions of contract (GCC & SCC) and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

We agree to keep the tender open for 120 days from the due date of submission of tender thereof and not to make any modifications in its terms and conditions.

The cost of tender document of value Rs. 1,180/- has been deposited in the shape of Demand Draft (DDs) / Pay Order/ Banker's Cheque of a Nationalised / Scheduled Bank issued in favour of Bridge and Roof Co. (India) Limited. if I/we agree that Bridge and Roof Co. (India) Limited or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money absolutely, otherwise the said earnest money shall be retained by him towards retention money to execute all the works referred to in the tender documents upon the terms and conditions of contract.

We accept that we will automatically be kept under Black Listing/Holiday List from being eligible for bidding in any contract with Bridge and Roof Co.(I) Ltd during the period of bid validity of 2 years from the date of occurrence, if we are in breach of our obligation(s) under the bid conditions because we:

- (a) Have withdrawn our Bid during the period of bid validity specified in the letter of Bid, or
- (b) Having being notified of the acceptance of our Bid by B AND R during the period of Bid validity,
 - (i) have failed or refused to execute the Contract, if required, or
 - (ii) have failed or refused to furnish the Performance Guarantee within prescribed period in accordance with the clause of Tender

I/we hereby declare that I/we shall treat the tender documents, Technical Specification and other records connected with the work as secret/ confidential documents and shall not communicate information derived there from to any person other than a person to whom I/we am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

(Signature of Bidder)

Date:

Annexure – G

PREAMBLE TO SCHEDULE OF RATES

- The Schedule of Rates / Prices shall be read with all other sections of this Bidding document.
- The Bidder is deemed to have studied the Drawings, Specifications and details of works to be done including Scope of Work, Scope of supply and Technical Specification within the Time Schedule & should have acquainted himself of the conditions prevailing at site.
- Bidder shall indicate only the Below / At-Par/ Above on total estimated value in terms of percentage upto 2 Decimal places in the 'Schedule of Rates' sheet. Bidder shall not change rate / amount indicate in 'Schedule of Rates'.
- The quoted price shall be firmed till the completion of the work.
- The quantity shown against the various items are only approximate and may VARY TO $\pm 20\%$. No claim shall be entertained during currency of this Contract towards any items due to the above.
- All items of Work mentioned in Schedule of Rates shall be carried out as per the Specification, Drawings and instruction of B AND R & the rates are deemed to be inclusive of Materials, labour, supervision as called for in the detail specification and condition of the Contract.
- B AND R reserves the right to cancel / delete / curtail any item or group of work if necessary. Such a step shall be not be construed as reason for changing the rates

SCHEDULE OF QUANTITY & RATES

NIT Ref. BANDR/71134/IOCL/CIVIL WORK/SITE/LC/NIT/03 Dated 19.06.2024

NAME OF THE WORK : "CARRYING OUT CONSTRUCTION OF GENERAL CIVIL WORKS LIKE EXCAVATION, PCC, REINFORCEMENT, SHUTTERING, RCC, BACKFILLING, FINISHING WORKS ETC. AND ALL OTHER NECESSARY WORKS FOR CHANNEL SLAB OF COOLING TOWER-02, FOUNDATION, CABLE TRENCH , MANHOLE, ROAD CULVERT ETC. AS PER EIL STANDARD SPECIFICATION IN CONNECTION WITH PILING, UG & CIVIL / STRUCTURAL WORKS U&O-P25 AREA PART-B FOR PANIPAT REFINERY EXPANSION PROJECT (P25) OF M/S IOCL AT PANIPAT, HARYANA."

SCHEDULE OF QUANTITIES & RATES (SOQR)

SL. NO.	DESCRIPTION OF ITEM	UNIT	QTY.	Rate (In Rs.)	Amount (In Rs.)
1	CIVIL & STRUCTURAL				
2	EARTH WORK (REFER SPECIFICATION NO. 6-68- 0003)				
3	Earthwork excavation in soil				
4	Earth work in EXCAVATION below ground level for all kinds of works in ALL TYPES OF SOILS EXCEPT SOFT ROCK AND HARD ROCK as classified in specification for a depth upto 1.5m including removal of vegetation, shrubs and debris, cutting and dressing of sides in slopes, levelling, grading and ramming of bottoms, dewatering of accumulated water from any source and keeping the surface dry for subsequent works and disposal or stacking of excavated material within a lead of 100m, as directed including providing temporary supports to existing service lines like water pipes, sewage pipes, electric overhead and underground cables etc. all complete, but excluding shoring and strutting.	Cu.m.	4300	₹ 211.00	₹ 9,07,300.00
5	Earth work in EXCAVATION below ground level for all kinds of works in ALL TYPES OF SOILS EXCEPT SOFT ROCK AND HARD ROCK as classified in specification for a depth beyond 1.5m and upto and inclusive of 3.0m including removal of vegetation, shrubs and debris, cutting and dressing of sides in slopes, levelling, grading and ramming of bottoms, dewatering of accumulated water from any source and keeping the surface dry for subsequent works and disposal or stacking of excavated material within a lead of 100m, as directed including providing temporary supports to existing service lines like water pipes, sewage pipes, electric overhead and underground cables etc. all complete, but excluding shoring and strutting.	Cu.m.	700	₹ 266.00	₹ 1,86,200.00
6	Backfilling after execution of work				
7	BACKFILLING after execution of the WORK to proper grade and level with selected materials from available excavated soil from spoil heaps within a LEAD OF 100M , including re- excavating the deposited soil excavated earlier, breaking clods, laying it at all depths and heights in layers of thickness not exceeding 15 Cms. watering, rolling and ramming by manual methods/ mechanical compactors to achieve 90% laboratory maximum dry density, dressing, trimming etc. in foundations, plinths, trenches, pits etc. all complete.	Cu.m.	2200	₹ 198.00	₹ 4,35,600.00
8	Transporting & Disposing the SURPLUS EARTH AND DEBRIS				
9	Transporting and disposing the SURPLUS EARTH AND DEBRIS including shrubs and vegetations from construction area beyond the initial LEAD OF 100M AND UPTO 1KM including re-excavating the deposited soil excavated earlier, transportation, loading, unloading, laying at all depths and heights, stacking, levelling and dressing both the area (viz. from where the earth is transported and where it is deposited) to required levels and slopes complete with all lifts as directed. For carting on the basis of truck measurements (volume of truck reduced by 30% for voids).	Cu.m.	500	₹ 144.00	₹ 72,000.00
10	PCC - Non FIM Items				
11	Laying of PLAIN CEMENT CONCRETE for all depths below and upto plinth level in foundations, drains, fillings, non-suspended floors, pavements & ramps or any other works etc. including shuttering, tamping, ramming, vibrating, curing, etc. all as specified in any shape, position, thickness and finishing the top surface rough or smooth as specified and directed all complete for concrete grade M20 with 20mm and down size graded crushed stone aggregates/Gravels. ALL MATERIALS EXCLUDING RMC SUPPLIED BY THE CONTRACTOR. (Only RMC will be supplied by B&R Free of Cost)	Cu.m.	280	₹ 1,118.00	₹ 3,13,040.00

NIT Ref. BANDR/71134/IOCL/CIVIL WORK/SITE/LC/NIT/03 Dated 19.06.2024

NAME OF THE WORK : "CARRYING OUT CONSTRUCTION OF GENERAL CIVIL WORKS LIKE EXCAVATION, PCC, REINFORCEMENT, SHUTTERING, RCC, BACKFILLING, FINISHING WORKS ETC. AND ALL OTHER NECESSARY WORKS FOR CHANNEL SLAB OF COOLING TOWER-02, FOUNDATION, CABLE TRENCH , MANHOLE, ROAD CULVERT ETC. AS PER EIL STANDARD SPECIFICATION IN CONNECTION WITH PILING, UG & CIVIL / STRUCTURAL WORKS U&O-P25 AREA PART-B FOR PANIPAT REFINERY EXPANSION PROJECT (P25) OF M/S IOCL AT PANIPAT, HARYANA."

SCHEDULE OF QUANTITIES & RATES (SOQR)

SL. NO.	DESCRIPTION OF ITEM	UNIT	QTY.	Rate (In Rs.)	Amount (In Rs.)
12	RCC Substructures - Non FIM Items				
13	Laying of REINFORCED CEMENT CONCRETE OF M-30 GRADE with 20 mm and down size graded crushed stone aggregates/ gravel in SUB- STRUCTURE e.g. foundations, raft, beams, slabs, pile caps, retaining walls, dyke walls, jambs, counterforts, buttresses, pedestals, pipe sleepers, columns, suspended floors, staircases, landings, steps, brackets etc., including equipment/ machine foundations & pedestals viz. compressors, ID & FD fans, pumps, generators, crushers, mills, etc., (including single pour concreting as specified on the drawing), applying cement wash on concrete surface (wherever no other surface application is specified), providing pockets, openings, recesses, chamfering, etc., wherever required, vibrating, tamping, curing and rendering if required to give a smooth and even surface etc. (EXCLUDING THE COST OF REINFORCEMENT, SHUTTERING & SPECIFIED ADMIXTURES) for all depths below and upto plinth level in any shape, position and thickness etc. all complete as specified, shown and directed. ALL MATERIALS EXCLUDING RMC SUPPLIED BY THE CONTRACTOR. (Only RMC will be supplied by B&R Free of Cost)	CUM	470	₹ 1,118.00	₹ 5,25,460.00
14	Laying of REINFORCED CEMENT CONCRETE OF M-30 GRADE with 20 mm and down size graded crushed stone aggregates/ gravel in SUB- STRUCTURE e.g. trenches, culverts, manholes, pipe encasement, catchpits, drains, pits, etc., applying cement wash on concrete surface (wherever no other surface application is specified), providing pockets, openings, recesses, chamfering, etc., wherever required, vibrating, tamping, curing and rendering if required to give a smooth and even surface etc. (EXCLUDING THE COST OF REINFORCEMENT, SHUTTERING & SPECIFIED ADMIXTURES) for all depths below and upto plinth level in any shape, position and thickness etc. all complete as specified, shown and directed. ALL MATERIALS EXCLUDING CEMENT SUPPLIED BY THE CONTRACTOR. (Only RMC will be supplied by B&R Free of Cost)	CUM	1000	₹ 1,260.00	₹ 12,60,000.00
15	RCC Superstructures - Non FIM Items				
16	Laying of REINFORCED CEMENT CONCRETE OF M-30 GRADE with 20 mm and down size graded crushed stone aggregates/ gravel in SUPER STRUCTURE in suspended floors, slabs, beams, columns, walls including counterforts, staircases, landings, steps, facias, fins, mouldings, gutters, shelves, window sills, canopies, lintels, girders, ducts, brackets, chajjas with drip moulds, pedestals, posts, struts, equipment/ machine foundations, ramps etc. (including single pour concreting as specified on the drawing), providing cement wash (wherever no other surface application is specified), providing pockets, openings, recesses, chamfering wherever required, vibrating, tamping, curing and rendering if required to give a smooth and even surface etc. (EXCLUDING THE COST OF REINFORCEMENT, SHUTTERING AND SPECIFIED ADMIXTURES) FOR ALL HEIGHTS UPTO & INCLUSIVE OF 20 m ABOVE PLINTH LEVEL in any shape, position, thickness etc. all complete as specified, shown and directed. ALL MATERIALS EXCLUDING CEMENT SUPPLIED BY THE CONTRACTOR. (Only RMC will be supplied by B&R Free of Cost)	CUM	30	₹ 1,332.00	₹ 39,960.00

NIT Ref. BANDR/71134/IOCL/CIVIL WORK/SITE/LC/NIT/03 Dated 19.06.2024

NAME OF THE WORK : "CARRYING OUT CONSTRUCTION OF GENERAL CIVIL WORKS LIKE EXCAVATION, PCC, REINFORCEMENT, SHUTTERING, RCC, BACKFILLING, FINISHING WORKS ETC. AND ALL OTHER NECESSARY WORKS FOR CHANNEL SLAB OF COOLING TOWER-02, FOUNDATION, CABLE TRENCH , MANHOLE, ROAD CULVERT ETC. AS PER EIL STANDARD SPECIFICATION IN CONNECTION WITH PILING, UG & CIVIL / STRUCTURAL WORKS U&O-P25 AREA PART-B FOR PANIPAT REFINERY EXPANSION PROJECT (P25) OF M/S IOCL AT PANIPAT, HARYANA."

SCHEDULE OF QUANTITIES & RATES (SOQR)

SL. NO.	DESCRIPTION OF ITEM	UNIT	QTY.	Rate (In Rs.)	Amount (In Rs.)
17	Precast Elements - Non FIM Items				
18	Manufacturing, transporting and erecting in position Reinforced Cement Concrete PRECAST ELEMENTS such as columns, beams, cover slabs, lintels, louvers, fins, shelves etc. of M-30 grade with 20mm and down size graded crushed stone aggregates/gravel, each unit upto and inclusive of 500 kg. for all leads, levels, shapes and thickness including all moulds, shuttering and centering, vibrating, tamping, curing, chamfering wherever required, finishing the top surface with cement mortar 1:3 (1 Cement : 3 Sand) to give a smooth and even surface, or non skid finish as specified, providing lifting hooks, metal inserts, making holes pockets, (only M.S. inserts to be measured & paid separately) transporting to site, erecting, levelling, aligning and fixing in position with cement mortar 1:3 (Cement : 3 Coarse Sand), breaking bricks and/or concrete surfaces and making good the same etc. all complete (excluding the Cost of Reinforcement) and as directed. All materials excluding RMC supplied by the contractor. (Only RMC will be supplied by B&R Free of Cost)	CUM	9.75	₹ 7,380.00	₹ 71,955.00
19	HYD Bars / MS Bars - Non FIM Items				
20	Placing in position HIGH YEILD- STRENGTH DEFORMED STEEL BARS REINFORCEMENT of Grade Fe500D TMT conforming to IS:1786, for RCC work including transporting the Steel, straightening, cleaning, decoiling, cutting, bending to required shapes and lengths as per details, binding with 18 SWG black soft annealed binding wire at every intersection, supplying and placing with proper cover blocks, supports, chairs, overlaps, welding, spacers, fanhooks etc. for all heights and depths etc. all complete as directed. All materials excluding Reinforcement steel supplied by the contractor. (Only Reinforcement steel will be supplied by B&R Free of Cost)	MT	240	₹ 8,820.00	₹ 21,16,800.00
21	Centering and Shuttering - Non FIM Items				
22	Providing and fixing CENTERING AND SHUTTERING for CURVED SHUTTERING in foundations in all types for Columns, Beams, Slabs, Walls, etc. of Buildings for all depths below and upto & inclusive of plinth level, including strutting, bracing, propping etc., keeping the same in position during concreting and removal of the same after specified period etc. for Straight/ Inclined Shuttering, keeping necessary provision for inserts, projecting dowels, anchor bolts or any other fixture etc. all complete and as specified and directed.	Sq.M.	1200	₹ 335.00	₹ 4,02,000.00
23	Providing and fixing CENTERING AND SHUTTERING in superstrctures in retaining walls, jambs, counter-forts, buttresses, equipment/ machine foundations, abutments, columns, lintels, suspended slabs, beams, staircases, landings, steps, non-circular tunnels/ bunkers/ silos/ shafts/ hoppers/ liquid storage structures etc. for all heights above plinth level including shuttering for single pour concreting, strutting, bracing, propping etc., keeping the same in position during concreting and removal of the same after specified period etc. for Straight/ Inclined Shuttering, keeping necessary provision for inserts, projecting dowels, anchor bolts or any other fixture etc. all complete and as specified and directed.	Sq.M.	4500	₹ 561.00	₹ 25,24,500.00
24	Expansion joints - Non FIM Items				
25	Supplying and fixing in position 50 mm (2X25 mm) thick BITUMEN IMPREGNATED FIBRE BOARD conforming to IS:1838 of approved quality in expansion joints at all locations and levels in concrete structures etc. all complete as shown, specified and directed.	Sq.M.	22.5	₹ 1,620.00	₹ 36,450.00
26	Supplying and sealing EXPANSION JOINTS 50 mm wide and 12mm deep at all locations and levels in Concrete Structures with approved two part liquid POLYSULPHIDE SEALING COMPOUND as per IS:12118 including raking of joints etc. all complete as shown, specified and directed.	M	35	₹ 402.00	₹ 14,070.00

NIT Ref. BANDR/71134/IOCL/CIVIL WORK/SITE/LC/NIT/03 Dated 19.06.2024

NAME OF THE WORK : "CARRYING OUT CONSTRUCTION OF GENERAL CIVIL WORKS LIKE EXCAVATION, PCC, REINFORCEMENT, SHUTTERING, RCC, BACKFILLING, FINISHING WORKS ETC. AND ALL OTHER NECESSARY WORKS FOR CHANNEL SLAB OF COOLING TOWER-02, FOUNDATION, CABLE TRENCH , MANHOLE, ROAD CULVERT ETC. AS PER EIL STANDARD SPECIFICATION IN CONNECTION WITH PILING, UG & CIVIL / STRUCTURAL WORKS U&O-P25 AREA PART-B FOR PANIPAT REFINERY EXPANSION PROJECT (P25) OF M/S IOCL AT PANIPAT, HARYANA."

SCHEDULE OF QUANTITIES & RATES (SOQR)

SL. NO.	DESCRIPTION OF ITEM	UNIT	QTY.	Rate (In Rs.)	Amount (In Rs.)
27	CONCRETE FOR LIQUID RETAINING/LEAK PROOF STRUCTURES (REFER SPECIFICATION NO.6-68- 0005)				
28	Laying of Leak Proof Reinforced Cement Concrete of GRADE M-30 (minimum Cement content shall be as per EIL Specifications) with 20 mm and down size graded crushed stone aggregates/ gravel at all positions and in any shape and thickness, in SUPER- STRUCTURE AT ALL HEIGHTS UPTO & INCLUSIVE OF 20 m ABOVE PLINTH LEVEL , leaving pockets, recesses, vibrating, tamping, curing, testing (for leak- proofness) and rendering (if required to give smooth and even surface) in foundations, walls, beams, buttresses, columns, piers, slabs, tunnels, trenches, basements, storage bins, reservoirs etc. (Excluding isolated/ overhead water tanks supported on staging) including cement wash (if no other surface application is specified) but excluding the cost of Reinforcement, Shuttering and specified admixtures, all complete as specified and directed. ALL MATERIALS EXCLUDING RMC SUPPLIED BY THE CONTRACTOR. (Only RMC will be supplied by B&R Free of Cost)	Cum	1200	₹ 1,598.00	₹ 19,17,600.00
29	PVC Water bars - Non FIM Items				
30	Supplying and fixing in position 230mm wide x 5mm thick approved PVC WATER STOPS as per manufacturer's specifications in R.C.C. Structures including cutting, fixing, jointing by vulcanising etc. all complete as shown specified and directed.	M	550	₹ 298.00	₹ 1,63,900.00
31	Anchor Bolts - Non FIM Items				
32	Supplying, fabricating, fixing and keeping in position at all levels and locations THREADED ANCHOR BOLTS of all diameters and nomenclature including nuts, washers, anchor plates, pipe sleeves etc. in foundations, columns, pedestals, slabs, beams, walls etc. or any other place as directed including handling & transporting, straightening if required, turning from relevant size M.S. rounds to required diameter, threading, welding, providing necessary templates and auxilliary dummy structures, if any, necessary tying and welding with reinforcement, adjustment of shuttering & reinforcement/any other fixture, greasing exposed metal surfaces, covering bolts and packing the sleeves with jute cloth etc. all complete as specified and directed. (SUPPLY OF ALL MATERIALS IN CONTRACTOR'S SCOPE).	MT	2	₹ 1,24,647.00	₹ 2,49,294.00
33	MS Metal Inserts - Non FIM Items				
34	Fabricating and fixing in position M.S. METAL INSERT (with lugs) of any shape made out of flats, plates, rolled sections, pipes etc. providing necessary templates, staging, cutting, straightening, if required, bolting, welding as required and embedding in position on both Plain and Reinforced Cement concrete members inclusive of adjusting shuttering & reinforcement/ any other fixture, welding where necessary, tying and holding to correct level, line and position, any auxiliary dummy structures to support the heavy inserts, painting exposed surfaces with a coat of primer as per EIL Specification No. 6-79-0020, etc. all complete for all depths and heights as specified and directed. (Only MS Insert Plates will be supplied by B&R Free of Cost).	MT	6.5	₹ 23,290.00	₹ 1,51,385.00
35	BI-POLAR CONCRETE PENETRATING CORROSION INHIBITING ADMIXTURE				
36	Supplying and mixing of approved brand of BI-POLAR CONCRETE PENETRATING CORROSION INHIBITING ADMIXTURE in concrete as per manufacturer's specification for protection of reinforcement against corrosion. Supply of admixture in Contractor's scope.	KG	300	₹ 100.00	₹ 30,000.00
37	Supplying and laying in position PVC pipes conforming to IS:4985 Class - I for cable crossings, including cutting the pipe if necessary, lowering, laying in position to proper levels, slopes ,providing proper jointing as per code requirements or manufacturers recommendations, sealing the open ends of pipes with gunny bags etc. all complete as per drawings, specifications and directions of Engineer-in-Charge. For following NOMINAL OUTSIDE PIPE DIA (MM)				

Order No : 71134				ANNEXURE-H	
NIT Ref. BANDR/71134/IOCL/CIVIL WORK/SITE/LC/NIT/03 Dated 19.06.2024					
NAME OF THE WORK : "CARRYING OUT CONSTRUCTION OF GENERAL CIVIL WORKS LIKE EXCAVATION, PCC, REINFORCEMENT, SHUTTERING, RCC, BACKFILLING, FINISHING WORKS ETC. AND ALL OTHER NECESSARY WORKS FOR CHANNEL SLAB OF COOLING TOWER-02, FOUNDATION, CABLE TRENCH , MANHOLE, ROAD CULVERT ETC. AS PER EIL STANDARD SPECIFICATION IN CONNECTION WITH PILING, UG & CIVIL / STRUCTURAL WORKS U&O-P25 AREA PART-B FOR PANIPAT REFINERY EXPANSION PROJECT (P25) OF M/S IOCL AT PANIPAT, HARYANA."					
SCHEDULE OF QUANTITIES & RATES (SOQR)					
SL. NO.	DESCRIPTION OF ITEM	UNIT	QTY.	Rate (In Rs.)	Amount (In Rs.)
38	(Dia (outer) - 160 mm, Piping Material Class - 1)	Mtr.	3200	₹ 555.00	₹ 17,76,000.00
39	Supplying and fixing in position medium/ heavy duty CI manhole frame with lugs and cover conforming to IS- 1726 including breaking of brick masonry or concrete surface to receive frame with lugs and making good the same with CM 1:3 including applying two coats of anticorrosive paint inclusive of all labours and materials etc. complete.				
40	Circular Size 500 Mm Dia Medium Duty Of Grade Md-10	EACH	10	₹ 9,450.00	₹ 94,500.00
41	Circular Size 560 Mm Dia Heavy Duty Of Grade Hd-20	EACH	10	₹ 12,106.00	₹ 1,21,060.00
42	"NOTE:- THE ABOVE RATE SHALL BE INCLUSIVE OF ALL TAXES & DUTIES, ROYALTIES, CESS, ENVIORMENTAL & POLLUTION, FITNESS & SAFETY CLEARANCE CHARGES (IF ANY), OR ANY OTHER INCIDENTAL CHARGES ETC BUT EXCLUDING GST."				
Total Amount					₹ 1,34,09,074.00
Quoted Rate [At-Par / Excess (+) / Less (-)] %					
Final Quoted Amount in Figure					
Final Quoted Amount in Words.....					
Note :- Quoted price Shall be Exclusivse of SGST and CGST / IGST					

ANNEXURE-I**RESPONSIBILITY MATRIX**
(On Bidder's Letter Head)

Sl. No.	Activity	Scope		Remarks
		B&R/Client	Bidder	
1	Construction Drawing	✓		
2	Insurance for the workmen	✓		
3	Labour License	✓		
4	Land for Sub-Contractor Site Office/Store subject to availability from Client	✓		
5	Supervision & Inspection by B&R/EIL/IOCL	✓		
6	Bought out material like TMT Bar, RMC & MS Plate on free issue basis.	✓		
7	Inspection by TPI (if any)		✓	
8	Lab Test from NABL/EIL/IOCL approved Lab (if any)		✓	
9	Submission of all required document incl. Police Verification Certificate, Insurance (PMJJBY & PMSBY) for preparation of Gate Pass		✓	
10	PF, ESI, Labour Cess		✓	
11	Accommodation & Transportation of Sub-Contractor's Employees/Workers		✓	
12	Construction & Maintenance of Labour Hutment in outside the plant premises		✓	
13	All types of equipments, machineries, tool & tackles along with valid TPI Certificate required for execution of work		✓	
14	All types of Consumables required for Execution of Work		✓	
15	All required Shuttering & Scaffolding material including Installation of Temporary Staging in line with the Safety Guideline of IOCL / EIL& Removal of the same after completion & acceptance of work in all respect		✓	
16	All PPEs, All Safety Accessories & Safety Appliances etc.		✓	
17	Construction of Temporary Site Office of Subcontractor/ Store etc.		✓	
18	Assistance for Statutory approvals		✓	
19	Construction Water, Drinking Water and Construction Power		✓	
20	Any / All other incidental Work		✓	
21	Liasoning with Statutory Authority and Local Administration for smooth execution		✓	
22	Insurance for all P&M, Materials, Transit etc.		✓	
23	1% (One percent) BOCW Cess		✓	
24	Watch & Ward of all materials owned by both the Agency and B&R.		✓	
25	Diesel, Lubricants etc. for construction equipment's & Machineries, compressors		✓	
Note: -				
1.	The above list is non-exhaustive; Any other manpower/Facilities etc are required for completion of the work, shall be under Contractor's scope and shall be included within their quoted rates.			
2.	Contractor shall use FIM as Conservative manner. Excess consumption of FIM shall be penalized to Contractor at mutually agreed upon.			
3.	In case, Agency fails to deliver the materials at site in time, B And R, at his sole discretion, will supply the Materials to the Agency and Actual Cost incurred toward the said supply including applicable "Handling Charge" will be deducted from their monthly R.A. Bills.			

For & on behalf of the Bidder

TIME SCHEDULE

NAME OF WORK	TIME OF COMPLETION IN ALL RESPECT
“Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited.”	03 (Three) Months from the date of placement of LOI

NOTES:

1. The time of completion shall be reckoned from date of Letter of Intent.
2. The time indicated is for completing all the works in all respect as per specifications. Codes, drawings and instructions of Engineer –In –Charge including mobilization and demobilization.

For & on behalf of the Bidder

ANNEXURE – K

TECHNO COMMERCIAL QUESTIONNAIRE

Bidder's reply / confirmation as furnished in the Commercial Questionnaire (CQ) shall supersede the stipulations mentioned elsewhere in their bid.

Sl. No.	Query	Bidder's confirmation regarding acceptance of item description is to be made by putting up signature against each item description
1.0	Confirm that your Bid is valid for 120 Days from the date of submission of Bid.	
2.0	Confirm your compliance to total Scope of Work mentioned in the Bidding Document.	
3.0	Confirm that the following documents are submitted with Part – I:	
a)	Master Index as mentioned in Annexure is submitted duly signed and stamped on each page.	
b)	Compliance letter for addendum / Amendments as a token of acceptance (Applicable, if issued).	
4.0	Confirm your compliance to submit of Bidding Documents as mentioned in ITB/NIB.	
5.0	Confirm that price has been submitted in a separately sealed envelope super scribing "PRICE PART" in original.	
6.0	Schedule of Rates/Price	
a)	Confirm that deviation / terms & conditions are not mentioned anywhere in the bid. In case any terms & conditions is mentioned anywhere in the bid, same shall not be considered.	
b)	Confirm that quoted price is for complete scope of work, supply of all labour etc. as applicable as per the Scope of Work.	
c)	Confirm that correction fluid is not used in the price part. (In case any corrections are required, the original writings shall be neatly cut / penned through and re-written nearby. No overwriting or erasure of original writings by use of 'white fluid' or otherwise is permitted. In case any erasure using 'white correcting fluid' is found, the tender shall be liable to be rejected. All correction / cutting/ alternations shall be signed in full by the bidder with date. Numerical figures shall be written both in figures as well in words.)	
7.0	Confirm that you have studied complete Bidding Documents including Technical and commercial part and your Bid are in accordance with the requirements of the Bidding Documents.	
8.0	Confirm your acceptance for Time Schedule as mentioned in Bidding Documents.	
9.0	Confirm that you shall deploy adequate organization with qualified supervisory personnel having requisite experience	
10.0	Confirm that while submitting your price, you have taken consideration of scope of supplies, scope of work and technical requirement mentioned in Bidding Documents.	

ANNEXURE – K

TECHNO COMMERCIAL QUESTIONNAIRE

Bidder's reply / confirmation as furnished in the Commercial Questionnaire (CQ) shall supersede the stipulations mentioned elsewhere in their bid.

Sl. No.	Query	Bidder's confirmation regarding acceptance of item description is to be made by putting up signature against each item description
11.0	Confirm that you have your own programme for execution this work. In case of award of work,	
12.0	Confirm that Bidder is not involved in any Litigation/Arbitration with B AND R/Client/Owner. In case of Litigation/ Arbitration, if any, please furnish information about the same.	
13.0	Confirm that Bidder is not under Liquidation, court receivership or similar proceedings.	
14.0	Confirm the following:	
15.0	Co-ordination and making available by Contractor of all staff, manpower etc. as required for timely completion of all WORK as per Owner's construction and priority schedule and in accordance with the available work front are included in the quoted rates.	
16.0	Site Mobilization to be started within 15 (Fifteen) days from the date of our instruction.	
17.0	No interest will be paid against Retention Money/Security Deposit.	
18.0	Rates quoted shall be firm till completion of work. No claim towards extra work/modification job for working during adverse weather condition/location/escalation or due to any other reason whatsoever shall be entertained.	
19.0	Bidder's scope of supply within their quoted rates shall generally be as follows but not limited to the same:	
20.0	i. Deployment of skilled /unskilled worker (as required) to execute the job to the entire satisfaction of B AND R/ OWNER.	
	ii. Accommodation & Transportation of their technicians and staff/engineers.	
	All applicable taxes / duties as per GCC and SCC	
21.0	The quantities indicated in the schedule are exclusively meant for giving an idea of the nature and gravity of the work and may vary upto ($\pm$) 20%. The bidder shall have to assess the site condition, nature of the work etc. of their own and quote their rates accordingly. Ignorance to the above and variation in quantities shall not be in any way be basis to claim any compensation and/or any revision to any rate as awarded at any stage of the work. Any compensation and/or revision in rates shall not be considered or paid to the Contractor on this account.	

 For & on behalf of the Bidder

Bridge and Roof Co. (India) Limited

(A Government of India Enterprise)

FORMAT FOR NO DEVIATION CERTIFICATE [To be submitted in Bidders Letter Head]

To,

The AGM(PROJECTS) PANIPAT

M/S Bridge and Roof Co. (India) Limited

C/O Indian Oil Corporation Ltd. (IOCL)

Piling, UG & Civil / Structural Works U&O-P25 Area Part-B

for Panipat Refinery Expansion Project (P25),

Panipat, Haryana-132140

Subject : No Deviation Certificate for "Construction of General Civil Works like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil Corporation Limited."

Dear Sir,

With reference to above this is to confirm that as per Tender conditions we have visited Site before submission of our Offer and noted the job content and site condition etc. We also confirm that we have not changed/modified the above tender document and in case of observance of the same at any stage it shall be treated as null and void.

We hereby also confirm that we have not taken any deviation from Tender Clause together with other reference as enumerated in the above referred Notice Inviting Tender and we hereby convey our unqualified acceptance to all terms & conditions as stipulated in the Tender Document.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit the deviations shall stand null and void.

Thanking you,

Yours faithfully,

(Signature & Seal of Authorized
representative of the Tenderer)

TERMS OF PAYMENT

1. General

In accordance with the provisions of Terms of Payment, the B AND R shall pay the Contractor for the Scope of Technical Specifications, on the basis of the item rate price in the Schedule of Quantities of Technical Specification.

2.0 INCOME TAX

As per GCC

3.0 Terms of Payment:

No Advance Payment including Mobilization Advance will be Paid.

Progress Payments shall be released to the Agency against Monthly running Account bill Duly Certified by Engineer-In-Charge after affecting the Necessary Deductions as per the following Terms of Payment.

FOR GENERAL CIVIL WORKS

- 95% on completion of work on pro-rata basis as certified in monthly progress bill.
- 05% on completion of all works in all respects and issuance of completion certificate.

While claiming progress payment, CONTRACTOR shall submit documentary evidence to the effect that he has deposited EPF/ EPS/ Labour Cess for his workers along with certificate indicating payment of minimum wages to the workmen at prevailing rates at Project site as per statute. CONTRACTOR shall also submit an undertaking that they have complied with all statutory requirement as per Contract. B AND R will pay to the contractor after receipt of same quantity from EIL/IOCL.

In case any or one of these documents is not submitted along with progress bills, payment against these bills may be kept in abeyance. In such an event contractor shall ensure payment of due wages to his workmen as well as payment to statutory authorities keeping employer completely indemnified

Deduction towards Income Tax & Surcharge, W.C.T from Contractor's bills (R/A & Final) will be as per prevailing rules. However, TDS certificates will be issued to Contractor for Tax Deduction at Source.

Note: -

All payment shall be made through electronic payment i.e RTGS / E-Payment, Money Transfer (MT) etc.]. Hence bidder/s shall provide the following details along with their offer.

1) Name of the Company, 2) Name of the Bank, 3) Name of Bank Branch, 4) City, 5) Account No 6) Account Type 7) IFSC Code of the Bank Branch 8) MICR Code of the Bank Branch

For & on behalf of the Bidder

Bridge and Roof Company (India) Limited**(A Govt. of India Enterprise)****FORMAT FOR CERTIFICATE OF DECLARATION
FOR CONFIRMING THE KNOWLEDGE OF SITE
CONDITIONS.**

(To be submitted in the bidder's letter head)

We, _____ (Name of the Sub-Contractor & their Full Address) _____
_____ hereby declare and confirm that
we have visited the project site under the subject namely "Construction of General Civil Works
like Excavation, PCC, Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc.
and all other necessary works for Channel Slab of CT-02, Foundation, Cable Trench,
Manhole, Road Culvert etc. as per EIL Standard Specification in connection with Piling, UG
& Civil / Structural Works U&O-P25 Area Part-B for Panipat Refinery Expansion
Project(P25) of M/s Indian Oil Corporation Limited." on Labour-Contract Basis and acquired
full knowledge and information about the site conditions, soil condition, awareness for political and
statutory bodies, accommodation & transportation of workers & staffs, wage structure, Industrial
climate etc. and total work involved. We further confirm that the above information is true and
correct and we will not raise any claim of any nature due to lack of knowledge of site condition.

Tenderer's Name and Address.

(Signature of the Tenderer's with Stamp)

Place :

Date :

Bridge and Roof Company (India) Limited
(A Govt. of India Enterprise)

**FORMAT FOR DECLARATION AGAINST TECHNICAL
SPECIFICATIONS**

(To be submitted in the bidder's letter head)

We, _____ (Name of the Sub-Contractor & their Full Address) _____
_____ hereby declare and confirm that
we have gone through all the technical specifications and drawings attached with this NIT under the
subject work namely "Construction of General Civil Works like Excavation, PCC,
Reinforcement, Shuttering, RCC, Backfilling, Finishing Works, etc. and all other necessary
works for Channel Slab of CT-02, Foundation, Cable Trench, Manhole, Road Culvert etc. as
per EIL Standard Specification in connection with Piling, UG & Civil / Structural Works
U&O-P25 Area Part-B for Panipat Refinery Expansion Project(P25) of M/s Indian Oil
Corporation Limited." and acquired full knowledge and total work involvement based on which we
have submitted the price bid.

Tenderer's Name and Address.

(Signature of the Tenderer's with Stamp)

Place :

Date :

ANNEXURE - P

COMPLIANCE CERTIFICATE REGARDING BIDDERS FROM COUNTRIES WHICH SHARES A LAND BORDER WITH INDIA

(Submitted on Bidder's Letter Head)

The bidder, (Name of the bidder) is not from a country which shares a land border with India.

(or)

The bidder, (Name of the bidder) is from a country (Name of the Country) which shares a land border with India and are registered with the Competent Authority. Certificate of registration is attached with the bid;

(or)

The bidder, (Name of the bidder) is from a country, (Name of the Country) which shares a land border with India and Government of India has extended lines of credit or is engaged in developmental projects in this country, (Name of the Country) and hence do not require any separate registration for participation in this tender.

b. I have read the Clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. (Where applicable, evidence of valid registration by the Competent Authority shall be attached).

c. I have read the Clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub- contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached].

Details of Vendor's authorized representative

Signature:

Name:

Stamp:

ANNEXURE – Q

**FORMAT FOR DECLARATION AGAINST INFORMATION OF LITIGATION, HOLIDAY
LIST/BANNING LIST, LIQUIDATION/COURT RECEIVERSHIP**

[To be submitted in Bidder's Letter Head]

We confirm that we are not involved in any Litigation or Arbitration against B&R or EIL/IOCL in last 5 years.

OR

We confirm that the current litigation/arbitration in which we are involved will not have any impact in work being tendered or in entering into contract during the validity of offer and performing the contract till all contractual obligations under contract are performed.

We confirm that we are not on Holiday/Negative List/Suspension List/Banning List of B&R/Owner/Consultant on due date of submission of bid.

We confirm that we are not banned or delisted or placed on "holiday List and/or any other similar list" (including the matter under sub judice, if any) by any Government or Quasi Government Agencies or PSUs.

We confirm that we are not under liquidation, Court Receivership or similar proceedings.

Tenderer's Name & Address:

Signature:

Stamp:

Technical Specification

मानक विनिर्देशन सिविल एवं संरचनात्मक कार्य

STANDARD SPECIFICATION CIVIL AND STRUCTURAL WORKS

सामान्य परिधि GENERAL SCOPE

5	04 07 2019	REAFFIRMED AND REISSUED AS SPECIFICATION	AVM	AJS	RS	RKT
4	28 03 2013	REAFFIRMED AND REISSUED AS SPECIFICATION	AJS	RS	PKM	DM
3	26 02 2008	REAFFIRMED AND REISSUED AS SPECIFICATION	PKB	PKM	VK	VC
2	08 06 2001	REAFFIRMED AND REISSUED AS SPECIFICATION	DPN	RPM	SCJ	MI
1	02 03 1994	ISSUED AS STD SPECIFICATION		HM	GPL	AS
Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
Approved by						

Abbreviations:

IS : Indian Standards

Structural Standards Committee:

Convenor: Mr. Rajanji Srivastava

Members: Mr. Anurag Sinha
Mr. VK Panwar
Mr. Samir Das
Mr. Amitabh Kishore
Mr. Gyasuddin
Mr. Charanjeet Singh (Projects)
Mr. Ravindra Kumar (Construction)

1. These specifications establish and define the material and constructional requirements for CIVIL and STRUCTURAL WORKS.
2. Methods of measurements are indicated in these specifications; where not so specified, latest revision of IS: 1200 shall be applicable.
3. Providing and operating all necessary measuring and testing devices/ equipments including all materials and consumables are included in the scope of work. No separate measurement or payment for testing the quality of work and materials shall be made; rates quoted for various items shall be deemed to include the cost of such tests which are required to ensure achievement of specified quality.
4. All materials shall be of standard quality, manufactured by renowned concerns conforming to Indian Standards or equivalent, and shall have IS mark as far as possible unless otherwise approved by the Engineer-in-Charge. Vendor List attached in the Tender document shall be followed. The Contractor shall get all materials approved by the Engineer-in-Charge prior to procurement and use. The Contractor shall furnish manufacturer's certificates for the materials supplied by him when asked for. Further to that he shall get the materials tested from an approved test house if asked for by the Engineer-in-Charge. The cost for all the tests and test certificates for the material procured by the Contractor shall be borne by the Contractor. No separate payment shall be made for the testing. The Engineer-in-Charge shall have the right to determine whether all or any of the materials are suitable. Any materials procured or brought to site and not conforming to specifications and satisfaction of the Engineer-in-Charge shall be rejected and the Contractor shall have to remove the same immediately from site at his own expense and without any claim for compensation due to such rejection.
5. Wherever referred to in the tender document, only the latest revision of Specifications, Codes of Practice and other publications of Bureau of Indian Standards shall be applicable.
6. Wherever the Contractor executes civil and structural works involving buildings, equipment foundations, supporting structures, pipe racks, etc., the following works are deemed to have been included in the quoted rates for various works.
 - Marking of centre lines of foundations etc.
 - Establishing layout and levels of foundations and superstructure etc., including establishment of reference lines, bench marks on various floors, platforms etc.
 - General upkeep of the plant site.
 - Preparation of Fabrication drawings and getting approval from Engineer-in-Charge after incorporating all the comments.
 - Preparation of "As-Built" scheme of structural drawings indicating constructed details including levels, centre lines, layouts, member sizes etc. complete.
7. The provisions of Schedule of Rates, specifications and drawings shall be read in conjunction with each other and in case of conflict amongst them, clarification shall be obtained from the Engineer-in-Charge whose decision shall be final and binding. However, the following procedure may generally be followed:
 - Description of items in schedule of rates shall be followed when provisions therein are different from those in specifications.

- Where the description of item does not call for some specific requirement but the same is given in specifications, the specifications shall be followed in addition to the requirement given in description of item.
- Where drawings call for requirements different from or additional to those given in item description and specifications, the decision of the Engineer-in-Charge shall be obtained as to what shall be followed.

मानक विनिर्देशन
सिविल एवं संरचनात्मक कार्य
STANDARD SPECIFICATION
CIVIL & STRUCTURAL WORKS

मिट्टी का कार्य
EARTHWORK

6	18.03.21	REVISED & REISSUED	TK	AJS	AS	SM
5	21.08.14	REVISED & REISSUED	AJS	AS	PKM	SC
4	19.06.09	REVISED & REISSUED	AS	SCH	VINAY KUMAR	N. DUARI
3	22.01.02	UPDATED & REISSUED	R SOOD	R SOOD	H MATHUR	GRR
2	AUG'94	UPDATED & REISSUED	-	H MATHUR	GP LAHIRI	A. SONI
Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
Approved by						

Abbreviations:

CNS : Cohesive Non Swelling

Structural Standards Committee

Convenor : Mr. Anurag Sinha

Members: Mr. C Damodaran
Mr. V.K.Panwar
Mr. Samir Das
Mr. Amitabh Kishore
Mr. Gyasuddin
Mr. Charanjit Singh (Projects)
Mr. Ravindra Kumar (Constn.)

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1.0 SCOPE

This specification deals with earth work in excavation and filling.

2.0 CLASSIFICATION OF SOIL

2.1 Ordinary Soil

2.1.1 Soft Soil/ Loose Soil

Generally any soil which yields to the ordinary application of pick and shovel, or to phawra, rake or other ordinary digging implements such as:

- a) Sand, gravel, loam, clay, mud, black cotton soil
- b) Vegetables or organic soil, turf, peats, soft shale or loose murrum
- c) Mud concrete below ground level
- d) Any mixture of soil mentioned above.

2.1.2 Hard/ Dense Soil

Generally any soil, which requires close application of picks or jumpers or scarifier and rippers to loosen the same, such as:

- i) Stiff heavy clay, hard shale or compact murrum requiring grafting tool and/ or pick and shovel
- ii) Shingle and river or nallah bed boulders
- iii) Soling of roads, paths etc. and hard core
- iv) Macadam surface of any description (water bound, grouted tarmac etc.)
- v) Lime concrete, stone masonry in lime or cement mortar below ground level
- vi) Soft conglomerate when the stone can be detached from the matrix with picks and shovels

2.2 Soft Rock

This is fissured/ disintegrated rocky strata, boulders (volume more than 0.028 m^3 and less than 0.400 m^3) and also which cannot be quarried/ excavated by using above manual tools but can be quarried/ excavated manually by using crow bars is classified as soft rock. Soft rock shall include all kinds of stiff and stratified rock, such as shales, thinly bedded phillites, laterite hard conglomerate, lime stone, sand stone and unreinforced cement concrete below ground level. Soft rock may be quarried or split with crow bar or picks and can also be excavated by rippers, dozers and other mechanical equipment, but without the aid of blasting. If required and permitted, light blasting may be resorted to, for loosening the materials, but this will not, in any way entitle the material to be classified as "Hard Rock".

2.3 Hard Rock

2.3.1 Hard Rock (Not Requiring Blasting)

This shall include all types of hard and compact rock, having closely spaced fissures or joints, on account of which blasting is not considered necessary and shall not be resorted unless permitted by the Engineer-in charge.

2.3.2 Hard Rock (Requiring General Blasting)

This shall include all types of hard and compact rock occurring in unfissured masses or similar foundations, boulders (volume more than 0.4 m^3) for excavation in which blasting is

considered necessary such as quartzite, granite, basalt stones, reinforced cement concrete (reinforcement to be cut through but not separated from concrete) below ground level and the like.

2.3.3 Hard Rock (Requiring Controlled Blasting (Explosive/ Non-explosive))

This type of excavation becomes necessary when excavation is done in formations, mentioned in Clause 2.3.2, in the vicinity of existing foundations/ structures. Mode of blasting shall be decided by Engineer-in-Charge, keeping in view the sensitivity of structures.

2.3.4 Hard Rock (Blasting Prohibited)

Hard rock requiring blasting as described in clause 2.3.2 above, but where blasting is prohibited for any reason and excavation has to be carried out by chiseling, wedging, pneumatic/ hydraulic/ electro-mechanical breaking by using splitter or by chemical means or any other agreed method.

The use of excavation shall not be considered as a reason for classification under hard rock requiring blasting unless clearly found necessary in the opinion of Engineer-in-Charge.

3.0 BACKFILLING MATERIAL

3.1 Suitable Materials:

3.1.1 Back filling suitable material shall be approved by the Engineer-in-charge. Additionally, they shall be free from refuse, large stones or rocks or other material which might prevent proper compaction or cause the compacted fill or embankment to perform inadequately or to have insufficient stability or bearing capacity for the superimposed loads to which it is likely to be subjected.

3.1.2 Back filling of excavation in trenches, foundations and elsewhere shall consist of one of the following materials as shown on drawing, or directed by the Engineer-in-charge.

- i) Soil
- ii) Selected earth from heaps or brought from borrow areas.

In case i) or ii) are not available, the Engineer-in-charge may approve use of any of the following:

- iii) Stone/ Gravel
- iv) Sand
- v) CNS material.

3.1.3 The material shall be free from refuse, debris, roots, hard lumps and any other foreign organic material.

3.2 Unsuitable Materials

Unsuitable material shall include particles in excess of 75 mm size and that which is:

- a) Organic material, logs, stumps and perishable materials.
- b) Material susceptible to spontaneous combustion
- c) Materials with undefined properties
- d) Materials having a moisture content greater than the maximum specified
- e) Building rubble and domestic and industrial wastes
- f) Soils and rock susceptible to deterioration/ change of their properties.

- g) Clay, silt and other loose or soft soils not in accordance with compaction criteria.
- h) Dredged material
- i) Material containing gypsum or other soluble salts.

4.0 SETTING OUT

- 4.1 The Contractor shall be responsible for the true and proper setting out of the work in relation to original points, *lines** and *levels** of reference and for the correctness of the levels, dimensions and alignment of all parts of the work. If at any time during progress of the work any error appears or arises in the position of level, dimension, or alignment of part of the work, the Contractor at his own expense shall rectify such errors to the satisfaction of the Engineer-in-Charge. The checking of any line or level by the Engineer-in-Charge shall not in any way relieve the Contractor of his responsibilities.

4.1.1 Tolerances*

The grade shall be properly shaped to the required elevations and parallel to the required surface. The elevation of any point and the line of any edge or center of the earthworks shall conform to that shown on the drawings within the tolerances stated below:

	Tolerances from True Level	Tolerances from True Line
Basic Grading	- 25 mm	- 75 mm
Embankments	+75 mm - 0	+75 mm - 75 mm

- 4.2 The Contractor shall lay out and construct one or more permanent bench marks in some central place before the start of the work, from which all important levels for the excavations will be set.

These permanent bench marks shall consist of masonry pillars with top neatly plastered and leveled as per the directions of the Engineer-in-Charge. Bench marks shall be well connected with triangular grid system or any other bench mark approved by the Engineer-in-Charge.

5.0 EARTHWORK IN EXCAVATION

- 5.1 Excavation shall be carried out in any material met on the site to the lines, levels and contours shown on the detailed drawings and the Contractor shall remove all excavated materials to spoil heaps on site or transport for use in filling on the site or stack them for reuse as directed.

- 5.2 Excavated material shall not be deposited within 1.5 m from the top edge of the excavation.

- 5.3 The sides of the excavation may be cut sloping, or shored and strutted to hold the face of earth as per site requirements and as directed by the Engineer-in- Charge.

- 5.4 Foundation pits/ trenches shall not be excavated to the full depth unless construction is imminent. The last 15 cm depth of the excavation shall not be done until concreting work is imminent. The full depth may at the discretion of the Engineer-in-Charge be excavated and the bed covered with a 50 mm (minimum) thick (or as indicated on drawing) layer of lean concrete 1:5:10 mix (1 cement : 5 coarse sand : 10 crushed stone aggregate) or as specified in schedule of rates/ shown on drawing, after watering if required, and consolidating the bed.

- 5.5 If the bottom of any excavation has been left exposed by the Contractor and in the opinion of the Engineer-in-Charge, that has become badly affected by the atmosphere or by water, then the Contractor shall remove such portions of the deteriorated material as the Engineer-

in-Charge may direct and shall make good with lean concrete 1:5:10 mix (1 cement : 5 coarse sand : 10 crushed stone aggregate). All expenses for such additional concrete and excavation shall be borne by the Contractor.

- 5.6 Where excavation is made in excess of the depth required, the Contractor shall, at his own expense, fill upto required level with lean concrete 1:5:10 mix (1 cement : 5 coarse Sand : 10 crushed stone aggregates) or as decided by Engineer-in-Charge.
- 5.7 The Contractor shall provide suitable drainage arrangement to prevent surface water from any source entering the foundation pits at his own cost.
- 5.8 The Contractor shall make all arrangements for dewatering during excavation and subsequent works, the accumulated water from any source (including subsoil water) in the excavated pits/trenches and keeping the excavated pits/ trenches dry for subsequent works.
- 5.9 The Contractor shall make necessary arrangements for lighting, fencing and other suitable measures for protection against risk of accidents due to open excavation.
- 5.10 Where the excavation is to be carried out below the foundation level of an adjacent structure, the precaution to be taken such as under pinning, shoring and strutting etc. shall be determined by the Engineer- in-Charge. No excavation shall be done unless such precautionary measures are carried out as per directions of the Engineer-in-Charge. The payment for such precautionary measures shall, however, be made separately.
- 5.11 Loose or soft bed ground encountered in excavation at the required depth shall on the Engineers-in-Charge's instructions be excavated to a firm bed and difference made up to the required level with lean concrete 1:5:10 mix (1 cement : 5 coarse Sand : 10 crushed stone aggregates).
- 5.12 In those cases where during excavation, side slips occur for reasons not attributable to the Contractor (e.g. side slips which take place on their own but not due to surcharge of earth kept near the edge of excavation and cracking of excavation top strata due to clay drying out leading to collapse of excavation sides), the Engineer-in-Charge shall admit payment at his discretion.
- 5.13 Any obstacle encountered during excavation shall be reported immediately to the Engineer-in-Charge and shall be dealt with as instructed by him. Removal of buried pipes or cables shall not be done without prior permission of the Engineer-in-Charge and the Contractor shall provide all measures to protect the same. Cost of such protective measures are deemed to be included in the rates for various items of excavation.
- 5.14 The Contractor shall not undertake any concreting in foundation until the excavation pit/trench is approved by the Engineer-in-Charge.
- 5.15 The specification for earth work shall also apply to excavation in rock in general.
- 5.16 In case of hard rock requiring blasting, the provisions mentioned below shall be strictly followed.

5.16.1 General

Where hard rock is met with and blasting operations are considered necessary, the Contractor shall intimate about the same to the Engineer-in-Charge, and obtain his approval in writing for resorting to blasting operation.

The Contractor shall obtain license from the district authorities for undertaking blasting work as well as for obtaining and storing the explosive as per the Explosive Rules 2008, corrected upto date. He shall purchase the explosives, fuses, detonators etc. only from a licensed dealer. He shall be responsible for the safe custody and proper accounting of the explosive materials. The Engineer-in-Charge or his authorised representative shall have the access to check the Contractor's store of explosive and his accounts.

In case where explosives are required to be transported and stored at site, relevant clauses of the Explosive Rules, 2008 as amended subsequently, shall apply.

The Contractor shall be responsible for any accident to workmen, public or property, due to blasting operations.

5.16.2 Precautions

Blasting operations shall be carried out under the careful supervision of a responsible authorised and licensed blaster of the Contractor (referred subsequently as "blaster" only) during specified hours, as approved in writing by the Engineer-in-Charge. The blaster shall be fully conversant with the rules of blasting.

Proper precautions for safety of persons shall be taken. Red flags shall be prominently displayed around the area to be blasted and all the people on the work except those who actually light the fuses, shall withdraw to a safe distance of not less than 200 m from the blast. Precautions as per Explosive Rules 2008 with amendment shall be followed.

5.16.3 Fuses

All fuses shall be cut to the lengths required before being inserted into the holes. Joints in fuses shall be avoided. Where these are unavoidable, a semicircular niche shall be cut in one piece of fuse about 2 cm. deep from the end and the end of other piece inserted into this niche, and the two pieces then wrapped together with a string. All joints exposed to dampness shall be wrapped with rubber tape. Fuse and detonators shall be kept separated from the explosives.

5.16.4 Blasting with Gun Powder

Blasting shall normally be done with gun powder. Dynamite, gelatine or any other high explosive shall only be used in special cases with the written permission of the Engineer-in-Charge.

In case of blasting with gun powder, the position of all bore holes to be drilled shall be marked out in circles with white paint. The bore holes shall be jumped or drilled in the rock face. The depth of bore hole shall be about the same as that of the line of least resistance and its size shall be such that the cartridges can easily pass down to the bottom. The bore holes must be dried before being charged and these shall be inspected by the Contractor's agent.

Gun powder may be used in the form of pellet blasting cartridges or as powder or granules. Cartridges are provided with tapered central hole. One end of fuse is passed through the narrow end of the hole and a sufficient length of the fuse is doubled back so that when the fuse is pulled, it is held tight in the tapered hole of the cartridge. Other cartridges are then inserted in the fuse to make up the required charge. The cartridge along with the fuse is lowered down in the bore hole, placed in position and gently filled and pressed home with dry hay or turf. The rest of the bore shall then be filled with dry clay, which shall be tamped with copper or brass rod until it becomes compact. Care shall be taken to avoid any possibility of an air space around the fuse. The safety fuses shall be taken to the required distance so as to allow the blasting to take place after the person lighting the fuse has withdrawn to a safe distance.

Where gun powder is used in the form of powder or granules it shall be introduced in the bore hole by means of funnel or copper tube. The bore holes shall be loaded with two thirds of the quantity of charge required, and safety fuse then directly introduced over the charge. Remaining one third charge shall then be introduced, and gently filled and pressed home with dry hay or turf. The rest of the bore hole shall be filled with dry clay in the same way as for cartridges, and the safety fuse taken to the required distance.

The charges shall be fired by igniting the fuse. The number of charges to be fired and the actual number of shots heard, shall be compared, and the Contractor's blaster shall satisfy himself by examination that all the charges have exploded, before workmen are permitted to approach the site. The charge which has not exploded, shall not be permitted to be withdrawn. The tamping and charge shall be flooded with water and the holes marked with a red cross (X) over it. Another hole shall be jumped at a distance of about 45 cm from the old hole and fired in the usual way. This operation shall be continued, till the original and any subsequent unfired charges are exploded.

5.16.5 Blasting with Dynamite or any other High Explosive

In case of blasting with dynamite or any other high explosive the position of all bore holes to be drilled shall be marked out in circle with white paint. These shall be inspected by the Contractor's blaster. Bore holes shall be of a size that the cartridge can easily pass down. After the drilling operation, the blaster shall re-inspect the holes to see that the holes marked out by him have been drilled. The Blaster shall then prepare all charges necessary for the bore holes. The bore holes shall be thoroughly cleaned before a cartridge is inserted. Wooden tamping rods (not pointed but cylindrical throughout) shall be used, in charging holes. Metal rods shall never be used for tamping. One cartridge shall be first placed in the bore hole, gently pressed and not rammed down. Other cartridges shall then be added as may be required to make up the necessary charge for the bore hole. The top most cartridge shall be connected to the detonator which shall in turn be connected to the safety fuse of required length.

The maximum of eight (8) bore holes shall be loaded and fired on each occasion. The charges shall be fired successively and not simultaneously.

Immediately before firing a blast, due warning shall be given and the blaster shall see that all persons have retired to a place of safety. The safety fuses of the charged holes shall be ignited in the presence of the blaster, who shall see that all the fuses are properly ignited.

Careful count shall be kept by him and others of each blast as it explodes. After the blast the blaster shall inspect the work and ascertain that all the charged holes have been exploded. In case of misfired holes, the Blaster shall inspect the same after half an hour and mark red crosses (X) over the holes. During this interval of half an hour, no body shall approach the misfired holes. None of the drillers shall work near such holes, until one of the two following operations has been done by the blaster.

- a) Either the Contractor's blaster shall very carefully (when the tamping is of damp clay) extract the tamping with a wooden scraper and withdraw the fuse, primer and detonator, after which a fresh detonator, primer and fuse shall be placed in the misfired holes and fired.

OR

- b) The hole shall be cleaned for 30 cm of tamping and its direction ascertained by placing a stick in the hole. Another hole shall then be drilled 15 cm away and parallel to it. This hole shall be charged and fired. The misfired hole should also explode along with the new one.

Before leaving the work, the blaster of one shift shall inform another blaster relieving him for the next shift, of any cases of misfire, and shall point out their positions denoted by red crosses and also state the action, if any, to be taken in the matter.

The Engineer-in-Charge shall also be informed by the blaster of all cases of misfire, their causes and steps taken in that connection.

5.16.6 Controlled Blasting (Explosive/ Non-explosive)

Whenever required by the Engineer-in-Charge, rock blasting shall be carefully controlled so that vibrations generated during the blasting do not cause damage to the buildings and installation around. Similarly, the rock pieces should not fly off and endanger the buildings and installations around. Apart from the general precautions mentioned in the preceding paragraphs, following protective measures and limits for use of explosive are suggested as guidelines. Bidders are requested to carefully check the site conditions and submit details of the scheme they propose to adopt for controlling the blast.

Following protective measures shall be adopted while carrying out blasting operations.

The hole shall be covered with mild steel plate of minimum 12 mm thickness.

Reinforcement rod mesh not less than 20 mm dia. at 150 mm centre in both directions shall be placed over the steel plates.

Steel plate and reinforcement shall be inspected after every blasting operation and all twists shall be removed before reuse to the satisfaction of the Engineer-in-Charge.

Sand filled bags of 6 to 8 layers shall be placed over the mesh suitably covering the whole region under blasting operation.

The thickness of covering plate and the kind of dead weight is to be duly approved by the Engineer-in-Charge.

5.16.7 Hard rock requiring blasting as described under Clause 2.3.2 above, but where blasting is prohibited for any reason(s), breaking up of rock can be done by using Splitter and/or chemical substances of approved manufacturer mixed in an appropriate proportion. The method involves drilling holes into rock and then inserting Splitter (hydraulic/ pneumatic/ electro-mechanical) or injecting Chemical solvents into the holes. The breaking-up of rock takes place in a controlled fashion without much noise and spark. Any other method as agreed with Engineer-in-Charge may also be used.

5.17 Excavation in areas where existing under ground cables are envisaged, to be carried out carefully by manual means taking proper safety precautions.

The earth work machinery be deployed after ensuring from the trial pits that no cable is crossing the proposed area of excavation.

5.18 Payment (applicable for item rate tenders only)

5.18.1 The payment clause shall be operated only if the earthwork is to be measured separately as per relevant tender item.

5.18.2 Payment for earth work in excavation shall be made on cubic meter (m³) basis on the measurement of volume of pit/ trench of excavation with working space as per relevant Indian Standards (IS:1200) and slopes/ steppings as permitted by the Engineer-in-Charge. The rate shall include cost of all the operations of blasting with explosives & accessories, making of all

arrangements for dewatering the accumulated water from any source in the excavated pit or trench, removal and disposal of surplus excavated soil within a lead of 100 m from construction areas. The rate shall also include setting out and line out work required for the excavation.

5.18.3 The following works shall not be measured separately and allowance for the same shall be deemed to have been made in the description of main item:

- a) Setting out works, profiles, etc.;
- b) Site clearance, such as cleaning grass and vegetation;
- c) Unauthorized battering or benching of excavation;
- d) Forming (or leaving 'dead men' or 'tell-tales' in borrow pits and their removal after measurements;
- e) Forming (or leaving) steps in sides of deep excavation and their removal after measurements;
- f) Excavation for insertion of planking and strutting;
- g) Unless otherwise specified, removing slips or falls in excavations;
- h) Bailing out or pumping of water in excavation from rains;
- i) Bailing out or pumping of water in excavation from sub-soil water, and
- j) Slings or supporting pipes, electric cables, etc, met during excavation.

5.18.4 Special pumping other than what is included in 5.18.3 (h and i) and well point dewatering where resorted to, shall each be measured separately, unless otherwise stated, in Kilo Watt Hour against separate specific provision(s) made for the purpose.

5.18.5 The Contractor shall intimate to the Engineer-in-Charge as soon as different classification of soils are met with. The measurements of various soil classifications then shall be worked out by either of the following alternatives in the order of their decreasing importance.

- a) Joint levels shall be taken as to the levels of different soil classifications and volume worked out on the basis of levels only.
- b) Where levels of different strata cannot be clearly marked and defined, the Contractor shall stack different soils of various classifications separately for measurement purpose and then dispose it off.
- c) If the quantum of work involved in (b) above is extensively large & time consuming, then the total area may be divided into various zones and reasonably representative samples as in (b) above may be taken and quantities of soils of various classifications finalized for the entire zone based on the representative.

If soil of any classification other than that specified in the Schedule of Rates is met with during excavation, the decision of the Engineer-in-Charge as to the classification of soil, levels of the strata of different classifications and their location shall be binding.

In above case, the total quantity of excavation shall be computed from the measurement of the pit/ trench excavated. The hard rock and soft rock shall be measured separately from the relevant stacks and each shall be reduced by fifty percent for voids, and paid under the relevant items. The balance, that is the total quantity of excavation minus the reduced (for voids) quantity of excavation for rocks shall be paid as soft/ hard soil as per the direction of the Engineer-in-Charge (However, the maximum payment shall be limited to the volume of the excavated pit/ trench as approved by Engineer-in-Charge).

6.0 SHORING AND STRUTTING

- 6.1** The shoring and strutting of the sides to withhold the face of excavation pits/trenches shall be done when approved or directed by the Engineer-in-Charge.
- 6.2** The shoring shall be of close or open timbering type or by Sheet Piling, Soldier Piling, etc. depending upon the site requirements and as directed by the Engineer-in-Charge whose decision shall be final and binding as to the type of shoring to be used.
- 6.3** The arrangement of the shoring and strutting shall be sound and safe and shall be got approved from the Engineer-in-Charge before installation. The approval shall not absolve the Contractor of his responsibilities of safety and any other requirements of the contract.
- 6.4** The shoring and strutting shall be kept in position till all the relevant work in the excavated area is completed and approved. It shall be dismantled and removed only after the permission to do so is obtained from the Engineer-in-Charge.

6.5 Sheet Piling

The contractor shall design, supply and install hot rolled steel sheet piles including all associated structural steel members viz. waler & runner beams, strut, cross ties, vertical members, guide frames, suitable interlocks, suitable corner sections, splicing & cutting of sheet piling. The contractor shall also apply recommended sealant for complete water tightness (as required) and ensure pre-drilling for installation into bedrock (as necessary), etc. as per site conditions.

The contractor shall mobilize/ demobilize all necessary tools & tackles, hammer (vibratory/ impact), crane(s) etc., shifting plant/ machinery and carryout all ancillary works (as required) and ensure subsequent removal of entire arrangement after completion of works.

6.6 Payment (applicable for item rate tenders only)

Payment for shoring and strutting by close and open timbering shall be made on square meter (m²) basis as separate items. In both the cases, the measurement shall be done on the basis of the surface area of the sides of the excavation actually shored and strutted.

The rate shall include all labour, materials, erection of the poling boards, wales, struts, ballies etc., fixing and keeping the same in position as required, dismantling and removing the same after the work is over as directed.

Payment for shoring and strutting by sheet piling shall be made on the basis of shoring area of sheet pile exposed after complete excavation.

The rate shall include all labour, design, supply and installation of hot rolled steel sheet piles including all associated structural steel members, application of recommended sealant, pre-drilling for installation into bedrock etc., mobilization/ demobilization of all necessary tools & tackles, hammer, crane(s) etc., shifting plant/ machinery & all ancillary works, fixing and keeping the sheet piling in position, dismantling and removing the same after the work is over, etc. all complete as directed by the Engineer-in-Charge.

No extra payment shall be made for cost of extraction and replacement for installing of sheet pile deviating the specification or rejected by Engineer-in-charge. Extracted sheet piles shall be contractor's property and contractor shall remove the same from site without any extra cost to client.

7.0 BACK FILLING AROUND FOUNDATIONS AND IN PLINTH

7.1 Back filling around completed foundations, structures, trenches and in plinth shall be done to the lines and levels shown on the drawings including any trimming of the surfaces, as may be necessary. This shall be done with selected and approved earth from excavation or otherwise with suitable materials described under Clause 3.1 as directed by the Engineer-in-Charge. Where sufficient suitable material is not available from the excavation, the Engineer-in-Charge may direct to import suitable earth from other sources. The filling shall be done in layers of thickness not exceeding 15 cm with watering, rolling and ramming by manual methods/ mechanical compactors to grade and level as shown on drawings to obtain 90% laboratory maximum dry density.

7.2 The Contractor shall not commence filling in and around any work until it has been permitted by the Engineer-in-Charge.

7.3 Backfilling around liquid retaining structures and pipes shall be done only after approval of the Engineer-in-Charge is obtained.

7.4 Payment (applicable for item rate tenders only)

Payment for backfilling with earth shall be based on volume in cubic meters (m^3) of consolidated fill. This volume shall be derived from the difference between the volume of excavation and the structure or trenches as the case may be. The rate shall include cost of extracting suitable approved earth from available excavated soil from spoil heaps within a lead of 100 m, placing, watering, rolling, ramming compacting in layers, trimming and dressing finished surface and disposal of surplus material upto a lead of 100 m.

However, backfilling done with materials other than earth shall be paid separately under relevant items.

8.0 TRANSPORTATION OF SURPLUS EARTH

8.1 Surplus earth and soil from excavation shall be removed from construction area to the area demarcated by the Engineer-in-Charge.

8.2 Payment (applicable for item rate tenders only)

8.2.1 Payment shall be made only for the lead beyond initial 100 m from construction area. Rate shall include re-excavation, loading, transportation, dumping, stacking or spreading (as per directions of the Engineer-in-Charge) the surplus earth and the soil in the area demarcated by the Engineer-in-Charge. Payment shall be made on cubic metre (m^3) basis on the difference of measurements of the volume of the excavated pits and the measurement of the back filling. Quantity generated due to voids in back filled volume of earth shall also be removed by the Contractor at no extra cost and this disposal of earth shall not be measured and paid under any item.

8.2.2 In exceptional circumstances the Engineer-in-Charge may direct the Contractor to remove surplus earth, concrete debris or any other waste material from site to the areas of disposal on the basis of truck measurement. In such cases volume of material shall be calculated on the basis of truck volume reduced by 30% for voids in case of soft/hard soils and 50% for soft/hard rock. All other provisions of disposal such as spreading, levelling, grading shall apply in this case also.

9.0 PROTECTION OF PROPERTY AND PERSONNEL

- 9.1** The Contractor shall protect all active utility lines shown on the drawings or encountered during the excavation. If he damages those lines, the Contractor shall repair or replace them. If existing utilities interfere with his work, the Contractor shall inform to the Engineer-in-charge and secure written instructions for further action.
- 9.2** The Contractor shall barricade open holes and depressions which he creates or exposes as part of this, and he shall post warning signs and lights on property adjacent to or with public access. He shall operate warning lights during hours from dusk to dawn each day and as otherwise required for safety.
- 9.3** The Contractor shall protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by his operations.
- 9.4** The Contractor shall plan and execute all aspects of the earthwork so that the safety of personnel, the work and adjacent property is guaranteed and such that a minimum of inconvenience is caused.

10.0 CLEAN UP

Upon completion of work, the Contractor shall leave the project site clear of debris and surplus materials off plant limits in a manner meeting all location authority requirements.

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STANDARD SPECIFICATION CIVIL & STRUCTURAL WORKS

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BRICK MASONRY

5	21.12.20	REVISED & REISSUED AS STANDARD SPECIFICATION	AS	RBS	AS	SM
4	10.03.16	REVISED & REISSUED AS STANDARD SPECIFICATION	MK	AJS	RS	S CHANDA
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Approved by						

Abbreviations:

BIS : Bureau of Indian Standards

IS : Indian Standards

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Mr. Charanjeet Singh (Projects)
Mr. Ravindra Kumar (Construction)

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1.0 SCOPE

This specification establishes the materials, dressing, laying, joining, curing, workmanship etc. for brick masonry works. Brick masonry shall also comply with all the requirements of IS: 2212.

2.0 REFERENCES

2.1 BIS Codes

S. No.	IS No.	Title
1.	IS:2212	Brick works- code of practice
2.	IS: 2250	Code of practice for preparation and use of Masonry mortars
3.	IS: 2750	Specification for Steel Scaffoldings

2.2 EIL specifications

6-68-0002: Materials

3.0 MATERIALS

Refer EIL Specification No. 6-68-0002.

4.0 GENERAL REQUIREMENTS

4.1 Cement Mortar

Cement mortar shall meet the requirements of IS:2250 and shall be prepared by mixing cement and sand by volume. Proportion of cement and sand shall be 1:6 (1 part of cement and 6 parts of sand), or as directed by the Engineer-in-Charge/shown on the drawing, for brick masonry of one brick thickness or more, while 1:4 cement mortar (1 part of cement and 4 parts of sand) shall be used for brick masonry of half brick thickness. The sand being used for mortar shall be sieved. The mortar shall be used as soon as possible after mixing and before it has begun to set and in any case within initial setting time of cement after water is added to the dry mixture. Mortar unused for more than initial setting time of cement, shall be rejected and removed from the site of work.

4.1.1 Proportioning

The unit of measurement for cement shall be a bag of cement weighing 50 Kg and this shall be taken as 0.035 cubic metre. Sand shall be measured in boxes of suitable size on the basis of its dry volume. In case of damp sand, its quantity shall be increased suitably to allow for bulking.

4.1.2 Mixing

The mixing of mortar shall be done in a mechanical mixer operated manually or by power. The Engineer-in-Charge may, however, permit hand-mixing as a special case, taking into account the magnitude, nature and location of work. The Contractor shall take the prior permission of Engineer-in-Charge, in writing, for using hand-mixing before the commencement of work.

4.1.2.1 Mixing in Mechanical Mixer

Cement and sand in specified proportions, by volume, shall be thoroughly mixed dry in a mixer. Water shall then be added gradually and wet mixing continued for atleast one minute. Care shall be taken not to add more water than that which shall bring the mortar to the consistency of stiff paste. Wet mix from the mixer shall be unloaded on water-tight masonry platform, made adjacent to the mixer. Platform shall be atleast 150 mm above the levelled ground to avoid contact of surrounding earth with the mix. Size of the platform shall be such that it shall extend atleast 300mm alround the loaded wet mix area. Wet mix, so prepared, shall be utilised within initial setting time of cement after addition of water. Mixer shall be cleaned with water each time before suspending the work.

4.1.2.2 Hand Mixing

The measured quantity of sand shall be levelled on a clean water-tight masonry platform and cement bags emptied on top. The cement and sand shall be thoroughly mixed dry by being turned over and over, backward and forward, several times till the mixture is of uniform colour. The quantity of dry mix which can be consumed within initial setting time of cement shall then be mixed with just sufficient quantity of water to bring the mortar to the consistency of stiff paste.

5.0 CONSTRUCTION PROCEDURE

5.1 Soaking of Bricks

Bricks shall be soaked in water before use for a period that is sufficient for the water to just penetrate the whole depth of bricks as well as to remove dirt, dust and sand. Proper soaking of bricks shall prevent the suction of water from the wet mortar as otherwise mortar will dry out soon and crumble before attaining any strength. The bricks shall not be too wet at the time of use as they are likely to slip on mortar bed and there will be difficulty in achieving the plumbness of wall as well as proper adhesion of bricks to mortar. The period of soaking shall be determined at site by a field test by immersing the bricks in water for different periods and then breaking the bricks to find the extent of water penetration. The least period that corresponds to complete soaking, will be the one, to be allowed for in the construction work.

The soaked bricks shall be stacked over a clean place, wooden planks or masonry platforms to avoid earth, dirt being smeared on them. It shall be ensured that at the time of laying of soaked bricks, they are skin dry.

5.2 Laying

5.2.1 Brick Work (one or more brick thickness)

Brick work (one or more brick thickness) shall be laid in English Bond unless otherwise specified. Half or cut bricks shall not be used except when needed to complete the bond. In no case the defective bricks shall be used.

A layer of average thickness of 10mm of cement mortar shall be spread on full width over a suitable length of lower course or the concrete surface. In order to check and achieve uniformity in masonry, the thickness of bed joints shall be such that four courses and three joints taken consecutively shall measure equal to four times the actual thickness of the brick plus 30mm. Each brick with frog upward, shall be properly bedded and set in position by gently tapping with handle of trowel or wooden mallet. Its inside faces shall be buttered with mortar before the next brick is laid and pressed against it. After completion of the course, all vertical joints shall be filled from top with mortar.

All brick courses shall be taken up truly plumb; if battered, the batter is to be truly maintained. All courses shall be laid truly horizontal and vertical joints shall be truly vertical. The level and verticality of work in walls shall be checked up at every one metre interval.

The masonry walls of structures shall be carried up progressively, leaving no part one metre lower than the other. If this cannot be adhered to, the brick work shall be raked back according to bond (and not left toothed) at an angle not more than 45 degrees but raking back shall not start within 60 cm of a corner. In all cases returns, buttresses, counter forts, pillars etc. shall be built up carefully course by course, and properly bonded with the main walls. The brick work shall not be raised more than fourteen (14) courses per day.

At the junction of any two walls, the bricks shall at each alternate course, be carried into each of the respective walls so as to thoroughly unite the work.

The courses at the top of plinth and sills, at the top of the wall just below the soffit of the roof slab or roof beam and at the top of the parapet, shall be laid with bricks on edge. Brick on edge course shall be so arranged as to tightly fit under the soffit of the roof beam or roof slab, restricting the mortar layer thickness upto 12mm. However, any gap between the finished brick work and soffit of roof slab/beam shall be suitably sealed with the mortar.

5.2.2 Brick Work (half brick thickness)

For brick walls of half brick thickness, all courses shall be laid with stretchers. Wall shall be reinforced with 2 nos. - 6mm diameter mild steel bars, placed at every fourth course. The reinforcement bars, shall be straightened and thoroughly cleaned. Half the mortar thickness for the bedding joint shall be laid first and for steel reinforcement, one on each face of the wall, shall be embedded, keeping a side cover of 12mm mortar. Subsequently, the other half of the mortar thickness shall be laid over the reinforcement covering it fully.

The reinforcement bars shall be carried at least 150mm into the adjoining walls or RCC columns. In case the adjoining wall being of half brick thickness, the length of bars shall be achieved by bending the bars in plan. During casting of reinforced concrete columns, 6mm dia. mild steel bars shall be placed at every fourth course of brick masonry. At the junction of two walls, the brick shall, at each alternate course, be carried into each of the respective walls so as to thoroughly unite the work. The brick masonry work shall not be raised more than 14 courses per day.

Brick course under the soffit of beam or slab, shall be laid by restricting the mortar thickness to 12mm. However, any gap between the finished brickwork and soffit of slab/beam, shall be suitably sealed with the mortar.

5.2.3 Cavity Walls

Brick work in cavity walls shall be similar to general brickwork. It shall consist of one wall of one or more brick thickness while the other wall shall be of half brick thickness at a clear gap of 50mm. The brick work on either side of cavity shall conform to the specifications already as stated in Cl. No. 5.2.1 and 5.2.2. At the base of the cavity wall, the walls shall be solidly constructed upto 300mm above the ground level. The cavity wall shall be terminated 300mm below the soffit of roof slab/beam and the courses over this shall be continued as solid brickwork.

Cavity should be continuous and free from obstructions. Mortar droppings shall be prevented from falling down the cavity by the use of laths or by hayhands which shall be drawn up the cavity as the work proceeds. Any mortar which may unavoidably fall on the

wall-ties, shall be removed daily and temporary openings shall be provided to permit the daily removal of mortar droppings from the bottom of the cavity.

The outer and inner leaves shall be tied by means of wall ties. Ties shall be of tor steel bars of 8mm dia. 200 mm long with hooks at both the ends. These shall be placed not more than 750mm c/c horizontally and not more than 300mm vertically, and staggered. Additional ties shall be provided near the openings. There shall at least, be 5 ties per square metre of surface area of the wall. Ties shall be given a bituminous coat before placement, to protect them from corrosion.

In order to keep the cavity dry, air slots shall be provided in the cavity walls at bottom as well as top to the extent of 50 sq.cm area of vents to every 2.0 sq.metre area of the wall.

5.2.4 Circular Brick Work

The detailed specification for brick work covered under clauses 5.2.1 & 5.2.2 shall also apply for circular brickwork. Bricks forming skew backs, shall be dressed or cut so as to give proper radial bearing. Defects in dressing of bricks shall not be covered up by extravagant use of mortar, nor shall the use of chips etc. be permitted.

The circular brick work shall be carried up from both ends simultaneously and keyed in the centre. The bricks shall be flushed with mortar and well pressed into their positions so as to squeeze out a part of their mortar and leave the joints thin and compact. All joints shall be full of mortar and thickness of joints shall be between 5mm and 15mm.

5.3 Jointing

Joints shall be restricted to a width of 10mm with brickwork of any classification. All bed joints shall be normal to the pressure upon them i.e. horizontal in vertical walls, radial in circular brick masonry and at right angles to the face in the battered retaining walls. The vertical joints in alternate courses shall come directly one over the other and shall be truly vertical. Care shall be taken that all the joints are full of mortar, well flushed up. In case no pointing is to be done, cement mortar shall be neatly struck as the work proceeds. The joints in faces which are to be plastered or pointed shall be squarely raked out to a depth of 12mm while the mortar is still green. The rake joints shall be brushed to remove loose particles. After the day's work, the faces of the brick work shall be cleaned on the same day with wire brush and all mortar droppings removed.

5.4 Curing

Green work shall be protected from rain or any other running water or accumulated water from any source, by suitable means. Masonry work, as it progresses, shall be kept thoroughly wet by sprinkling water at regular intervals, on all faces. Curing shall be done after 24 hours of completion of day's work as per IS:2212.

5.5 Staging/Scaffolding

5.5.1 Staging/scaffolding shall be properly planned and designed by the Contractor. Use of only steel tubes is permitted for staging/scaffolding. Design of staging/scaffolding shall be submitted for approval of the Engineer-in-Charge, before commencement of work.

Single scaffolding having one set of vertical support, shall be used and other end of the horizontal scaffolding member shall rest in a hole provided in the header course. The support shall be sound and strongly clamped with the horizontal pieces over which the scaffolding planks shall be fixed. The holes left in the masonry work for supporting the scaffolding shall be filled and made good with plain cement concrete of grade 1:2:4 (M15)

during plastering. Suitable access shall be provided to the working platform area. The scaffolding shall be strong enough to withstand all loads likely to come upon it and shall also meet the requirements specified in IS:2750.

Double scaffolding shall be provided for pillars less than one metre in width or for the first class masonry or for a building having more than two storeys.

Following measures shall also be considered during erection of the scaffolding/ staging:

- a) Sufficient sills or underpinnings, in addition to base plates, shall be provided, particularly, where scaffoldings are erected on soft grounds.
- b) Adjustable bases to compensate for uneven ground shall be used.
- c) Proper anchoring of the scaffolding/staging at reasonable intervals shall be provided in each direction with the main structure wherever available.
- d) Horizontal braces shall be provided to prevent the scaffolding from rocking.
- e) Diagonal braces shall be provided continuously from bottom to top between two adjacent rows of uprights.
- f) The scaffolding/staging shall be checked at every stage for plumb line.
- g) Wherever the scaffolding/staging is found to be out of plumb line, it shall be dismantled and re-erected afresh. Efforts shall not be made to bring it in line with a physical force.
- h) All nuts and bolts shall be properly tightened and care shall be taken that all the clamps/couplings are firmly tightened to avoid slippage.
- i) Erection work of a scaffolding/staging, under no circumstance shall be left totally to semiskilled or skilled workmen and shall be carried out under the supervision of Contractor's technically qualified civil engineer.

5.5.2 For smaller works or works in remote areas wooden ballies may be permitted for scaffolding/staging by the Engineer-in-Charge at his sole discretion. The contractor must ensure the safety and suitability of such works as described under clause 5.5.1 above.

5.6 Embedment of Fixtures

All fixtures, pipes, conduits, holdfasts of doors and windows etc. required to be built in walls, shall be embedded in plain cement concrete block of grade 1:2:4 (M15), at the required positions, as the work proceeds.

6.0 PAYMENT

This clause shall apply to Item Rate tender only.

6.1 General

The payment of brick masonry shall be inclusive of all labour, material, scaffolding/staging sampling and testing, soaking of bricks, laying of bricks, raking of joints, cutting of bricks, providing recesses and making rectangular or round openings, sealing the gap between brick masonry and soffit of beam/slab with and including cement mortar, curing, making of masonry platform for unloading the wet mix, embedding the fittings/fixtures including

providing PCC 1:2:4 (M15) etc, all as specified for all heights and depths. Deduction for rectangular or circular openings shall be done as per relevant BIS Codes.

- 6.1.1 Payment for brick masonry works of one or more brick thickness, including circular brickwork, shall be made on cubic metre basis of the work done.
- 6.1.2 Payment for half brick masonry work shall be made on square metre basis on the area of work done and shall also include the cost of supplying and fixing of reinforcement bars in position.
- 6.1.3 Payment for forming the cavity shall be in square metres and shall include the cost of laying of bitumen coated tor steel ties in position, labour required for keeping the cavity clear, providing air slots etc.

मानक विनिर्देशन सिविल एवं संरचनात्मक कार्य

STANDARD SPECIFICATION CIVIL & STRUCTURAL WORKS

सादा एवं प्रबलित सीमेंट कंक्रीट PLAIN AND REINFORCED CEMENT CONCRETE

7	29 th JAN 16	UPDATED & REISSUED	AJS	AS	RS	SC
6	15 th DEC 14	UPDATED & REISSUED	SP	AS	PKM	SC
5	28 th DEC 12	UPDATED & REISSUED	CDS	AJS	PKM	SC
4	23 rd NOV 07	UPDATED & REISSUED	YPC	PKM	VK	VC
3	APR,01	UPDATED & REISSUED	RPM7097	SCS	SCJ1151	MI
Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
Approved by						

Abbreviations:

ACI	:	American Concrete Institute
ASTM	:	American Society for Testing and Materials
BS	:	British Standards
GI	:	Galvanized Iron
IS	:	Indian Standard
ISO	:	International Organization for Standardization
PVC	:	PolyVinyl Chloride
RCC	:	Reinforced Cement Concrete
SCC	:	Self Compacting Concrete
SWG	:	Standard Wire Gauge

Structural Standards Committee

Convenor: Mr. Rajanji Srivastava

Members : Mr. Anurag Sinha
Mr. J K Bhagchandani
Mr. S K Naskar
Mr. V K Panwar
Mr. Charanjit Singh (Projects)
Mr. Ravindra Kumar (Construction)

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1.0 SCOPE

This specification is applicable for Concrete Grade up to M60 and establishes the requirements of materials, mix proportioning, placing, curing, etc. of all types of cast-in-situ and precast concrete (ref. section 1.6) used in foundations, underground and above ground structures, floors, pavements etc. Any special requirements as shown or noted on the drawings shall supersede the provisions of this specification.

1.1 Reference Codes and Specifications

Apart from this specification, construction of plain and reinforced concrete works shall be in accordance with the Indian Standard Code of Practice for "Plain and Reinforced Concrete" IS 456: 2000 along with all amendments till date and other relevant codes mentioned therein.

- 1.2 For Liquid Retaining Structures, EIL Specification No. 6-68-0005 shall be applicable.
- 1.3 For Structural Steel works, EIL Specification No. 6-68-0006 & 0008 shall be applicable.
- 1.4 For Bipolar Concrete Penetrating Corrosion Inhibiting Admixture, EIL Specification No. 6-68-0017 shall be applicable.
- 1.5 For Self Compacting Concrete, EIL Specification No. 6-68-0019 shall be applicable.
- 1.6 For precast concrete manufacturing refer EIL Specification No. 6-68-0014.
- 1.7 In case of conflict between the clauses mentioned in this specification and those in the Bureau of Indian Standards (BIS), this specification shall govern.

2.0 MATERIALS

- 2.1 Materials for concrete viz cement, Pozzolanas, Fly Ash, Ground Granulated Blast Furnace Slag, Sand, Coarse aggregate, Water, etc. shall be as described in EIL Specification No. 6-68-0002.
- 2.2 Materials for all reinforcements, embedment, inserts, water bars etc. shall conform to EIL Specification 6-68-0002.
- 2.3 Materials to be used as additive to concrete shall conform to EIL specification 6-68-0002 & 6-68-0017.

3.0 GRADES OF CONCRETE

Characteristic Compressive strength for different grades of concrete shall be as per Table-1.

TABLE – 1
GRADES OF CONCRETE

Group	Grade Designation	Specified Characteristic Compressive Strength of 150 mm cube at 28 days (N/mm ²)
Ordinary Concrete	M10	10
	M 15	15
	M 20	20

TABLE – 1
GRADES OF CONCRETE

Group	Grade Designation	Specified Characteristic Compressive Strength of 150 mm cube at 28 days (N/mm ²)
Ordinary Concrete	M10	10
	M 15	15
	M 20	20
Standard Concrete	M 25	25
	M 30	30
	M 35	35
	M 40	40
	M 45	45
	M 50	50
	M 55	55
	M 60	60

Note: The characteristic strength is defined as the strength of material below which not more than five (5) percent of the test results are expected to fall.

4.0 TYPE OF CONCRETE MIX

4.1 Unless otherwise noted on drawings, all lean/plain concrete shall be of Nominal Mix type and reinforced concrete shall be of Design Mix type.

4.2 Nominal Mix Concrete

This concrete shall be made (without preliminary tests) by adopting nominal concrete mix with proportions of materials as specified in Table 9 of IS: 456.

4.3 Design Mix Concrete

The mix shall be designed as per IS: 10262 in an approved laboratory to produce the grade of concrete having the required workability and characteristic strength not less than appropriate values given in Table-1. The target mean strength of concrete mix shall be equal to the characteristic strength plus 1.65 times the standard deviation.

As long as the quality of materials does not change, a mix design done earlier but not prior to one year may be considered adequate for later work. However, in case the source & quality of materials changes or there is a break in the continuity of construction, the Engineer-in-Charge shall ask for a new design mix.

Irrespective of the grade of concrete required to be produced as per characteristic strength criteria, the minimum cement content and maximum water cement ratio in the design concrete shall be strictly maintained as stipulated in Table 5 of IS: 456.

5.0 CONCRETE MIX PROPORTIONING

Proportioning, as used in this specification, shall mean the process of determining the proportions of the various ingredients to be used to produce concrete of the required workability when fresh/green and strength, durability & surface finish, when hardened. The following information shall be collected prior to design of the concrete mix:

The Engineer-in-Charge shall verify the strength of the concrete mix, before giving his sanction of its use. However, this does not absolve the Contractor of his responsibility as regards achieving the prescribed strength of the mix. If during the execution of the work, cube tests show lower strengths than required, the Engineer-in-Charge shall order fresh trial mixes to be made by the Contractor. No claim to alter the rates of concrete work shall be entertained due to such changes in mix variations. Any variation in cement consumption shall be taken into consideration for material reconciliation. Preliminary mix designs shall be established well ahead of start of work.

5.1 Maximum Density

Suitable proportions of sand and the different sizes of coarse aggregates for each grade of concrete shall be selected to give as nearly as practicable the maximum density as per clause 10.2.3 of IS 456. This shall be determined by mathematical means, laboratory tests, field trials and suitable changes in aggregate gradation. The contractor shall ensure the same to the satisfaction of Engineer-in-Charge.

5.2 Consistency

The concrete shall have a consistency such that it shall be workable in the required position and when properly vibrated it flows around reinforcing steel, all embedded fixtures, etc.

5.3 Workability

“Workability of Concrete” shall be as per clause 7 of IS: 456.

5.4 Durability

For achieving sufficiently durable concrete, strong, dense aggregates, low water-cement ratio and adequate cement content shall always be used. Workability of concrete shall be such that concrete can be completely compacted with the means available. Leak-proof formwork shall be used so as to ensure no loss of cement-slurry during pouring and compaction. Cover to reinforcement shall be uniform. Concrete mix design shall always take into account the type of cement, minimum cement content irrespective of the type of cement and maximum water cement ratio and minimum grade of concrete conforming to environmental exposure conditions (refer Table 3 of IS 456) as given in Table 5 of IS: 456.

Generally, following types of cement shall be used for Plain and Reinforced concrete works:

- a) 43 Grade Ordinary Portland Cement conforming to IS: 8112.
- b) 53 Grade Ordinary Portland Cement conforming to IS: 12269.
- c) Rapid hardening Portland Cement conforming to IS: 8041.
- d) Portland Slag Cement conforming to IS: 455.
- e) Portland Pozzolana Cement(fly ash based) conforming to IS:1489(Part 1)
- f) Portland Pozzolana Cement (calcined clay based) conforming to IS: 1489(Part-2).
- g) Sulphate Resisting Portland Cement conforming to IS: 12330

Sulphate Resisting Portland Cement shall be used only for specific requirements depending on environmental and process exposure conditions to which the structures may be subjected to like high Sulphate concentrations, processes involving Sulphur handling etc.

5.4.1 Water Cement Ratio

Once a mix, including its water cement ratio, has been determined and approved for use by the Engineer-in-Charge, that water cement ratio shall be maintained. The Contractor shall determine the water content of the aggregates frequently as the work progresses, and the

amount of mixing water shall be adjusted so as to maintain the approved water cement ratio. Maximum water-cement ratio shall be as per Table 5 of IS: 456 for different exposure condition.

The minimum cement content as mentioned in Table 5 of IS: 456 shall be adjusted for aggregates other than 20mm nominal maximum size as defined in Table 6 of IS 456.

For maximum cement content refer Cl.8.2.4.2 of IS: 456.

- 5.4.2 Where specified, Bipolar concrete penetrating corrosion inhibiting Admixture in reinforced concrete as per EIL specification No. 6-68-0017 shall be used for protecting the reinforcement from corrosion.

5.5 Limits to Deleterious Constituents

Careful selection of the mix and the constituent materials shall be made to limit the presence of deleterious constituents in concrete. The total acid soluble chloride content calculated from the mix proportion and the measured chloride content of each of the constituents shall not exceed 0.6 kg/m^3 at the time of placing of concrete. The total water soluble Sulphate content of the concrete mix shall not exceed 4 percent by mass of the cement in the mix.

6.0 BATCHING

Refer clause 10.2 of IS: 456.

7.0 CONCRETE MIXING

- 7.1 Ready Mixed Concrete supplied by Ready Mixed Concrete Plants or from on/off-site batching plants (IS: 4926) shall be used for structural concrete.

All records and charts for the batching and mixing operations shall be prepared and maintained by the contractor in accordance with IS: 4926 or as per the instructions of Engineer-in-Charge.

In case Ready Mixed Concrete is not available, the mixing of concrete shall be strictly carried out in an approved type of mechanical concrete mixer. The mixer shall be fitted with water measuring devices. The mixing shall be continued until there is a uniform distribution of the material and the mass is uniform in colour and consistency. If there is segregation after unloading from the mixer, the concrete shall be remixed.

7.2 Mixer

- 7.2.1 Mechanical Mixers shall comply with IS: 1791 and 12119 and shall be maintained in satisfactory operating condition. These shall be used only for producing lean/ plain concrete and/ or nominal mix concrete wherever permitted.

7.2.2 Mixing Time

Mixing time shall be as indicated in the following Table-2. Excessive mixing requiring additions of water shall not be permitted. Time shall start when all solid materials are poured in the revolving mixer drum, provided that all of the mixing water shall be introduced before one-fourth of the mixing time has elapsed. The Engineer-in-Charge may, however, direct a change in the mixing time, if he considers such a change necessary.

TABLE-2
MINIMUM MIXING TIME FOR MIXERS

Capacity of mixer	Minimum mixing time
2 m ³ or less	2 minutes
Above 2 m ³	3 minutes or as recommended by the mixer manufacturer.

7.3 Hand Mixing

Hand mixing of concrete shall not be permitted. However, for non-critical applications namely foundations for crossovers, isolated operating platforms etc., using concrete upto grade M20 and located at far away isolated places, this may be permitted by the Engineer-in-charge as a special case. Mixing shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. No extra payment shall be made to the Contractor for mixing by hand or for using extra cement due to hand mixing.

7.4 Additives

Additive in concrete shall be used only with the prior approval of the Engineer-in-Charge and shall comply with Cl. 5.5 of IS: 456. Any additive used for obtaining proper workability or leak proofness of concrete or repair/rendering works of concrete due to non-conformance to the specifications, shall not be measured and paid for. All costs relating to such usage shall be borne by the Contractor.

8.0 TRANSPORTATION, PLACING AND COMPACTION

8.1 General

The entire concrete placing programme including transportation arrangements, deployment of equipment, layout, proposed procedures and methods, shall be submitted to the Engineer-in-Charge 24 hours prior to concreting for approval. No concreting shall be placed until his approval has been received. Approval of the Engineer-in-Charge for pouring concrete shall be taken as 'conveyed', when the concrete pour card is signed by him.

8.1.1 Chuting

The use of long troughs, chutes and pipes for conveying concrete from the mixer to the forms shall be permitted only on written authorization from the Engineer-in-Charge. In case an inferior quality of concrete is produced by the use of such conveyors, the Engineer-in-Charge may order discontinuance of their use and the substitution of a satisfactory method of placing the concrete. Open troughs and chutes shall be equipped with baffles and be in short lengths to avoid segregation. Chutes shall be designed so that the concrete is, to some extent, remixed at the lower end by passing down through a funnel shaped pipe or drop chute. Alternatively, they shall discharge into a storage hopper from which the concrete shall be transported to the point of placing by wheel barrows or other means. Where drop chutes are used, a sufficient number of these must be provided, so that the concrete discharged from the chute is not required to flow laterally more than 1.0 metre. Where a drop chute is swung from the vertical, the bottom two sections must be maintained in a vertical position to avoid segregation. The addition of water at any point in the system of transportation, to facilitate the movement of concrete shall not be permitted. All chutes, troughs and pipes, shall be kept clean and free from coatings of hardened concrete by thoroughly flushing them with water after each run; water used for flushing shall be discharged clear of the structure.

8.1.2 Vibrators

- 8.1.2.1 Concrete shall be compacted with mechanical vibrating equipment supplemented, if necessary to obtain consolidation, by hand spreading, rodding and tamping. The vibrators shall be of immersion type with operational frequency ranging between 8,000 to 12,000 vibrations per minute. All vibrators shall comply with IS: 2505. Screed board concrete vibrators or concreting vibrating tables or form vibrators conforming to IS: 2506, 2514 and 4656 respectively shall be used where specifically required and directed by Engineer-in-Charge.
- 8.1.2.2 Immersion type vibrators shall be inserted in a vertical position at intervals of about 600mm, depending upon the mix, the equipment used, and experience on work. The vibrators shall be withdrawn slowly. The spacing shall provide some overlapping of the area vibrated at each insertion. In no case shall vibrators be used to transport concrete inside the forms. Over vibration or under vibration shall not be permitted as both are harmful. Hand tamping in some cases may be allowed subject to the approval of the Engineer-in-Charge.
- 8.1.2.3 In placing concrete in layers which are advancing horizontally as the work progresses, great care shall be exercised to ensure adequate vibration, bonding and moulding of the concrete between the succeeding batches.
- 8.1.2.4 The vibrator shall penetrate the layer being placed and also penetrate the layer below while the under layer is still plastic to ensure good bond and homogeneity between the two layers and prevent the formation of cold joints.
- 8.1.2.5 Care shall be taken to prevent contact of vibrators against all embedded reinforcing steel or inserts. Vibrators shall not be allowed to come in contact with forms.
- 8.1.2.6 The use of form vibrators shall not be permitted for compaction of in-situ concrete without specific authorization of the Engineer-in-Charge.
- 8.1.2.7 The use of surface vibrators of screed board type shall not be permitted for consolidation of concrete under ordinary conditions. However, for thin slabs (of thickness less than 200mm) surface vibration by such vibrators may be permitted, upon approval of the Engineer-in-Charge.
- 8.1.2.8 Whenever vibration has to be applied externally, the design of formwork and the disposition of vibrators shall be carefully planned to ensure efficient compaction and to avoid surface blemishes.

8.2 Transportation

- 8.2.1 All concrete shall be conveyed from the mixer to the place of final deposit such as formwork as rapidly as possible using suitable buckets, dumpers, pumps, transit mixers containers or conveyors which shall be mortar leak tight. Care shall be taken to prevent the segregation or loss of the ingredients and maintaining the required workability. For structural concrete produced from Ready Mixed Concrete/ Batching Plants, concrete shall be transported from the plants to the sites only by transit mixers and Delivery Ticket for each delivery of concrete shall be maintained by the contractor.
- 8.2.2 During hot or cold weather, concrete shall be transported in deep containers. Other suitable methods to reduce the loss of water by evaporation in hot weather and heat loss in cold weather may also be adopted. All equipment used for transporting and placing of concrete shall be maintained in clean condition. All buckets, hoppers, chutes, dumpers and other equipment shall be thoroughly cleaned after each use.

8.3 Placing and Compaction

- 8.3.1 Before placing concrete, all soil surfaces upon which or against which concrete is to be placed shall be well compacted and free from standing water, mud or debris. Soft or yielding soil shall be removed and replaced, with lean concrete or with selected soils/sand and compacted to the density as directed by Engineer-in-Charge. The surface of absorptive soil (against which concrete is to be placed) shall be moistened thoroughly so that moisture is not drawn from the freshly placed concrete. Similarly, for concrete to be placed on formworks, all chippings, shavings and sawdust etc. shall be removed from the interior of the forms before the concrete is placed.
- 8.3.2 Concrete shall not be placed until the formwork, the placement of reinforcing steel, embedded parts; pockets etc. have been inspected and approved by the Engineer- in-Charge. Any accumulated water on the surface of the bedding layer shall be removed by suitable means before start of placement. No concrete shall be placed on a water covered surface.
- 8.3.3 Concrete shall be discharged by vertical drop only and the drop height shall not normally exceed 1.5 metre throughout all stages of delivery until the concrete comes to rest in forms. However, drop height can be relaxed by the Engineer-in-Charge as per the provisions given under Cl. 8.1.1. For continuous concreting operation windows of suitable size shall be kept in the formwork or chutes shall be used to avoid segregation of concrete.
- 8.3.4 Concrete shall be deposited as near as practicable in its final position to avoid rehandling. Concrete shall be placed in successive horizontal layers. The bucket loads, or other units of deposit, shall be placed progressively along the face of the layer with such over-lap as will facilitate spreading the layer of uniform depth and texture with a minimum of hand shoveling. Any tendency to segregation shall be corrected by shovelling coarse aggregates into mortar rather than mortar on the coarse aggregates. Such a tendency for segregation shall be corrected by redesign of mix, change in process or other means, as directed by the Engineer-in-Charge.
- 8.3.5 All struts, stays and braces (serving temporarily to hold the forms in correct shape and alignment pending the placing of concrete at their locations) shall be removed when the concrete placing has reached an elevation rendering their service unnecessary. These shall not be buried in the concrete. Concrete shall be thoroughly compacted with vibrators and fully worked around the reinforcement, embedded fixtures and into corners of formwork before setting commences and shall not be subsequently disturbed. Methods of placing shall be such as to preclude segregation and avoid displacement of reinforcement or formwork. The formation of stone-pockets or mortar bondage in corners and against face forms shall not be permitted. Should these occur, they shall be dug out, reformed and refilled to sufficient depth and shape for thorough bonding as directed by the Engineer-in-Charge. Care shall be taken to avoid displacement of reinforcement and embedded inserts or movement of formwork.
- 8.3.6 Unless otherwise approved, concrete shall be placed in single operation to the full thickness of foundation rafts, slabs, beams and similar members. Concrete shall be placed continuously until completion of the part of the work between approved construction joints or as directed by the Engineer-in-Charge.
- 8.3.7 The method of placing and compaction employed in any particular section of the work shall be to the entire satisfaction of the Engineer-in-Charge.
- 8.3.8 During hot weather (atmospheric temperature above 40 degree Celsius) or cold weather (atmospheric temperature below 5 degree Celsius, the concreting shall be done as per the procedure set out in IS: 7861).
- 8.3.9 Concrete that has set standing and becomes stiffened shall not be used in the work.

8.3.10 Continuous Concreting

Where called out on the drawings, continuous concreting shall be done in a single operation as per the requirements of IS: 456 and IS: 2974. Sufficient "Windows" shall be left in the formwork for pouring & compaction of concrete and inspection. These windows shall be fixed tight once the level of concrete reaches their levels.

8.3.11 Concreting under special conditions

- a) Work in extreme weather conditions during hot or cold weather, the concreting shall be done as per procedure set out in IS: 7861(Part 1) or IS: 7861 (Part2).
- b) Under water concreting shall be as per clause 14.2 of IS: 456.

8.4 Items Embedded in Concrete

8.4.1 Concreting shall not be started unless the electrical conduits, pipes, fixtures etc., wherever required, are laid by the concerned agency. The Contractor shall afford all the facilities and maintain co-ordination of work with other agencies engaged in electrical and such other works as directed by the Engineer-in-Charge.

8.4.2 Before concreting, the Contractor shall provide, fabricate and lay in proper position all metal inserts, anchor bolts, pipes etc. (which are required to be embedded in concrete members) as per relevant drawings and directions of Engineer-In-Charge.

8.4.3 All embedment, inserts etc. shall be fully held and secured in their respective positions by the concerned agencies to the entire satisfaction of Engineer-in-Charge so as to avoid any dislocation or displacement during the concreting operations. The Contractor shall take all possible care during concreting to maintain these embedment/inserts in their exact locations.

9.0 CONSTRUCTION JOINTS

9.1 Construction joints shall be provided in position as shown or described on the drawings or as directed by the Engineer-in-Charge. Such joints shall be kept to the minimum. These shall be straight and at right angles to the direction of main reinforcement and shall be placed at accessible locations to permit cleaning out of laitance, cement slurry and unsound concrete.

9.2 In a column, the joint shall be formed about 100mm to 150mm below the lowest soffit of the beams framing into it. Concrete in a beam and slab shall be placed throughout without a joint but if the provision of a joint is unavoidable, the joint shall be vertical and located within 1/3 to 1/4 of the span, unless otherwise shown on the drawings.

9.3 When stopping the concrete on a vertical plane in slabs and beams, an approved stop board shall be placed with necessary slots for reinforcement bars. The construction joints shall be keyed by providing a triangular or trapezoidal fillet nailed on the stop board. Inclined joints shall not be permitted. Any concrete flowing through the joints of stop board shall be removed soon after the initial set. When concrete is stopped on a horizontal plane, the surface shall be roughened and cleaned after the initial set and a triangular or trapezoidal groove shall be provided for keying with the new concrete later.

9.4 When the work has to be resumed on a surface which has hardened, such surface shall be cleared of any foreign materials and roughened to expose the tips of the coarse aggregate. This may be done by manual chipping of concrete, with a high pressure water jet or by any other appropriate means as per Engineer-in-Charge's directions. It shall then be swept clean and thoroughly washed and wetted before any new concrete is poured. Any set mortar or concrete sticking to the exposed reinforcing rods in and around such joints shall be thoroughly removed. The reinforcements shall be wire brushed and washed just before

pouring any cement slurry or mortar. For vertical joints neat cement slurry shall be applied on the surface before it is dry. For horizontal joints the surface shall be covered with a layer of mortar about 10 to 15mm thick composed of cement and sand in the same ratio as the cement and sand in concrete mix. This layer of cement slurry or mortar shall be freshly mixed and applied immediately before placing new concrete.

- 9.5 Where the concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of particles of aggregate. The surface shall be thoroughly wetted and all free water removed. The surface shall then be coated with neat cement slurry. On this surface layer of concrete not exceeding 150mm in thickness shall first be placed and shall be well rammed against old work, particular attention being paid to corners and close spots; work thereafter shall proceed in normal way.

10.0 SEPARATION JOINT

- 10.1 Separation joint shall be obtained by using an approved Alkathene sheet stuck on the surface against which concrete shall be placed. Adequate care shall be taken to cause no damage to the sheet.

11.0 EXPANSION JOINTS/ISOLATION JOINT

- 11.1 Expansion/ Isolation joints in structures shall be formed in the positions and to the shapes shown in the relevant drawings. Joints shall be filled with joint filling material as stipulated in the drawings/schedule of rates. Isolation joints shall be provided around all equipment foundations, columns, pedestals, trenches etc. on grade.

12.0 WATER STOPS

PVC water stops as per EIL Specification No. 6-68-0002 for materials shall be accurately cut, fitted and integrally joined as per manufacturer's specifications to provide a continuous, watertight diaphragm at all points.

The water stops shall be located and embedded at expansion/contraction/ construction joints as indicated in the drawings or directed by the Engineer-in-Charge.

Adequate provision shall be made for the support and protection of water stops during the progress of the work. Damaged water stops shall be replaced and/or repaired as directed.

13.0 PROTECTION OF FRESHLY LAID CONCRETE

- 13.1 Newly placed concrete shall be protected, by approved means, from rain, sun and wind. Concrete placed below the ground level shall be protected from falling earth during and after placing. Surface shall be kept free from contact with such ground or with water draining from such ground during placing of concrete for a period of at least 3 days, unless otherwise directed by the Engineer-in-Charge. The ground water around newly poured concrete shall be kept to an approved level by pumping or other approved means of drainage and adequate steps shall be taken to prevent floatation and flooding. Steps shall be taken to protect immature concrete from damage by debris, loading, vibration, abrasion, mixing with deleterious materials that may, in the opinion of the Engineer-in-Charge, impair the strength and/or durability of the concrete.

14.0 CURING

- 14.1** Concrete shall be cured by keeping it continuously moist wet for the specified period of time to ensure complete hydration of cement and its hardening. Curing shall be started after 8 hours of placement of concrete in normal weather, and in hot weather after 4 hours. The water used for curing shall be of the same quality as that used for making of concrete.

Curing shall be assured by use of an ample water supply under pressure in pipes, with all necessary appliances such as hose, sprinklers etc. A layer of sacking, canvas, hessian, or other approved material, which will hold moisture for long periods and prevent loss of moisture from the concrete, shall be used as covering. Type of covering which would stain, disfigure or damage the concrete, during and after the curing period, shall not be used. Only approved covering shall be used for curing.

Exposed surfaces of concrete shall be maintained continuously in a damp or wet condition for at least the first 7 days after placing of concrete.

The Contractor shall have all equipment and materials required for curing on hand and ready to use before concrete is placed.

For curing the concrete in pavements, floors, flat roofs or other level surfaces, the ponding method of curing shall be used. For the first 24 hours after concreting, the concrete shall be cured by use of wet sacking, canvas, hessian etc. The minimum water depth of 25mm for ponding shall be maintained. The method of containing the ponded water shall be approved by the Engineer-in-Charge. The ponded areas shall be kept continuously filled with water, and leaks, if any, shall be promptly repaired. Areas cured by ponding method shall be cleared of all debris and foreign materials after curing period is over.

Alternatively, membrane curing may be used in lieu of moist curing with the permission of the Engineer-in-Charge. Such compounds shall be applied to all exposed surfaces of the concrete by spraying or brushing as soon as possible after the concrete has set. Minimum film thickness of such curing compounds shall be as per the recommendation of the manufacturer so as to obtain an efficiency of 90% as specified by BS-8110. This film of curing compound shall be fully removed from the concrete surface after the curing period specified earlier. Engineer-in-Charge may not allow curing by curing compounds for those surfaces where use of curing compound may be detrimental to application of future finishes over the concrete. Impermeable membranes such as polyethylene sheeting closely covering the concrete surface may also be used.

- 14.2** For concretes containing Portland pozzolana cement or Portland slag cement, the curing period as given in Cl. 14.1 shall be doubled. Curing by ponding shall, however, commence after the first 24 hours of concreting.

15.0 FIELD TESTS

15.1 Grading Test

Grading test on fine and coarse aggregates shall be carried out as per IS: 2386 at intervals specified by the Engineer-in-Charge.

The mandatory tests and their frequencies shall be done as given in Table-3A & 3B below:

TABLE – 3A
(For Concrete prepared at site by using Mechanical mixers)
MANDATORY TESTS ON SAND & STONE AGGREGATES

S. No	MATERIAL	TEST	FIELD / LAB TEST	MIN. QTY OF MATERIAL/ WORK FOR CARRYING OUT TEST	FREQUENCY OF TESTING*
1.	Sand	(a) Bulking of sand	Field Test	20 m ³	Every 20 m ³ or part thereof or more frequently as decided by the Engineer-in-Charge
		(b) Silt content	Field Test	20 m ³	
		(c) Particle size distribution	Field or Lab as decided by the Engineer-in-Charge	40 m ³	1) Every 40 m ³ of fine aggregate/sand required in RCC works only 2) Every 80 m ³ of fine aggregate/ sand required for other items
2.	Stone aggregate	a) Percentage of soft or deleterious materials	General visual inspection, laboratory test where required by Engineer-in-Charge or as specified	As required by Engineer-in-Charge	For all quantities
		b) Particle size distribution	Field or lab. as required by Engineer-in-Charge	45 m ³	For every 45 m ³ or part thereof as decided by Engineer-in-Charge
		c) Ten percent Fine value	Laboratory	45 m ³	Initial test and subsequent test as & when required by Engineer-in-Charge

* Fresh testing is mandatory whenever there is change in Source of materials.

TABLE – 3B
(Refer Cl. 4.4 & 4.6.1 of IS:4926)

(For Ready Mixed Concrete supplied by Ready Mixed Concrete Plants
or from on/off-site Batching Plants)

MATERIALS TESTING REQUIREMENTS

S. No	AGGREGATE PROPERTY/ PARAMETER	TYPE OF AGGREGATE	ASSESSMENT OF TYPICAL PROPERTIES AND HIGH TEST RATE*	NORMAL MONITORING AND LOW TEST RATE*	REQUIREMENT FOR NORMAL MONITORING AND LOW TEST RATE
1.	Grading	Sand/Fine	Weekly	Monthly	Last 8 results conform to IS 383 or representative values
		Coarse-Single sized/ Graded	Weekly	Monthly	
2.	Particle density -Oven Dry -Saturated Surface Dry -Apparent	All Types	Weekly	3 Monthly	Last 4 results ±0.04 percent
3.	Absorption	All Types	Weekly	3 Monthly	Last 4 results ±0.04 percent

S. No	AGGREGATE PROPERTY/ PARAMETER	TYPE OF AGGREGATE	ASSESSMENT OF TYPICAL PROPERTIES AND HIGH TEST RATE*	NORMAL MONITORING AND LOW TEST RATE*	REQUIREMENT FOR NORMAL MONITORING AND LOW TEST RATE
4.	Bulk Density - Loose - Compacted	All Types	Monthly	6 Monthly	Last 4 results ± 75kg/m ³
5.	Fines(Silt) Content	Sand	Weekly	Monthly	Last 10 results <75 percent maximum allowed
		Coarse	Monthly	3 Monthly	
6.	Aggregate Impact Value	Coarse	As specified	As specified	-
7.	10 % Fines	Coarse	Yearly	Yearly	-
8.	Flakiness	Coarse	2 Weekly	6 Monthly	Last 3 results conform to standard
9.	Chloride Content	All Types	Weekly	6 Monthly	Last 3 results < 0.01 percent
10.	Aggregate Abrasion Value (Los Angeles Method)	Coarse	-	Yearly/ Source Change	-
11.	Soundness	Fine and Coarse	-	Yearly/ Source Change	-
12.	Potential Alkali Aggregate Reactivity Including Petrography	Fine and Coarse	-	5 Yearly/ Source Change	-
13.	Petrographic Description (General)	All Types	-	5 Yearly	-

***Note :** The high or low test rates apply in accordance with the following conditions:

- a) High test rate
 - i) To establish the typical characteristics of an aggregate, and
 - ii) When significant changes in properties occur outside the tolerances for low test rates given.
- b) Low test rate
 - i) When the typical characteristics of the aggregate have been established, and
 - ii) When subsequent tests lie within the tolerances for low test rates given

15.2 Compaction Factor Test /Slump Test of Concrete

- 15.2.1 For structural quality concrete (excluding pavements, flooring etc.) at least one Slump Test shall be made for every compressive strength test carried out. More frequent tests shall be made if there is a distinct change in working conditions or if required by the Engineer-in-Charge.

In case of Ready Mixed Concrete, provisions of IS: 4926 shall be followed.

- 15.2.2 For structural quality concrete for pavements & floorings, measurement of workability shall be by determination of compacting factor. Value of compacting factor of 0.75 to 0.8 shall generally be acceptable.

15.3 Strength Test of Concrete

- 15.3.1 Samples from fresh concrete shall be taken as per IS: 1199 and cubes shall be made, cured and tested at 28 days in accordance with IS: 516.

- 15.3.2 In order to get a relatively quicker idea of the quality of concrete, optional tests on beams for modulus of rupture at 72 ± 2 hours or at 7 days, or compressive strength tests at 7 days may be carried out in addition to 28 days compressive strength tests. For this purpose, the values shall be arrived at based on actual testing. In all cases, the 28 days compressive strength specified in Table-1 shall alone be the criterion for acceptance or rejection of the concrete in accordance with clause 15.3.9.

15.3.3 Sampling Procedure

A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested that is, the sampling should be spread over the entire period of concreting and cover all mixing units.

15.3.4 Frequency of Sampling

The minimum frequency of sampling of concrete for each grade shall be in accordance with Table-4.

TABLE – 4
(Refer Cl. 15.2.2 of IS:456)

FREQUENCY OF CONCRETE SAMPLING

Quantity of concrete in the work (m^3)	Number of samples
1-5	1
6-15	2
16-30	3
31-50	4
51 & above	4 plus one additional sample for each additional $50m^3$ or part thereof.

At least one sample shall be taken from each shift.

When concrete is produced at continuous production units such as ready mixed concrete/batching plants, atleast one sample shall be taken for every $50m^3$ of concrete or after every 50 batches, whichever occurs at a greater frequency or as decided by the Engineer-in-Charge. Samples shall be avoided from the first and the last cubic metre of concrete mix in a lot.

15.3.5 Test Specimen

Three test specimens shall be made for each sample for testing at 28 days. Additional cubes may be required for various purposes such as to determine the strength of concrete at 7 days or at the time of striking the formwork or to check the testing error. Additional samples may also be required for testing samples cured by accelerated methods as described in IS: 9013. The specimen shall be tested as described in IS: 516.

15.3.6 Identification mark on concrete test cubes:

The following numbering system shall be adopted on each 150mm cube:

First line: ZZ	(Alpha code assigned by the Engineer -in-Charge to the Contractor for a particular contract starting with AA and progressing to AB, AC and so on).
Second line: XXXX	(Unique integer in ascending order starting from 1).
Third line: DD-MM-YY	(Date of casting of cube)

15.3.7 Test Results of Sample

The test results of the sample shall be the average of the strength of three specimens. The individual variation should not be more than ± 15 percent of the average. If more, the test results of the sample shall be considered invalid.

15.3.8 Standard Deviation

Standard deviation for each grade of concrete shall be calculated separately.

Standard deviation based on test results of samples:

- The total number of test samples required to constitute an acceptable record for calculation of standard deviation shall be not less than 30. Attempts shall be made to obtain the 30 samples, as early as possible, when a mix is used for the first time.
- For design of mix in the first instance, the value of standard deviation given in Table 8 of IS: 456, Amendment No. 4 may be assumed.
- As soon as sufficient results of samples are available, actual calculated standard deviation shall be used and the mix design shall be revised/ updated. However, when adequate past records for a similar grade exist and justify to the designer a value of standard deviation different from that shown in Table 8 of IS: 456, Amendment No. 4, it shall be permissible to use that value.
- For additional requirement on standard deviation refer clause 9.2.4 of IS : 456.

15.3.9 Acceptance Criteria

15.3.9.1 Compressive Strength

The concrete shall be deemed to comply with the strength requirement when both the conditions as given in col. 2 & col.3 of Table-5 for that particular grade of concrete are simultaneously met. For working out standard deviation compressive test result of date wise serially logged 30 sample test result shall be used.

15.3.9.2 Flexural Strength

The concrete shall be deemed to comply with flexural strength requirements when both the following conditions are simultaneously met:

- The mean strength determined from any group of four non-overlapping consecutive test results exceeds the specified characteristic strength by at least 0.3 N/mm^2 .
(For non overlapping consecutive compressive test result any one alternate set of four samples shall be used for verification of compliance to clause no. 16.1.a of IS 456)
- The strength determined from any test result is not less than the specified characteristic strength less 0.3 N/mm^2

Table-5
(Refer Cl. 16.1 & 16.3 of IS:456)

Characteristic Compressive Strength Compliance Requirement

Specified Grade	Mean of the Group of 4 Non-Overlapping Consecutive Test Results in N/mm^2	Individual Test Results in N/mm^2
M15 or above	$\geq f_{ck} + 0.825 \times \text{established standard deviation}$ (rounded off to nearest 0.5 N/mm^2) or $\geq f_{ck} + 3 \text{ N/mm}^2$, Whichever is greater	$\geq f_{ck} - 3 \text{ N/mm}^2$

NOTE : 1) In the absence of established value of standard deviation, the values given in Table 8 of IS:456, Amendment No. 4, may be assumed, and attempt should be made to obtain results of 30 samples as early as possible to establish the value of standard deviation.

2) For concrete of quantity 30 m^3 (where the number of samples to be taken is less than four as per the frequency of sampling given in cl. 15.3.4, Table 4), the mean of test results of all such samples shall be $f_{ck} + 4 \text{ N/mm}^2$, minimum and the requirement of individual test results shall be $f_{ck} - 2 \text{ N/mm}^2$, minimum. However, when the number of sample is only one as per Table 4, the requirement shall be $f_{ck} + 4 \text{ N/mm}^2$.

15.3.9.3 Quantity of Concrete Represented by Strength Test Results

The quantity of concrete represented by group of four consecutive test results shall include the batches from which first and last samples were taken together with all intervening batches. Acceptance of concrete shall be applicable for serially logged 30 samples. In case serially logged samples are less than 30 then standard deviation of adjoining previous sample sets will be used for establishing acceptance criteria as per clause 16.1.a of IS: 456.

For the individual test result requirements given in col. 3 of Table-5 or in item (b) of 15.3.9.2, only the particular batch from which the sample was taken shall be at risk.

Where the mean rate of sampling is not specified, the maximum quantity of concrete that four consecutive test results represent shall be limited to 60 m^3 .

15.3.9.4 If the concrete is deemed not to comply pursuant to Cl. 15.3.9.1 or 15.3.9.2, the structural adequacy of the parts affected shall be investigated and any consequential action as needed shall be taken (Refer Cl. 16.0).

15.3.9.5 Concrete of each grade shall be assessed separately.

15.3.9.6 Concrete is liable to be rejected if it is porous or honey-combed, its placing has been interrupted without providing a proper construction joint, the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measures and tests to the fullest satisfaction of the Engineer-in-Charge.

15.3.9.7 Tolerance in leveling of concrete surface at foundation/ pedestal top level where grouting is to be done:

Maximum Plan Dimension	$\leq 2\text{m}$	$>2\text{m but } \leq 4\text{m}$	$> 4\text{m}$
Tolerance in leveling	+ 10mm	+ 10mm	+ 10mm
	- 10mm	- 20 mm	- 25mm

15.3.9.8 Tolerance in dimensions of pocket:

20mm overall maximum tolerance on the size of pocket.

For pockets, chemically dissolvable moulds shall be preferred. Smooth removal of moulds without affecting the pocket size shall be ensured.

16.0 INSPECTION AND TESTING OF STRUCTURES

16.1 Inspection

To ensure that the construction complies with the design, an inspection procedure shall be set up by the contractor and duly approved by the Engineer-in Charge covering materials used, receipt of materials, their test results, records, workmanship and construction etc.

Contractor shall ensure that the surface which is to receive the grout is at proper level and so are the openings for pockets as per Cl. 15.3.9.7 & 15.3.9.8.

16.2 Immediately after stripping the formwork, all concrete shall be carefully inspected and any defective work or small defects either removed or made good before concrete has thoroughly hardened.

16.3 Testing

In case of doubt regarding the grade or soundness of concrete used, either due to poor workmanship or based on results of cube strength, compressive strength tests of concrete on the basis of clause 17.4 of IS: 456 and/or load test as per clause 17.6 of IS: 456 shall be carried out.

The Engineer-in-Charge shall be the final authority for interpreting the results of all tests and shall decide upon the acceptance or otherwise. The decision of the Engineer-in-Charge shall be final and binding on the contractor. In case the results of the tests are unsatisfactory, the Engineer-in-Charge may instruct the contractor to demolish and reconstruct the structure or part thereof without any extra cost to the Owner.

16.4 Members other than Flexural Members

Members other than flexural members like columns etc. shall be referred to the designer to investigate the structural adequacy. The decision of the designer shall be final and binding on the contractor.

16.5 Non-destructive Tests

Non-destructive tests using Ultrasonic Pulse Velocity and Rebound Hammer methods shall be resorted to for checking the soundness of concrete placed and shall be as per the directions of Engineer-in-Charge. The testing shall be based on IS: 13311, Part-1. However, the Rebound Hammer test (IS: 13311, Part-2) shall only be used in combination with other tests (Destructive or Non-Destructive) for checking the concrete quality.

17.0 FINISHING OF CONCRETE

17.1 On striking the formwork, all surface defects such as bulges, ridges and honey-combing etc. observed shall be brought to the notice of the Engineer-in-Charge. The Engineer-in-Charge may, at his discretion allow rectification by necessary chipping and packing or grouting with concrete or cement mortar. However, if honey-combing or sagging is of such extent as being undesirable, the Engineer-in-Charge may reject the work totally and his decision shall be binding. No extra payment shall be made for rectifying these defects, demolishing and reconstructing the structure. However, quantity of cement actually used for this purpose may be considered for reconciliation of materials. All burrs and uneven faces shall be rubbed smooth with the help of carborundum stone.

The surface of non-shuttered faces shall be smoothened with a wooden float to give a finish similar to that of the rubbed down shuttered faces. Concealed concrete faces shall be left as from the formwork except that honey-combed surface shall be made good as specified above. The top faces of slabs not intended to be covered shall be levelled and floated to a smooth finish to the rises or falls shown on the drawings or as directed. The floating shall not be executed to the extent of bringing excess fine materials to the surface. The top faces of slabs intended to be covered with screed, granolithic or similar finishes, shall be left with a rough finish.

17.2 Repair and Replacement of Unsatisfactory Concrete

17.2.1 Repair shall be made as soon as possible after the forms are removed and before the concrete becomes too hard with prior permission from the Engineer-in-Charge, in writing. Stone pockets, segregation patches and damaged areas shall be chipped out and the edges

- undercut slightly to form a key. All loose material shall be washed out before patching. No excess water shall be left in the cavity, but the concrete shall be damp. A good bond between the patch and parent concrete shall be obtained by sprinkling dry cement on the wet surface or by throwing mortar with force on to the wetted concrete, or by brush in a coat of thick cement grout of about 1:1 (1 cement:1 sand) just before applying the patching material. Before this has dried, the remainder of the patch shall be filled with mortar or concrete, depending on the extent of the repair.
- 17.2.2 Cement concrete/mortar used in repair of exposed surfaces shall be made with cement from the same source as that used in concrete and blended with sufficient amount of white Portland cement to produce the same colour as in the adjoining concrete. The proportions of ingredients shall be same as those used in parent concrete. The mortar shall be as dry as possible and well compacted into the cavity. All filling shall be tightly bonded to the concrete and shall be sound, free from shrinkage cracks after the filling has been cured and dried.
- 17.2.3 For larger repairs to hardened concrete, necessary formwork bearing tightly at the edges of the cavity shall be provided. Concrete shall be chipped out to a depth of at least 100mm and preferably 150mm. Mortar shall be scrubbed into all surfaces with a wire brush before placing the concrete. Damaged reinforcement shall be adequately spliced with new steel so as to maintain the original strength. Additional reinforcement, if required in the patch, shall be provided as per the instructions of Engineer-in-Charge.
- 17.2.4 In case, in the opinion of the Engineer-in-Charge, defects in the concrete is excessive or beyond repair, the contractor shall either redo the structure or take other remedial measures as instructed by the Engineer-in-Charge. The decision of the Engineer-in-Charge shall be final and binding to all in this respect.
- 17.2.5 Approved epoxy formulation for bonding fresh concrete used for repairs with already hardened concrete shall be used by the Contractor if asked by the Engineer-in-Charge. Epoxy shall be applied in strict accordance with EIL Specification 6-68-0056 and the instructions of the manufacturer.
- 17.2.6 All repair works due to non-conformance or non-adherence to specification, if allowed by the Engineer-in-Charge, shall be carried out free of cost to the owner.
- 17.3 Curing of Patched Work**
- Immediately after patching is completed, the patched area shall be covered with an approved non-staining water saturated material which shall be kept wet and protected against sun and wind for a period of 12 hours. Thereafter, the patched area shall be kept continuously wet by a fine spray or sprinkling for not less than 10 days.
- 18.0 WATERPROOF CEMENT PAINT**
- Wherever specified, concrete elements (whether cast-in-situ or precast) exposed to atmosphere shall be provided with three coats of cement based waterproof paint as per IS:5410 provided these surfaces shall not contain any protective coating. Prior to application of the paint, the surface shall be prepared to remove all foreign particles, loose materials, extra deposited concrete lumps, etc. using appropriate mechanical/ manual means.
- 19.0 FORM WORK**
- 19.1 General**
- 19.1.1 Forms for concrete shall be of plywood conforming to IS: 6461 (Part-5) or steel or as directed by the Engineer-in-Charge and shall give smooth and even surface after removal thereof.

19.1.2 If it is desired by Engineer-In-Charge, the Contractor shall prepare, before commencement of actual work, design and drawings for formwork and get them approved by the Engineer-in-Charge. For details regarding design, detailing etc., reference may be made to IS: 14687.

19.1.3 Form work and its supports shall maintain their correct position and be to correct shape and profile so that the final concrete structure is within the limits of dimensional tolerances specified below, unless required otherwise, for functional/aesthetic reasons. The decision of the Engineer-in-Charge shall be final and binding in this regard.

(a) Deviation from specified dimensions of cross section of columns and beams. - 5mm to +10mm

(b) Deviation from dimensions of footings (see Note below)

i) Dimensions in plan -10mm to +50mm

ii) Eccentricity 0.02 times the width of the footing in the direction of deviation but not more than 50 mm.

iii) Thickness -10mm to +50mm or ± 0.05 times the specified thickness, whichever is less

Note: These tolerances apply to Cast-in-situ concrete dimensions only, not to positioning of vertical reinforcing steel or dowels.

(c) Deviation in length (major dimension of single unit)

upto 3m	± 6 mm
3m to 4.5m	± 9 mm
4.5m to 6m	± 12 mm
Additional deviation for every subsequent 6m.	± 6 mm

(d) Deviation in straightness or bow (deviation from specified line) for a single or continuous member) e.g. beam, column or slab edge.

upto 3m	6mm
3m to 6m	9mm
6m to 12m	12mm
additional for every subsequent 6m.	6mm

(e) Deviation in squareness shall be measured taking the longer of two adjacent sides as the base line.

The shorter side shall not vary in its distance from a perpendicular so that the difference between the greatest and shortest dimensions exceeds 6mm. For this purpose, any error due to lack of straightness shall be ignored. Squareness shall be checked with respect to the straight lines that are most nearly parallel with the features being checked. When the nominal angle is other than 90 degree, the included angle between check lines shall be varied accordingly.

(f) Deviation in twist shall be within a limit such that any corner shall not be more than the limit given below from the plane containing other three corners:

upto 600mm wide and upto 6m in length	:	6mm
over 600mm wide and for any length	:	12mm

(g) Maximum deviation in flatness from a 1.5m straight edge placed in any position on a nominally plain surface shall not exceed 6mm.

(h) Tolerance in leveling of concrete surface at foundation/ : As per Cl. 15.3.9.7
pedestal top level where grouting is to be done

19.2 Form Requirement

- 19.2.1 The formwork shall be true, rigid and adequately braced both horizontally as well as diagonally. The forms shall have smooth and even surface and be sufficiently strong to carry, without deformation, the dead weight of the green concrete, working load, wind load and also the side pressure exerted by the green concrete. As far as practical, clamps shall be used to hold the forms together. Where use of nails is unavoidable minimum number of nails shall be used. Projected part of nail shall not be bent or twisted for easy withdrawal.
- 19.2.2 Where through tie rods are required to be put to hold the formwork and maintain accurate dimension, they shall always be inserted through a precast concrete block (of same mix proportion as is to be used for concreting) with a through hole of bigger diameter. The Precast block shall tightly fit against in inner faces of formwork. The holes left after the withdrawal of tie rods shall be fully grouted with cement-sand mortar of same proportion as that used for concrete. However, use of such precast block shall in no case impair the desired appearance or durability of the structure. No such tie rods shall be used in any liquid retaining or basement structure.
- 19.2.3 Tie wires shall be permitted only upon approval of the Engineer-in-Charge and shall be cut off flush with the face of the concrete or counter sunk, filled and finished in the manner specified in clause 17.
- 19.2.4 Form joints shall not permit any leakage. The formwork shall be strong enough to withstand the effect of vibrations practically without any deflection, bulging, distortion or loosening of its components.
- 19.2.5 Forms for beams and slabs (span more than 6.0m) shall have camber of 1 in 500 so as to offset the deflection and assume correct shape and line after deposition of concrete. For cantilevers, the camber at free end shall be 1/100th of the projected length. Where architectural considerations and adjunctive work are critical, smaller form cambers shall be adopted as decided by the Engineer-in-Charge.
- 19.2.6 All vertical wall forms may be designed and constructed for the following minimum pressure. The pressures listed in Table-6 are intended as guide only and the Contractor shall ensure that the formwork is adequately strong and sturdy.

TABLE - 6
MINIMUM DESIGN PRESSURE FOR WALL FORMWORK

Rate of pour in meter/hour	Pressure in KN/m ²	
	at 10 ⁰ (in Celsius)	at 24 ⁰ (in Celsius)
0.6	36.0	29.0
0.9	40.0	32.0
1.2	44.0	35.0
1.5	46.0	37.0

All horizontal forms shall be designed and constructed to withstand the dead load of the green concrete, reinforcement, equipment, material, embedment and a minimum live load of 2.0 kN/m².

19.3 Inspection of Forms

Temporary openings shall be provided at the base of column and wall forms and other places necessary to facilitate cleaning and inspection. Before concrete is placed, all forms shall be carefully inspected to ensure that they are properly placed, sufficiently rigid and tight, thoroughly cleaned, properly treated and free from foreign material. The complete form work shall be inspected and approved by the Engineer-in-Charge before the reinforcement bars are placed in position. When forms appear to be unsatisfactory in any way, either before or during the placing of concrete, the work shall be stopped until the defects have been rectified as per the instructions of the Engineer-in-Charge.

19.4 Cleaning and Treatment of Formwork

The surfaces of forms that would come in contact with concrete shall be well treated with approved non-staining form release agents such as soft soap, oil, emulsions etc. Release agents shall be applied so as to provide a thin uniform coating to the forms without coating the reinforcement.

19.5 Chamfers and Fillets

All corners and angles shall be formed with 45 degree mouldings to form chamfers or fillets on the finished concrete. The standard dimensions of chamfers and fillets, unless otherwise detailed or specified shall be 25x25mm. For heavier work chamfers or fillets shall be 50x50mm. Care shall be exercised to ensure accurate mouldings. The diagonal face of the moulding shall be planed or surfaced to the same texture as the forms to which it is attached.

19.6 Reuse of forms

Before reuse, all forms shall be thoroughly scrapped, cleaned, examined and when necessary, repaired and retreated, before resetting. Formwork shall not be reused, if declared unfit or un-serviceable by the Engineer-in-Charge.

19.7 Removal of Forms/Stripping Time

In the determination of time for removal of forms, consideration shall be given to the location and character of the structures, the weather and other conditions including the setting and curing of the concrete and material used in the mix.

Forms and their supports shall not be removed without the approval of the Engineer-in-Charge. Forms shall not be released until the concrete has achieved a strength of at least twice the stress to which the concrete may be subjected at the time of removal. The formwork shall be removed without shock and methods of form removal likely to cause over stressing or damage to the concrete shall not be adopted. Supports shall be removed in such a manner as to permit the concrete to uniformly and gradually take the stresses due to its own weight.

In normal circumstances when average air temperature exceeds 15 degree Celsius during the period under consideration after pouring of concrete and where ordinary Portland cement is used, forms may generally be removed after expiry of following periods.

- | | |
|---|---|
| (a) Walls, columns and vertical faces of all structural members | 16 to 24 hours as may be decided by the Engineer-in-Charge. |
| (b) Slabs (props left under) | 3 days. |

- (c) Beam Soffits (props left under) 7 days.
- (d) Removal of props under slabs:
- | | |
|---------------------|----------|
| Spanning upto 4.5m. | 7 days. |
| Spanning over 4.5m. | 14 days. |
- (e) Removal of props under beams and arches:
- | | |
|------------------|----------|
| Spanning upto 6m | 14 days. |
| Spanning over 6m | 21 days |
- (f) Cantilever Construction Formwork shall remain till structures for counter acting or bearing down have been erected and have attained sufficient strength (minimum 14 days).

Notes:

- i) For other cements, the stripping time recommended for ordinary Portland cement shall be suitably modified as per the instructions of the Engineer- in-Charge.
- ii) The number of props left under, their sizes, supporting arrangement, and disposition shall be such as to be able to safely carry the full dead load of the slab, beam or arch as the case may be together with any live load likely to occur during curing or further construction.
- iii) Where the shape of the element is such that the formwork has re-entrant angles, the form work shall be removed as soon as possible after the concrete has set, to avoid shrinkage cracking occurring due to the restraint imposed.
- iv) For rapid hardening cement, 3/7 of the above mentioned periods shall be considered subject to a minimum of 16 hours.
- v) For Portland pozzolana or low heat cement, 10/7 of the above mentioned periods shall be considered.

19.8 Staging/Scaffolding

19.8.1 Staging/Scaffolding shall be properly planned and designed by the Contractor. Use of only steel tubes is permitted for staging/scaffolding. The Contractor shall get it reviewed by Engineer-in-Charge before commencement of work. While designing and during erection of scaffolding/staging, the following measures shall be considered:

- (a) Sufficient sills or underpinnings in addition to base plates shall be provided particularly where scaffolding is erected on soft grounds.
- (b) Adjustable bases to compensate for uneven ground shall be used.
- (c) Proper anchoring of the scaffolding/staging at reasonable intervals shall be provided in each direction with the main structure wherever available.
- (d) Horizontal braces shall be provided to prevent the scaffolding/staging from rocking.
- (e) Diagonal braces shall be provided continuously from bottom to top between two adjacent rows of uprights.
- (f) The scaffolding/staging shall be checked at every stage for plumb line.

- (g) Wherever the scaffolding/staging is found to be out of plumb line it shall be dismantled and re-erected afresh and effort shall not be made to bring it in line with a physical force.
 - (h) All nuts and bolts shall be properly tightened and care shall be taken that all clamps/couplings are firmly tightened to avoid slippage
 - (i) Erection work of a scaffolding/staging under no circumstances shall be left totally to semi-skilled or skilled workmen and shall be carried out under the supervision of a technically qualified civil engineer of the Contractor.
- 19.8.2 For smaller works or works in remote areas, wooden ballies may be permitted for scaffolding/staging by the Engineer-in-Charge at his sole discretion. The contractor must ensure the safety and suitability of such works as described under clause 19.8.1 above.

20.0 EXPOSED/ARCHITECTURAL CONCRETE WORK

20.1 Form Work

Other things remaining same as per clause 19.0, formwork shall be of high quality. Care shall be taken to arrange the forms so that the joints between forms correspond with the pattern indicated in the drawings. The forms shall be butting with each other in straight lines, the corners of the boards being truly at right angles. The joints between the forms shall cross in the two directions at right angles. The size of forms shall be so selected as to exactly match with the pattern of forms impression on the concrete face indicated in the drawings. Maximum care shall be taken to make the form work watertight. Burnt oil shall not be used for treatment of forms. The Contractor shall be permitted reuse of forms brought new on the work place only if forms are properly cared for, stored and treated after each use.

The Engineer-In-Charge may, at his absolute discretion, order removal of any forms considered unsuitable for use in the work.

20.2 Finishing

Repairing to exposed concrete work shall be avoided. Rendering and plastering shall not be done. Minor repairing, if unavoidable shall be done as specified in clause 17.0 with the written permission of the Engineer-in-Charge.

21.0 REINFORCEMENT

- 21.1 The Contractor shall develop the bar bending schedule for all RCC structures/ structural parts at no extra cost to the Owner and shall get it reviewed by the Engineer-in-charge. Reinforcement shall be cut and bent to shape as per dimensions shown in the bar bending schedule/ drawings.

If protective fusion bonded epoxy coating is required to be applied on reinforcement bars, the same shall be done as per IS: 13620. All repairs to applied protective coating required due to mishandling and/ or bending of reinforcement bars shall also be done as per relevant clauses of IS:13620.

21.2 Straightening, Cutting and Bending

Procedure for cutting and bending shall be as given in IS: 2502. Bars shall be bent in a slow and regular movement to avoid fractures by mechanical means only. In case bars are supplied in coils, they shall be smoothly straightened without any kinks.

Cold twisted deformed bars shall be bent cold. Bars larger than 25mm in size (except cold twisted deformed bars) may be bent hot at cherry red heat to a temperature not exceeding 850⁰ Celsius as per the instructions of the Engineer-in-Charge. The bars shall be allowed to cool gradually without quenching.

Bars shall be cut & bend in a Bar Bending Machine. Bars which develops cracks or splits after bending shall be rejected. A second bending of reinforcement bars shall be avoided but when reinforcement bars are bent aside at construction joints and afterwards bent back into their original position, care should be taken to ensure that at no time is radius of the bend less than 6 times bar diameter for high strength deformed bars. Care shall also be taken when bending back the dowel bars to ensure that concrete around the bars is not damaged. All bars shall be properly tagged for easy identification.

21.3 Placing and Fixing

All reinforcement shall be cleaned to ensure freedom from loose mill scale, loose rust, oil, form releasing agents, grease or any other harmful material before placing them in position. Reinforcement shall not be surrounded by concrete unless it is free from all such materials. Rough handling and dropping of reinforcement from a height shall be avoided.

All reinforcement shall be fixed in the correct position and shall be properly supported to ensure that displacement will not occur when the concrete is placed and compacted.

The uncoated reinforcement bars shall be tied at every intersection by two strands of 16 SWG black soft annealed binding wire. The Epoxy coated reinforcement bars shall be tied with 2 strands of PVC coated GI 18 SWG wire at every intersection. Crossing bars shall not be tack welded for assembly of reinforcement. The reinforcement bars shall be kept in position by using the following methods:

- a) In case of beam and slab construction, precast cover blocks (having the same sand contents as the concrete which shall be placed) of size 40 x 40 mm and thickness equal to the specified covers shall be placed firmly in between the bars and forms so as to secure and maintain the specified covers over the reinforcement.

When reinforcement bars are placed in two or more layers in beams, the vertical distance between the horizontal bars shall be maintained by introducing spacer bars at 1 to 1.2m centre to centre.

- b) In case of thick rafts & pile caps having two or multi layers of reinforcement, the vertical distance between the horizontal bars shall be maintained by introducing suitable chairs, spacers, etc.
- c) In case of columns and walls, the vertical bars shall be kept in position by means of timber templates with slots accurately cut in them. The templates shall be removed after the concreting has been done below it.
- d) Exposed portions of reinforcement bars shall not be subjected to impact or rough handling and workmen will not be permitted to climb on extending bars until the concrete has attained sufficient strength so that no movement of the bars in the concrete is possible.

21.4 Special requirements for Handling, Stacking, Placing of Epoxy coated Reinforcing bars.

Epoxy coated reinforcing bars shall be carefully handled and it shall be ensured that these do not rub on any hard surface or against another epoxy coated/uncoated reinforcing bar whether during conveying/transportation, stacking or placing.

During transportation and while stacking the epoxy coated reinforcing bars shall be placed on wooden planks not spaced farther than 600mm. When placed in stacks the epoxy coated reinforcing bars shall be neatly tied in bundles using PVC binding material.

The cut ends of bars shall be touched up with special touch up material of specifications as provided by the coating agency. After cutting of the bar the application of touch up material shall be completed within four hours.

While bending the bars the pins of work bench(s) shall be provided with a PVC or plastic sleeve. Each bending operation on epoxy coated reinforcing bar shall be completed in time not less than 90 seconds.

Epoxy coated reinforcing steel bar shall not be directly exposed to sun rays or rain, and shall be protected with opaque polyethylene sheets or similar means as approved by the Engineer in Charge.

While doing concreting the workmen or machinery shall not rest or move on the epoxy coated reinforcing bars. Wooden planks shall suitably be placed to create proper gang-way.

21.5 Splicing/Overlapping

Only bars of full length shall be used as shown in the drawings. But where this cannot be done, overlapping of bars shall be done as directed by the Engineer-in-Charge. The overlapping bars shall be tied with two strands of 16 SWG black soft annealed binding wire. The overlaps shall be staggered for different bars and located at points along the span where neither shear nor bending moment is maximum.

21.6 Welded Joints

Welding of reinforcing bars shall not be permitted without the written permission of the Engineer-in-Charge. Where welding of reinforcing bars is permitted, it shall be in accordance with the recommendations of IS: 2751 and IS: 9417. Welded joints shall be located at suitable staggered positions. Tests shall be made as directed by the Engineer-in-Charge to prove that the joints are of the full strength of the bars. Maximum one welded joint shall be allowed per bar.

21.7 Mechanical Connections (upto Seismic Zone-III as per IS:1893 Part-I)

The mechanical splices in reinforcement by means of couplers, clamps etc. shall be used (as per manufacturer's specifications) with the written approval of the Engineer-in-Charge. Following tests, at the minimum, shall be conducted in advance to prove efficiency of the coupled joint before putting them in actual use:

Name of the Test	Testing Requirement	Code of conformance
Static Tension & Compression Test	Each connection shall develop atleast 125% of the specified yield strength of the reinforcing bar	ASTM A370/ ACI 318/ ISO 15835
Permanent Elongation (Slip)	Permanent elongation across the coupled joint shall be less than 0.1mm after loading at 60% of the yield strength of the reinforcing bar	BS 8110/ ISO 15835

Name of the Test	Testing Requirement	Code of conformance
Moderate Oligocyclic (Seismic) Test (Cyclic Tension & Compression Test)	Deformation across the coupled joint shall be less than 0.3mm after subjecting the joint to a series of 20 cycles with 90% tension as well as 50% compression of the yield strength of the reinforcing bar	ISO 15835

All operations relating to reinforcement coupling shall be done by using manufacturer's patented machine/ equipment in the presence of Engineer-in-Charge. Mechanical connections shall be placed away from points of high stress and shall be staggered.

21.8 Tolerances on Placing of Reinforcement

Unless otherwise directed by the Engineer-in-Charge, reinforcement shall be placed within the following tolerances:

- a) For effective depth 200mm or less $\pm 10\text{mm}$
- b) For effective depth more than 200mm $\pm 15\text{mm}$

21.9 Substitution

When indicated diameter of reinforcement bar is not available, the Contractor shall use other diameter of reinforcement bars on written approval of the Engineer-In-Charge.

21.10 Tolerance to Cover

The actual concrete cover shall not deviate from the required nominal cover by + 10mm measured over the steel reinforcement including links.

22.0 PAYMENT

22.1 Plain and Reinforced Concrete

- 22.1.1 Payment for plain and reinforced cement concrete (cast- in-situ) shall be made on cubic metre basis of the volume of the actual finished work done or as per approved construction drawings, whichever is less and shall be inclusive of providing pockets, openings, recesses of all sizes, chamfers, fillets, grooves, separation/ expansion/ isolation/ construction/ movement joints, curing by normal moist curing or using curing compound etc. as directed by Engineer-in-Charge etc. The rates shall be deemed to include complete cost of getting the respective mix designs approved, making and testing concrete cubes and carrying out other tests including tests of various ingredients, as per specifications and as directed by Engineer-in-Charge. Payment shall, however, be separately made for tests on concrete cubes done by accelerated methods of curing as defined in IS: 9013.
- 22.1.2 No separate payment shall be made for any additive/ admixture/ Plasticizer/ Fibres used by the contractor for accelerating or retarding the strength of concrete or for achieving specified workability. The rate quoted shall be deemed to be inclusive of all costs related to any such additive/admixture/ Plasticizer/ Fibres.
- 22.1.3 The rate shall however be exclusive of reinforcement, metal inserts, pipe sleeves, formwork, water stops and any filler material in expansion/isolation joints.
- 22.1.4 Where the strength of concrete mix as indicated by tests, lies in between the strengths of any two grades given in Table-1 and it is accepted by the Owner/Engineer-in-Charge, such

concrete shall be classified as a grade belonging to the lower of the two grades between which it lies. In case the cube strength shows higher results than those specified for the particular grade of the concrete, it shall not be placed in the higher grade nor shall the Contractor be entitled for any extra payment on such account. The concrete giving lower strength than specified may be accepted at reduced rates after satisfying the safety of the structure by checking it with tests as specified or rejected entirely at the discretion of the Engineer-in- Charge. The rejected concrete shall be dismantled at no extra cost to the owner and no payment or extension of time shall be granted for the concrete so rejected and the formwork and reinforcement used for the same. Cost of any material supplied by the Owner free of cost shall be recovered from the Contractor at double the prevailing market rate. In case the concrete of lower strength can be improved by carrying out some strengthening measures entirely at the discretion of the Engineer-in-Charge, then the said measures including all related tests shall be carried out by Contractor at his own cost. If the Contractor is able to make up the strength to the required grade by such improvement measures to the entire satisfaction of Engineer-in-Charge, payment shall be made for the grade achieved. However, if the strength of concrete is not made up to the strength of required grade, payment shall be made only for the lower strength if such concrete is accepted by the Engineer-in-Charge.

22.1.5 Deductions for openings, pockets etc. shall be as specified in relevant parts of IS 1200.

22.1.6 Payment under continuous concreting item in the schedule of rates shall be made only where the total quantity of concrete between two consecutive construction joints specifically called-out on the drawings exceeds 250 cubic metres. For any foundation/structure involving concrete quantity upto 250 cubic metres between two consecutive construction joints shown on drawings, the concrete shall not be measured or paid for under this category (i.e. continuous concreting), even though the same is required to be constructed in single pour. The rate quoted against this item shall be inclusive of all extra cost related to labour, shuttering, staging and making all other arrangements for such continuous casting e.g. provisions for adequate movement and storage spaces, special gangways, scaffolding, additional construction equipments, adequate lighting and supervision while the work continues round the clock etc. The rate shall also be inclusive of all costs related to concreting in any thickness, shape and position and at any height or depth so as to avoid any cold joint between specified construction joints.

22.1.7 Form Work

Unless otherwise specified, payment for form work shall be on square metre basis of the actual area in contact with the concrete cast. The rates shall be inclusive of keeping the formwork for the full period as specified in the above clauses and removing the same after the period is over. No extra payment shall be made for providing scaffolding/ staging/ access/ stairways/ ladders etc.

The rates shall be inclusive of any provision to be made or kept in the formwork for providing dowels, inserts etc.

Superior quality formwork for exposed/architectural concrete work shall be measured and paid separately under the relevant item in the schedule of rates.

22.2 Reinforcement

22.2.1 Payment for plain round mild steel reinforcement bars, high strength deformed steel bars and epoxy coated reinforcing steel bar shall be on the basis of weight of bare steel irrespective of any coating applied in metric tons. The weight of the bar shall be derived from the sizes and corresponding nominal unit weight given in Table-1 of IS: 1786. In case actual unit weight of the bars is less than nominal unit weight, but within permissible tolerances, the weight of reinforcement shall be calculated on the basis of actual unit weight. In case actual unit weight of the bars is more than nominal unit weight, the payment shall be made on the basis

of nominal unit weight. Standard hook lengths, chairs, spacer bars and authorized laps only shall be included in the weight calculated. Binding wire shall not be weighed nor otherwise measured. Measurements for weight shall not include cutting allowance etc.

22.2.2 Rate quoted for reinforcement shall include cost of supplying, decoiling, straightening, cleaning, cutting, bending, placing, binding, welding (if required) and providing necessary cover blocks of concrete.

22.2.3 Payment for a mechanical threaded coupler/ clamp shall be made by measuring the Lap length of the respective rebar on which coupler/ clamp is used. The rate shall include supply of complete assembly, fixing, testing etc. all complete.

22.3 Water Stops/Water Bars & Expansion/Isolation Joints

22.3.1 Payment for PVC water bars shall be made on running metre (RM) basis of the water stops provided in position. Rate shall include supplying cutting, fixing, jointing by vulcanising or any other approved method, wastage, etc. complete.

22.3.2 Payment for filler materials in Expansion/Isolation joints shall be made on running metre basis of the joint provided. For boards provided at expansion/isolation joints, the measurement shall be made on square metre basis. Rate shall be inclusive of supply, cutting, fixing, jointing, wastage etc. complete.

22.4 Waterproof Cement Paint

22.4.1 Payment for waterproof cement paint as per Cl. 18.0 shall be made separately on Sqm basis.

मानक विनिर्देशन
सिविल एवं संरचनात्मक कार्य
STANDARD SPECIFICATION
CIVIL & STRUCTURAL WORKS
गिराने एवं तोड़ने सम्बंधी कार्य
DEMOLITION AND DISMANTLING

5	13 05 19	REAFFIRMED & REISSUED	TK	AS	RS	RKT
4	18 11 13	REVISED & ISSUED AS STANDARD SPECIFICATION	AJS	RS	PKM	SC
3	10 06 08	REAFFIRMED & REISSUED	PKB	PKM	VK	VC
2	25 04 01	REVISED & ISSUED AS STANDARD SPECIFICATION	SKP	RS	SCJ	MI
1	16 03 98	REVISED & ISSUED AS STANDARD SPECIFICATION	SARITA	SKP	SCJ	AS
0	AUG'89	ISSUED AS STANDARD SPECIFICATION		AKV	GPL	RCPC
Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
Approved by						

Abbreviations:

C&D	:	Construction & Demolition
GI	:	Galvanized Iron
RA	:	Recycled Aggregates
RCC	:	Reinforced Cement Concrete

Structural Standards Committee

Convenor : Mr. Rajanji Srivastava

Members : Mr. Anurag Sinha
Mr. VK Panwar
Mr. Samir Das
Mr. Amitabh Kishore
Mr. Gyasuddin
Mr. Ravindra Kumar (Const.)
Mr. Charanjit Singh (Proj.)

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1.0 SCOPE

This specification covers the procedure and safety requirements for demolition and dismantling of masonry (Brick & Stone), concrete (Plain /Reinforced), structural steel (sheeted/ unsheeted) works.

2.0 GENERAL

- 2.1** Apart from this specification, the demolition and dismantling of structures (part or whole) shall be in compliance with all statutory safety regulations and any other special requirement as shown/ noted on the drawings and General Conditions of Contract. Prior consent and approval of the Engineer-in-Charge shall be obtained in writing before starting any dismantling works. Any restrictions imposed regarding working hours shall also be strictly followed by the Contractor.
- 2.2** All materials obtained from dismantling/demolition operations shall be the property of the Owner unless otherwise specified and shall be segregated as serviceable or unserviceable materials and kept in safe custody until handed over to the Engineer-in-Charge.
- 2.3** Contractor shall follow the principle of selective demolition by sequencing the demolition activities in such a way that the non-structural materials like window/ door frames, pipes, tiles, bricks, asphalt, ceramics, etc. shall be removed first before starting the main demolition activities.
- 2.4** Where it becomes necessary to disconnect any existing service line(s) (such as electrical, piping etc.) during dismantling/demolishing operation and where so required by the Engineer-in-Charge, suitable alternate arrangement shall be made by the Contractor to maintain the continuity and proper functioning of the affected service line(s) with the approval of the Engineer-in-Charge at no extra cost to the Owner.
- 2.5** Specification No. 6-68-0003 (Earthwork) shall be referred to the extent applicable.

3.0 SAFETY PRECAUTIONS

- 3.1** The Contractor shall adhere to safe demolishing/ dismantling practice at all stages of work to guard against accidents, hazardous and unsafe working procedures.
- 3.2** Necessary propping, shoring, strutting and/or underpinning shall be done for the safety of all surrounding structures (whose safety is likely to be endangered) before taking up the demolishing and dismantling works.
- 3.3** Temporary enclosures/ barricading made out of GI sheets, fencings, danger lights, warning tapes, etc. shall be provided by the Contractor and got approved by the Engineer-in-Charge before start of work to prevent accidents.
- 3.4** Contractor must ensure the availability of adequate fire fighting equipments/ arrangements before starting actual demolishing/ dismantling works. These facilities shall be made available throughout the entire operation of demolition and dismantling of structures.
- 3.5** All equipments, pipes, fittings and instruments, underground utilities etc. located in the vicinity shall be protected by suitable means, as decided by the Engineer-in-Charge, during demolishing/ dismantling operations.
- 3.6** Roads and working spaces shall be kept free of any debris/dismantled materials at the end of day's work.

- 3.7 Necessary measures shall be taken to keep the dust and noise nuisance to minimum levels.
- 3.8 Dismantled elements/components shall not be dropped from a height or thrown from a distance. Dismantling of elements fixed by screws/bolts/hooks etc. shall be done by taking out the fixtures with proper tools only. Such fixtures may be allowed to be cut by sawing or flame cutting, in the event of their being stuck up due to corrosion etc. However, the decision of Engineer-in-Charge in this regard shall be final and binding. Welds shall be removed by flame cutting. Tearing or ripping of elements shall not be resorted to under any condition.
- 3.9 Dismantling of equipments/ instruments and such other fixtures shall be done with utmost care with proper tools & tackles and shall be stacked separately. Their disposal or retainment shall be as per the directions of Engineer-in-Charge.

4.0 PROCEDURE

- 4.1 Entire work of demolishing & dismantling shall be meticulously planned. Prior to start of work, the Contractor shall thoroughly understand the scope and nature of the work, and then prepare and submit the proposed work execution plan of demolishing & dismantling to the Engineer-in-Charge for his review. Comments if any, shall be taken care by the contractor and execution of the work shall be done based on the revised execution plan.
- 4.2 Demolition and dismantling shall be restricted to the extent shown on drawings or as directed by the Engineer-in-Charge.
- 4.3 Necessary work permits (as applicable) shall be obtained prior to start of demolishing/ dismantling activities.
- 4.4 Demolition of any structure shall be carried out in the sequence reverse to that followed at the time of its construction.
- 4.5 Dismantling shall be done in a systematic manner. All elements including equipments/ instruments shall be carefully removed without causing any damage.
- 4.6 Blasting in any form shall not be permitted. However, techniques like pneumatic/ hydraulic breakers, diamond cutting, etc. shall be utilized to the maximum possible extent.
- 4.7 Chipping of concrete/grout shall be done with precision by chiseling. The finished surfaces shall be made true to the requisite size and shape.
- 4.8 Pockets/holes of specified size shall be made/ cut by drilling/ chiseling/ core cutting/ diamond cutting, etc.
- 4.9 Cut-outs in RCC Slab/ wall shall be made by vibration-less spark-free mechanical means like core-cutting, wet cutting by diamond wall saw system, etc.

5.0 CLEANING & STACKING

All demolished/dismantled serviceable materials such as bricks, stones, reinforcement bars, structural steel, sheeting etc. shall be separated out, cleaned and stacked in separate lots within the plant boundary as directed by the Engineer-in-Charge.

6.0 DISPOSAL

All unserviceable materials shall be disposed off in spoil heaps within or outside the plant boundary as per the directions of the Engineer-in-Charge. Areas required outside the plant

boundary for dumping of disposed material shall be arranged by the contractor and got approved by the Engineer-in-Charge.

7.0 C&D WASTE MANAGEMENT

Contractor shall make all possible efforts to reduce, reuse and recycle Construction & Demolition (C&D) waste. A comprehensive Waste Management Plan shall be submitted to the Engineer-in-Charge for review. As a social responsibility, contractor shall promote and spread awareness about recycling of C&D waste that can act as a perfect substitute for depleting natural aggregate resources, shortage of dumping sites, increasing transportation & disposal cost, stringent regulations for extracting new materials and environmental pollution as a whole. Recycling equipments like jaw/ cone crushers, shaft impactors, magnetic separators, vibrating screens, washing equipments, etc. are now easily available in the market. Recycled Aggregates (RA) both coarse & fine can be used in PCC, pavements, drains, plastering, making bricks, kerb stones, pavement blocks and for soil stabilization. Residual concrete can be recycled in Ready Mixed Concrete Plants by installing Recycling Drum and rebars extracted from C&D waste can be used in drains, pavements, chairs, spacers, stirrups, etc.

8.0 PAYMENT

8.1 General

Measurement of all works shall be taken prior to start of demolishing/ chipping/ dismantling works.

8.2 Masonry/Concrete Works (Demolition)

8.2.1 Payment shall be made on the basis of actual volume in cubic metres (cu.m.) of masonry/ concrete works demolished. The thickness of plaster/ bitumen felt shall be included in measurements.

8.2.2 The rate for demolishing shall include supply of all labour, tools & tackles, necessary safety measures, propping, underpinning, scaffolding, handling, cutting, straightening, scraping & cleaning of reinforcement bars and other embedments (in case of reinforced concrete works), sorting out and stacking of all serviceable materials, disposal of all unserviceable material, clearing the site, etc. all complete as specified and directed by the Engineer-in-Charge.

8.3 Excavation & Backfilling

8.3.1 Excavation and backfilling shall be paid separately as per relevant clauses of Specification No. 6-68-0003 for Earth Work.

8.4 Chipping of Concrete Works

8.4.1 Payment shall be made on the basis of admissible area in square metres (sq.m.) of concrete surfaces chipped, pertaining to the different categories of thicknesses specified in the schedule of items.

8.4.2 The rate for chipping shall include supply of all labour, tools and tackles, necessary safety measures, scaffolding, chiseling, handling, exposing, cutting, straightening, scraping, clearing the reinforcement bars (in case of reinforced concrete works), wire brushing and washing the exposed surfaces, disposal of all unserviceable material etc. all complete as directed.

8.5 Making Pockets/Holes in Concrete Works and Cut-outs in RCC Slab/ Wall

- 8.5.1** Payment for Pockets/ holes shall be made on the basis of number (Each) of pockets/ holes of sizes upto & inclusive of 200x200x500mm deep, made or cut in the concrete works at all depths & heights.
- 8.5.2** Payment for cut-outs in RCC slab/ wall shall be made in CuM on the basis of plan/ elevation area for a thickness upto & inclusive of 400mm at all depths & heights.
- 8.5.3** The rate for making pockets/holes and cut-outs shall include supply of all labour, tools & tackles, necessary safety measures, scaffolding, chiseling, drilling, core/ diamond cutting, diamond wall saw system, handling, cutting or relocating reinforcement bars, cleaning, disposal of all unserviceable material etc. all complete as directed.

8.6 Dismantling of Structural Steel Works

- 8.6.1** Payment shall be made on the basis of weight (MT) of the structure/components being dismantled. Assessment of weight shall be done as per the specifications or as per the direction of Engineer-in-Charge.
- 8.6.2** The rate for dismantling shall include supply of all labour, tools and tackles, equipment, consumables, necessary safety measures, scaffolding, propping, handling, unbolting, cutting (by sawing or flame cutting) of gussets/ plates/ bolts/ hooks/ welds, cleaning, sorting out and stacking of all serviceable materials, disposal of all unserviceable material, etc. all complete as specified and directed.

8.7 Dismantling of Roof & Wall Sheeting

- 8.7.1** Payment shall be made on the basis of dismantled sheeted area in square metres (sq.m.) of plan area in case of roof sheeting and area in elevation in case of side and louver sheeting.
- 8.7.2** The rate for dismantling shall include supply of all labour, tools and tackles, equipments, consumables, necessary safety measures, handling, scaffolding, unbolting, cutting (by saw or flame cutting) of hook bolts, removal of ridges, gutters, flashings, transporting, stacking of all serviceable materials, disposal of all unserviceable material, etc. all complete as directed.

मानक विनिर्देश सिविल एवं संरचनात्मक कार्य विविध मदें

STANDARD SPECIFICATIONS CIVIL AND STRUCTURAL WORKS MISCELLANEOUS ITEMS

4	22.03.16	REVISED & REISSUED	<i>Modita</i> MODITA	<i>Alpana</i> ALPANA	<i>HL</i> R.SRIVASTAVA	<i>Seetha</i> S.CHANDA
3	29.06.10	REISSUED	AS	PKM	SCH	N DUARI
2	26.04.01	UPDATED & REISSUED	SBJ	R SOOD	SC JAIN	MI
1	AUG 94	UPDATED & REISSUED	SBJ	R SOOD	GPL	A SONI
0	AUG 89	ISSUED AS STANDARD SPECIFICATION	-	AKV	GPL2	RCPC
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Abbreviations:

BIS	:	Bureau of Indian Standards
DPC	:	Damp Proof Course
FGL	:	Finished Ground Level
IS	:	Indian Standard
RCC	:	Reinforced Cement Concrete

Structural Standards Committee

Convenor : Mr. Rajanji Srivastava

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Mr. J K Bhagchandani
Mr. S K Naskar
Mr. V K Panwar
Mr. Charanjit Singh (Projects)
Mr. Ravindra Kumar (Construction)

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1.0 SCOPE

The scope shall be as specified separately for different items below.

2.0 REFERENCES

2.1 BIS Codes

S.No.	IS No.	Title
1.	IS:73	Paving bitumen - specification
2.	IS:383	Specification for coarse and fine aggregates from natural sources for Concrete
3.	IS:6313	Code of practice for Anti-termite measures in buildings

2.2 EIL specifications

6-68-0002: Materials

6-68-0004: Plain and Reinforced Cement Concrete

3.0 MATERIALS

The materials shall be as specified separately for different items below.

4.0 GENERAL REQUIREMENTS

The Contractor shall test the materials, wherever applicable, in approved laboratory as required by the Engineer-in-Charge and furnish test certificates for materials and obtain the approval of the Engineer-in-Charge prior to the use of such materials in the works. All tests shall be in accordance with relevant Indian Standards.

5.0 PRE-CONSTRUCTIONAL ANTI-TERMITE TREATMENT

5.1 Scope

This specification establishes the materials and method of accomplishing pre-constructional anti-termite treatment of soil for protection of buildings against attack by subterranean termites with the usage of chemical emulsions in accordance with the procedure laid down.

5.2 Materials

Refer EIL Specification No. 6-68-0002.

5.3 Procedure for Treatment

5.3.1 The treatment shall be carried out by an approved agency specialized in the field. Apart from this specification, the work shall be carried out in compliance with IS:6313. In case of any contradiction, this specification shall govern.

5.3.2 Site Preparation

Prior to start of Anti Termite treatment, area(s) shall be made free from logs, stumps, timber offcuts, leveling pegs, roots of plants/ trees etc. Soil treatment shall start when foundation trenches/ pits are ready to take concrete/ masonry in foundations and plinth area ready for laying the subgrade. Treatment shall not be carried out when it is raining or the subsoil

water level is at the same or higher than the level of treatment. In the event of water-logging of foundations, the water shall be pumped out and the chemical emulsion applied when the soil is absorbent.

5.3.3 Treatment of the excavated pits/ trenches and backfill for Foundations

- a) The bottom surface and the lower 300 mm side surfaces of the excavated pits/ trenches for foundations of masonry works and RCC plinth beams supporting such masonry works, shall be treated with specified chemical emulsion @ 5 litres/m² of the surface area. However, no such treatment shall be required in case of pits/ trenches made for RCC foundations supporting RCC walls and/ or columns.
- b) On completion of construction of masonry foundations, the backfill in immediate contact with the substructure shall be treated in layers, of 300 mm, with emulsion @ 7.5 litres/m² of the vertical surface of the substructure (i.e. $7.5 \times 0.3 = 2.25$ litres/meter of perimeter) for each side. The treatment shall be given after ramming of each layer of soil, by rodding the earth at 150 mm centres close to the wall surface and working the rod backward and forward (parallel to the wall surface) and then spraying the specified dosage of emulsion. The emulsion shall be directed towards the masonry surfaces so that the soil in contact with these surfaces is well treated with the chemical. After the treatment, the soil shall be tamped back into place. This shall be done for full depth of the fill.
- c) For RCC walls and columns, the treatment as specified in (b) shall start from a depth 500 mm below the finished ground level, and shall be done upto the FGL.

5.3.4 Treatment of Plinth/ Basement and Apron

- a) The top surface of the consolidated earth below the non-suspended floor slabs and the peripheral aprons of widths upto 750 mm, the bottom surface and side surfaces of the excavated pits for the basements shall be treated with chemical emulsion @ 5 litres/m² of the surface area. Holes 50 mm to 75 mm deep at 150 mm centre, both ways, shall be made on the surface with 12 mm diameter mild steel rod and then emulsion shall be sprayed uniformly over the area. At expansion joint locations, anti-termite treatment shall be supplemented by treating through the expansion joint @ 2.0 litres per linear metre of joint after the sub-grade has been laid.
- b) Treatment of Junctions of plinth filling and wall/column faces shall be done after making a small channel 30 mm x 30 mm, by making rod holes 150 mm apart (upto the ground level) in the channel and then by moving the rod backward and forward to break up the earth. The chemical emulsion shall be poured along the channel @ 7.5 litres/m² of the vertical wall/column surface so as to soak the soil right to the bottom. The soil shall be tamped back into place after the treatment.

5.3.5 Treatment of Soil along External Perimeter of Building

After the building is complete, the earth along the external perimeter shall be rodded at intervals of 150 mm and to depth of 300 mm. The rod shall be moved backward and forward parallel to the wall to break up the earth and chemical emulsion poured along the wall @ 7.5 litres/m² of vertical surface (i.e. $7.5 \times 0.3 = 2.25$ litres/metre of perimeter). After the treatment, the earth shall be tamped back into place.

5.4 Payment

This clause shall apply to Item Rate tender only.

Payment for pre-constructional anti-termite treatment shall be made on square metre (sq.m.) basis of plinth area of the building at ground floor only.

The rate shall include supplying all materials, spray pumps, tools, tackles & other accessories, labour, site preparation, rodding, tamping, mixing, spraying the specified chemical emulsion at prescribed dosage, storage facilities, handling, transporting etc. all complete as directed & specified.

6.0 ANTI-CORROSIVE LAYER

6.1 Scope

This specification covers the requirement of materials, method of preparation and procedure for laying an anticorrosive layer over top surface of tank foundations for protection of bottom plates of steel tanks against corrosion attack.

6.2 Materials

6.2.1 Sand shall be clean, dry, coarse, hard, angular, free from coatings of clay, dust and mix of vegetable and organic matter and shall conform to IS:383 - Grade III.

6.2.2 Bitumen shall be of grade VG10 conforming to IS:73.

6.3 Mixing and Laying

The bitumen shall be heated till it melts. 3% kerosene may be added if required. Sand shall be thoroughly mixed with bitumen (8% to 10% by volume) in a mixing drum to give a uniform mixture and shall be laid over clean and dry surface of tank foundation to line, grade and levels as shown on the drawings and directed by the Engineer-in-Charge. Bitumen shall not be heated beyond the specified temperature limits. The layer shall be tamped to form hard mass of specified compacted thickness.

6.4 Payment

This clause shall apply to Item Rate tender only.

The payment shall be made on square metre (sq.m.) basis of the area covered with the anticorrosive layer.

The rate shall include supplying all materials, tools, plants, labour, transportation, handling, heating, mixing, laying, tamping etc. all complete as specified.

7.0 DRESSING & TRIMMING

7.1 Scope

This specification covers the procedure for dressing, trimming and paving with earth the peripheral area around the completed building/ structure.

7.2 Procedure

The ground all around the completed building/structure for 3 metres width or as specified by the Engineer-in-Charge, shall be cleaned and dressed to suitable slope. Over the prepared ground a layer of approved earth shall be spread, watered and well consolidated so as to achieve an average thickness of 75 mm.

7.3 Payment

This clause shall apply to Item Rate tender only.

Payment shall be made on square metre (sq.m.) basis of the actual area dressed and paved with earth.

The rate shall include supplying all materials, labour including cleaning, dressing the ground to required slope, spreading of earth, watering, ramming, consolidating etc. all complete as directed.

8.0 BREAKING PILE HEADS

8.1 Scope

This specification covers procedure for breaking pile heads of RCC piles.

8.2 Procedure

- 8.2.1 Head of already cast/ driven RCC piles shall be broken after 28 days of casting up to a length and elevation as shown on the drawing by chiseling or by approved mechanical means taking all necessary safety precautions. Care shall be taken that pile reinforcement is not cut or damaged during chiseling operation. All debris and loose or cracked concrete in the pile shall be removed and disposed off within the plant boundary as per the directions of the Engineer-in-Charge and site shall be left clean for casting of pile caps. The surface of reinforcement bars shall be cleaned, if required by wire brushing, so that no old concrete sticks to them.

8.3 Payment

This clause shall apply to Item Rate tender only.

Payment shall be made per pile basis for the actual number of pile heads broken.

The rate shall include supplying all tools and tackles, labour including disposal of debris, bending the pile reinforcements for proper anchorage within the pile cap etc. all complete as directed.

9.0 BUILDING-UP PILE HEADS

9.1 Scope

This specification covers requirements of materials and procedure for building-up of RCC Pile Heads.

9.2 Materials

- 9.2.1 Concrete shall be of the same grade & EIL specification shall be same as that for the pile.
- 9.2.2 Reinforcement shall be of the same grade as that for the pile.
- 9.2.3 Type of cement shall be same as that used for the pile.

9.3 Procedure

Concrete in existing piles shall be chiseled off minimum upto the lap-length of the reinforcements in the pile. In cases where reinforcements are longer than the concreted piles, the top concrete of the existing piles shall be chiseled or by approved mechanical means upto a length of 800 mm.

Concrete surface and reinforcement of pile shall be cleaned of any dirt, grease, debris etc. and concrete surface shall be made rough by hacking. Reinforcement shall be lapped/ welded as per the direction of the Engineer-in-Charge. Neat cement slurry shall be applied on top surface of concrete and using approved formwork, concreting shall be done upto the level shown on the drawing and as directed by the Engineer-in-Charge.

9.4 Payment

This clause shall apply to Item Rate tender only.

Payment shall be made on cubic metre basis for the total quantity of concrete actually poured for achieving the level as shown on drawings.

The rate shall include supply of all materials (except reinforcement which shall be paid separately as per respective item) labour, cleaning, welding, shuttering, vibrating, finishing, curing etc. all complete. Cutting of pile heads and excavation including backfilling shall be paid separately as per respective item.

10.0 HARD CORE

10.1 Scope

This specification covers the requirements of materials and procedure for laying of hard core.

10.2 Materials

Hard core shall consist of broken/ crushed stones of 150 mm and down size. Stones shall be sound, angular, hard and free from flakes, dust and other impurities.

10.3 Procedure

Hard core shall be laid to the grade, level and thickness as shown on the drawing. Broken stones of required height shall be vertically placed and blinded with approved murrum/ sand and consolidated with roller including watering, dressing etc. However, areas inaccessible by roller may be compacted by hand rammer.

10.4 Payment

This clause shall apply to Item Rate tender only.

The hard core shall be measured on the basis of volume in cubic metres (cu.m.) of the compacted hard core laid. The rate shall include all labour, materials, consolidation by rammer/ roller, watering, dressing etc. all complete.

11.0 SAND FILLING IN PLINTH/FOUNDATIONS

11.1 For specification of sand to be used for filling, reference shall be made to EIL Specification No. 6-68-0002.

- 11.2 Filling shall be carried out in layers not exceeding 150 mm and shall be compacted mechanically or by saturation to specified grade and level and to obtain 90% laboratory maximum dry density or as specified in schedule of rates.
- 11.3 Compaction by flooding may be accepted at the discretion of the Engineer-in-Charge, provided the required compaction is achieved.
- 11.4 The Contractor shall not commence filling in and around any work until it has been permitted by the Engineer-in-Charge.
- 11.5 **Payment**

This clause shall apply to Item Rate tender only.

Payment shall be made on cubic metre (cu.m.) basis of the finished compact volume. The rate shall include cost of sand for any compacted thickness, wastage if any, all handling, transport for all leads, tamping, watering, flooding, dressing etc. Any brick work required for ponding shall be paid separately under relevant item.

12.0 DAMP PROOF COURSE - (DPC)

- 12.1 All materials used for Damp Proof Course shall comply with EIL Specification No. 6-68-0002.
- 12.2 The 40 mm thick Damp Proof Course shall consist of plain cement concrete of the same grade as used for RCC work.
- 12.3 The Damp Proof Course shall be laid at plinth level of masonry walls, flush with the floor surface and shall not be carried across doorways.
- 12.4 Before laying, the top surface of wall shall be thoroughly cleaned and watered. The DPC shall be laid in layers of 20 mm thickness retaining the edges by necessary formwork and shall be well tamped and troweled to smooth finish. The layer shall be cured by keeping the surface wet for 40 hours and after it has dried, two coats of hot bitumen of grade VG10 conforming to IS:73 shall be applied over it at the rate of 1.7 kg/m². Over this, the second layer of 20 mm thick concrete shall be laid and cured as described in case of the first layer and two coats of hot bitumen at the rate of 1.7 kg/m² shall be applied again in a similar manner. Over this, dry sharp sand shall be sprinkled evenly before hardening of second coat of bitumen paint.

12.5 Payment

This clause shall apply to Item Rate tender only.

Payment shall be made on square metre (sq.m.) basis of the area laid. The rate shall be inclusive of formwork, curing, providing and laying bitumen, supplying and spreading sand over bitumen etc. complete.

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STANDARD SPECIFICATION CIVIL AND STRUCTURAL WORKS

प्रीकास्ट कंक्रीट PRECAST CONCRETE

1	10 03 2019	REAFFIRMED & ISSUED AS STANDARD SPECIFICATION	AVM	AJS	RS	RKT
0	26 07 2013	ISSUED AS STANDARD SPECIFICATION	AK	VG/RS	PKM	DM
Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
					Approved by	

Abbreviations:

NIL

Structural Standards Committee

Convenor: Mr. Rajanji Srivastava

Members: Mr. Anurag Sinha
Mr. VK Panwar
Mr. Samir Das
Mr. Amitabh Kishore
Mr. Gyasuddin
Mr. Charanjit Singh (Proj.)
Mr. Ravindra Kumar (Const.)

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1.0 GENERAL

This Specification defines the requirements for the manufacture of precast concrete units. Precast concrete units shall be designed and fabricated by an experienced and acceptable precast concrete manufacturer. The manufacturer shall have been regularly and continuously engaged in the manufacture of precast concrete units either RCC or PCC similar to that indicated in the project specifications or drawings for at least 7 years. The units to be precast shall take care of any special requirements specified in the “**Contract Specific Requirements**” or on the Drawings.

The precast units shall be manufactured in accordance with Specification No. 6-68-0004.

2.0 QUALITY REQUIREMENTS

At a minimum, the Contractor’s Quality Plan shall include the following documents, procedures and/or instructions:

- (a) Lifting methods (where not shown on the Drawings);
- (b) Minimum concrete strength requirements prior to lifting (where not shown on the Drawings); and
- (c) Where it is proposed to stack units, evidence to demonstrate the strength and stability of the stack.

This documentation shall be submitted at least 28 days prior to the commencement of site work, if not submitted beforehand.

3.0 MANUFACTURE

Formwork shall be of rigid construction and concrete vibration shall be such that intense concrete compaction will be achieved. This may require the use of form vibrators or vibrating tables on some large and/or complex shaped units.

Formwork and embedded items shall not restrain movements nor damage precast units within the formwork due to the effects of shrinkage or steam curing.

The casting of the precast units shall be carried out on specially prepared casting beds which will prevent any distortion or misalignment of the forms during and after concreting. Each precast unit shall be cast in one continuous operation with no construction joints.

If the batch volume is less than 2 cubic metres, the sampling rate shall be reduced as follows:

- (a) Less than 2 cubic metres per batch : 50% rounded up
- (b) Less than 0.5 cubic metres per batch : 30% rounded up.

In any case a minimum of 1 test representing each member shall be undertaken. Test specimens, for the purpose of determination of adequate unit strength for lifting and handling, shall be subjected to the same curing regime as the unit they represent. The Contractor shall ensure that sufficient cubes are provided to enable the required testing to be undertaken.

4.0 CURING

Concrete shall be:

- (a) moist cured in accordance with Specification No. 6-68-0004 or
- (b) membrane cured in accordance with Specification No. 6-68-0004

5.0 MARKING

For the purposes of unit curing, testing, location and orientation within the final structure, each batch of units, or if continuous production methods are used, each day's production, shall be clearly identified and indelibly marked to show:

- (a) Unit identification
- (b) Date of manufacture.
- (c) Marking of top and bottom surface to ensure correctness of the reinforcement.

Each unit shall be marked on a surface which is not visible in the final structure.

6.0 LIFTING, HANDLING AND STORAGE

Precast units shall not be lifted or handled before the concrete has attained a compressive strength of 10 MPa or strength required during lifting as per design requirement or as specified on the Drawings, whichever is greater.

The Contractor shall detail in the Quality Plan the measures to be taken to minimise handling stresses, in particular those due to de-moulding.

The Contractor shall carefully handle precast units by methods that will not damage them or their connections. Units shall be handled from the approved lifting points shown on the Drawings. Beams and slabs shall be lifted and supported with the top surfaces uppermost at all times, unless shown otherwise on the Drawings.

Units shall be stored clear of the ground and supported on non-staining timber bearers only at approved bearing points. The thickness and width of the bearers shall be compatible with the strength group of the timber used, the type of precast unit and the site. The bearers shall support the units over their full width at the specified lifting points. The ground or space between the bearers supporting the units shall be carefully cleared and leveled to prevent the unit from being supported at positions other than on the bearers. The bearers shall rest on a firm foundation and adequate precautions shall be taken to prevent subsidence.

If units are stacked in tiers, the bearers shall be placed directly over each other. The lowest unit shall not be overstressed.

7.0 TRANSPORTATION

Unless stated otherwise on the Drawings, units shall not be transported until the concrete has reached its 28 day characteristic compressive strength and is at least 7 days old.

No unit shall be removed from the casting yard until a lot conformance package has been completed.

Submission of the lot conformance package prior to removal from the yard shall be required.

Units shall be securely fixed to the transporter by ties fitted with suitable tensioners. Provision shall be made to protect the units from damage caused by these ties.

Precast concrete units shall be delivered to the site in accordance with the delivery schedule to avoid excessive build-up of units in storage at the site. Upon delivery to the jobsite all precast concrete units shall be inspected by the Engineer-in-charge for quality and final acceptance.

8.0 PAYMENT

- 8.1 Payment for precast concrete members shall be made on cubic meter basis of the volume of the finished member. The rate quoted shall include cost of formwork, preparation of casting yard, finishing as specified, curing, marking, lifting, handling, storage, transportation to site of work, fixing in position etc. Reinforcement and pipe sleeves shall be paid separately under relevant items. Lifting hooks shall be paid on the same basis as reinforcement. Metal inserts shall be paid as per relevant clauses of Specification No. 6-68-0008 (Miscellaneous Steel Works).
- 8.2 The quoted rate shall be inclusive of providing pockets, openings, recesses of all sizes, chamfers, fillets grooves, holes, curing (hot, cold or by using curing compounds). The rate shall be deemed to include complete cost of taking and testing concrete cubes and carrying out other tests including tests of various ingredients as per specification and as directed by the Engineer-in-Charge.

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STANDARD SPECIFICATION FOR CONCRETE PAVEMENT

4	04 07 19	REVISED AND ISSUED AS STD SPEC	SD	GS/AK	RS	RKT
3	23 05 11	REVISED AND ISSUED AS STD SPEC	ALOK	RKS	RBB	DM
2	20 01 05	REVISED AND ISSUED AS STD SPEC	GG	SKC	VDS	SKG
1	15 7 98	REVISED AND ISSUED AS STD SPEC	PCS	RJAIN	MMK	ASONI
0	31 3 82	ISSUED AS STANDARD SPECIFICATION	RP	RPB	HVR	RCPC
Rev. No	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman

Abbreviations:

BS	:	British Standard
IRC	:	Indian Road Congress
IS	:	Indian Standard
MS	:	Mild Steel
PCC	:	Plain Cement Concrete
RCC	:	Reinforced Cement Concrete
DLC	:	Dry Lean Concrete

Structural Standards Committee

Convener: Mr. Rajanji Srivastava

Members: Mr. Anurag Sinha
Mr. VK Panwar
Mr. Samir Das
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1.0 SCOPE

This specification establishes the requirements of material, laying and finishing of concrete pavements and roads.

2.0 REFERENCE CODES AND SPECIFICATIONS

IS: 456	Plain and Reinforced Concrete-Code of Practice.
IS: 1834	Specification for Hot Applied Sealing Compounds for Joints in Concrete.
IS: 1838, Part-1	Specification for Preformed Fillers for Expansion Joints in Pavements and Structures (Non Extruding and Resilient Type): Part 1 Bitumen Impregnated Fibre.
IS: 2720, Part-8	Method of Test for Soils-Part 8: Determination of Water Content-Dry Density Relation Using Heavy Compaction.
IS: 9214	Method of Determination of Modulus of Sub-grade Reaction (k value) of Soils in the Field.
IRC: 57	Recommended practice for sealing of joints in concrete pavement
IRC-15	Standard Specifications and code of Practice for construction of concrete roads
MoRTH	Specification for Road and Bridge Works of Ministry of Road Transport and Highways
6-68-0002	Technical Specification - Civil & Structural Works - Materials.
6-68-0004	Technical Specification - Civil & Structural Works – Plain and Reinforced Cement Concrete.
7-65-0404	RCC Pavement Details
	MoRTH Specification for Road and Bridge

In case of conflict between the Clauses mentioned in this Specification and those in above Codes and Specifications, this Specification shall govern.

3.0 MATERIALS

- 3.1** Material for Cement Concrete viz. Cement, Sand, Coarse and Fine aggregate and water, Reinforcements Bars, Embedment, Inserts and Admixture etc. shall be as described in EIL Specification no. 6-68-0002.
- 3.2** Material for DLC shall be as described Specification for Road and Bridge Works of Ministry of Road Transport and Highways (MoRTH).

4.0 GRADES, TYPE OF CONCRETE MIX, PROPORTIONING AND BATCHING

- 4.1** The grades of concrete shall be as per standard / Job drawing.
- 4.2** Specification for Concrete mix, Mix Proportioning and Batching shall be as described in EIL Specification no. 6-68-0004 and IS: 456.

5.0 EQUIPMENTS

All equipments like sub grade templates, hand tempers, vibrating screens, internal vibrators, longitudinal floats, bridges, push brooms, straight edges, edging tools etc. shall be on the worksite in first class working condition and shall have been inspected by the Engineer-in-Charge before paving operations are permitted to start. Throughout the construction period, the contractor shall maintain adequate equipment in first class working conditions to ensure the proper execution of the work.

6.0 PREPARATION OF SUB GRADE

6.1 The area where concrete is to be placed must be cleared of all loose material and virgin soil must be exposed. Such exposed surface must be consolidated properly to obtain 95% of Maximum Laboratory Dry Density of the soil. All soft patches must be worked out to remove the soft soil and selected approved earth must be filled back and compacted.

6.2 For areas, where pavement is to be laid on cutting / natural grade level, Sub grade shall be thoroughly compacted to 95% of laboratory dry density as per IS: 2720 Part VIII. For filled up areas, top 450 mm of the soil shall be compacted to 95% of laboratory dry density below pavement in layers of 150 mm.

6.3 The difference between the sub grade levels of Type-I, Type-II, Type-III and any other type (as per job drawing) Concrete pavements (due to difference in thickness of Type-I, Type-II, Type-III and any other type pavements) shall be achieved by stripping the grade level and not by filling. Hence, site-grading level below pavement shall be kept up to sub grade level of Type-II or Type-III as the case may be, to avoid filling of smaller thickness at later stage.

6.4 The sub grade or sub base for laying of the concrete pavement shall comply with the following requirements:

6.4.1 No soft spots shall be present in the sub grade.

6.4.2 The uniformly compacted sub grade or base course shall extend at least 300mm on either side of the area to be concreted.

6.4.3 The sub grade shall be properly drained.

6.4.4 The minimum modulus of sub grade in wet condition, reaction obtained with a Plate Bearing Test as per IS: 9214, shall be 6.0 Kg/cm²/cm.

6.4.5 Sub grade shall be prepared to the lines and grades to match with the slope of pavement as shown on the drawings.

7.0 PREPARATION OF SUB BASE

7.1 The construction of the Dry Lean concrete sub base for cement concrete pavement shall conform to the requirements of section 601.0 of specification for Road and Bridge Works of Ministry of Road Transport and Highways (MoRTH) and EIL standard Drg. No. 7-65-0404/ Job drawing.

7.2 Sub Base layer shall be prepared to the lines and grades to match with the slope of pavement as shown on the drawings.

7.3 No concrete shall be placed around manholes or other structures until they have been brought to required grade and alignment. All sides of manholes / pits etc. shall have same elevation.

- 7.4 A separation membrane shall be used between the concrete slab and the sub base (DLC) which shall conform to EIL standard Drg. No. 7-65-0404/ Job drawing. The separation membrane shall be laid flat without creases. Before placing the separation membrane, the sub-base shall be swept clean of all the extraneous materials using air compressor. Wherever overlap of plastic sheets is necessary, the same shall be at least 300 mm and any damaged sheeting shall be replaced at the Contractor's expense. The separation membrane may be nailed to the lower layer with concrete nails.

8.0 FORMS

- 8.1 All side Forms shall be of mild steel unless use of wooden sections is specially permitted. The steel forms shall be of MS channel sections and their depth shall be equal to thickness of the pavement. The sections shall have a length of at least 3.0m except on curves, where shorter sections may be used. These forms should be provided with ample bracing and supports to prevent the springing of the forms under the concrete pressure or thrust of machinery operating nearby.
- 8.2 The forms should be in a sufficient number and they should not be removed until concrete has hardened sufficiently.
- 8.3 In case wooden forms are permitted, these shall have minimum base width of 100 mm for 150mm or lesser thick slabs and 150mm for 200mm thick slabs.

9.0 REINFORCEMENT, MIXING & PLACING OF CONCRETE

9.1 Laying of Reinforcement

All reinforcement work shall confirm to IS: 456 and as described in EIL Specification no. 6-68-0004.

9.2 Mixing

Mixing shall be as described in EIL Specification no. 6-68-0004.

9.3 Placing

- 9.3.1 The place where concrete is to be poured should be clean and free from all loose dirt, wooden pieces, dust, standing water etc.
- 9.3.2 Walking on reinforcement layers is not permissible. Walkways of wooden planks or similar material can be placed with removable supports and should be independent of the reinforcement. The reinforcement position should not be disturbed nor should it sag during carriage and placement of concrete.
- 9.3.3 Placing and vibration should not take totally more than 20 minutes from time of mixing. Method of placing should be got approved by Engineer-in-Charge. Segregation during carriage and placement should be avoided. If during carriage concrete segregates, it should be remixed before placement.
- 9.3.4 Concrete should not be dropped from a height of over 1.5m.
- 9.3.5 To ensure bond and water tightness between old concrete surface and fresh concrete to be placed, the surface should be cleaned and roughened by "initial green cut" by wire brushing or chipping. The initial green may be done by wire brush after 6 hours of placing concrete in order to facilitate the work. Chipping can be done only after 48 hours. A layer of cement

slurry with 1:1 mix (1 cement: 1 sand) should be poured to obtain a uniform coating on old concrete. Immediately thereafter, the fresh concrete should be poured.

- 9.3.6 Concrete shall be mixed in quantities required for immediate use and shall be deposited on the sub-grade in a single operation to the required depth and width of the pavement. Spreading shall be as uniform as possible to avoid re-handling of concrete. Where however, a certain amount of redistribution is necessary, it shall be done with shovels and not with rakes. Concrete shall be vibrated with internal vibrators. Concrete shall be placed continuously until completion of the part of the work between construction joints or as directed by Engineer-in-Charge continuously until completion of the part of the work between construction joints or as directed by Engineer-in-Charge.

9.3.7 Placing in inclement weather

All precautions shall be taken for concreting in extreme weather in accordance with the relevant clauses of IS: 456. Due protection shall be provided to prevent cement being blown away while proportioning and mixing during windy weather. No concreting shall be carried out in continuous heavy rains. Necessary arrangements to cover the freshly poured concrete shall be provided, to protect it from the direct rays of the sun and from drying winds.

- 9.3.8 All concreting placement should be co-ordinated with placement of conduits, inserts, embedded parts etc. executed either by same agency or separately.

- 9.3.9 Concrete shall be laid in panels as shown in the standard drawing or as directed by Engineer-in-Charge.

9.4 Compaction & Finishing

9.4.1 Compaction

The surface of the pavement shall be compacted either by means of power driven finish machine or a vibrating hand screed. For areas where width of the pavement is very small, hand consolidation and finishing shall be done as follows:

- 9.4.1.1 Concrete as soon as placed, shall be struck off uniformly and screeded to the crown and cross-section shown on the plans and to such level above the base that when compacted and finished, the pavement shall conform to the grade and cross-section indicated by the plans. The entire surface shall then be tamped until a close-knit dense surface is obtained.
- 9.4.1.2 The Tamper shall rest on the side forms and shall be drawn ahead with a swing motion in combination with a series of lifts and drops alternating with lateral shifts. The aim of this operation is compaction and screeding to the approximate level required. Subsequent tamping should advance 75 mm at a time in the direction in which the work is proceeding and in final stages, the tamping should be closer, about 12 mm at a time, until a level and dense surface is obtained.
- 9.4.1.3 If so directed by Engineer-in-charge, hand operated vibrating tamper consisting of normal type of hand tamper attached to a pneumatic or electric vibrating unit shall be used for compaction.
- 9.4.1.4 Segregated particles of coarse aggregate, which collect in front of the tamper, shall be thrown outside the forms or thoroughly mixed by hand with a mass of concrete already on the base.
- 9.4.1.5 Compaction by tamping shall be carried on till the mortar in the mix just works up to the surface. The surface shall be examined after compaction correction. If needed correction shall be made by adding or removing concrete, followed by further compaction and finishing.

9.4.2 Floating

As soon as practicable, after concrete has been struck off and compacted, it shall be further smoothed and compacted by means of a longitudinal float, 1200 mm long and 75 mm wide, operated from a foot bridge.

9.4.3 Straight Edging

After floating is completed and excess water removed but while concrete is still plastic, the slab surface shall be tested for trueness with a straight edge and rectified, if necessary.

9.4.4 Brooming

After belting and as soon as surplus water has risen to the surface, the pavement shall be given a broom finish to produce corrugations of uniform appearance of not more than 1/16 inch in depth.

9.4.5 Edging

Before the concrete has its initial set, the edges shall be carefully finished with an edger of the radius required and pavement edge shall be left smooth and true to line.

9.5 Curing

Curing of concrete shall be as described in EIL Specification no. 6-68-0004.

10.0 JOINTS

10.1 Wherever called for on the drawings, expansion joints, construction joints and sealing joints shall be provided as per details indicated in the drawing and as directed by Engineer-in-Charge.

10.2 Sealing of Joints

10.2.1 After the curing, the temporary seal or other intruded materials of all expansion and contraction joints shall be removed completely and the slots filled with approved silicone sealant. It shall be self leveling low modulus type conforming to ASTM 5893. The sealant shall conform to IRC 57. The filler material for Expansion and Sealing joints shall be preformed fillers of Bitumen Impregnated Fiber, conforming to IS: 1838, Part-I.

10.2.2 The edges of the joints shall be thoroughly cleaned and a suitable primer as recommended by sealant manufacturer shall be applied in accordance with IRC:57.

10.2.3 The application of the sealing compound shall conform to the process as specified in IRC 57.

11.0 OPENING TO TRAFFIC

11.1 Traffic shall not be allowed for a period of 28 days after laying of concrete in pavement.

11.2 Before opening the pavement to traffic, all joints shall be filled and trimmed or topped out as required.

11.3 Sampling, testing and acceptance of concrete work for pavement / road shall be according to IS: 456 / IRC -15 as applicable.

12.0 METHOD AND BASIS FOR PAYMENT

12.1 Plain and Reinforced Concrete

- 12.1.1 Payment for plane and reinforced concrete in pavements shall be made on cubic metre basis of the volume of the actual finished work done and shall be inclusive of cost of providing Forms, Pockets, Chamfers, Fillets, Grooves, Cement wash, Curing by normal moist curing or using curing compound etc. as directed by Engineer-in-Charge. The rates shall be deemed to include complete cost of getting the respective mix designs approved, making and testing concrete cubes and carrying out other tests including tests of various ingredients, as per specifications and as directed by Engineer-in-Charge.
- 12.1.2 No separate payment shall be made for any admixture used by the contractor for accelerating or retarding the strength of concrete or for achieving specified workability / water tightness. The rate quoted shall be deemed to be inclusive of all costs related to any such additive / admixture.
- 12.1.3 The rate shall however be exclusive of reinforcement, metal inserts, pipe sleeves and any filler material in expansion / sealing joints.
- 12.1.4 Where the strength of concrete mix (nominal or design mix) as indicated by tests, lies in between the strengths of two grades given in Table-1 of EIL Specification No. 6-68-0004 and it is accepted by owner/Engineer-in-charge, such concrete shall be classified as a grade belonging to the lower of the two grades between which it lies. In case the cube strength shows higher results than those specified for the particular grade of the concrete, it shall not be placed in the higher grade nor shall the Contractor be entitled for any extra payment on such account. The concrete giving lower strength than specified may be accepted at reduced rates after satisfying the safety of the structure by checking it with tests as specified or rejected entirely at the discretion of the Engineer-in Charge. The rejected concrete shall be dismantled at no extra cost to the owner and no payment or extension of time shall be granted for the concrete so rejected and the formwork and reinforcement used for the same. Cost of any material supplied by the Owner free of cost shall be recovered from the contractor at double the prevailing market rate. In case the concrete of lower strength can be improved by carrying out some strengthening measures entirely at the discretion of the Engineer-in-Charge, then Contractor shall carry out the said measures including all related tests at his own cost. If the Contractor is able to make up the strength to the required grade by such improvement measures to the entire satisfaction of Engineer-in-Charge, payment shall be made for the grade achieved. However, if the strength of concrete is not made up to the strength of required grade, payment shall be made only for the lower strength if such concrete is accepted by the Engineer-in-Charge.
- 12.1.5 Deductions for openings, pockets etc. shall be as specified in relevant Indian Standard Codes.

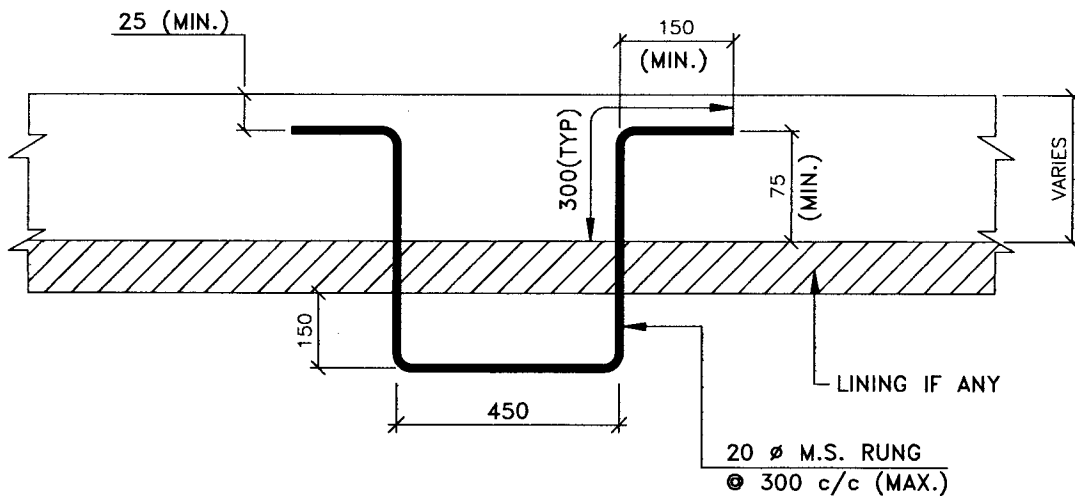
12.2 Reinforcement

- 12.2.1 Payment for plain round mild steel reinforcement bars and high strength deformed steel bars shall be on the basis of weight of bare steel, irrespective of any coating applied, in metric tons. The weight of the bar shall be derived from the sizes and corresponding unit weights given in hand book of Bureau of Indian Standards. Standard hook length, chairs, spacer bars and authorised laps only shall be included in the weight calculated. Binding wire shall not be weighed nor otherwise measured. Measurement for weight shall not include cutting allowance etc.

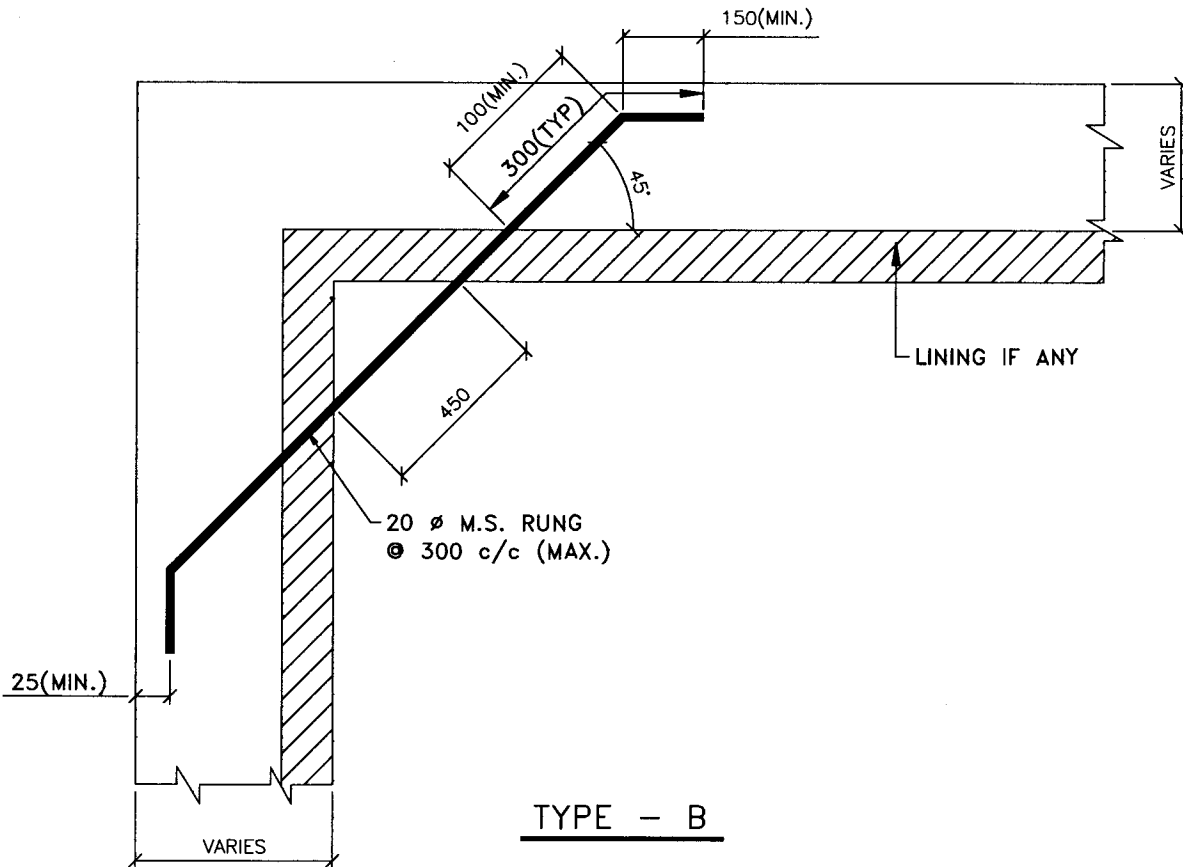
- 12.2.2 Rate quoted for reinforcement shall include cost of supplying, decoiling, straightening, cleaning, cutting, bending, placing, binding, welding if required, and providing necessary cover blocks of concrete.

12.3 Joints

Payment for expansion joints, construction joints and sealing joints shall be made on running metre basis. The rate shall include cleaning of joints, filler material and sealing with approved compound, all material, labour etc. complete, as per drawing.



TYPE - A



TYPE - B

NOTES :-

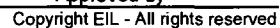
1. ALL DIMENSIONS ARE IN mm.
2. FIRST RUNG SHALL BE AT 300 mm FROM TOP.

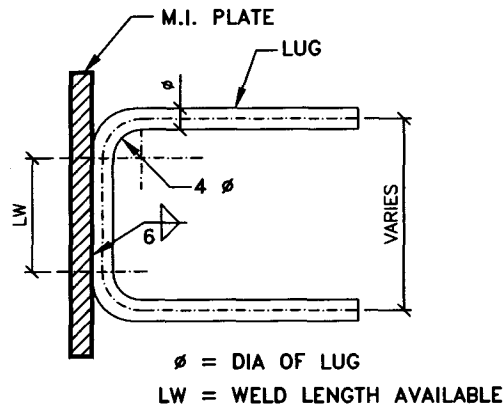
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Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
Approved by						
Copyright EIL - All rights reserved						

GENERAL NOTES :-

1. ALL LUGS SHALL BE OF HIGH STRENGTH DEFORMED BARS OF GRADE Fe500/Fe500D CONFORMING TO IS:1786 (WITH GUARANTEED WELDABILITY) AND SHALL BE CONNECTED TO METAL INSERT PLATES BY 6 mm FILLET WELDS AS SHOWN IN SKETCHES.
2. METAL INSERT PLATES SHALL BE CONFORMING TO IS:2062 (GR-A/B).
3. METAL INSERT PLATES MARKED ON DRAWING REFER AS UNDER
IP-(A) • (C)
IP = INSERT PLATE
A = TYPE OF INSERT PLATE
C = ELEVATION OF INSERT PLATE (TOP EDGE)
e.g IP-R9a • EL.110.300 MEANS INSERT PLATE TYPE R9a AT EL.110.300.
4. METAL INSERT PLATES SHALL BE KEPT FLUSH WITH CONCRETE SURFACE.
5. THE LONGER SIDE OF METAL INSERT PLATE SHALL BE KEPT VERTICAL UNLESS SHOWN OTHERWISE.
6. METAL INSERT PLATE ON COLUMN OR BEAM SHALL BE KEPT SYMMETRICAL ABOUT C_o OF COLUMN OR BEAM, UNLESS SHOWN OTHERWISE.

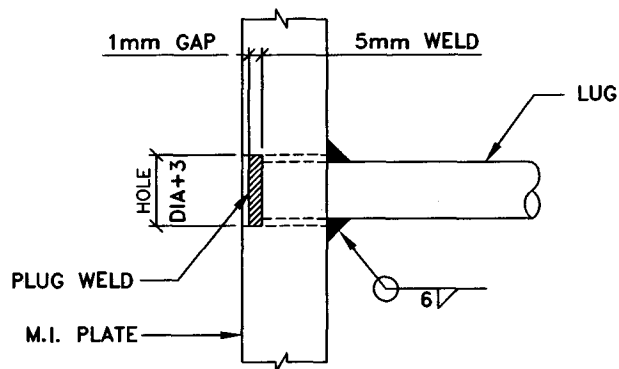
7	06.06.18	REAFFIRMED AND ISSUED AS STANDARD	CS	Aditya	R SRIVASTAVA	RK TRIVEDI
6	23.10.12	REVISED AND ISSUED AS STANDARD	VPS	P.K.MITTAL	S CHATURVEDI	D MALHOTRA
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
						Approved by





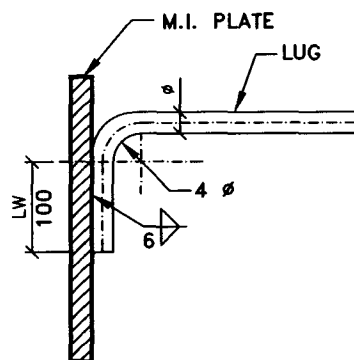
BENDING DIMENSIONS FOR 12Φ & 16Φ LUGS

(FOR SPACING OF LUGS ≥ 190)
(NOT APPLICABLE FOR S1, S2, R1 & PS1)



WELD DETAIL OF 12Φ & 16Φ LUGS WITH M.I. PLATE

(FOR SPACING OF LUGS < 190)
(VALID FOR S1, S2 R1 & PS1)



BENDING DIMENSIONS FOR 12Φ & 16Φ LUGS

(VALID FOR R9, R10, R12, R13, R14, PS11, & PS12)

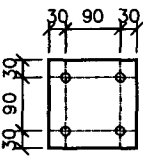
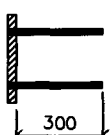
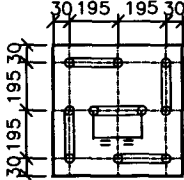
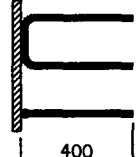
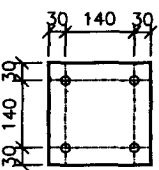
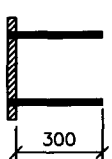
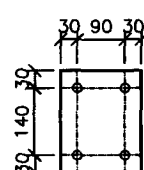
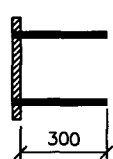
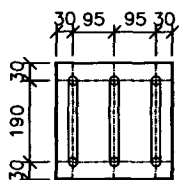
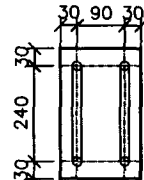
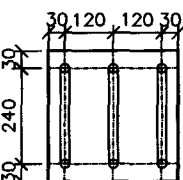
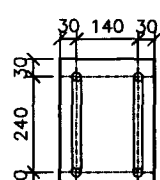
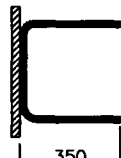
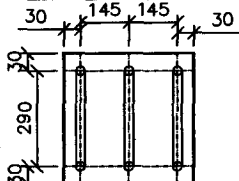
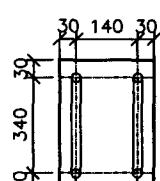
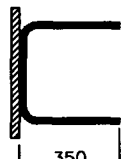
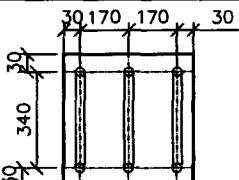
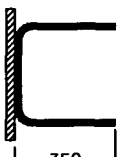
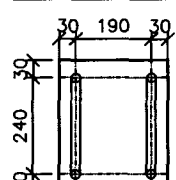
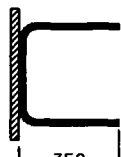
7	06.06.18	REAFFIRMED AND ISSUED AS STANDARD	CS	Aditya	AVM	R.SRVASTAVA	RK TRIVEDI
6	23.10.12	REVISED AND REISSUED AS STANDARD	VPS	P.K.MITTAL	S CHATURVEDI	D MALHOTRA	
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman	Approved by

**METAL INSERT PLATES
(S/R DESIGNATES)**

STANDARD No.

7-68-0056 Rev. 7

Page 4 of 7

S. NO.	TYPE OF INSERT	DIA OF LUGS	THK. OF INSERT	DETAILS OF INSERT PLATE		S. NO.	TYPE OF INSERT	DIA OF LUGS	THK. OF INSERT	DETAILS OF INSERT PLATE	
				PLAN	CROSS SECTION					PLAN	CROSS SECTION
1.	S1a	12	12			7.	S7a	12	12		
	S1b	16	16	SIZE 150x150			S7b	16	16	SIZE 450x450	
2.	S2a	12	12			8.	R1a	12	12		
	S2b	16	16	SIZE 200x200			R1b	16	16	SIZE 150x200	
3.	S3a	12	12			9.	R2a	12	12		
	S3b	16	16	SIZE 250x250			R2b	16	16	SIZE 150x300	
4.	S4a	12	12			10.	R3a	12	12		
	S4b	16	16	SIZE 300x300			R3b	16	16	SIZE 200x300	
5.	S5a	12	12			11.	R4a	12	12		
	S5b	16	16	SIZE 350x350			R4b	16	16	SIZE 200x400	
6.	S6a	12	12			12.	R5a	12	12		
	S6b	16	16	SIZE 400x400			R5b	16	16	SIZE 250x300	

7 06.06.18 REAFFIRMED AND ISSUED AS STANDARD

6 23.10.12 REVISED AND REISSUED AS STANDARD

CS A.K. Singh

R SRIVASTAVA

RK TRIVEDI

VPS P.K. MITTAL

S CHATURVEDI

D MALHOTRA

Rev. No. Date Purpose

Prepared by Checked by

Stds. Committee Convenor

Stds. Bureau Chairman

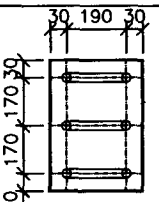
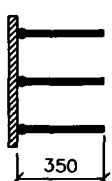
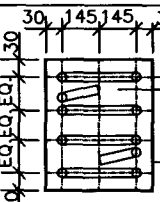
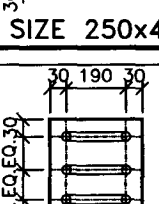
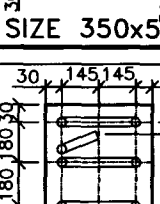
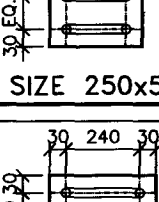
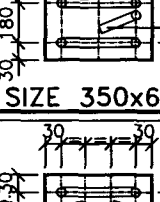
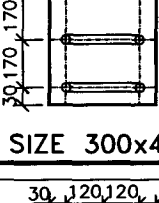
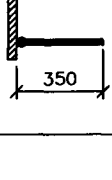
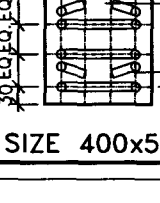
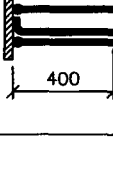
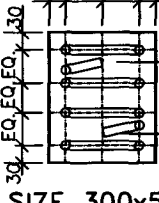
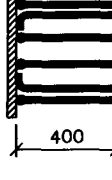
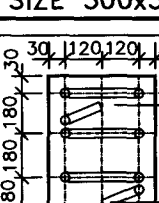
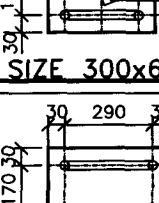
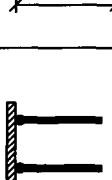
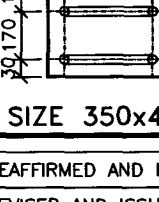
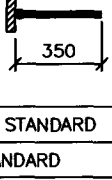
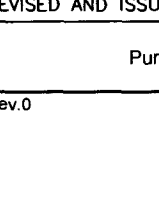
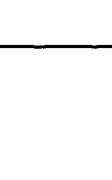
Approved by

METAL INSERT PLATES
(R DESIGNATES)

STANDARD No.

7-68-0056 Rev. 7

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13.	R6a	12	12			19.	R12a	12	12		
	R6b	16	16				R12b	16	16		
14.	R7a	12	12			20.	R13a	12	12		
	R7b	16	16				R13b	16	16		
15.	R8a	12	12			21.	R14a	12	12		
	R8b	16	16				R14b	16	16		
16.	R9a	12	12			17.	R10a	12	12		
	R9b	16	16				R10b	16	16		
18.	R11a	12	12				R11b	16	16		
	R11b	16	16								

7 06.06.18 REAFFIRMED AND ISSUED AS STANDARD

6 23.10.12 REVISED AND ISSUED AS STANDARD

CS *Aditya*
CS AVM

R. SRIVASTAVA

R. M. TRIVEDI
RK TRIVEDI

VPS

P.K. MITTAL

S. CHATURVEDI

D. MALHOTRA

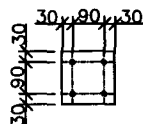
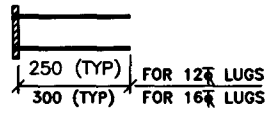
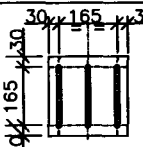
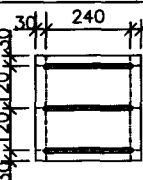
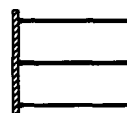
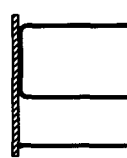
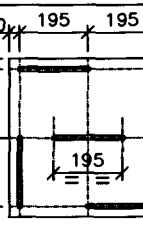
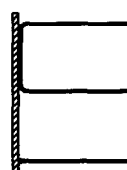
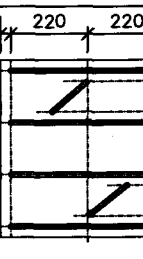
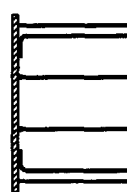
Rev. No. Date Purpose

Prepared by Checked by

Stds. Committee
Convenor

Stds. Bureau
Chairman

Approved by

S.NO.	TYPE OF INSERT	DIA OF LUGS	THK. OF INSERT	DETAILS OF INSERT PLATE	
				PLAN	CROSS SECTION
1.	PS1	12	12	 SIZE 150x150	
	PS2	16	16		
2.	PS3	12	12	 SIZE 225x225	
	PS4	16	16		
3.	PS5	12	12	 SIZE 300x300	
	PS6	16	16		
4.	PS7	12	12	 SIZE 400x400	
	PS8	16	16		
5.	PS9	12	12	 SIZE 450x450	
	PS10	16	16		
6.	PS11	12	12	 SIZE 500x500	
	PS12	16	16		

7 06.06.18 REAFFIRMED AND ISSUED AS STANDARD

CS

AVM

R.SRVASTAVA

RK TRIVEDI

6 23.10.12 REVISED AND ISSUED AS STANDARD

VPS

P.K.MITTAL

S CHATURVEDI

D MALHOTRA

Rev.
No.

Date

Purpose

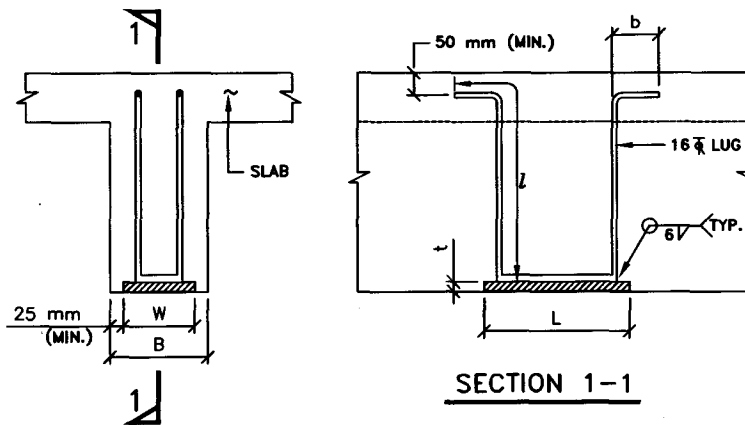
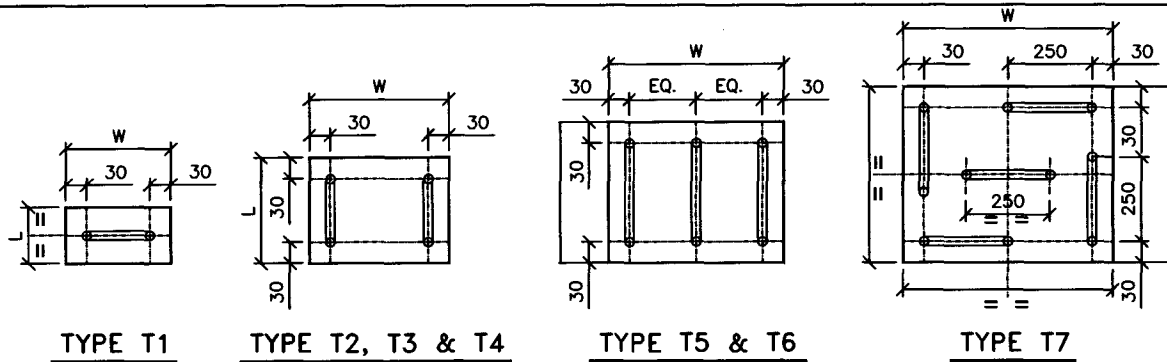
Prepared
by

Checked
by

Stds. Committee
Convenor

Stds. Bureau
Chairman

Approved by



S.NO.	TYPE OF INSERT	WIDTH OF BEAM 'B' (mm)	MAXIMUM WIDTH OF PLATE 'W' (mm)	LENGTH OF PLATE 'L' (mm)	MAXIMUM 'b' (mm)	THICKNESS OF PLATE 't' (mm)	TOTAL ANCHORAGE LENGTH 'l' (mm)
1.	T1	230	180	180	110	16	350
2.	T2	300	220	250	110	20	350
3.	T3	350	270	250	110	20	350
4.	T4	400	320	250	110	20	350
5.	T5	450	370	300	110	32	350
6.	T6	500	420	300	110	32	350
7.	T7	500	420	400	110	32	350

7	06.06.18	REAFFIRMED AND ISSUED AS STANDARD	CS	AVM	R.SRIVASTAVA	RK TRIVEDI
6	23.10.12	REVISED AND ISSUED AS STANDARD	VPS	P.K.MITTAL	S CHATURVEDI	D MALHOTRA
Rev. No.	Date	Purpose	Prepared by	Checked by	Std. Committee Convenor	Std. Bureau Chairman
Approved by						Copyright EIL - All rights reserved

HSE RULES & REGULATIONS

निर्माण स्थल पर स्वास्थ्य, सुरक्षा एवं
पर्यावरण प्रबंधन हेतु मानक विनिर्देश

STANDARD SPECIFICATION FOR HEALTH, SAFETY & ENVIRONMENTAL (HSE) MANAGEMENT AT CONSTRUCTION SITES

0	23/12/2020	REVISED & UPDATED				
Rev. No.	Date	Purpose	Prepared by	Checked by	Standards Committee Convenor	Standards Bureau Chairman
Approved by						

Abbreviations:

AERB	:	Atomic Energy Regulatory Board
ANSI	:	American National Standards Institute
BARC	:	Bhabha Atomic Research Centre
BS	:	British Standard
EIL	:	Engineers India Limited
ELCB	:	Earth Leakage Circuit Breaker
EPC	:	Engineering, Procurement and Construction
EPCC	:	Engineering, Procurement, Construction and Commissioning
ESI	:	Employee State Insurance
GCC	:	General Conditions of Contract
GM	:	General Manager
GTAW	:	Gas Tungsten Arc Welding
HOD	:	Head of Department
HSE	:	Health, Safety & Environment
HIRAC	:	Hazard, Identification Risk Assessment & Control
HMV	:	Heavy Motor Vehicle
HV	:	High Voltage
IS	:	Indian Standard
ISO	:	International Organization for Standardization
IE	:	Indian Electricity
LTI	:	Lost Time Injuries
LMV	:	Light Motor Vehicle
LOTO	:	Lock Out & Tag Out
LPG	:	Liquefied Petroleum Gas
LSTK	:	Lump Sum Turn Key
MV	:	Medium Voltage
OH&S	:	Occupational Health and Safety
OISD	:	Oil Industry Safety Directorate
PPE	:	Personal Protective Equipment
PUC	:	Pollution Under Control
RC	:	Registration Certificate
RCCB	:	Residual Current Circuit Breaker
RCM	:	Resident Construction Manager or Site-in-Charge, as applicable
SCC	:	Special Conditions of Contract
SLI	:	Safe Load Indicator
SWL	:	Safe Working Load
TPI	:	Third Party Inspection
TBT	:	Tool Box Talks

Construction Standards Committee

Convenor: Sh.AK Kundu, ED-I/C (Construction)

Members: Sh. Janak Kishore, ED (Projects)
Sh. Biswajit Mandal, Sr.GM (SCM)
Sh. Udayan Chakravarty, Sr.GM (Piping)
Sh. Ravindra Kumar, GM (Construction)
Sh. Debasish Ghosal, GM(Construction)
Sh. Pankaj Kumar Rai, AGM (Construction)

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Attachments (Reporting Formats)

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V	Monthly HSE Report	HSE-5 Rev.0
VI	Permit for Working at Height	HSE-6 Rev.0
VII	Permit for Working in Confined Space	HSE-7 Rev.0
VIII	Permit for Radiation work	HSE-8 Rev.0
IX.	Permit for Demolishing/ Dismantling	HSE-9 Rev.0
X	Daily Safety Checklist	HSE-10 Rev.0
XI	Housekeeping Assessment & Compliance	HSE-11 Rev.0
XII	Inspection of Temporary Electrical Booth/ Installation ...	HSE-12 Rev.0
XIII	Inspection for Scaffolding	HSE-13 Rev.0
XIV	Permit for Erection / Modification & Dismantling of Scaffolding	HSE-14 Rev.0
XV	Permit for Heavy Lift/Critical Erection	HSE-15 Rev.0
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1.0 SCOPE

This specification establishes the Health, Safety and Environment (HSE) management requirement to be complied by Contractors/Vendors including their sub-contractors/sub vendors during construction.

This specification is not intended to replace the necessary professional judgment needed to design & implement an effective HSE system for construction activities and the contractor is expected to fulfill HSE requirements in this specification as a minimum. It is expected that contractor shall implement best HSE practices beyond whatever are mentioned in this specification.

Requirements stipulated in this specification shall supplement the requirements of HSE Management given in relevant Act(s)/ Legislations, General Conditions of Contract (GCC), Special Conditions of Contract (SCC) and Job (Technical) Specifications. Where different documents stipulate different requirements, the most stringent shall apply.

2.0 REFERENCES

The document should be read in conjunction with following:

- General Conditions of Contract (GCC)
- Special Conditions of Contract (SCC)
- Building and other construction workers Act,
- Indian Factories Act
- Job (Technical) specifications
- Relevant International/ National Codes (refer Appendix-A for standards/codes on HSE)
- Relevant State & National Statutory requirements.
- Operating Manuals Recommendation of Manufacturer of various construction Machineries
- Occupation Health and Safety Management System (OHSAS 18001:2007/ISO 45001) and Environmental Management System (ISO 14001:2015)

3.0 REQUIREMENTS OF HEALTH, SAFETY & ENVIRONMENTAL (HSE) MANAGEMENT SYSTEM TO BE COMPLIED BY BIDDERS

3.1 Management Responsibility

3.1.1 HSE Policy & Objectives

The Contractor should have a documented and duly approved HSE policy & objectives to demonstrate commitment of their organization to ensure health, safety and environmental aspects in their line of operations.

3.1.2 Management System

The HSE management system of the Contractor shall cover the HSE requirements & commitments to fulfill them, including but not limited to what have been specified under clauses 1.0 and 2.0 above. The Contractor shall obtain the approval of its site specific HSE Plan from EIL/ Owner prior to commencement of any site works. Corporate as well as Site management of the Contractor shall ensure compliance of their HSE Plan at work sites in its entirety in true spirit.

3.1.3 Indemnification

Contractor shall indemnify & hold harmless, Owner/EIL & their representatives, free from any and all liabilities arising out of non-fulfillment of HSE requirements or its consequences.

3.1.4 Deployment & Qualifications of Safety Personnel

The Contractor shall designate/deploy various categories of HSE personnel at site as indicated below in sufficient number. In no case, deployment of safety Supervisor / Safety Steward shall substitute deployment of Safety Officer / Safety Engineer what is indicated in relevant statute of BOCW Act i.e. deployment of safety officer/Safety Engineer is compulsory at project site. The Safety supervisors, Safety stewards/Observer etc. would facilitate the HSE tasks at grass root level for construction sites and shall assist Safety Officer /Engineers.

Contractor shall appoint safety personnel as given below for every work shift (As per table below):

- Safety Observer/Steward: Contractor shall depute one Safety Observer/Steward for every 100 workers and additionally thereon.
- Safety Supervisor: In addition to above (i), contractor shall depute one Safety Supervisor for every 250 workers and additionally thereon.
- Safety Engineer: In addition to above (i & ii), one safety engineer/ officer for every 1000 workers and additionally thereon.

No. of Workers deployed	Requirement of Safety Personnel for every shift		
	Safety Observer/Steward	Safety Supervisor	Safety Engineer/ Officer
1-100	One	One (1-250)	One
101-200	Two	Two (250-500)	
201-300	Three		
301-400	Four		
401-500	Five		
Up to 1000	Ten	Four	
Up to 2000	Twenty	Eight	Two

In case any of the safety personnel leave the contractor the same shall be intimated to the owner/ Consultant/ EIL. The contractor shall recruit new personnel and fill up the vacancy.

a) Safety Steward/Observer

As a minimum, he shall possess class XII pass certificate and trained in fire-fighting as well as in safety/occupational health related subjects, with minimum two year of practical experience in construction work environment and should have adequate knowledge of the local language spoken by majority of the workers at the construction site.

b) Safety Supervisor

As a minimum, he shall possess a recognized graduation Degree in Science (with Physics & Chemistry) or a Diploma in Engg. Or Tech. with minimum Two years of practical experience in construction work environment and should possess requisite skills to deal with construction safety & fire related day-to-day issues.

c) Safety Officer / Safety Engineer

Safety Officer/Engineer should possess following qualification & experience:

- (i) Recognized degree in any branch of Engg. or Tech. or Architecture with practical experience of working in a building or other construction work in supervisory capacity for a period of not less than two years, **or** possessing recognized diploma in any branch of Engg. or Tech with practical experience of working in a building or other construction work in supervisory capacity for a period of not less than five years.
- (ii) Recognized degree or one year diploma in Industrial safety (from any Indian Institutes recognized by AICTE or State Council of Tech. Education of any Indian State/Union territory) with at least one paper in construction safety (as an elective subject).
- (iii) Preferably have adequate knowledge of the language spoken by majority of the workers at the construction site.

Alternately

- (i) Person possessing Graduation Degree in Science with Physics & Chemistry and degree or one year diploma in Industrial Safety (from any Indian institutes recognized by AICTE or State Council of Tech. Education of any Indian State/ Union Territory) with practical experience of working in a building, plant or other construction works (as Safety Officer, in line with Indian Factories Act, 1948) for a period of not less than five years, may be considered as Safety Officer.

d) HSE In-Charge

In case there is more than one Safety Officer at any project construction site, one of them, who is senior most by experience (in HSE discipline), may be designated as HSE In-Charge. Duties & responsibilities of such person shall be commensurate with that of relevant statute and primarily to coordinate with top management of EIL/Client and contractors.

In case the statutory requirements i.e. State or Central Acts and / or Rules as applicable like the Building and Other Construction Workers' Regulation of Employment and Conditions of Service- Act, 1996 or State Rules (wherever notified), the Factories Act, 1948 or Rules (wherever notified), etc. are more stringent than above clarifications, the same shall be followed.

Contractors shall ensure physical availability of safety personnel at the place of specific work location, where Hot Work Permit is required/granted. No work shall be started at any of the project sites until above safety personnel & concerned Site Engineer of Contractor are physically deployed at site. The Contractor shall submit a HSE Organogram clearly indicating the lines of responsibility and reporting system and elaborate the responsibilities of safety personnel in their HSE Plan.

The Contractor shall verify & authenticate credentials of such safety personnel and furnish Bio-Data/Resume/Curriculum Vitae of the safety personnel as above for EIL/Owner's approval, at least 1 month before the mobilization. The Contractor, whenever required, shall arrange submission of original testimonials/certificates of their Safety personnel, to EIL/Owner (for verification/scrutiny, etc.)

Imposition/ Realization of penalty shall not absolve the Contractor from his/her responsibility of deploying competent safety officer at site.

Adequate planning and deployment of safety personnel shall be ensured by the Contractor so that field activities do not get affected because of non-deployment of competent & qualified safety personnel in appropriate numbers.

3.1.5 Implementation, Inspection/ Monitoring

- a) The Contractor shall be fully responsible for planning, reporting, implementing and monitoring all HSE requirements and compliance of all laws & statutory requirements.
- b) The Contractor shall also ensure that the HSE requirements are clearly understood & implemented conscientiously by their site personnel at all levels at site.
- c) The Contractor shall ensure physical presence of their field engineers / supervisors, during the continuation of their contract works / site activities including all material transportation activities. Physical absence of experienced field engineers / supervisors of Contractor at critical work spot during the course of work may invite halting / stoppage of work.
- d) The Contractor shall regularly review inspection report internally and implement all practical steps / actions for improving the status continuously.
- e) Contractor skilled workmen like riggers, scaffold erectors, welders, crane operators etc. should have sufficient past experience and skill on the relevant job.
- f) The Contractor shall ensure important safety checks right from beginning of works at every work site locations and to this effect format No. HSE-10 "Daily Safety Check List" shall be prepared by field engineer & duly checked by safety personnel for conformance.
- g) The Contractor shall carry out inspection to identify various unsafe conditions of work sites/machinery/equipment's as well as unsafe acts on the part of workmen/supervisor/engineer while carrying out different project related works.
- h) Adequate records for all inspections shall be maintained by the Contractor and the same shall be furnished to EIL/Owner, whenever sought.
- i) To demonstrate involvement/commitment of site management of Contractor, at least one Safety Walk through in a month shall be carried out by Contractor's head of site (along with his area manager/field engineers) and a report shall be furnished to EIL/Owner as per format No: HSE-1" Safety walk through report" followed by compliance for unsatisfactory remarks.
- j) As a general practice lifting tools/tackles, machinery, accessories etc. shall be inspected, tested and examined by competent person (approved by concerned State authorities) before being used at site and also at periodical interval (e.g. during replacement, extension, modification, elongation/reduction of machine/parts, etc.) as per relevant statutes. Hydra, cranes, lifting machinery, mobile equipment's/ machinery/ vehicles, etc. shall be inspected regularly by only competent / experienced personnel at site and requisite records for such inspections shall be maintained by contractor. Contractor shall also maintain records of maintenance of all other site machinery (e.g. generators, rectifiers, compressors, cutters, etc.) & portable tools/equipment's being used at project related works (e.g. drills, abrasive wheels, punches, chisels, spanners, etc.). The Contractor shall not make use of arbitrarily fabricated 'derricks' at project site for lifting/ lowering of construction materials.
- k) Site facilities /temporary. installations, e.g. batching plant, cement godown, DG-room, temporary electrical panels/distribution boards, shot-blasting booth, fabrication yards, etc. and site welfare facilities, like labour colonies, canteen/pantry, rest-shelters, motor cycle/bicycle-shed, First-aid centers, urinals/toilets, etc. should be periodically inspected by Contractor (preferably utilizing HR/Admin. personnel to inspect site welfare facilities) and records to be maintained.

3.1.6 Behaviour Based Safety

- a) The contractor shall develop a system to implement Behavior-Based Safety (BBS) through which work groups can identify, measure and change the behaviors of employees and workers towards construction safety aspects.
- b) The BBS process shall include the following:
 - Identify the behaviors critical to achieve required safety performance.
 - Communicate the behaviors and how they are performed correctly by all

- Observe the work force and record safe/at risk behaviors. Intervene with workers to give positive reinforcement when unsafe behaviors are observed. Provide coaching/correction when at risk behaviors are observed
- Collect and record observation data
- Summarize and analyze observation data
- Communicate observation data and analysis results to all employees
- Provide recognition or celebrate when safe behavior improvements occur
- Change behaviors to be observed or change activators or change consequences as appropriate.
- Communicate any changes to workforce
- c) Contractor through its own HSE committee shall implement the above process.
- d) The necessary procedures and Monthly reporting formats shall be developed by the contractor for approval by EIL/Owner.
- e) The HSE committee of contractor shall observe individual's behavior for safe practices adapted for utilization/execution of work for followings a minimum:-
 - PPE
 - Tools & equipment's
 - Hazard Identification & control
 - House keeping
 - Confined space entry
 - Hot works
 - Excavation
 - Loading & unloading
 - Work at height
 - Stacking & storage
 - Ergonomics

3.1.7 Awareness and Motivation

- a) The Contractor shall promote and develop awareness on Health, Safety and Environmental protection among all personnel working for the Contractor.
- b) The contractor shall display safety statistics board at all prominent location. Also shall provide dedicated notice board for displaying of safety alerts or any other safety related notices for awareness site workforces.
- c) Regular awareness programs and fabrication shop/work site meetings at least on monthly basis shall be arranged on HSE activities to cover hazards/risks involved in various operations during construction.
- d) Contractor's workmen & supervisory staff shall participate in common Tool Box Meeting as & when organized/required at site to avoid any incident/accident or occupational disease arising out of multidisciplinary jobs/activities being performed by various contracting agencies in the same location at different elevation.
- e) Contractor to motivate & encourage the workmen & supervisory staff by issuing/ awarding them with tokens/ gifts/ mementos/ monetary incentives/ certificates etc. The motivational program shall be organized on regular basis.
- f) Contractor shall assess & recognize the behavioral change of its site engineers / supervisors periodically and constantly motivate / encourage them to implement HSE practices at project works

3.1.8 Fire Prevention & First-Aid

The Contractor shall arrange suitable First-aid measures such as First Aid Box (Refer Appendix-B for details), stand-by Emergency Vehicle. Additionally separate ambulance with trained personnel/male or female nurse to administer First Aid shall be provided by the Contractor beyond deployment of 500 workmen during day/night working hours.

- a) The Contractor shall arrange installation of fire protection measures such as adequate number of steel buckets with sand & water and adequate number of appropriate portable fire extinguishers (Refer Appendix-C for details) to the satisfaction of EIL/Owner.
- b) The Contractor shall arrange EMERGENCY MOCK DRILL like fire, bomb threat, gas leakage, earth quake, etc. at each site at least once in three months, involving site workmen and site supervisory personnel & engineers. The Contractor shall maintain record of such mockdrills at project site.
- c) The contractor shall require to tie-up with the hospitals located in the neighborhood for attending medical emergency.

3.1.9 Documentation

The Contractor shall evolve a comprehensive, planned and documented system covering the following as a minimum for implementation and monitoring of the HSE requirements and the same shall be submitted for approval by owner/EIL.

- HSE Organogram
- Site specific HSE Plan
- Safety Procedures, forms and Checklist. Indicative list of HSE procedures is attached as Appendix :H
- Inspections and Test Plan
- Risk Assessment & HIRAC for critical works.
- HIRAC Register as per Format no: HSE-19 to identify, assess, analyze & mitigate the construction hazards& incorporate relevant control measures before actually executing site works.
- Environmental Aspect Impact Register as per Format no: HSE-18 (identify, assess, analyze & mitigate the environmental impact & incorporate relevant control measures).
- Legal Register to identify and comply to all applicable HSE related legal requirements.

The monitoring for implementation shall be done by regular inspections and compliance of the observations thereof. The Contractor shall get similar HSE requirements implemented at his sub-contractor(s) work site/office, if applicable. However, compliance of HSE requirements shall be the responsibility of the Contractor. Any review/approval by EIL/Owner shall not absolve contractor of his responsibility/liability in relation to fulfilling all HSE requirements.

3.1.10 Audit

The Contractor shall submit an Audit Plan to EIL/Owner indicating the type of audits covering following as minimum:

- a) Internal HSE audits regularly on six monthly basis by engaging internal qualified auditors (viz safety officers/Construction personnel having 5years experience in construction safety and Lead Auditor Course: OHSAS 18001/ISO 45001 certification).However, minimum two internal HSE audit will have to be conducted irrespective of time period of the contract.
- b) External HSE audits regularly on yearly basis by engaging authorized auditing agencies (viz. National Safety Council etc.) or qualified external auditors (viz safety officers/Construction personnel having 10 years experience in construction safety and Lead Auditor Course : OHSAS 18001/ISO 45001certification). However, minimum one external HSE audit will have to be conducted irrespective of time period of the contract.

All HSE shortfalls/ non-conformances on HSE matters brought out during review/audit, shall be resolved forthwith (generally within a week) by Contractor& compliance report shall be submitted to EIL/Owner.

In addition to above audits by contractor, the contractor's work shall be subjected to HSE audit by EIL/Owner at any point of time during the pendency of contract. The Contractor shall take all actions required to comply with the findings of the Audit Report and issue regular

Compliance Reports for the same to OWNER/ EIL till all the findings of the Audit Report are fully complied.

Failure to carry-out HSE Audits& its compliance (internal & external) by Contractor, shall invite penalization.

3.1.11 Meetings

- i. The Contractor shall ensure participation of his top most executive at site (viz. Resident Construction Manager / Resident Engineer/ Project Manager / Site-in-Charge) in Safety Committee/HSE Committee meetings arranged by EIL/Owner usually on monthly basis or as and when called for. In case Contractor's top most executive at site is not in a position to attend such meeting, he shall inform EIL/Owner in writing before the commencement of such meeting indicating reasons of his absence and nominate his representative – failure to do so may invite very stringent penalization against the specific Contractor, as deemed fit as per Contract. The obligation of compliance of any observations during the meeting shall be always time bound. The Contractor shall always assist EIL/Owner to achieve the targets set by them on HSE management during the project implementation.
- ii. In addition, the Contractor shall also arrange internal HSE meetings chaired by his top most executive at site on fortnightly basis and maintain records. Such internal HSE meetings shall essentially be attended by field engineers / supervisors including safety personnel of the Contractor and its associates. Records of such internal HSE meetings shall be maintained by the Contractor for review by EIL/Owner or for any HSE Audits.
- iii. Agenda of internal HSE meeting should broadly cover: -
 - a) Confirmation of record notes /minutes of previous meeting
 - b) Discussion on outstanding subjects of previous points / subjects, if any
 - c) Incidents / Accidents (of all types) at project site, if any
 - d) Current topics related to site activities / subjects of discussion
 - e) House keeping
 - f) Behavioral Safety
 - g) Information / views / deliberations of members / site sub-contractors
 - h) Report from Owner / Client
 - i) Status of Safety awareness, Induction programs & Training programs

The time frame for such HSE meeting shall be religiously maintained by one and all.

3.1.12 Intoxicating drinks & drugs and smoking

- a) The Contractor shall ensure that his staff members & workers (permanent as well casual) shall not be in a state of intoxication during working hours and shall abide by any law relating to consumption & possession of intoxicating drinks or drugs in force.
- b) The Contractor shall not allow any workman to commence any work at any locations of project activity who is/are influenced / effected with the intake of alcohol, drugs or any other intoxicating items being consumed prior to start of work or working day.
- c) Awareness about local laws on this issue shall form part of the Induction Training and compulsory work-site discipline.
- d) The Contractor shall ensure that all personnel working for him comply with “No-Smoking” requirements of the Owner as notified from time to time. Cigarettes, lighters, auto ignition tools or appliances as well as intoxicating drugs, dry tobacco powder, etc. shall not be allowed inside the project / plant complex.
- e) Smoking shall be permitted only inside smoking booths, if any, exclusively designated & authorized by the Owner/EIL.

3.1.13 Penalty

The Contractor shall adhere consistently to all provisions of HSE requirements. In case of non-compliances and also for repeated failure in implementation of any of the HSE provisions,

EIL/Owner may impose stoppage of work without any cost & time implication to the Owner and/or impose a suitable penalty.

The amount of penalty to be levied against defaulted Contractor shall be up to a cumulative limit of

2.0% (Two percent) of the contract value for Item Rate or Composite contracts with an overall ceiling of 1,00,00,000(Rupees One Crore).

0.5% (Zero decimal five percent) of the contract value for LSTK, OBE, EPC, EPCC or Package contracts with an overall ceiling of 10,00,00,000(Rupees Ten Crores)

This penalty shall be in addition to all other penalties specified elsewhere in the contract. The decision of imposing stop-work-instruction and imposition of penalty shall rest with EIL/Owner. The same shall be binding on the Contractor. Imposition of penalty does not make the Contractor eligible to continue the work in unsafe manner.

The amount of penalty applicable for the Contractor on different types of HSE violations is specified below:

Sl. No.	Violation of HSE Norms	Penalty Amount
1.	For not using personal protective equipment like Helmet, Safety Shoes, and other safety gadgets as applicable as per nature of work.	Rs.500/- per day/Item / Person
2.	Working without Work Permit/Clearance	Rs.20,000/- per occasion
3.	Execution of work without deployment of requisite field engineer / supervisor at work spot	Rs.5,000/- per violation per day
4.	Unsafe electrical practices (not installing ELCB, using poor joints of cables, using naked wire without top plug into socket, laying wire/cables on the roads, electrical jobs by incompetent person, etc.)	Rs.10,000/- per item per day
5.	Working at height without full body harness, using non-standard/ rejected scaffolding and not arranging fall protection arrangement as required, like hand-rails, life-lines, Safety Nets etc.	Rs.10,000/- per case per day
6.	Unsafe handling of compressed gas cylinders (No trolley, jubilee clips double gauge regulator, and not keeping cylinders vertical during storage/handling, not using safety cap of cylinder).	Rs.1,000/- per item per day
7.	Use of domestic LPG for cutting purpose / not using flash back arresters on both the hoses/tubes on both ends.	Rs.5,000/-per occasion
8.	No fencing/barricading of excavated areas / trenches.	Rs.5,000/- per occasion
9.	Not providing shoring/strutting/proper slope and not keeping the excavated earth at least 1.5M away from excavated area.	Rs.5,000/-per occasion
10.	Non display of scaffold tags, caution boards on erected scaffolds.	Rs.1,000/- per occasion per day
11.	Traffic rules violations like over speeding of vehicles, rash driving, talking on mobile phones during vehicle driving, wrong parking, not using seat belts, vehicles not fitted with reverse horn / warning alarms / flicker lamps during foggy weather.	Rs.3,000/-per occasion per day

Sl. No.	Violation of HSE Norms	Penalty Amount
12.	Absence of Contractor's RCM/SIC or his nominated representative (prior approval must be taken for each meeting for nomination) from site HSE meetings whenever called by EIL/Owner & failure to nominate his immediate deputy for such HSE meetings.	Rs.10,000/- per meeting
13.	Failure to maintain HSE records by Contractor Safety personnel, in line with approved HSE Plan/Procedures/Contract specifications.	Rs.10,000/- per month
14.	Failure to conduct daily site safety inspection (by Contractor's Site Engineer & safety officer), internal HSE meeting, internal HSE Awareness/Motivation Program and Site HSE Training at predefined frequencies (as approved in HSE Plan).	Rs.10,000/- per occasion
15.	Failure to fill online/submit the monthly HSE report by 5 th of subsequent month to Engineer-in-Charge/Owner	Rs.10,000/-per occasion and Rs.1,000/-per day of further delay
16.	Poor House Keeping	Rs.5,000 /- per occasion per subject
17.	Failure to report & follow-up accident (including Near Miss) reporting system within specific time-frame.	Rs.20,000/- per occasion
18.	Degradation of environment (not confining toxic spills, spilling oil/lubricants onto ground)	Rs.10,000/- per occasion
19.	Not medically examining the workers before allowing them to work at height / to work in confined space / to work in shot-blasting / to work for painting / to work in bitumen or asphalt works, not providing ear muffs while allowing them to work in noise polluted areas, made them to work in air polluted areas without respiratory protective devices, etc.	Rs.5,000/- per occasion per worker
20.	Violation of any other safety condition as per job HSE plan / work permit and HSE conditions of contract (e.g. using crowbar on cable trenches, improper welding booth, not keeping fire extinguisher ready at hot work site, unsafe rigging practices, non-availability of First-Aid box at site, not providing dead man handle switch for blasting, whiplash arrestor for the compressor line, not using hood with respiratory devices by blaster for shot/grit blasting, etc.)	Rs.5,000/- per occasion
21.	Penalty for non-deployment of ambulance in case of man-power more than 500 or not providing dedicated emergency vehicle in case of man-power less than 500.	Rs.3,000 per day
22.	Failure to carry-out Safety audit in time (internal & external), close-out of identified shortfalls of Observations of Safety Aspects (OSA), etc.	Rs.20,000/- per occasion (for internal audit & OSA). Rs.30,000/-per occasion for external audit
23.	Carrying out sand blasting instead of grit/shot blasting	Rs.50,000/- per day

Sl. No.	Violation of HSE Norms	Penalty Amount
24.	Failure to deploy adequately qualified and competent Safety Officer	Rs.10,000/- per day per Officer
25.	Utilization of hydra/back-hoe loader for material shifting or any other unauthorized /unsafe lifting works	Rs.25,000/- per occasion
26.	Any Fatal Accident	Rs.10,00,000/-per fatality
27.	Any violation not covered above	To be decided by EIL/Owner.

Note: Penalty amount deducted from the contractor shall be utilized by owner/EIC for the promotion of the safety during the currency of the project.

The Contractor shall make his field engineers/supervisors fully aware of the fact that they keep track with the site workmen for their behavior and compliance of various HSE requirements. Safety lapses / defects of project construction site shall be attributable to the concerned job supervisor / engineer of the Contractor, (who remains directly responsible for safely executing field works). For repeated HSE violations, concerned job supervisor / engineer shall be reprimanded or appropriate action, as deemed fit, shall be initiated (with information to EIL & Owner) by the concerned Contractor.

Contractor shall initiate verbal warning shall be given to the worker/employee during his first HSE violation. A written warning shall be issued on second violation and specific training shall be arranged / provided by the Contractor to enhance HSE awareness/skill including feedback on the mistakes/ flaws. Any further violation of HSE stipulations by the erring individuals shall call for his forthright debar from the specific construction site. A record of warnings for each worker/employee shall be maintained by the Contractor, like by punching their cards / Gate passes or by displaying their names at the Project entry gate. Warnings, penalizations, appreciations etc. shall be discussed in HSE Committee meetings by site Head of the Contractor.

3.1.14 Accident/ Incident investigation

All accidents/incidents shall be informed to EIL/Owner at least telephonically by Contractor immediately and in writing within 24 hours on Format No. HSE-2 as applicable, by Contractor. Thereafter, a Supplementary Accident/Incident investigation Report on Format No. HSE-3 shall be submitted to EIL/Owner within 72 hours. Near Miss incident(s), Dangerous accidents/incident shall also be reported on Format No. HSE-4 within 24 hours. The accident/incident shall be investigated by a team of Contractor's senior Site personnel (involving Site-in-Charge or at least by his deputy) for establishing root-cause and recommending corrective & preventive actions. Findings shall be documented and suitable actions taken to avoid recurrences shall be communicated to EIL/Owner. Owner/EIL shall have the liberty to independently investigate such occurrences and the Contractor shall extend all necessary help and cooperation in this regard. EIL/Owner shall have the right to share the content of this report with the outside world.

3.2 House Keeping

The Contractor shall ensure that a high degree of housekeeping is maintained and shall ensure inter-alia; the followings:

- All surplus earth and debris are removed/disposed-off from the working areas to designated location(s).
- Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas are removed to identify location(s).

- c) All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to identified location(s).
- d) Roads shall be kept clear and materials like pipes, steel, sand, boulders, concrete, chips and bricks etc. shall not be allowed on the roads to obstruct free movement of men & machineries.
- e) Fabricated steel structural, pipes & piping materials shall be stacked properly.
- f) Water logging on roads shall not be allowed.
- g) No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.
- h) Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas.
- i) Protective measures to be ensured with projected rebar by suitable means.
- j) Trucks carrying sand, earth and pulverized materials etc. shall be covered while moving within the plant area/ or these materials shall be transported with top surface wet.
- k) The contractor shall ensure that the atmosphere in plant area and on roads is free from particulate matter like dust, sand, etc. by keeping the top surface wet for ease in breathing.
- l) At least two exits for any unit area shall be assured at all times – same arrangement is preferable for digging pits/ trench excavation/ elevated work platforms/ confined spaces etc.
- m) Welding cables and the power cable must be segregated and properly stored and used. The same shall be laid away from the area of movement and shall be free from obstruction.
- n) Schedule for upkeep/cleaning of site to be firmed up and implemented on regular basis.

The Contractor shall carry-out regular checks (minimum one per fortnight) as per format No. HSE-11 for maintaining high standard of housekeeping and maintain records for the same. The Contractor shall provide supervisor for housekeeping exclusively for management of day-to-day housekeeping activities.

3.3 HSE Measures

3.3.1 Construction Hazards

The Contractor shall ensure identification of all Occupational Health, Safety & Environmental hazards in the type of work he is going to undertake and enlist mitigation measures. Contractor shall carry out HIRAC specifically for high risk jobs/critical jobs like

- a) Working at height (+2.0 Mts height) for cold (incl. colour washing, painting, insulation etc.) & hot works.
- b) Work in confined space,
- c) Deep excavations & trench cutting (depth > 2.0 mts.)
- d) Operation & Maintenance of Batching Plant.
- e) Shuttering / concreting (in single or multiple pour) for columns, parapets & roofs.
- f) Erection & maintenance of Tower Crane.
- g) Erection of structural steel members / roof-trusses / pipes at height more than 2.0 Mts. with or without crane.
- h) Erection of pipes (full length or fabricated) at height more than 2.0 Mts. height with Crane of 100T capacity.
- i) All lifts using 100T Crane plus mechanical pulling.
- j) All lifts using two cranes in unison (Tandem Lifting).
- k) Any lift exceeding 80% capacity of the lifting equipments (hydra, crane etc.).
- l) Laying of pipes (isolated or fabricated) in deep narrow trenches – manually or mechanically.
- m) Maintenance of crane / extension or reduction of crane-boom on roads or in yards.

- n) Erection of any item at >2.0 Mts. height using 100T crane or of higher capacity
- o) Hydrostatic test of pipes, vessels & columns and water-flushing.
- p) Radiography jobs (in-plant & open field)
- q) Work in Live Electrical installations / circuits
- r) Handling of explosives & Blasting operations
- s) Demolishing/ dismantling activities
- t) Welding/ gas cutting jobs at height (+2.0 Mts.)
- u) Lifting/placing roof-girders at height (+2.0 Mts.)
- v) Lifting & laying of metallic / non-metallic sheet over roof/structures.
- w) Lifting of pipes, gratings, equipment's/vessels at heights (+2.0 Mts.) with & without using cranes
- x) Calibration of equipment, instruments and functional tests at yards / work-sites.
- y) Operability test of Pump, Motors (after coupling) & Compressors.
- z) Cold or Hot works inside Confined Space.
- aa) Transportation & shifting of ODC consignments into project areas.
- bb) Working in "Charged/Live" elect. Panels
- cc) Stress Relieving works (Electrically or by Gas-burners).
- dd) Pneumatic Tests
- ee) Card board blasting
- ff) Grit Blasting activity
- gg) Catalyst loading/unloading
- hh) Erection/dismantling of scaffolding
- ii) Chemical cleaning

The necessary HSE measures devised shall be put in place, prior to start of an activity & also shall be maintained during the course of works, by the Contractor. Copies of such HIRAC shall be kept available at work sites by the Contractor to enable all concerned carrying out checks / verification.

A list of typical construction hazards along with their effects & preventive measures is given in **Appendix-E**.

3.3.2 Accessibility

- g) The Contractor shall provide safe means of access (in sufficient numbers) & efficient exit to any working place including provisions of suitable and sufficient scaffolding at various stages during all operations of the work for the safety of his workmen and EIL/Owner.
- h) The Contractor shall implement use of all measures including use of "life line", "fall-arresters", "retractable fall arresters", "safety nets" etc. during the course of using all safe accesses & exits, so that in no case any individual remains at risk of slip & fall during their travel.
- i) A ladder or step-ladder must have a level and firm footing, in case of use of fixed ladders, sufficient foot hold and hand hold to be provided.
- j) The access to operating plant / project complex shall be strictly regulated. Any person or vehicle entering such complex shall undergo identification check, as per the procedures in force / requirement of EIL/Owner.
- k) Accessibility to 'confined space' shall be governed by specific system / regulation, as established at project site.

3.3.3 Personal Protective Equipment (PPEs)

- a) The Contractor workmen shall be permitted entry inside the project premises only with proper PPEs.
- b) The Contractor shall ensure that all their staff, workers and visitors including their sub-contractor(s) have been issued (records to be kept) & wear appropriate PPEs like nape strap type safety helmets preferably with head & sweat band with ¾" cotton chin strap (made of

industrial HDPE), High ankle safety shoes with steel toe cap and antiskid sole, Coverall, full body harness (CE marked and conforming to EN361), protective goggles, gloves, ear muffs, respiratory protective devices, etc. All these gadgets shall conform to applicable IS Specifications/CE or other applicable international standards. The Contractor shall implement a regular regime of inspecting physical conditions of the PPEs being issued / used by the workmen of their own & also its sub-agencies and the damaged / unserviceable PPEs shall be replaced forthwith.

- c) Owner/EIL may issue a comprehensive color scheme for helmets to be used by various agencies. The Contractor shall follow the scheme issued by the owner/EIL and shall choose colour other than white (for Owner) or blue (for EIL). All HSE personnel shall preferably wear dark green band on their helmet or green color safety helmet so that workmen can approach them for guidance during emergencies. HSE personnel shall preferably wear such dresses with fluorescent stripes, which are noticeable during night, when light falls on them.
- d) Florescent jackets with respective company logo to be worn by the contractor workmen with different color coding for categories like supervisor and workmen.
- e) Workers required using or handling alkalies, acid or other similar corrosive substance at site shall be provided with appropriate protective equipment, in accordance with MSDS.
- f) For shot blasting, the usage of protective face shield and helmets, gauntlet and protective clothing is mandatory. Such protective clothing should conform relevant IS Specification.
- g) For off-shore jobs/contracts, contractor shall provide PPEs (new) of all types to EIL & Owner's personnel, at his (contractor's) cost. All personnel shall wear life jacket at all time.
- h) An indicative list of HSE standards/codes is given under **Appendix-A**.
- i) Contractor shall ensure procurement & usage of following safety equipment's/ accessories (conforming to applicable IS mark / CE standard) by their staff, workmen & visitors including their subcontractors all through the span of project construction / pre-commissioning/ Commissioning:-
 - i. PPEs (Helmet with company name/logo, Safety Goggles, Coverall, Ear-muff, Face Shield, Hand Gloves, High Ankle Safety Shoes, Gum Boot etc.)
 - ii. Barricading tape / warning signs
 - iii. Rechargeable Safety torch (flame-proof)
 - iv. Safety nets (with tie-chords)
 - v. Fall arresters
 - vi. Portable ladders (varying lengths)
 - vii. Life-lines (steel wire-rope, dia. not less than 8.0 mm)
 - viii. Full body double lanyard Safety harness with Rebar/ladder hook or scaffolding hook.
 - ix. Lanyard
 - x. Karabiner
 - xi. Retractable fall arresters (various length)
 - xii. Portable fire extinguishers (DCP type) – 5 kg&10 kg capacity
 - xiii. Portable Multi Gas detector
 - xiv. Sound level meter
 - xv. Digital lux meter
 - xvi. Fire hoses & flow nozzles
 - xvii. Fire blankets/ Fire retardant cloth (with eyelets)

3.3.4 Working at height

- a) The Contractor shall issue permit for working (PFW) at height after verifying and certifying the checkpoints as specified in the attached permit (Format No. HSE-6). He shall also undertake to ensure compliance to the conditions of the permit during the currency of the permit including adherence of personal protective equipment's. Contractor's Safety Officer shall verify compliance status of the items of permit document after implementation of action is completed by Contractor's execution / field engineers at

work site. HIRAC for specific works at height duly commented by EIL/Owner, shall be kept attached with particular Permit for Work (PFW) at site for ready reference & follow-up.

- b) Such PFW shall be initially issued for one single shift or expected duration of normal work and extended further for balance duration, if required. EIL/Owner can devise block-permit system at any specific area, in consultation with project specific HSE Committee to specify the time-period of validity of such PFW or its renewal. This permit shall be applicable in areas where specific clearance from Owner's operation Deptt./ Safety Deptt. is not required. EIL / Owner's field Engineers/Safety Officers/Area Coordinators may verify and counter sign this permit (as an evidence of verification) during the execution of the job.
- c) All personnel shall be medically examined & certified by registered doctor, confirming their 'medical fitness (Vertigo or epilepsy must be covered under test report) for working at height. The fitness examination shall be done once in six months.
- d) In case work is undertaken without taking sufficient precautions as given in the permit, EIL/Owner Engineers may exercise their authority to cancel such permit and stop the work till satisfactory compliance/rectification is arranged made. Contractors are expected to maintain a register for issuance of permit and extensions thereof including preserving the used permits for verification during audits etc.
- e) The Contractor shall arrange (at his cost) and ensure use of Fall Arrester Systems by his workers. Fall arresters are to be used while climbing/descending tall structures or vessels / columns etc. These arresters should lock automatically against the anchorage line, restricting free fall of the user. The device is to be provided with a double security opening system to ensure safe attachment or release of the user at any point of rope. In order to avoid shock, the system should be capable of keeping the person in vertical position in case of a fall. All the fall arrest systems should be cleaned after use and stored in a clean & dry area. Defective Safety Harness, lanyards & life line must be discarded from workplace and record to be maintained.
- f) The Contractor shall ensure that Full body harnesses with double lanyards conforming EN361 and having authorized CE marking is used by all personnel while working at height. The lanyards and life lines should have enough tensile strength to take the load of the worker in case of a fall. One end of the lanyard shall be firmly tied with the harnesses and the other end with life line. The harness should be capable of keeping the workman vertical in case of a fall, enabling him to rescue himself.
- g) The Contractor shall provide Roof Top Walk Ladders for carrying out activities on sloping roofs in order to reduce the chances of slippages and falls.
- h) The Contractor shall ensure that a proper Safety Net System is used wherever the hazard of fall from height is present. The safety net, preferably a knotted one with mesh ropes conforming to IS 5175/ ISO 1140 shall have a border rope & tie cord of minimum 12mm dia. The Safety Net shall be located not more than 6.0 meters below the working surface extending on either side upto sufficient margin to arrest fall of persons working at different heights.
- i) In case of accidental fall of person on such Safety Net, the bottom most portion of Safety Net should not touch any structure, object or ground.
- j) Grade separators shall be provided in Pipe-rack/Tech-structures to arrest falling objects like welding spatters, welding rods, nuts, bolts, tools etc. and to facilitate U/G and A/G works simultaneously.
- k) Beam Clamps may be used for construction of localized temporary working platforms sheds for welding booths etc. at height in all types of steel structure due to faster installation and requirement of less scaffolding materials.
- l) Hanging Platform, manufactured by Standard HSE equipment vendors must be encouraged for painting of Buildings etc.

- m) All the tools used at height (like spanner, screw driver etc.) shall be provided with securing arrangement like back-pack/waist pouch to prevent accidental slippage from worker hand.
- n) The Contractor shall install temporary lightening arrester in tall structures during construction to save human life and to avoid damage to equipment's & machineries. During the possibility of a thunderstorm, all the work at height where a person can be exposed to lightning shall be stopped.
- o) To the extent possible use Roller arrangement to shift overhead pipes from one end to other in Pipe Racks Area.
- p) Providing of steel scaffold stair tower system with landings at regular intervals as and when required for height work.
- q) The Contractor shall ensure positive isolation while working at different levels like in the pipe rack areas. The working platforms with toe boards & hand rails shall be sufficiently strong & shall have sufficient space to hold the workmen and tools & tackles including the equipment's required for executing the job. Such working platforms shall have mid-rails, to enable people work safely in sitting posture.

3.3.5 Scaffoldings & Barricading

- a) Suitable steel scaffoldings only shall be provided to workmen for all works that cannot be safely done from the ground or from solid construction except such short period work that can be safely done using ladders or certified (by 3rd party competent person) man-basket. When a ladder is used, an extra workman shall always be engaged for holding the ladder. The ladder shall be inspected before use for cracked or split stiles, missing, broken, loose or damaged rungs & splinters. The ladder shall be of adequate length to enable it to extend to at least 1.0m above the landing place or working point. Metallic ladders shall be only used as access.
- b) The Contractor shall ensure that the scaffolds used during construction activities shall be strong enough to take the designed load. Main Contractor shall always furnish duly approved construction-design details of scaffold & SWL (from competent designers) free of charge, before they are being installed/ constructed at site. Owner/EIL reserves the right to ask the Contractor to submit certification and or design calculations from his Head Office/ Design/Engineering expert regarding load carrying capacity of the scaffoldings. All steel tubing, couplers and fittings used for scaffolding shall conform to IS 3696 or an acceptable equivalent. Only metallic scaffold boards shall be allowed to use. Steel tubes shall be free from cracks, splits. Surface flaws & other defects. All couplers & fittings shall be properly oiled and maintained. Nuts shall have a free running fit on their bolts. Bolts with worn or damaged thread shall be replaced.
- c) All scaffolds shall be inspected by a competent Scaffolding Inspector (person with scaffolding related experience in construction field and having a training of scaffolding supervisor from a institute/agency like National Safety Council etc.). He shall paste a GREEN tag (duly signed by competent Scaffolding Inspector) on each scaffold found safe and a RED tag (duly signed by competent Scaffolding Inspector) on each scaffold found unsafe. Scaffolds with GREEN tag only shall be permitted to be used and Scaffolds with RED ones shall immediately be made inaccessible. Work being found continuing on scaffolds with RED tag shall be considered unauthorized work by Contractor and may invite penalization from EIL/Owner. For every 120-125 m² /m³ area / volume or its parts there of minimum one TAG shall be provided.
- d) The Contractor shall ensure positive barricading (indicative as well as protective) of the excavated, radiography, heavy lift, high pressure hydrostatic & pneumatic testing and other such areas. Sufficient warning signs shall be displayed along the barricading areas.
- e) Scaffolding shall be constructed using foot seals or base plates only. Base plates shall be used below each standard on surface. Sole plate of timber shall be used beneath the base plate to achieve greater load distribution.

3.3.6 Electrical installations

- a) All electrical installations/ connections shall be carried out as per the provisions of latest revision of following codes/standards, in addition to the requirements of Statutory Authorities and IE/applicable international rules& regulations:
 - OISD STD 173 : Fire prevention & protection system for electrical installations
 - SP 30 (BIS) : National Electric Code
- b) All electrical installations shall be approved by the concerned statutory authorities.
- c) All temporary electrical installations / facilities shall be regularly checked by the licensed/competent electricians of the Contractor and appropriate records shall be maintained in format no: HSE-12" Inspection of temporary electrical booth/installation at project construction site". Such inspection records are to be made available to EIL/Owner, whenever asked for.

3.3.6.1 The Contractor shall meet the following requirements:

- a. Shall make Single Line Diagram (SLD) for providing connection to each equipments & machinery and the same (duly approved by EIL/Owner) shall be pasted on the front face of DBs (distribution boards) or JBs (Junction boxes) at every site.(A typical Switch Board Sketch is attached as Appendix -G)
- b. Ensure that electrical systems and equipment including tools & tackles used during construction phase are properly selected, installed, used and maintained as per provisions of the latest revision of the Indian Electrical/ applicable international regulations.
- c. Shall deploy qualified & licensed electricians for proper & safe installation and for regular inspection of construction power distribution system/points including their earthing. A copy of the license shall be submitted to EIL / Owner for records. Availability of at least one competent (ITI qualified) / licensed electrician (by State Elec. authorities) shall be ensured at site round the clock to attend to the normal/emergency jobs.
- d. All switchboards / welding machines shall be kept in well-ventilated & covered shed/ with rain shed protection. The shed shall be elevated from the existing ground level to avoid water logging inside the shed. Installation of electrical switch board must be done taking care of the prevention of shock and safety of machine.
- e. No flammable materials shall be used for constructing the shed. Also flammable materials shall not be stored in and around electrical equipment / switchboard. Adequate clearances and operational space shall be provided around the equipment.
- f. Fire extinguishers and insulating mats shall be provided in all power distribution centers.
- g. Temporary electrical equipment shall not be employed in hazardous area without obtaining safety permit.
- h. Proper housekeeping shall be done around the electrical installations.
- i. All temporary installations shall be tested before energizing, to ensure proper earthing, bonding, suitability of protection system, adequacy of feeders/cables etc.
- j. All welders shall use hand gloves irrespective of holder voltage.

- k. Multilingual (Hindi, English and local language) caution boards, shock treatment charts and instruction plate containing location of isolation point for incoming supply, name & telephone No. of contact person in emergency shall be provided in substations and near all distribution boards / local panels.
- l. ELCB tester /test meter shall be used for testing the ELCBs operation. ELCBs testing shall be carried out by using ELCB tester on monthly basis but in specific cases like heavy rain as decided by owner/EIC. Record of the testing shall be maintained.
- m. Regular inspection of all installations at least once in a month. (Ref. **Format HSE-12**).

3.3.6.2 The following features shall also be ensured for all electrical installations during construction phase by the contractor:

- a. Each installation shall have a main switch with a protective device, installed in an enclosure adjacent to the metering point. The operating height of the main switch shall not exceed 1.5 M. The main switch shall be connected to the point of supply by means of armoured cable.
- b. The outgoing feeders shall be double or triple pole switches with fuses / MCBs. Loads in a three phase circuit shall be balanced as far as possible and load on neutral should not exceed 20% of load in the phase.
- c. The installation shall be adequately protected against overload, short circuit and earth leakage by the use of suitable protective devices. Fuses wherever used shall be HRC type. Use of rewirable fuses shall be strictly prohibited. ELCB/RCCB (Residual Current Circuit Breaker) must be fitted with all Electrical installation. The earth leakage devices shall have an operating current not exceeding 30 mA.
- d. All connections to the hand tools / welding receptacles shall be taken through proper switches, sockets and plugs.
- e. All single phase sockets shall be minimum 3 pin type only. All unused sockets shall be provided with socket caps.
- f. Only 3 core (P+N+E) overall sheathed flexible cables with minimum conductor size of 1.5 mm² copper shall be used for all single phase hand tools.
- g. Only metallic distribution boxes with double earthing shall be used at site. No wooden boxes shall be used.
- h. All power cables shall be terminated with compression type cable glands. Tinned copper lugs shall be used for multi-strand wires / cables.
- i. Cables shall be free from any insulation damage.
- j. Minimum depth of cable trench shall be 750 mm for MV & control cables and 900 mm for HV cables. These cables shall be laid over a sand layer and covered with sand, brick & soil for ensuring mechanical protection. Cables shall not be laid in waterlogged area as far as practicable. Cable route markers shall be provided at every 25 M of buried trench route.

When laid above ground, cables shall be properly cleated or supported on rigid poles of atleast 2.1 M high. Minimum head clearance of 6 meters shall be provided at road crossings.

- k. Underground road crossings for cables shall be avoided to the extent feasible. In any case no underground power cable shall be allowed to cross the roads without pipe sleeve.
- l. All cable joints shall be done with proper jointing kit. No taped/temporary joints shall be used.
- m. An independent earthing facility should preferably be established within the temporary installation premises. All appliances and equipment shall be adequately earthed. In case of armored cables, the armour shall be bonded to the earthing system. IS: 3043 Code for earthing practices shall be followed at project site.
- n. All cables (green colour) and wire rope used for earth connections shall be terminated through tinned copper lugs.
- o. In case of local earthing, earth electrodes shall be buried near the supply point and earth continuity wire shall be connected to local earth plate for further distribution to various appliances. All insulated wires for earth connection shall have insulation of green colour. Periodical check tests of all electrodes should be carried out and record shall be maintained of such checks.
- p. Separate core shall be provided for neutral. Earth / Structures shall not be used as a neutral in any case.
- q. ON/OFF position of all switches shall be clearly designated / painted for easy isolation in emergency.

3.3.7 Welding/ Grinding/Gas cutting

- a) Contractor shall ensure that flash back arrestors conforming to BS:6158 or equivalent are installed on all gas cylinders as well as at the torch end of the gas hose, while in use.
- b) All cylinders shall be mounted on trolleys and provided with a closing key. Empty & filled-up gas cylinders shall be stored separately with TAG, protecting them from direct sun or rain. Minimum 2 nos. of Portable DCP type fire extinguishers (10 kg) shall be maintained at the gas cylinder stores. Stacking & storing of compressed gas cylinders shall be arranged away from DG set, hot works, Elect. Panels / Elec. boards, etc.
- c) The burner and the hose placed downstream of pressure reducer shall be equipped with Flash Back Arrestor/Non Return Valve device.
- d) The hoses for acetylene and oxygen cylinders must be of different colours. Their connections to cylinders and burners shall be made with a safety collar.
- e) At end of work, the cylinders in use shall be closed and hoses depressurized.
- f) Cutting of metals using gases, other than oxygen & acetylene, shall require written concurrence from Owner.
- g) Grinding activity shall not be carried out in confined spaces without a valid work permit.
- h) All grinding/cutting machines shall be guarded and fitted with Dead-Man switch and this shall not be bypassed any time.
- i) All welding/grinding machines shall have effective earthing at least at distinctly isolated two points.
- j) In order to help maintain good housekeeping, and to reduce fire hazard, live electrode bits shall be contained safely and shall not be thrown directly on the ground.
- k) The hoses of Acetylene and Oxygen shall be kept free from entanglement & away from common pathways / walkways and preferably be hanged overhead in such a manner which can avoid contact with cranes, hydra or other mobile construction machinery.

- l) Hot spatters shall be contained / restricted appropriately (by making use of effective fire-retardant cloth/fabric) and their flying-off as well as chance of contact with near-by flammable materials shall be stopped. The Fire retardant blanket shall be woven from ceramic yarn with eyelets.
- m) The Contractor shall arrange adequate systems & practices for accumulation / collection of metal & other scraps and remnant electrodes and their safe disposal at regular interval so as to maintain the fabrication and other areas satisfactorily clean & tidy.
- n) All gas cylinders must have a cylinder cap on at all times when not in use.

3.3.8 Ergonomics and tools & tackles

- a) The Contractor shall assign to his workmen, tasks commensurate with their qualification, experience and state of health. Competency of the crane operator to be thoroughly checked prior to engaging in crane operation.
- b) All lifting tools, tackles, equipment, trailers, trucks/dumpers, accessories including cranes shall be tested periodically by statutory/competent authority for their condition and load carrying capacity. Valid test & fitness certificates from the applicable authority shall be submitted to Owner/EIL for their review/acceptance before the lifting tools, tackles, equipment, trailers, trucks/dumpers, accessories and cranes are used. Third party inspection certificate is mandatory for all lifting tools & tackles before put into use.
- c) Load testing of Cranes by competent person must be made mandatory after each modification/alteration of crane configuration/change in boom length. All heavy equipment's including cranes must be maintained in good condition & record of such maintenance shall be maintained. Routine preventive maintenance of the crane to be carried out & record to be maintained for such preventive maintenance. Healthiness of the crane to be checked by Crane Expert on regular basis as per manufacturer guidelines.
- d) HIRAC/JSA for assembly/dismantling activity of the crane to be submitted for approval of EIC.
- e) No one should stand/work below the mast & boom of the crane. Mast of the crane should not be used for unintended lifts.
- f) Mast of the crane to be kept in right position during dismantling activity of the crane.
- g) Log book of all crane to be maintained.
- h) Only authorized person shall be allowed to give signal to the operator.
- i) Lifting/Loading/Unloading activities shall be carried out by the trained riggers under supervision of rigging Foreman.
- j) Prior to marching/movement of the crane, obstructions free access/route to be ensured.
- k) Skilled Technician to be engaged for AC gas checking and refilling of refrigerant and should follow the safe operating procedure for cranes.
- l) Manufacturer's instructions to be followed without any deviation.
- m) The contractor shall not be allowed to use defective equipment or tools not adhering to safety norms.
- n) Adequate capacity of Chain pulley blocks with valid TPI certificate to be used for lifting/lowering/dragging/erection of piping material .
- o) Colour coding system for lifting tools & tackles shall be followed on quarterly basis for a particular colour as mentioned below:

Period	Colour Code
January, February, March	Blue
April, May, June	Yellow
July, August, September	Green
October, November, December	Orange
For Quarantine (Unsafe Tools & Tackles)	Red

Contractor shall arrange non-sparking tools for project construction works in operating plant areas / hydrocarbon prone areas.

- i. Wherever required the Contractor shall make use of Elevated Work Platforms (EWP) or Aerial Work Platforms (mobile or stationary) to avoid ergonomical risks and workmen shall be debarred to board such elevated platform during the course of their shifting / transportation.
- ii. Contractor shall ensure installation of Safe Load Indicator (SLI) on all cranes (while in use) to minimize overloading risk. SLI shall have capability to continuously monitor and display the load on the hook, and automatically compare it with the rated crane capacity at the operating condition of the crane. The system shall also provide visual and audible warnings at set capacity levels to alert the operator in case of violations.
- iii. The contractor shall be responsible for safe operations of different equipments mobilized and used by him at the workplace like transport vehicles, Tower Crane, engines, cranes, mobile ladders, scaffoldings, work tools, etc. Strictly avoid standing close to Hydra/vehicles tyres during operation.
- iv. In general Man basket shall not be lifted by Hydra. Generally Crane shall be used for lifting the man basket.
- v. Tower Crane, Crane, Hydra mobile Crane (F-15 or equivalent), Hydraulic Rig & Boom Lift shall be inspected on fortnightly basis as per Format No. HSE-20, HSE-21, HSE-22, HSE-23 & HSE-24.
- vi. The Contractor shall arrange periodical training for the operators of hydra mobile crane, crane, excavator, mobile machinery, Tower Crane, etc. at site by utilizing services from renowned manufacturers.
- vii. Hydra mobile crane (F-15 or equivalent) having steering control mechanism shall be permitted at construction site only for the purpose of loading/unloading. However, continuous rigger availability during marching of hydraulic crane at site shall be ensured by contractor.

3.3.9 Occupational Health

- a) The contractor shall identify all operations that can adversely affect the health of its workers and issue & implement mitigation measures.
- b) For surface cleaning operations, sand blasting shall not be permitted even if not explicitly stated elsewhere in the contract.
- c) To eliminate radiation hazard, Tungsten electrodes used for Gas Tungsten Arc Welding shall not contain Thorium.
- d) Appropriate respiratory protective devices (hood with respiratory devices) shall be used to protect workmen from inhalation of air borne contaminants like silica, asbestos, gases, fumes, etc.
- e) Workmen shall be made aware of correct methods for lifting, carrying, pushing & pulling of heavy loads. Wherever possible, manual handling shall be replaced by mechanical lifting equipment's.
- f) In view of the congested working environment and associated hazards, deployment of manpower/machineries shall be in staggered manner keeping adequate safe distance between two adjacent work spot.
- g) For jobs like drilling/demolishing/dismantling/steam blowing/cardboard blasting etc. where noise pollution exceeds the specified limit of 85decibels, ear muffs shall be provided to the workers. The Noise level monitoring record shall be maintained.
- h) To avoid work related upper limb disorders (WRULD) and backaches, Display Screen Equipments' workplace stations shall be carefully designed & used with proper sitting postures. Power driven hand-held tools shall be maintained in good working condition to minimize their vibrating effects and personnel using these tools shall be taught how to operate them safely & how to maintain good blood circulation in hands.

- i) The Contractor shall arrange health check-up (by registered medical practitioner) for all the workers at the time of induction. Health check may have to be repeated if the nature of duty assigned to him is changed necessitating health check or doubt arises about his wellness. EIL/Owner reserves the right to ask the contractor to submit medical test reports. Regular health check-ups are mandatory for the workers assigned with Welding, Radiography, Blasting, Painting, Heavy Lift and Height (>2m) jobs. All the health check-ups shall be conducted by registered Medical practitioner and records are to be maintained by the Contractor.
- j) The Contractor shall arrange Medical Camps at regular intervals at work sites and labor colonies to assess health condition of workers.
- k) The Contractor shall ensure vaccination of all the workers including their families, during the course of entire project span.

3.3.10 Hazardous substances

- a) Hazardous, inflammable and/or toxic materials such as solvent coating, thinners, anti-termite solutions, water proofing materials shall be stored in appropriate containers preferably with lids having spillage catchment trays and shall be stored in a good ventilated area. These containers shall be labeled with the name of the materials highlighting the hazards associated with its use and necessary precautions to be taken. Respective MSDS (Material Safety Data Sheet) shall be made available at site & may be referred whenever problem arises.
- b) Where contact or exposure of hazardous materials are likely to exceed the specified limit or otherwise have harmful effects, appropriate personal protective Equipment's such as gloves, goggles/face-shields, aprons, chemical resistant clothing, respirator, etc. shall be used.
- c) The work place shall be checked prior to start of activities to identify the location, type and condition of any asbestos materials which could be disturbed during the work. In case asbestos material is detected, usage of appropriate PPEs by all personnel shall be ensured and the matter shall be reported immediately to EIL/ Owner.

3.3.11 Slips, trips & falls

- a) The contractor shall establish a regular cleaning and basic housekeeping programme that covers all aspects of the workplace to help minimize the risk of slips, trips & falls. The contractor shall take positive measures like keeping the work area tidy, storing waste in suitable containers & harmful items separately, keeping passages, stairways, entrances & exits especially emergency ones clear, cleaning up spillages immediately and replacing damaged carpet/ floor tiles, mats & rugs at once to avoid slips, trips & falls.
- b) Grating removal permit system should be implemented during construction phase. So that after permanent gratings are installed on platforms and tech structure floors; removal of any gratings for whatever purpose (including for lifting piping material etc.) is required to be sanctioned by signed permit by HSE officers of both contractor and Engineer-in-charge. The spot where gratings are removed shall be hard-barricaded during course of work. The removed gratings shall be re-installed immediately after completion of work or at the time of cessation of work every day whichever is earlier and the permit shall be closed on daily basis. A register shall be maintained for recording all the grating removal permits and their closure shall be monitored on daily basis.

3.3.12 Radiation exposure

- a) All personnel exposed to physical agents such as ionizing & non-ionizing radiation, including ultraviolet rays or similar other physical agents shall be provided with adequate shielding or protection commensurate with the type of exposure involved.

- b) For Open Field Radiography works, requirements of Bhabha Atomic Research Centre (BARC)/ Atomic Energy Regulatory Board (AERB) shall be followed.
- c) The Contractor shall implement an effective system of control (as described in the AERB regulations) at site for handling radiography-sources & for avoiding its misuse & theft.
- d) The contractor shall generate the Format No: HSE-8 "Permit for radiation work" before start of work.
- e) In case the radiography work has to be carried out at day time, suitable methodology to be used so that other works, people are not affected.

3.3.13 Explosives/Blasting operations

- a) Blasting operations shall be carried out as per latest Explosive Rules (Indian/ International) with prior permission. The Contractor shall obtain license from Chief Controller of Explosives (CCoE) for collection, transportation, storage of explosives as well as for carrying out blasting operations.
- b) The Contractor shall prepare exclusive method statement (in cognizance with statutory requirements) for rock blasting works & diffusing unfired explosives, if any, at project site before carrying out actual task. Nowhere blasting shall be carried out by the Contractor or its agency without the involvement of competent supervisor and licensed blaster.

3.3.14 Demolition/ Dismantling

- a) The contractor shall adhere to safe demolishing/ dismantling practices at all stages of work to guard against unsafe working practices.
- b) The contractor shall disconnect service lines (power, gas supply, water, etc.)/ make alternate arrangements prior to start of work and restore them, if required as directed by EIL/ Owner at no extra cost.
- c) Before carrying out any demolition/dismantling work, the contractor shall take prior approval of EIL/Owner and generate the Format No.HSE-9. For revamp jobs in operating plants where location of underground utilities is not known with certainty, the contractor shall depute an experienced engineer for supervision and shall make adequate arrangements for Fire-fighting & First-Aid during the execution of these activities.
- d) The Contractor shall arrange approved HIRAC/ Method Statement for the specific demolition / dismantling task and corresponding action plan commensurate with hazards / risks associated therein. In no case any activity related to demolition / dismantling shall be carried out by the Contractor without engaging own supervision / field engineer.

3.3.15 Road Safety

- a) The Contractor shall ensure adequately planned road transport safety management system.
- b) The vehicles shall be fitted with reverse warning alarms & flashing lights / fog-lights and usage of seat belts shall be ensured.
- c) The Contractor shall also ensure a separate pedestrian route for safety of the workers and comply with all traffic rules & regulations, including maintaining speed limit of 20 KMPH or indicated by owner for all types of vehicles / mobile machinery. The maximum allowable speed shall be adhered to.
- d) In case of an alert or emergency, the Contractor must arrange clearance of all the routes, roads, access. The Contractor shall deploy sufficient number of traffic controllers at project site routes / roads/ accesses, to alert reversing movement of vehicles & machinery as well as pedestrians. Experienced drivers/operators with valid driving license (LMV/HMV) shall be allowed to drive/operate the vehicles/ equipments. The Contractor shall maintain copy of PUC, RC and Insurance etc. for all the vehicles/ equipments.
- e) Dumpers, Tippers, etc. shall not be allowed to carry workers within the plant area and also to & from the labour colony to & from project sites.

- f) Hydra mobile crane (F-15 or equivalent) shall only be allowed for handling (loading/unloading) the materials at fabrication/ storage yards and in no case shall be allowed to transport the materials over project / plant roads.
- g) The Contractor shall not deploy any such mobile machinery / Equipment's, which do not have competent operator and / or experienced banks-man/signal-man. Such machinery/equipment's shall have effective limit-switches, reverse-alarm, front & rear-end lights etc. and shall be maintained in good working order.
- h) The Contractor shall not carry-out maintenance of vehicles / mobile machinery occupying space on project / plant roads and shall always arrange close supervision for such works.
- i) For pipeline jobs, the contractor shall submit a comprehensive plan covering transportation, loading / unloading of pipes, movement of side booms, movement of vehicles on the ROW, etc.
- j) Height barrier/Restriction to be provided on both side of the HT lines, if required.
- k) Contractor's shall arrange /install visible road signs, diversion boards, caution boards, etc. on project roads for safe movement of men and machinery.

3.3.16 Welfare measures

Contractor shall, at the minimum, ensure the following facilities at work sites:

- a) A crèche at site where 10 or more female workers are having children below the age of 6 years.
- b) Adequately ventilated / illuminated rooms at labour camps & its hygienic up-keeping.
- c) Reasonable canteen facilities at site and in labour camps at appropriate location depending upon site conditions. Contractor shall make use of "industrial" variety of LPG cylinder & satisfactory illumination at the canteens. Necessary arrangement for efficient disposal of wastes from canteens & urinals /toilets shall also be made and regular review shall be made to maintain the ambience satisfactorily hygienic & shall also comply with all applicable statutory requirements.
- d) Adequately lighted & ventilated Rest rooms at site (separate for male workers and female workers).
- e) Provision for suitable mobile toilets to be made available by Contractor for remote/scattered job locations.
- f) Urinals, Toilets, drinking water, washing facilities, adequate lighting at site and labour camps, commensurate with applicable Laws/ Legislation.
- g) The contractor shall ensure the test report of drinking water.
- h) The contractor at periodic interval shall arrange to prevent mosquito breeding by fumigation/spraying of insecticides at workplace/fabrication yard.

3.3.17 Environment Protection

Contractor shall ensure proper storage and utilization methodology of materials that are detrimental to the environment. Where required, Contractor shall ensure that only the environment friendly materials are selected and emphasize on recycling of waste materials, such as metals, plastics, glass, paper, oil & solvents. The waste that cannot be minimized, reused or recovered shall be stored and disposed of safely. In no way, toxic spills shall be allowed to percolate into the ground. The contractor shall not use the empty areas for dumping the wastes.

The contractor shall ensure availability of stack emission test report of DG set.

Contractor to submit Environmental Aspect Impact Register detailing the list of activities in his scope, the respective environmental impact and the actions taken to minimize the impact. Environmental Aspect Impact Register to be prepared as per Format HSE-18 and to be updated and maintained till job completion.

The contractor shall strive to conserve energy and water wherever feasible.

The contractor shall ensure dust free environment at workplace by sprinkling water on the ground at frequent intervals. The air quality parameters for dust, poisonous gases, toxic releases, harmful radiations, etc. shall be checked by the contractor on daily basis and whenever need arises.

The contractor shall not be allowed to discharge chemicals, oil, silt, sewage, sullage and other waste materials directly into the controlled waters like surface drains, streams, rivers, ponds. A discharge plan suggesting the methods of treating the waste before discharging shall be submitted to EIL/Owner for approval.

For pipeline jobs, top soil shall be stacked separately while making ROW through fields. This fertile soil shall be placed back on top after backfilling.

For offshore construction barges, arrangements shall be made for safe disposal of human, food & other wastes and applicable laws in this regard shall be followed.

3.3.18 Rules & Regulations

All persons deployed at site shall be knowledgeable of and comply with the environmental laws, rules & regulations relating to the hazardous materials, substances and wastes. Contractor shall not dump, release or otherwise discharge or disposes off any such materials without the express authorization of EIL/Owner. An indicative list of Statutory Acts & Rules relating to HSE is given under Appendix-D.

3.3.19 Weather Protection

Contractor shall take appropriate measures to protect workers from severe storms, rain, solar radiations, poisonous gases, dust, etc. by ensuring proper usage of PPEs like Sun glasses, Sun screen lotions, respirators, dust masks, etc. and rearranging/ planning the construction activities to suit the weather conditions. Effective arrangement (without creating inconvenience to project facilities & permanent installations) for protecting workmen from hailstorm, drizzle in the form of temporary shelter shall be made at site.

3.3.20 Communication

All persons deployed at the work site shall have access to effective means of communication so that any untoward incident can be reported immediately and assistance sought by them.

All health & safety information shall be communicated in a simple & clear language easily understood by the local workforce.

For information to all, typical subjects that should be communicated are: -

Inside the company (Top to down)

- a. Quality Policy
- b. HSE Policy contents
- c. Environment Policy
- d. HSE Objectives
- e. Safety Cardinal Rules
- f. HSE Target – reached or missed
- g. Praises & Warnings to personnel for HSE Management
- h. Safety Walk Through Reports and safety defects / shortfalls (by management)
- i. HSE Audit results
- j. Revised Statutory Health & Safety provisions, if any

- k. H & S publicity
- l. Suggestions

Inside the Company (Bottom to up)

- a. Complaints
- b. Compliances on safety defects / shortfalls
- c. Suggestions
- d. Proposals for changes & improvements
- e. HSE Reports (including near-miss reports)

3.3.21 Confined Space Entry

The contractor shall generate a work permit (Format No. HSE -7) before entering a confined space. People, who are permitted to enter into confined space, must be medically examined & certified by registered doctor, confirming their 'medical fitness for working in confined space'. All necessary precautions mentioned therein shall be adhered to. An attendant shall be positioned outside a confined space for extending help during an emergency. Effective communication shall be maintained between personnel in confined space and outside by combination of visual/voice or portable radio. Compressed gas cylinders shall not be taken into confined space. Entry Register for confined space to be maintained with the name and time of entry/exit. All appropriate PPEs and air quality parameters shall be checked before entering a confined space. It shall be ensured that the piping of the equipment which has to be opened is pressure-free by checking that blinds are in place, vents are open and volume is drained. Inside confined space works, only electrical facilities / installations of 24V shall be permitted. Contractor shall ensure usage of safe & suitable arrangement of oxygen supply for individual workmen (during the course of work in confined space), if oxygen concentration is found to be less than 19.5% (v/v) there. All persons must be made aware of the risk associated with Nitrogen & all precautionary measures shall be taken when vessel/sphere/pipelines etc. are being purged with nitrogen.

Rescue arrangement must be readily available at workplace to fulfill requirement of the emergency situation.

3.3.22 Heavy Lifts

- a) The contractor shall submit detailed rigging study/ plan for EIL/ Owner approval prior to lifting equipment requiring a crane of approx. 100 MT capacity or more due to constraints of its dimensions, location of foundation height, approach & weight.
- b) Contractor shall generate the format no. HSE-15 "Permit for heavy lift/critical erection"
- c) The Safe Working Load (SWL) and manufacturer's serial numbers shall be clearly marked on the slings and the lifting gears, either by tagging, stamping, engraving or embossing.
- d) Prior to actual lifting activities, contractor shall check the validity of the crane inspection certificate issued by statutory/ competent authority. This requirement shall also apply to all rigging equipments utilized for the job.
- e) The contractor shall, at all times, be responsible for all rigging activities.
- f) The Contractor shall ensure medical fitness of all workmen who are engaged / involved in erection of equipments, vessels etc. and such fitness checks shall be carried-out every six months interval with the help of a registered medical practitioner & record shall be maintained
- g) Adequate safety measures such as positive barricading, usage of appropriate PPEs, permit to work, etc. shall be taken during all heavy or critical lifts.
- h) Ground condition should be suitable to sustain the Ground Bearing Load of the Crane with full load condition.

- i) For lifting any material (irrespective of shape, size or volume), at any height, it is always advisable to prepare a Plan of Erection (PoE) taking into consideration hazards & risks associated therein – this can enable people to put their own experiences of various natures & side-by-side establish a practical method for risk-free erection / lifts. The contractor shall prepare PoE & shall document the same, when risks are identified as “medium” or “high” and the same shall be approved by its competent / qualified engineer.

3.3.23 Key Performance Indicators

The contractor shall measure an activity in both leading & trailing indicators for statistical and performance measurement. The activities pertaining to key performance indicators are covered in Monthly HSE Report (Format No. HSE-5). The contractor shall try to achieve a statistically fair record and strive for its continual improvement.

Leading Indicators viz:-

- Number of Safety Inductions carried-out at site (for workmen & staff members)
- Number of HSE inspections carried out
- Number of “Safety Walk Through” carried-out by site-head.
- Number of HSE shortfalls / lapses identified per contractor & closed-out in time.
- Number of Safety Meetings conducted (in-house / with contractors)
- Number of HSE Audits made (internal & external) vis-à-vis non conformances raised
- Number of HSE Awareness / Motivational program conducted by contractors
- Number of HSE Trainings conducted at site for supervisors & workmen
- Study of Near miss case reported
- Encouragements / Awards / Recognitions to workmen, job supervisors & field engineers.
- Suggestions for improvement

Trailing Indicators viz:-

- Calculation of HSE statistics viz frequency rate, severity rate, LTA free man hours etc.
- Analysis of incidents / accidents (nature, severity, types etc.)
- Study of Incident / Accident with respect to :-
 - Variety
 - Period of the year / project span
 - Timings of the incident / accident
 - Age profile of victims
 - Body parts involved
 - Penalty levied for causing incident / accident

3.3.24 Unsuitable Land Conditions

Contractor shall take appropriate measures and necessary work permits/clearances if work is to be done in or around marshy areas, river crossings, mountains, monuments, etc. The Contractor shall make right assessment and take all necessary action for developing work areas to make them safe & suitable for crane operations or other vehicular movement before carrying out any project related activity / operation. Contractor shall take all necessary actions to make the surroundings of its site establishments (site office, stores, lay-down area etc.) work-worthy safe and secure.

3.3.25 Under Water Inspection

Contractor shall ensure that boats and other means used for transportation, surveying & investigation works shall be certified seaworthy by a recognized classification society. It shall be equipped with all life saving devices like life jackets, adequate fire protection arrangements

and shall possess communication facilities like cellular phones, wireless, walkie-talkie. All divers used for seabed surveys, underwater inspections shall have required authorized license, suitable life-saving kit. Number of hours of work by divers shall be limited as per regulations. EIL/ Owner shall have the right to inspect the boat and scrutinize documents in this regard.

3.3.26 Excavation

The Contractor shall obtain permission from competent authorities prior to excavation wherever required.

The Contractor shall locate the position of buried utilities (water line, cable route, etc.) by referring to project / plant drawing / in consultation with EIL/Owner. The Contractor shall start digging manually to locate the exact position of buried utilities & thereafter use mechanical means.

In case of non-availability of sufficient data/drawings, underground services i.e. underground cable/ pipe shall be checked by cable detector/pipe locator by the contractor.

The Contractor shall keep soil heaps at least 1.5 M away from edge or a distance equal to depth of pit (whichever is more)

All excavated pits greater than 10 Sq.M plan area and depth more than 1.5M shall have at least two access routes for ingress and egress. Also, additional access routes shall be provided such that distance between any two access routes shall not be more than 20M.

The Contractor shall maintain sufficient “angle of repose” during excavation – shall also provide slope or suitable bench as decided by EIL / Owner.

The Contractor shall arrange “battering” or “benching” wherever required for preventing collapse of edge of excavations.

Avoid vertical wall of less than 2mtrs between two adjacent deep excavated pit/area. Further deep excavation should not be kept open for a longer duration.

The Contractor shall identify & arrange de-watering pump or well-point system to prevent earth collapse due to heavy rain / influx of underground water.

The Contractor shall arrange protective fencing/hard barricading with warning signal around excavated pits, trenches, etc. along with minimum 2 (two) entries, exits / escape ladders.

The Contractor must avoid “underpinning” / under-cutting to prevent collapse of chunk of earth during excavation.

The Contractor shall use “stoppers” to prevent over-run of vehicle wheels at the edge of excavated pits / trenches. Vehicles movement should be restricted to minimum three meters away from the excavated pit.

The Contractor shall arrange strengthening of “shoring” & “strutting” proactively to avoid collapse of earth / edges due to vehicular movement in close proximity of excavated areas / pits/ trenches, etc.

3.4 Tool Box Talks (TBT)

Contractor shall conduct daily TBT with workers prior to start of work and shall maintain proper record of the meeting. A suggested format is given below. The Job specific TBT is to be conducted by the immediate supervisor of the workers.

The Contractor shall conduct TBT before start of every morning or evening shift or night shift activities, for alerting the workers on specific hazards and their appropriate dos & don'ts. The Contractor shall provide sufficient rests to the site workmen and their foremen to avert fatigue & thereby endangering their lives during the course of site works.

TOOLBOX TALK RECORDING SHEET		
Date & Time		
Work Location		
Subject (Nature of work)		
Presenter		
Hazards involved		
Precautions to be taken		
Worker's Name	Signature	Section
Remarks, in any		

The topics during TBT shall include

- Hazards related to work assigned on that day and precautions to be taken.
- Any forthcoming HSE hazards/events/instruction/orders, etc.

The above record can be kept in local language, which workers can read. These records shall be made available to EIL/ Owner whenever demanded.

3.5 Training & Induction Programme

- Initial induction of workers into Construction oriented activities and appraising them about the methodology of works and how to carry-out safely and the same should not be inter mixed with Tool Box Talks or HSE Training. In this regard careful action should be made & maintained for imparting HSE induction to every individual, irrespective of his task/designation/level of employment, whereas, HSE Training should be imparted to specific person/group of people who are to carry-out that specific task more than once – for example, Riggers must be trained for working at heights, welders must be trained for work in confined space, fitters/carpenters, masons must be trained for work at heights, etc.
- Contractor shall conduct Safety induction programme on HSE for all his workers and maintain records. The Gate Pass shall be issued only to those workers who successfully qualify the Safety induction programme.
- The Contractor shall brief the visitors about the HSE precautions which are required to be taken before their proceeding to site and make necessary arrangements to issue appropriate PPEs like Aprons, hard hats, ear-plugs, goggles & safety shoes etc., to his visitors. The Contractor shall always maintain relevant acknowledgement from visitor on providing him brief information on HSE actions.
- Contractor shall ensure that all his personnel possess appropriate training to carry out the assigned job safely. The training should be imparted in a language understood by them and should specifically be trained about
 - Potential hazards to which they may be exposed at their workplace
 - Measures available for prevention and elimination of these hazards

The topics during training shall cover, at the minimum: -

- Why safety should be considered during work - explanation
- Education about hazards and precautions required

- Employees' duties & responsibilities
 - Emergency and evacuation plan
 - HSE requirements during project activities
 - Fire fighting and First-Aid
 - Use of PPEs
 - Occupational health issues – dos & don'ts
 - Local laws on intoxicating drinks, drugs, smoking in force
 - Common environmental subjects – lighting, ventilation, vibration, smoke/fumes etc.
- e) Records of the training shall be kept and submitted to EIL/ Owner.
- f) The Contractor shall make regular program for conducting Safety Training on various topics related to various activities & their safe-guarding utilizing experienced persons / outside agency / faculty. A program for Safety Training (indicative list as per Appendix –F) shall be furnished by the Contractor in its HSE Plan.
- g) For offshore and jetty jobs, contractor shall ensure that all personnel deployed have undergone a structured sea survival training including use of lifeboats, basket landing, use of radio communication etc. from an agency acceptable to Owner/EIL.

3.6 ADDITIONAL SAFETY REQUIREMENTS FOR WORKING INSIDE A RUNNING PLANT

As a minimum, the contractor shall ensure adherence to following safety requirements while working in or in the close vicinity of an operating plant:

- a) Contractor shall obtain permits for Hot work, Cold work, Excavation and Confined Space from Owner in the prescribed format.
- b) The contractor shall monitor record and compile list of his workers entering the operational plant/unit each day and ensure & record their return after completing the job.
- c) Contractor's workers and staff members shall use designated entrances and proceed by designated routes to work areas only assigned to them. The workers shall not be allowed to enter units' area, tanks area, pump rooms, etc. without work authorization permit.
- d) Work activities shall be planned in such a way so as to minimize the disruption of other activities being carried out in an operational plant/unit and activities of other contractors.
- e) The contractor shall submit a list of all chemicals/toxic substances that are intended to be used at site and shall take prior approval of the Owner.
- f) Specific training on working in a hydrocarbon plant shall be imparted to the work force and mock drills shall be carried out for Rescue operations/First-Aid measures.
- g) Proper barricading/cordoning of the operational units/plants shall be done before starting the construction activities. No unauthorized person shall be allowed to trespass. The height and overall design of the barricading structure shall be finalized in consultation with the Owner and shall be got approved from the Owner.
- h) Care shall be taken to prevent hitting underground facilities such as electrical cables, hydrocarbon piping during execution of work.
- i) Barricading with water curtain shall be arranged in specific/critical areas where hydrocarbon vapors are likely to be present such as near horton spheres or tanks. Positioning of fire tenders (from owner) shall also be ensured during execution of critical activities.

- j) Emergency evacuation plan shall be worked out and all workmen shall be apprised about evacuation routes. Mock drill operations may also be conducted.
- k) Flammable gas test shall be conducted prior to any hot work using appropriate measuring instruments. Sewers, drains, vents or any other gas escaping points shall be covered with flame retardant tarpaulin.
- l) Respiratory devices shall be kept handy while working in confined zones where there is a danger of inhalation of poisonous gases. Constant monitoring of presence of Gas/Hydrocarbon shall be done.
- m) Clearance shall be obtained from all parties before starting hot tapping, patchwork on live lines and work on corroded tank roof.
- n) Positive isolation of line/equipment by blinding for welding/cutting/grinding shall be done. Closing of valve will not be considered sufficient for isolation.
- o) Welding spatters shall be contained properly by using fire retardant blanket and in no case shall be allowed to fall on the ground containing oil. Similar care shall be taken during cutting operations.
- p) The vehicles, cranes, engines, etc. shall be fitted with spark arresters on the exhaust pipe and got it approved from Safety Department of the Owner.
- q) Plant air should not be used to clean any part of the body or clothing or use to blow off dirt on the floor.
- r) Gas detectors should be installed in gas leakage prone areas as per requirement of Owner's plant operation personnel.
- s) Flame proof electrical distribution board, plug and socket shall be used for electrical appliances.
- t) Experienced full time safety personnel shall be exclusively deployed to monitor safety aspects in running plants.

3.7 Self-Assessment and Enhancement

The contractor shall develop a method of check & balance through self-assessment & enhancement techniques and shall explore the opportunities for continual improvement in the HSE system.

3.8 HSE Promotion

The contractor shall encourage his workforce to promote HSE efforts at workplace by way of organizing workshops/seminars/training programs, celebrating HSE awareness weeks & National Safety Day, conducting quizzes & essay competitions, distributing pamphlets, posters & material on HSE, providing incentives for maintaining good HSE practices and granting incentives/ bonus for completing the job without any lost time accident.

3.9 Lock Out and Tag Out (LOTO) for Isolation of Energy Source

- a) Contractor shall follow the LOTO/Isolation procedure of owner for all energy source isolations installed/under purview by /of owner i.e. "Brown field"
- b) For all the other energy source (not under purview of client/owner) i.e. "Green field" Contractor shall develop a system to ensure the isolation of equipments, pipelines, Vessel, electrical panels from the energy source covering following as minimum:-
 - Identification of all energy source viz. electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravitational, radiation and other forms of stored or kinetic energy.
 - Establishing the energy isolation devices viz. manually operated electrical circuit breakers, disconnection switches, blind flanges, etc.

- Installation of Lock Out devices for preventing the inadvertent release of stored energy and Tag Out devices (“Danger”, “Do Not operate” or “Do not Remove” tags) to indicate that testing, maintenance or servicing is underway and the device cannot be operated until the tag out device is removed.
 - Lock Out and Tag out log book
 - Permit for isolation and de-isolation of energy source as per format No.: HSE-16
 - Availability of competent persons like experienced operators at substations, pump house, units etc. supervisors etc.
- c) Contractor shall ensure that all the sources are locked out and tagged properly before giving clearance to start the job.
- d) After the completion of job, contractor shall ensure all tools and tackles are removed and nobody is present in the working area and signing on LOTO log book.
- e) Only on confirmation of above the contractor will remove their lock and tag from the isolation points and give instructions for energizing the same. Only the person carrying out the task shall himself carry the key for the lock in /Lock out.

4.0 DETAILS OF HSE MANAGEMENT SYSTEM BY CONTRACTOR

4.1 On Award of Contract

The Contractor shall submit a comprehensive Health, Safety and Environmental Plan or programme for approval by EIL/Owner prior to start of work. The Contractor shall participate in the pre-start meeting with EIL/Owner to finalize HSE Plans which shall including the following:

- HSE policy & Objectives
- Job procedure to be followed by the Contractor for construction activities including handling of equipment's, scaffolding, electric installations, etc. describing the risks involved, actions to be taken and methodology for monitoring each activity. Indicative list of procedures is enclosed as Annexure-H
- EIL/Owner review/audit requirement.
- Organization structure along with responsibility and authority, on HSE activities.
- Administrative & disciplinary steps involving implementation of HSE requirements
- Emergency evacuation plan/ procedures for site and labour camps
- Procedures for reporting & investigation of accidents and near misses.
- HSE Inspection
- HSE Training programme at project site
- HSE Awareness programme at project site
- Reference to Rules, Regulations and statutory requirements.
- HIRAC
- Environment Aspect Impact Register
- Legal Register
- HSE documentation viz reporting, analysis & record keeping.

4.2 During Job Execution

Contractor shall implement approved Health, Safety and Environment management plan or programme including but not limited to as brought out under para 3.0. Contractor shall also ensure:

- a) to arrange workmen compensation insurance, registration under ESI Act, third party liability insurance, registration under BOCW Act etc., as applicable.
- b) to arrange all HSE permits before start of activities (as applicable), like permits for hot work, working at heights (Refer Format No. HSE-6), confined space (Refer Format No. HSE-7), Radiation Work Permit (Refer Format No. HSE-8), Demolishing/ Dismantling Work Permit (Refer Format No. HSE-9), Permit for erection/modification & dismantling of

scaffolding (Refer Format No:HSE-14), Permit for heavy lift/critical erection (Refer Format No:HSE-15), Permit for energy Isolation & De-isolation” (HSE-16) ,storage of chemical/explosive materials & its use and implement all precautions mentioned therein. In this regard, requirements of *Oil industry Safety Directorate Standard No. Std -105 "Work Permit Systems"* shall be complied with while working in existing Oil or Gas processing plants. List of the persons involved shall be maintained as annexure to the work permit issued for a particular activity.

- c) to submit, timely, the completed checklist on HSE activities in Format No.HSE-1, Monthly HSE report in Format No.HSE-5 (use of web based package (www.eil.co.in/conthse) is compulsory wherever the facility is available else a hard copy is to be submitted), accident/incident reports, investigation reports etc. as per EIL/Owner requirements. Compliance of instructions on HSE shall be done by Contractor and informed urgently to EIL/Owner.
- d) that his top most executive at site attends all the Safety Committee/HSE meetings arranged by EIL/Owner and carries out safety walk regularly. Only in case of his absence from site that a second senior most person shall be nominated by him, in advance, and communicated to EIL/Owner for performing the above tasks.
- e) display at site office and at prominent locations HSE Policy, caution boards, list of hospitals, emergency services available, safety signs like Men at work, Speed Limits, Hazardous Area, various do's & don'ts, etc.
- f) provide posters, banners for safe working to promote safety consciousness.
- g) identify, assess, analyze & mitigate the construction hazards& incorporate relevant control measures before actually executing site works. (HIRAC = Hazard Identification, Risk Analysis and Control).
- h) identify, assess, analyze & mitigate the environmental impact & incorporate relevant control measures through Environmental Aspect Impact Register
- i) Identify and comply to all applicable HSE related legal requirements by preparing and maintaining a Legal register
- j) arrange testing, examination, inspection of own as well as borrowed construction equipment's/ machinery (stationary & mobile) before being used at site and also at periodical interval, through own resources and also by 3rd party competent agencies (as deemed fit in statutes). Records of such test, examination etc. shall be maintained & shall be submitted to EIL/Owner as & when asked for.
- k) carryout audits/inspection (internal & external) at his works as well as sub-contractor works as per approved HSE plan/procedure/programme & submit the compliance reports of identified shortfalls for EIL/Owner review.
- l) Arranging HSE training for site workmen (of his own & subcontractors) through internal or external faculty at periodical intervals.
- m) Assistance& cooperate during HSE audits by EIL/Owner or any other 3rd party and submit compliance report.
- n) Generate& submit of HSE records/report as per this specification.
- o) Contractor shall arrange minimum 100 lux illumination level at construction site for night works& record shall be maintained.
- p) The contractor shall assign responsible person as in charge for night works and it shall be informed to owner/EIL.
- q) Appraise EIL/Owner on HSE activities at site regularly.
- r) Carry-out all dismantling activities safely, with prior approval of EIL/Owner representative.
- s) The Contractor shall ensure that “Hot works” and painting works do not continue at the same place/ location at project site for which chance or probability of “fire” incident exists.

4.3 During Short Listing of the Sub-Contractors

The contractor shall review the HSE management system of the sub-contractors in line with the requirements given in this specification. The contractor shall be held responsible for the shortcomings observed in the HSE management system of the sub-contractor(s) during execution of the job.

5.0 RECORDS

At the minimum, the contractor shall maintain/ submit HSE records in the following reporting formats:

Safety Walk Through Report	HSE-1
Accident/ Incident Report	HSE-2
Supplementary Accident/ Incident Investigation report	HSE-3
Near Miss Incident Report	HSE-4
Monthly HSE Report	HSE-5
Permit for working at height	HSE-5
Permit for working in confined space	HSE-7
Permit for radiation work	HSE-8
Permit for demolishing/ dismantling	HSE-9
Daily Safety checklist	HSE-10
Housekeeping Assessment & compliance	HSE-11
Inspection of temporary electrical booth/installation	HSE-12
Inspection for scaffolding	HSE-13
Permit for erection/modification & dismantling of scaffolding	HSE-14
Permit for heavy lift/critical erection.	HSE-15
Permit for Energy isolation and de-isolation.	HSE-16
Permit for Excavation	HSE-17
Environmental Aspect Impact Register	HSE-18
HIRAC Register	HSE-19
Checklist for Tower Crane	HSE-20
Crane Inspection Checklist	HSE-21
Hydra Crane Inspection Checklist	HSE-22
Hydraulic Rig Inspection Checklist	HSE-23
Boom Lift Inspection Checklist	HSE-24
Inspection reports of Equipment/tools/tackles	*
Report of Toolbox Talks	As indicated in specification
PPE issue report/register	*
Site inspection reports	*
Training records	*

(*) The formats shall be developed in consultation with EIL/Owner.

APPENDIX-A
(Sheet 1 of 2)

A. IS CODES ON HSE

SP: 53	Safety code for the use, Care and protection of hand operated tools.
IS: 838	Code of practice for safety & health requirements in electric and gas welding and cutting operations
IS: 1179	Eye & Face precautions during welding, equipment etc.
IS: 1860	Safety requirements for use, care and protection of abrasive grinding wheels.
IS: 1989 (Pt -II)	Leather safety boots and shoes
IS: 2925	Industrial Safety Helmets
IS: 3016	Code of practice for fire safety precautions in welding & cutting operation.
IS: 3043	Code of practice for earthing
IS: 3764	Code of safety for excavation work
IS: 3786	Methods for computation of frequency and severity rates for industrial injuries and classification of industrial accidents
IS: 3696	Safety Code of scaffolds and ladders
IS: 4083	Recommendations on stacking and storage of construction materials and components at site
IS: 4770	Rubber gloves for electrical purposes
IS: 5121	Safety code for piling and other deep foundations
IS: 5216 (Pt-I)	Recommendations on Safety procedures and practices in electrical works
IS: 5557	Industrial and Safety rubber lined boots
IS: 5983	Eye protectors
IS: 6519	Selection, care and repair of Safety footwear
IS: 6994 (Pt-I)	Industrial Safety Gloves (Leather & Cotton Gloves)
IS: 7293	Safety Code for working with construction Machinery
IS: 8519	Guide for selection of industrial safety equipment for body protection
IS: 9167	Ear protectors
IS: 11006	Flash back arrestor (Flame arrestor)
IS: 11016	General and safety requirements for machine tools and their operation
IS: 11057	Specification for Industrial safety nets
IS: 11226	Leather safety footwear having direct moulded rubber sole
IS: 11972	Code of practice for safety precaution to be taken when entering a sewerage system
IS: 13367	Code of practice-safe use of cranes
IS: 13416	Recommendations for preventive measures against hazards at working place

**APPENDIX-A
(Sheet 2 of 2)**

B. INTERNATIONAL STANDARDS ON HSE

Safety Glasses	:	ANSI Z 87.1, ANSI ZZ 87.1, AS 1337, BS 2092, BS 1542, BS 679, DIN 4646/ 58311
Safety Shoes	:	ANSI Z 41.1, AS 2210, EN 345
Hand Gloves	:	BS 1651
Ear Muffs	:	BS 6344, ANSI S 31.9
Hard Hat	:	ANSI Z 89.1/89.2, AS 1808, BS 5240, DIN 4840
Goggles	:	ANSI Z 87.1
Face Shield	:	ANSI Z 89.1
Breathing Apparatus	:	BS 4667, NIOSH
Welding & Cutting	:	ANSI Z49.1
Safe handling of compressed:P-1		(Compressed Gas Association Gases in cylinders 1235 Jefferson Davis Highway, Arlington VA 22202 - USA)
Full body harness	:	EN-361
Lanyard	:	EN-354
Karabiner	:	EN-362 and EN-12275

APPENDIX-B

DETAILS OF FIRST AID BOX

SL. NO.	DESCRIPTION	QUANTITY
1.	Small size Roller Bandages, 1 Inch Wide (Finger Dressing small)	6 Pcs.
2.	Medium size Roller Bandages, 2 Inches Wide (Hand & Foot Dressing)	6 Pcs.
3.	Large size Roller Bandages, 4 Inches Wide (Body Dressing Large)	6 Pcs.
4.	Large size Burn Dressing (Burn Dressing Large)	4 Pkts.
5.	Cotton Wool (20 gms packing)	4 Pkts.
6.	Antiseptic Solution Dettol (100 ml.) or Savlon	1 Bottle
7.	Mercurochrome Solution (100 ml.) 2% in water	1 Bottle
8.	Ammonia Solution (20 ml.)	1 Bottle
9.	A Pair of Scissors	1 Piece
10.	Adhesive Plaster (1.25 cm X 5 m)	1 Spool
11.	Eye pads in Separate Sealed Pkt.	4 pcs.
12.	Tourniquet	1 No.
13.	Safety Pins	1 Dozen
14.	Tinc. Iodine/ Betadine (100 ml.)	1 Bottle
15.	Polythene Wash cup for washing eyes	1 No.
16.	Potassium Permanganate (20 gms.)	1 Pkt.
17.	Tinc. Benzoin (100 ml.)	1 Bottle
18.	Triangular Bandages	2 Nos.
19.	Band Aid Dressing	5 Pcs.
20.	Iodex/ Moov (25 gms.)	1 Bottle
21.	Tongue Depressor	1 No.
22.	Boric Acid Powder (20 gms.)	2 Pkt.
23.	Sodium Bicarbonate (20 gms.)	1 Pkt.
24.	Dressing Powder (Nebasulf) (10 gms.)	1 Bottle
25.	Medicinal Glass	1 No.
26.	Duster	1 No.
27.	Booklet (English& Local Language)	1 No. each
28.	Soap	1 No.
29.	Toothache Solution	1 No.
30.	Vicks (22 gms.)	1 Bottle
31.	Forceps	1 No.
32.	Snake –Bite Lancet	1No.
33.	Note Book	1 No.
34.	Splints	4 Nos.
35.	Lock	1 Piece
36.	Life Saving/Emergency/Over-the counter Drugs	As decided at site

Box size: Suitable size first aid box to be used for first aid items

Note : The medicines prescribed above are only indicative. Equivalent medicines can also be used.
A prescription, in this regard, shall be required from a qualified Physician.

APPENDIX-C

TYPE OF FIRES VIS-À-VIS FIRE EXTINGUISHERS

Fire Extinguisher Fire	Water	Foam	CO ₂	Dry Powder	Multi purpose (ABC)
Originated from paper, clothes, wood	✓	✓	can control minor surface fires	can control minor surface fires	✓
Inflammable liquids like alcohol, diesel, petrol, edible oils, bitumen	✗	✓	✓	✓	✓
Originated from gases like LPG, CNG, H ₂	✗	✗	✓	✓	✓
Electrical fires	✗	✗	✓	✓	✓

LEGEND : ✓ : CAN BE USED

✗ : NOT TO BE USED

Note: Fire extinguishing equipment must be checked atleast once a year and after every use by an authorized person. The equipment must have an inspection label on which the next inspection date is given. Type of extinguisher shall clearly be marked on it.

APPENDIX-D

List of Statutory Acts & Rules Relating to HSE

- The Indian Explosives Act and Rules
- The Motor Vehicle Act and Central Motor Vehicle Rules
- The Factories Act and concerned Factory Rules
- The Petroleum Act and Petroleum Rules
- The Workmen Compensation Act
- The Gas Cylinder Rules and the Static & Mobile Pressure Vessels Rules
- The Indian Electricity Act and Rules
- The Indian Boiler Act and Regulations
- The Water (Prevention & Control & Pollution) Act
- The Water (Prevention & Control of Pollution) Cess Act
- The Mines & Minerals (Regulation & Development) Act
- The Air (Prevention & Control of Pollution) Act
- The Atomic Energy Act
- The Radiation Protection Rules
- The Indian Fisheries Act
- The Indian Forest Act
- The Wild Life (Protection) Act
- The Environment (Protection) Act and Rules
- The Hazardous Wastes (Management & Handling) Rules
- The Manufacturing, Storage & import of Hazardous Chemicals Rules
- The Public Liability Act
- The Building and Other Construction Workers (Regulation of Employment and Condition of Service) Act
- Other statutory acts Like EPF, ESIS, Minimum Wages Act.

APPENDIX-E (Sheet 1 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
(A) EXCAVATION Pit Excavation upto 3.0m	Falling into pit	Personal injury	Provide guard rails/ barricade with warning signal Provide at least two entries/ exits. Provide escape ladders.
	Earth Collapse	Suffocation/ Breathlessness Buried	Provide suitable size of shoring and strutting, if required. Keep soil heaps away from the edge equivalent to 1.5m or depth of pit whichever is more. Don't allow vehicles to operate too close to excavated areas. Maintain at least 2m distance from edge of cut. Maintain sufficient angle of repose. Provide slope not less than 1:1 and suitable bench of 0.5m width at every 1.5m depth of excavation in all soils except hard rock. Battering/benching the sides.
	Contact with buried electric cables Gas/ Oil Pipelines	Electrocution Explosion	Obtain permission from competent authorities, prior to excavation, if required. Locate the position of buried utilities by referring to plant drawings. Start digging manually to locate the exact position of buried utilities and thereafter use mechanical means.
Pit Excavation beyond 3.0m	Same as above plus Flooding due to excessive rain/ underground water	Can cause drowning situation	Prevent ingress of water Provide ring buoys Identify and provide suitable size dewatering pump or well point system
	Digging in the vicinity of existing Building/ Structure	Building/Structure may collapse Loss of health & wealth	Obtain prior approval of excavation method from local authorities. Use under-pining method Construct retaining wall side by side.
	Movement of vehicles/ Equipments close to the edge of cut.	May cause cave-in or slides. Persons may get buried.	Barricade the excavated area with proper lighting arrangements Maintain at least 2m distance from edge of cut and use stop blocks to prevent over-run Strengthen shoring and strutting

APPENDIX-E: (Sheet 2 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
Narrow deep excavations for pipelines, etc.	Same as above plus Frequent cave-in or slides	May cause severe injuries or prove fatal	Battering/benching of sides Provide escape ladders
	Flooding due to Hydro- static testing	May arise drowning situation	Same as above plus Bail out accumulated water Maintain adequate ventilation.
Rock by excavation blasting	Improper handling of explosives	May prove fatal	Ensure proper storage, handling & carrying of explosives by trained personnel. Comply with the applicable explosive acts & rules.
	Uncontrolled explosion	May cause severe injuries or prove fatal	Allow only authorized persons to perform blasting operations. Smoking and open flames are to be strictly prohibited
	Scattering of stone pieces in atmosphere	Can hurt people	Use PPE like goggles, face mask, helmets etc.
Rock excavation by blasting (Contd)	Entrapping of persons/ animals.	May cause severe injuries or prove fatal	Barricade the area with red flags and blow siren before blasting.
	Misfire	May explode suddenly	Do not return to site for atleast 20 minutes or unless announced safe by designated person.
Piling Work	Failure of pile-driving equipment	Can hurt people	Inspect Piling rigs and pulley blocks before the beginning of each shift.
	Noise pollution	Can cause deafness and psychological imbalance.	Use personal protective equipment's like ear plugs, muffs, etc.
	Extruding rods/casing	Can hurt people	Barricade the area and install sign boards Provide first-aid
	Working in the vicinity of 'Live-Electricity'	Can cause electrocution/ Asphyxiation	Keep sufficient distance from Live-Electricity as per IS code. Shut off the supply, if possible Provide artificial/rescue breathing to the injured
(B) CONCRETING	Air pollution by cement	May affect Respiratory System	Wear respirators or cover mouth and nose with wet cloth.
	Handling of ingredients	Hands may get injured	Use gloves & other PPE.
	Protruding reinforcement rods.	Feet may get injured	Provide platform above reinforcement for movement of workers or provide end caps for protection on reinforcement bars.

APPENDIX-E : (Sheet 3 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Earthing of electrical mixers, vibrators, etc. not done.	Can cause electrocution/asphyxiation	Ensure earthing of equipments and proper functioning of electrical circuit before commencement of work.
	Falling of materials from height	Persons may get injured	Use hard hats Remove surplus material immediately from work place. Ensure lighting arrangements during night hours
	Continuous pouring by same gang	Cause tiredness of workers and may lead to accident.	Insist on shift pattern Provide adequate rest to workers between subsequent pours.
	Revolving of concrete mixer/vibrators	Parts of body or clothes may get entrapped.	Allow only mixers with hopper Provide safety cages around moving motors Ensure proper mechanical locking of vibrator.
Super-structure	Same as above plus Deflection in props or shuttering material	Shuttering/props may collapse and prove fatal	Avoid excessive stacking on shuttering material Check the design and strength of shuttering material before commencement of work Rectify immediately the deflection noted during concreting.
	Passage to work place	Improperly tied and designed props/planks may collapse	Ensure the stability and strength of passage before commencement of work. Do not overload and stand under the passage.
(C) REINFOR-CEMENT	Curtailment and binding of rods	Persons may get injured	Use PPE like gloves, shoes, helmets, etc. Avoid usage of shift tools
	Carrying of rods for short distances/at heights	Workers may get injured their hands and shoulders.	Provide suitable pads on shoulders and use safety gloves. Tie up rods in easily liftable bundles Ensure proper staging.
	Checking of clear distance/cover with hands	Rods may cut or injure the fingers	Use measuring devices like tape, measuring rods, etc.
	Hitting projected rods and standing on cantilever rods.	Persons may get injured and fell down	Use safety shoes and avoid standing unnecessarily on cantilever rods Avoid wearing of loose clothes

APPENDIX-E: (Sheet 4 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Falling of material from height	May prove fatal	Use helmets Provide safety nets
	Transportation of rods by trucks/ trailers	Protruded rods may hit the persons	Use red flags/lights at the ends Do not protrude the rods in front of or by the side of driver's cabin. Do not extend the rods 1/3 rd of deck length or 1.5m whichever is less
(D)WELDING AND GAS CUTTING	Welding radiates invisible ultraviolet and infra-red rays	Radiation can damage eyes and skin.	Use specified shielding devices and other PPE of correct specifications. Avoid thoriated tungsten electrodes for GTAW
	Improper placement of oxygen and acetylene cylinders	Explosion may occur	Move out any leaking cylinder Keep cylinders in vertical position Use trolley for transportation of cylinders and chain them Use flashback arrestors
	Leakage/ cuts in hoses	May cause fire	Purge regulators immediately and then turn off Never use grease or oil on oxygen line connections and copper fittings on acetylene lines Inspect regularly gas carrying hoses Always use red hose for acetylene & other fuel gases and black for oxygen
	Opening-up of cylinder	Cylinder may burst	Always stand back from the regulator while opening the cylinder Turn valve slowly to avoid bursting Cover the lug terminals to prevent short circuiting
	Welding of tanks, container or pipes storing flammable liquids	Explosion may occur	Empty & purge them before welding Never attach the ground cable to tanks, container or pipe storing flammable liquids Never use LPG for gas cutting

APPENDIX-E: (Sheet 5 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES ...(Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
(E) RADIOGRAPHY	Ionizing radiation	Radiations may react with the skin and can cause cancer, skin irritation, dermatitis, etc.	Ensure Safety regulations as per BARC/AERB before commencement of job. Cordon off the area and install Radiation warning symbols Restrict the entry of unauthorized persons Wear appropriate PPE and film badges issued by BARC/AERB
	Transportation and Storage of Radiography source	Same as above	Never touch or handle radiography source with hands Store radiography source inside a pit in an exclusive isolated storage room with lock and key arrangement. The pit should be approved by BARC/AERB. Radiography source should never be carried either in passenger bus or in a passenger compartment of trains. BARC/AERB has to be informed before source movement. Permission from Director General of Civil Aviation is required for booking radio isotopes with airlines.
	Loss of Radio isotope	Same as above	Try to locate with the help of Survey Meter. Inform BARC/AERB (*)
(F) ELECTRICAL INSTALLATION AND USAGE	Short circuiting	Can cause Electrocutation or Fire	Use rubberized hand gloves and other PPE Don't lay wires under carpets, mats or door ways. Allow only licensed electricians to perform on electrical facilities Use one socket for one appliance Ensure usage of only fully insulated wires or cables Don't place bare wire ends in a socket Ensure earthing of machineries and equipment's Do not use damaged cords and avoid temporary connections Use spark-proof/flame proof type field distribution boxes.

(*) Atomic Energy Regulatory Board (AERB),
Bhabha Atomic Research Centre (BARC)
Anushakti Nagar, Mumbai – 400 094

APPENDIX-E: (Sheet 6 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			Do not allow open/bare connections Provide all connections through 30mAELCB Protect electrical cables/equipments from water and naked flames Check all connections before energizing
	Overloading of Electrical System	Bursting of system can occur which leads to fire	Display voltage and current ratings prominently with 'Danger' signs. Ensure approved cable size, voltage grade and type Switch off the electrical utilities when not in use Do not allow unauthorized connections. Ensure proper grid wise distribution of Power
	Improper laying of overhead and underground transmission lines/cables	Can cause electrocution and prove fatal	Do not lay unarmoured cable directly on ground, wall, roof of trees Maintain atleast 3m distance from HT cables All temporary cables should be laid atleast 750 mm below ground on 100 mm fine sand overlying by brick soling Provide proper sleeves at crossings/ inter-sections Provide cable route markers indicating the type and depth of cables at intervals not exceeding 30m and at the diversions/termination
(G) FIRE PREVENTION AND PROTECTION	Small fires can become big ones and may spread to the surrounding areas	Cause burn injuries and may prove fatal	In case a fire breaks out, press fire alarm system and shout "Fire, Fire". Keep buckets full of sand & water/ fire extinguishing equipment near hazardous locations. Confine smoking to 'Smoking Zones' only. Train people for using specific type of fire fighting equipments under different classes of fire. Keep fire doors/shutters, passages and exit doors unobstructed. Maintain good housekeeping and first-aid boxes (for details refer Appendix-B). Don't obstruct access to Fire extinguishers. Do not use elevators for evacuation during fire. Maintain lightening arrestors for elevated structures. Stop all electrical motors with internal combustion.

APPENDIX-E : (Sheet 7 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			Move the vehicles from dangerous locations. Remove the load hanging from the crane booms Remain out of the danger areas.
	Improper selection of Fire extinguisher	It may not extinguish the fire	Ensure usage of correct fire extinguisher meant for the specified fire (for details refer Appendix-C). Do not attempt to extinguish Oil and electric fires with water. Use foam cylinders/CO ₂ /sand or earth.
	Improper storage of highly inflammable substances	Same as above	Maintain safe distance of flammable substances from source of ignition. Restrict the distribution of flammable materials to only min. necessary amount. Construct specifically designed fuel storage facilities. Keep chemicals in cool and dry place away from heat. Ensure adequate ventilation. Before welding operation, remove or shield the flammable material properly. Store flammable materials in stable racks, correctly labeled preferably with catchment trays. Wipe off the spills immediately
	Short circuiting of electrical system	Same as above Can cause Electrocutation	Don't lay wires under carpets, mats or door ways Use one socket for one appliance. Use only fully insulated wires or cables. Do not allow open/bare connections. Provide all connections through 30m AELCB. Ensure earthing of machineries and equipments.
(H) VEHICULAR MOVEMENT	Crossing the Speed Limits (Rash driving)	Personal injury	Obey speed limits and traffic rules strictly. Always expect the unexpected and be a defensive driver. Use seat belts/helmets. Blow horn at intersections and during overtaking operations. Maintain the vehicle in good condition. Do not overtake on curves, bridges and slopes.
	Adverse weather condition	Same as Above	Read the road ahead and ride to the left. Keep the wind screen and lights clean. Do not turn at speed. Recognize the hazard, understand the defense and act correctly in time.

APPENDIX-E : (Sheet 8 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Consuming alcohol before and during the driving operation	Same as above	Alcohol and driving do not mix well. Either choose alcohol or driving. If you have a choice between hitting a fixed object or an on-coming vehicle, hit the fixed object Quit the steering at once and become a passenger. Otherwise take sufficient rest and then drive. Do not force the driver to drive fast and round the clock. Do not day dream while driving
	Falling objects/ Mechanical failure	May prove fatal	Ensure effective braking system, adequate visibility for the drives, reverse warning alarm. Proper maintenance of the vehicle as per manufacturer instructions
(I) PROOF TESTING (HYDROSTATIC/ PNEUMATIC TESTING)	Bursting of piping Collapse of tanks Tanks flying off	May cause injury and prove fatal	Prepare test procedure & obtain EIL/owner's approval. Provide separate gauge for pressurizing pump and piping/equipment. Check the calibration status of all pressure gauges, dead weight testers and temperature recorders. Take dial readings at suitable defined intervals and ensure most of them fall between 40-60% of the gauge scale range. Provide safety relief valve (set at pressure slightly higher than test pressure) while testing with air/ nitrogen. Ensure necessary precautions, stepwise increase in pressure, tightening of bolts/nuts, grouting, etc. before and during testing. Keep the vents open before opening any valve while draining out of water used for hydro-testing of tanks. Pneumatic testing involves the hazard of released energy stored in compressed gas. Specific care must therefore be taken to minimize the chance of brittle failure during a pneumatic leak test. Test temperature is important in this regard and must be considered when the designer chooses the material of construction.

APPENDIX-E : (Sheet 9 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			A pressure relief device shall be provided, having a set pressure not higher than the test pressure plus the lesser of 345 KPa (50 psi) or 10% of the test pressure. The gas used as test fluid, if not air, shall be nonflammable and nontoxic.
(J) WORKING AT HEIGHTS	Person can fall down	May sustain severe injuries or prove fatal	Provide guard rails/barricade at the work place Use PPE like full body harness, life line, helmets, safety shoes, etc. Obtain a permit before starting the work at height above 2 meters Fall arrest and safety nets, etc. must be installed Provide adequate working space(min. 0.6 m) Tie/weld working platform with fixed support Use roof top walk ladder while working on a slopping roofs Avoid movement on beams
		May hit the scrap/material stacked at the ground or in between	Keep the work place neat and clean Remove the scrap immediately
	Material can fall down	May hit the workers working at lower levels and prove fatal	Same as above plus Do not throw or drop materials or equipment from height. i.e. do not <i>bomb</i> materials All tools to be carried in a tool-kit Bag or on working uniform Remove scrap from the planks Ensure wearing of helmet by the workers working at lower levels. Multiple activities at same location to be avoided.
(K) CONFINED SPACES	Suffocation/drowning	Unconsciousness, death	Use respiratory devices, if reqd. Avoid overcrowding inside a confined space Provide Exhaust fans for ventilation Do not wear loose clothes, neck ties, etc. Fulfill conditions of the permit

APPENDIX-E: (Sheet 10 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
			Check for presence of hydrocarbons, O ₂ level Obtain work permit before entering a confined space Ensure that the connected piping of the equipment which is to be opened is pressure free, fluid has been drained, vents are open and piping is positively isolated by a blind flange
	Presence of foul smell and toxic substances	Inhalation can pose threat to life	Same as above plus Check for hydrocarbon and Aromatic compounds before entering a confined space Depute one person outside the confined space for continuous monitoring and for extending help in case of an emergency
	Ignition/ flame can cause fire	Person may sustain burn injuries or explosion may occur	Keep fire extinguishers at a hand distance Remove surplus material and scrap immediately Do not smoke inside a confined space Do not allow gas cylinders inside a confined space Use low voltage (24V) lamps for lighting Use tools with air motors or electric tools with max. voltage of 24V Remove all equipment's at the end of the day
(L) HANDLING AND LIFTING EQUIPMENTS	Failure of load lifting and moving equipment's	Can cause accident and prove fatal	Avoid standing under the lifted load and within the operating radius of cranes. Check periodically oil, brakes, gears, horns and tyre pressure of all moving machinery. Check quality, size and condition of all chain pulley blocks, slings, U-clamps, D-shackles, wire ropes, etc. Allow crane to move only on hard, firm and leveled ground. Allow lifting slings as short as possible and check gunny packings at the friction points. Do not allow crane to tilt its boom while moving Install Safe Load Indicator. Ensure certification by applicable authority.

APPENDIX-E : (Sheet 11 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
	Overloading of lifting equipments	Same as above	Safe lifting capacity of derricks and winches written on them shall be got verified The max. safe working load shall be marked on all lifting equipments Check the weight of columns and other heavy items painted on them and accordingly decide about the crane capacity, boom and angle of erection Allow only trained operators and riggers during crane operation.
	Overhead electrical wires	Can cause electrocution and fire	Do not allow boom or other parts of crane to come within 3m reach of overhead HT cables Hook and load being lifted shall preferably remain in full visibility of crane operators.
(M) SCAFFOLDING, FORMWORK AND LADDERS	Person can fall down	Person May sustain severe injuries and prove fatal	Provide guard rails for working at height. Face ladder while climbing and use both hands. Ladders shall extend about 1m above landing for easy access and tying up purpose. Do not place ladders against movable objects and maintain base at 1/4 unit of the working length of the ladder. Suspended scaffolds shall not be less than 500 mm wide and tied properly with ropes. No loose planks shall be allowed. Use PPE, like helmets, safety shoes etc.
	Failure of scaffolding material	Same as above	Inspect visually all scaffolding materials for stability and anchoring with permanent structures. Design scaffolding for max. load carrying capacity. Scaffolding planks shall not be less than 50X250 mm full thickness lumber or equivalent. These shall be cleated or secured and must extend over the end supports by at least 150mm and not more than 300mm. Don't overload the scaffolds. Do not splice short ladders to make a longer one. Vertical ladders shall not exceed 6m.
	Material can fall down	Persons working at lower level gets injured	Remove excess material and scrap immediately. Carry the tools in a tool-kit bag only. Provide safety nets.

APPENDIX-E: (Sheet 12 of 12)

CONSTRUCTION HAZARDS, THEIR EFFECTS & PREVENTIVE MEASURES (...Contd.)

ACTIVITY	TYPE OF HAZARD	EFFECT OF HAZARD	PREVENTIVE MEASURES
(N) STRUC-TURAL WORKS	Personal negligence and danger of fall	Can cause injury or casualty	Do not take rest inside rooms built for welding machines or electrical distribution system. Avoid walking on beams at height. Wear helmet with chin strap and full body harness while working at height. Use hand gloves and goggles during grinding operations. Cover or mark the sharp and projected edges. Do not stand within the operating radius of cranes.
	Lifting/ slipping of material	Same as above	Do not stand under the lifted load. Stack properly all the materials. Avoid slippage during handling. Control longer pieces lifted up by cranes from both ends. Remove loose materials from height. Ensure tightening of all nuts & bolts.
(O) PIPELINE WORKS	Erection/ lowering failure	Can cause injury	Do not stand under the lifted load. Do not allow any person to come within the radii of the side boom handling pipes. Check the load carrying capacity of the lifting tools & tackles. Use safe Load Indicators (SLI). Use appropriate PPEs.
	Other	Same as above	Wear gum boots in marshy areas. Allow only one person to perform signaling operations while lowering of pipes. Wedges to be provided below the pipe to prevent spool/pipe roll out. Provide night caps on pipes. Provide end covers on pipes for stoppage of pigs while testing/ cleaning operations.
(P) GRIT BLASTING	Pollution in neighboring area, hit by grits and high pressure air	Can cause personal injury	Ensure the blasting is done in enclosed shed. Keep safe distance while blasting operations. Wear positive pressure blast hood or helmet with view-window, ear-muff/plug, gloves, overall or leather coat /apron, rubber shoes.

APPENDIX-F

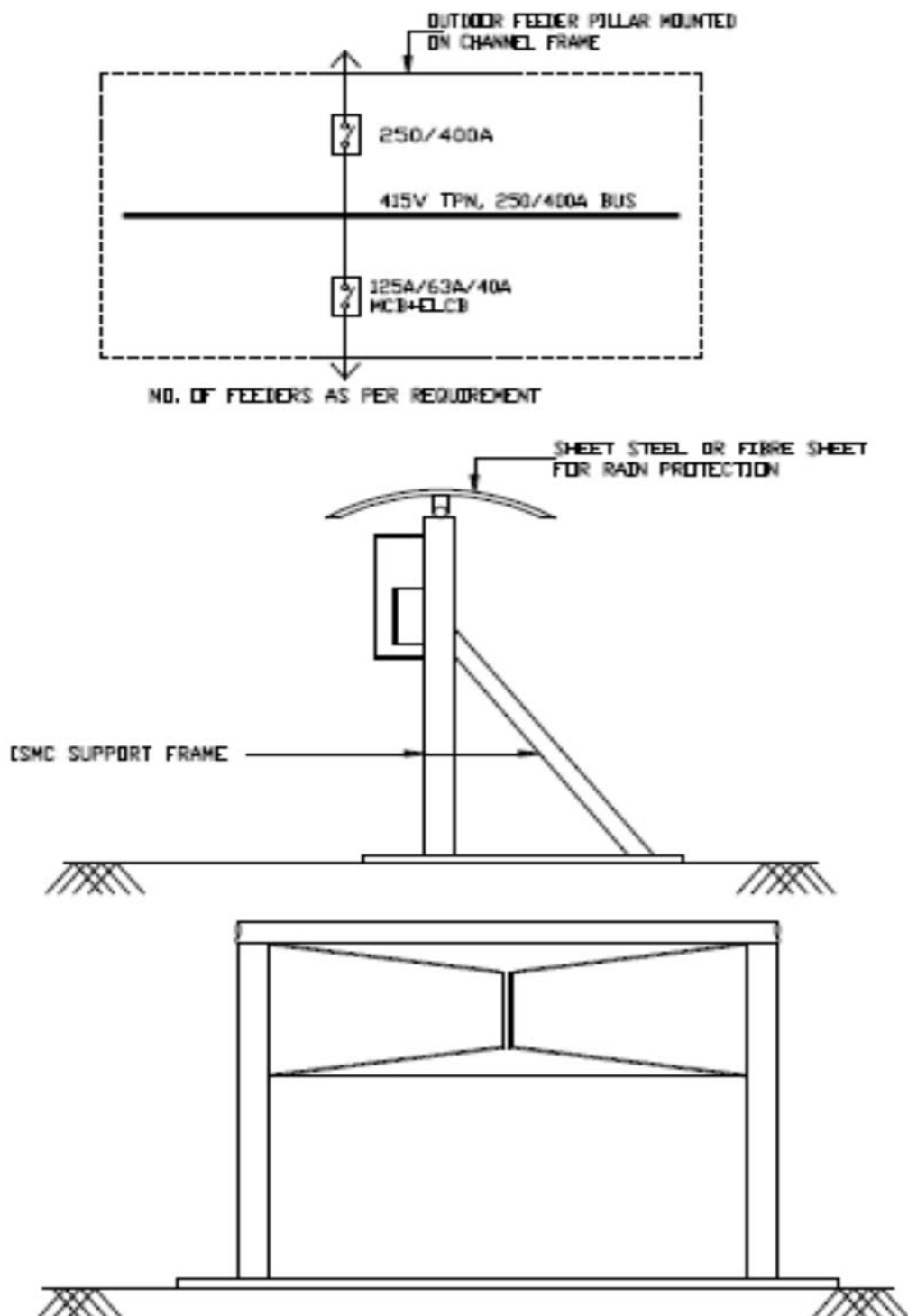
TRAINING SUBJECTS / TOPICS

(For contractors' personnel)

1. The Law & Safety – Statutory Requirement / Applicable statutes / Duties of employer / employee.
2. Policy & Administration – Why HSE? / Duties & Responsibilities of Safety Personnel at project site / Effect of incentive on accident prevention.
3. HSE & Supervision – Duties of Supervisor / HSE integrated supervision / Who should be held responsible for site accidents?
4. Safety Budget / Cost of Accidents – Direct costs / Indirect costs.
5. Hazard Identification / Type of hazards / HIRAC.
6. Behavioral Safety & Motivation.
7. Housekeeping – Storage / Stacking / Handling of materials / Hydra handling.
8. Occupational Health in Construction sector.
9. Personal Protective Equipments – Respiratory & Non- respiratory.
10. Electricity & Safety – ELCB / Fuse / Powered tools / Project illumination.
11. Handling of Compressed Gas – Transportation / Storage / FBAs / Fire prevention.
12. Machine Safety – Machine guarding / Maintenance.
13. Transportation – Hazards & risks in transp. of materials / ODC consignments.
14. Cranes & Other Lifting machinery – Legal requirements vis-à-vis essential safety requirements.
15. Communication – HSE Induction / TBTs / Safety Committee / Safety meeting / Safety propaganda / Publicity.
16. Excavation – Risks & Dangers / Safety measures.
17. Working at Heights – Use of ladder / Work on roofs / Scaffolds / Double harness lanyards / Life-line / Fall arrester / Safety Nets / Floor openings.
18. Hazards in Welding & important safety precautions.
19. Gas Cutting – Hazards & safety measures.
20. Fire prevention & fire protection.

APPENDIX - G

CONSTRUCTION POWER BOARD (typ.)



NOTES:-

1. CONTRACTOR TO INSTALL TEMPORARY CONST. POWER BOARD AS SHOWN IN THE DRG. ITS LOCATION SHALL BE EASILY ACCESSABLE.
2. POWER DISTRIBUTION BOARD SHALL BE EARTHED AT TWO POINTS BY MINIMUM 40X5MM GI STRIP FROM THE AVAILABLE GRID OR DIRECTLY CONNECTED TO TWO DIRECTLY DRIVEN EARTH ELECTRODES.
3. DISTRIBUTION BOARD SHALL BE FABRICATED BY USING 14MM CRCA SHEET STEEL WITH HINGED DOORS AND ALL COMPONENT MOUNTED IN IT.
4. ALL INCOMING AND OUTGOING CABLES SHALL HAVE BOTTOM ENTRY.

APPENDIX-H

LIST OF PROCEDURES (MINIMUM) TO BE FORMING PART OF HSE PLAN:-

- A. HSE Management Procedures:
- HSE Risk Management (including HIRA)
 - HSE Legal Compliance and Other Requirements
 - HSE Objectives & Performance
 - HSE Training and Competence (including Induction)
 - HSE Motivation & Award Scheme
 - HSE Audits
 - HSE Sub Contractor Management
 - HSE Emergency Management
 - HSE Incidents Reporting and Management
 - HSE procedure for Behaviour based Safety
 - First Aid & Management
 - Roles, Responsibility, accountabilities and Authorities
- B. Job procedures/Safe Operating procedures
- Setting Up Site & Signages
 - Working at Height
 - Confined Space Entry
 - Permit to Work (including hot works)
 - Housekeeping
 - Transportation of materials including Manual Handling
 - Earthmoving Operations & excavation
 - Scaffolding
 - Fire Prevention/Protection
 - Hazardous Substance handling & Storage
 - Personal Protective Equipment

FORMAT NO. : HSE-1 REV 0

(Sheet 1 of 6)

SAFETY WALK-THROUGH REPORT

(Name & signature of walk through performer to be inserted at the bottom of each page)

Project : _____ Report no. : _____

Date : _____ Contractor : _____

Inspection by : _____ Owner : _____

Frequency : Monthly Job no. : _____

Note : Write 'NA' wherever the item is not applicable

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
1.	HOUSEKEEPING				
a)	Waste containers provided and used				
b)	Sanitary facilities adequate and Clean				
c)	Passageways and Walkways Clear				
d)	General neatness of working areas				
e)	Other				
2.	PERSONNEL PROTECTIVE EQUIPMENT				
a)	Goggles; Shields				
b)	Face protection				
c)	Hearing protection				
d)	Foot protection				
e)	Hand protection				
f)	Respiratory Masks etc.				
g)	Full body harness conforming to CE, EN 361				
h)	Hard hat (HDPE)				
i)	Other				
3.	EXCAVATIONS/OPENINGS				
a)	Openings properly covered or barricaded				
b)	Excavations shored				
c)	Excavations barricaded				
d)	Overnight lighting provided				
e)	Other				

Safety walk-through performer (Name& Signature).....

FORMAT NO. : HSE-1 REV 0

(Sheet 2 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
4.	WELDING & GAS CUTTING				
a)	Gas cylinders chained upright				
b)	Cables and hoses not obstructing				
c)	Screens or shields used				
d)	Flammable materials protected				
e)	Live electrode bits contained properly				
f)	Fire extinguisher (s) accessible				
g)	Other				
5.	SCAFFOLDING & BARRICADING				
a)	Fully decked platforms				
b)	Guard and intermediate rails in place				
c)	Toe boards in place				
d)	Adequate shoring				
e)	Adequate access				
f)	Positive barricading for critical activities				
g)	Installation of warning signs				
h)	Other				
6.	LADDERS				
a)	Extension side rails 1 m above				
b)	Top of landing				
c)	Properly secured				
d)	Angle + 70° from horizontal				
e)	Other				

Safety walk-through performer (Name & Signature).....

FORMAT NO. : HSE-1 REV 0

(Sheet 3 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
7.	HOISTS, CRANES AND DERRICKS				
a)	Condition of cables and sheaves OK				
b)	Condition of slings, chains, hooks and eyes O.K.				
c)	Inspection and maintenance log-books maintained				
d)	Outriggers used				
e)	Reverse horn installed / active / coupled with gear				
f)	Signs/barricades provided				
g)	Signals observed and understood				
h)	Qualified operators				
i)	Other				
8.	MACHINERY, TOOLS AND EQUIPMENT				
a)	Proper instruction				
b)	Safety devices				
c)	Proper cords				
d)	Inspection and maintenance				
e)	Other				
9.	VEHICLE AND TRAFFIC				
a)	Rules and regulations observed				
b)	Inspection and maintenance				
c)	Licensed drivers				
d)	Other				

Safety walk-through performer (Name& Signature).....

FORMAT NO. : HSE-1 REV 0

(Sheet 4 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
10.	TEMPORARY FACILITIES				
a)	Emergency instructions posted				
b)	Fire extinguishers provided				
c)	Fire-aid equipment available				
d)	Secured against storm damage				
e)	General neatness				
f)	In accordance with electrical requirements				
g)	Other				
11.	FIRE PREVENTION				
a)	Personnel trained & instructed to make use of facility				
b)	Fire extinguishers checked periodically & record maintained				
c)	No smoking in Prohibited areas.				
d)	Fire Hydrants not obstructed				
e)	Regular fire drill conducted				
12.	ELECTRICAL				
a)	Use of 3-core armored cables everywhere				
b)	Usage of 'All insulated' or 'double-insulated' electrical tools				
c)	All electrical connection are routed through ELCB				
d)	Natural Earthing at the source of power (Main DB)				
e)	Continuity and tightness of earth conductor				
f)	Effective covering of junction boxes, panels and other energized wiring places				
g)	Ground fault circuit interrupters provided				
h)	Prevention of tripping hazards maintained				
f)	DCP extinguishers arranged & licensed electrician engaged at site				

Safety walk-through performer (Name& Signature).....

FORMAT NO. : HSE-1 REV 0

(Sheet 5 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
13.	HANDLING AND STORAGE OF MATERIALS				
a)	Safely stored or stacked				
b)	Passageways clear / free from obstructions				
c)	Fire fighting facility in place				
14.	FLAMMABLE GASES AND LIQUIDS				
a)	Containers clearly identified / protected from fire				
b)	Safe storage & transportation arrangement made				
c)	Fire extinguishers positioned nearby				
d)	Facilities kept away from electric spark, hot spatters & ignition source.				
15.	WORKING AT HEIGHT				
a)	Approved Erection plan and work permit in place				
b)	Safe access, Safe work platform & Safety nets provided				
c)	Life lines, Fall arrester, Full body harness with double lanyards used;				
d)	Health Check record available for workers going up?				
e)	Protective handrails arranged around floor openings				
16.	CONFINED SPACE				
a)	Work Permit obtained from requisite authority				
b)	Test for toxic gas and sufficient availability of oxygen conducted & status				
c)	Supervisor present at site & at least one person outside the confined space for monitoring deputed				
d)	Availability of safe means of entry, exit and ventilation (register for entry & exit maintained)				
e)	Fire extinguisher and first-aid facility ensured				
f)	Lighting provision made by using 24V Lamp				
g)	Proper usage of PPEs ensured				
17.	RADIOGRAPHY				
a)	Proper storage and handling of source as per BARC/ AERB guidelines (authorized radiographer available)				
b)	Work permit obtained				

Safety walk-through performer (Name& Signature).....

FORMAT NO. : HSE-1 REV 0

(Sheet 6 of 6)

SL. NO.	ITEM	Satisfactory/ Yes	Non satisfactory/ No	Remarks	Action
c)	Cordoning of the area done				
d)	Use of appropriate PPE's ensured				
e)	HSE training to workers/supervisors imparted during the fortnight (indicate topic)				
f)	Minimum occupancy of workplace ensured				
18.	HEALTH CHECKS				
a)	All Workers medically examined and found be fit for working at heights (slinging, rigging, painting etc.) in confined space in excavation / trenching in shot blasting				
b)	Availability of First Aid box with contents				
c)	Proper sanitation at site, office and labour camps				
d)	Arrangement of medical facilities.				
e)	Measures for dealing with illness at site & labour camps.				
f)	Availability of Potable drinking water for workmen & staff.				
g)	Provision of crèches for children.				
h)	Stand by vehicle / ambulance available for evacuation of injured				
19.	ENVIRONMENT				
a)	Chemical and Other Effluents properly disposed				
b)	Cleaning liquid of pipes disposed off properly				
c)	Seawater used for hydro-testing disposed off as per agreed procedure				
d)	Lubricant Waste/Engine oils properly disposed				
e)	Waste from Canteen, offices, sanitation etc. disposed properly				
f)	Disposal of surplus earth, stripping materials, Oily rags and combustible materials done properly				
g)	Green belt protection				

Safety walk-through performer (Name& Signature).....

FORMAT NO. : HSE-2 REV 0

(Sheet 1 of 3)

ACCIDENT REPORT

(To be submitted by Contractor after every Accident within 24 hours to EIL/ Owner)

Report No.: _____ Date: _____

Project site: _____ Name of work: _____

Contractor's name: _____ Contractor's Job Engineer (name) _____

Non-disabling injury (Non-LTI)	Hospitalized but resumed duty before end of 48 hrs of accident	
Disabling injury (other LTI)	Hospitalized & failed to resume duty within next 48 hrs	
Fatal (LTI):	Death / Expiry	
First Aid case	Resume duty after first aid	

Name of the injured: _____ Father's name of victim: _____

Sub Contractor's Name:

Gate Pass No.: Age: ____ Yrs. Victim's medical fitness exam. (Pre-empl.) date: - _____

Date & time of Accident / Incident: _____

Names of Witnesses: (1) _____ (2) _____ (3) _____

Profession of victim:

Bar bender		Carpenter		Meson	
Fitter		Helper		Gas cutter	
Grinder		Welder		Electrician	
Driver		Rigger		M/c. operator	
Engineer		Manager		Other/specify	

Qualification

No formal education		Non-Matriculate		Matriculate	
Graduate		Post- grad		Other/specify	

Job Experience

NIL		Less than 2 yrs		2-5 yrs	
5-10 yrs		11-15 yrs		15 years and above	

Location where the incident happened: _____

FORMAT NO. : HSE-2 REV 0

(Sheet 2 of 3)

Activity / Works that were continuing during incident / accident: -

Excavation		Demolition		Concrete carrying	
Concrete pouring		Transportation of materials (manually)		Transportation of materials (mechanically)	
Work on or adjacent to water		Work at height (+2.0 mts)		Scaffold preparation	
Scaffold dismantling		Piling works		Welding	
Grinding		Gas-cutting		Pipe fit-ups & fabrication	
Structural fabrications		Machine works		Hydro-testing works	
Electrical works		Erection activities		Other/specify	

What exactly the victim was doing just before the incident / accident?

.....

.....

Nature of injury:

Bruise or Contusion		Abrasion (superficial wound)		Sprains or strains	
Cut or Laceration		Puncture or Open wound		Burn	
Inhalation of toxic or Poisonous fumes or gases		Absorption		Amputation	
Fracture		Other/specify			

Parts of body involved in incident / accident

Head		Face		Eyes	
Throat		Arm (above wrist)		Hand (including wrist)	
Fingers		Trunk (Abdomen / Back / Chest / Shoulder)		Throat	
Leg (above ankle)		Foot (incl. ankle)		Toes	
Multiple				Other/specify	

Accident type:

Struck against		Struck by		Fall from Elevation	
Fall on same level		caught in		caught under	
caught in between		Rubbed or abraded		Contact with (Electricity)	
Contact with (Temp./ extremes)		Contact with chemicals or oils		Vehicle accident	
Other/specify					

FORMAT NO. : HSE-2 REV 0

(Sheet 3 of 3)

Medical Aid provided:-(indicate specific aids / treatment etc.)-

.....

Actions taken to prevent recurrence of similar incident / accident:

.....

Intimation to local authorities (Dist. Collector / Local Police Station / ESI authority): Yes / No / NA.

If yes, to whom

Safety Officer
 (Signature and Name)
 Stamp of Contractor

Site Head / Resident Construction Manager
 (Signature and Name)

To : Owner
 : RCM/Site-in-charge EIL (3 copies)
 → Nodal Officer HO through RCM (In case of major accident)
 → Divisional Head (Constn) through RCM
 → Project Manager, EIL, through RCM

FORMAT NO. : HSE-3 REV 0

(Sheet 1 of 5)

SUPPLEMENTARY ACCIDENT INVESTIGATION REPORT

TICK THE APPROPRIATE ONEAS APPLICABLE (furnish within 72 hours)

Supplementary to Incident / Accident Report No: _____ (Copy enclosed)

Report No.: _____ Date: _____

Project site: _____ Name of work: _____

Contractor's name: _____ Contractor's Job Engineer (name) _____

Non-disabling injury (Non-LTI)	Hospitalized but resumed duty before end of 48 hrs of accident.	
Disabling injury (other LTI)	Hospitalized & failed to resume duty within next 48 hrs.	
Fatal (LTI)	Death / Expiry	
First Aid case	Resume duty after first aid	

Name of the injured: _____ Father's name of victim: _____

Sub Contractor's Name:

Gate Pass No.: Age: _____ Yrs. Victim's medical fitness exam. (Pre-empl.) date: - _____

Date & time of Accident / Incident: _____

Names of Witnesses: (1) _____ (2) _____ (3) _____

Profession of victim:

Bar bender		Carpenter		Meson	
Fitter		Helper		Gas cutter	
Grinder		Welder		Electrician	
Driver		Rigger		M/c. operator	
Engineer		Manager		Other/specify	

Qualification

No formal education		Non-Matriculate		Matriculate	
Graduate		Post- grad		Other/specify	

Job Experience

NIL		Less than 2 yrs.		2-5 yrs.	
5-10 yrs.		11-15 yrs.		15 years and above	

Location where the incident happened: _____

FORMAT NO. : HSE-3 REV 0

(Sheet 2 of 5)

Activity / Works that were continuing during incident / accident: -

Excavation		Demolition		Concrete carrying	
Concrete pouring		Transportation of materials (manually)		Transportation of materials (mechanically)	
Work on or adjacent to water		Work at height (+2.0 mts)		Scaffold preparation	
Scaffold dismantling		Piling works		Welding	
Grinding		Gas-cutting		Pipe fit-ups & fabrication	
Structural fabrications		Machine works		Hydro-testing works	
Electrical works		Erection activities		Other/specify	

What exactly the victim was doing just before the incident / accident?

.....

.....

Particular of tools & tackles being used and condition of the same after incident/accident:

.....

.....

Description of Incident/Accident (How the incident was caused) :

.....

.....

.....

Nature of injury:

Bruise or Contusion		Abrasion (superficial wound)		Sprains or strains	
Cut or Laceration		Puncture or Open wound		Burn	
Inhalation of toxic or Poisonous fumes or gases		Absorption		Amputation	
Fracture		Other/specify			

Parts of body involved in incident / accident

Head		Face		Eyes	
Throat		Arm (above wrist)		Hand (including wrist)	
Fingers		Trunk (Abdomen / Back / Chest / Shoulder)		Throat	
Leg (above ankle)		Foot (incl. ankle)		Toes	
Multiple				Other/specify	

FORMAT NO. : HSE-3 REV 0

(Sheet 3 of 5)

Accident type:

Struck against		Struck by		Fall from Elevation	
Fall on same level		caught in		caught under	
caught in between		Rubbed or abraded		Contact with (Electricity)	
Contact with (Temp./ extremes)		Contact with chemicals or oils		Vehicle accident	
Other/specify					

Name & Designation of person who provided First-Aid to the victim: _____

Name & Telephone number of Hospital where the victim was treated _____

Mode of transport used for transporting victim – Ambulance / Private car / Tempo / Truck / Others

How much time taken to shift the injured person to Hospital _____

In case of FATAL incident, indicate clearly the BOCW Registration No. of the victim/Company.....

...

Comments of Medical Practitioner, who treated / attended the victim/injured (attached / described here) _____

What actions are taken for investigation of the incident, please indicate clearly – (Video film / Photography / Measurements taken etc.)

Immediate cause (Please tick the right applicable) –

Hazardous methods or procedures inadequately guarded		Poor housekeeping		Inadequate or improper PPE	
Environmental hazards (excess noise/ space constraint/ inadequate ventilation)		improper illumination/Moving on oval surface		Working on dangerous equipment	

FORMAT NO.: HSE-3 REV 0

(Sheet 4 of 5)

Failure to secure		Horse-play		Failure to use PPE	
Inattention to surroundings		Improper use of hands & body-parts		By-passing safety devices	
Unsafe mixing or placement of tools & tackles		Bypassing standard procedures		Failure in communication	
Operating without authority		Improper use of equipment or tools & tackles		drug or alcoholic influence	
excessive haste		Others(specify)			

Basic cause

Over confidence		Impulsiveness		over-exertion	
Faulty judgement or poor understanding		Failing to keep attention constantly		Nervousness & Fear	
Fatigue		Defective vision		Ill health or sickness	
Slow reaction		Others(specify)			

Root cause

Inadequate Engg		Improper Design		Inadequate Planning & organization	
Inadequate knowledge		Inadequate skill		Inadequate training	
Inadequate supervision		Improper work procedure		Inadequate compliance with standard	
Substandard performance		Inadequate maintenance		Improper inspection	
Others(specify)					

Loss of man days and impact on site works, (if any) –

Remarks from Contractor's Safety Officer/ Engineer –

Was the victim performing relevant tasks for which he was engaged /employed? Yes / No
 Was the Supervisor present on work-site during the incident? Yes / No
 Have the causes of incident rightly identified? Yes / No
 Cause of Accident was _____

FORMAT NO. : HSE-3 REV 0

(Sheet 5 of 5)

Remedial measures recommended by **Safety Officer of Contractor** for avoiding similar incident in future

:

.....

.....

.....

.....

.....

.....

Intimation to local authorities (Dist. Collector / Local Police Station / ESI authority): Yes / No / NA.

If yes, to whom

Safety Officer
(Signature and Name)

Site Head / Resident Construction Manager
(Signature and Name)
Stamp of Contractor

To : Owner

: RCM/ Site-in-charge of EIL (3 copies)

 → Nodal Officer HO through RCM (In case of major accident)

 → Divisional Head (Constn) through RCM

 → Project Manager EIL, through RCM

FORMAT NO. : HSE-4 REV 0

NEAR MISS INCIDENT/ DANGEROUS OCCURRENCE REPORT PROFORMA

(to be submitted within 24 hours)

Report No.: _____

Name of Site: _____

Date: _____

Name of work: _____

Contractor: _____

Incident reported by :

Date & Time of Incident :

Location :

Brief description of incident

Probable cause of incident

Suggested corrective action

Steps taken to avoid recurrence

Yes ☐

No ☐

Safety Officer

Site Head / Resident Construction Manager

(Signature and Name)

(Signature and Name)

Stamp of Contractor

Note:

- **Near Miss:** Human injury escaped & no damage to property, equipment or interruption to work.
- **Dangerous Occurrence:** Occurrences as mentioned below shall be considered as “Dangerous occurrences”
 - a. collapse or failure of lifting appliances or hoist or conveyors or other similar equipment for handling building or construction material or breakage or failure of rope, chain or loose gears; overturning of cranes used in building or other construction work; falling of objects from height;
 - b. collapse or subsidence of soil, any wall, floor, gallery, roof or any other part of any structure, platform, staging, scaffolding or any means of access including formwork;
 - c. collapse of transmission tower;
 - d. fire and explosion causing damage to property at Construction site.
 - e. spillage or leakage of hazardous substances and damage to their container;
 - f. Collapse, capsizing, toppling or collision of transport equipment;
 - g. Leakage or release of harmful toxic gases at the construction site.

To :Owner

:RCM/Site-in-charge EIL (3 copies)

└─ Divisional Head (Const) through RCM
 └─ Project Manager EIL, through RCM

} (Applicable for Dangerous Occurrence only)

FORMAT NO. : HSE-5 REV 0
MONTHLY HEALTH, SAFETY & ENVIRONMENTAL (HSE) REPORT

(To be submitted by each Contractor)

Actual work start Date: _____ For the Month of: _____
Project: _____ Report No: _____
Name of the Contractor: _____ Status as on: _____
Name of Work: _____ Job No : _____
(Contractor in consultation with EIL shall generate the reports through web based package
(www3.eil.co.in/eilhse)only.

ITEM	UPTO PREVIOUS MONTH	THIS MONTH	CUMULATIVE
1) Average number of Staff & Workmen (average daily headcount, not man days)			
2) Total Man-hours worked			
3) Number of site personnel undergone HSE Induction			
4) Number of HSE meetings organized at site			
5) Number of HSE awareness programmes conducted at site			
6) Number of Tool Box Talks conducted			
7) Number of Loss Time Injuries (LTI)	Fatalities		
	Other LTI		
8) Number of Non disabling injury (Non-LTI)			
9) Number of First Aid Cases			
10) Number of Near Miss Incidents			
11) Number of Dangerous Occurrences			
12) No. of unsafe acts/ practices detected			
13) No. of disciplinary actions taken against staff/ workmen			
14) Man-days lost due to injury			
15) LTI Free man-hours i.e. LTI free man-hours counted from the Last LTI (enter date:)			
16) Frequency Rate (No. of reportable LTI per 10lacs man-hours worked)			
17) Severity Rate (No. of man days lost due to LTI per 10 lacs man-hours worked)			
18) No. of activities for which HIRA Completed			
19) No. of incentives/ awards given			
20) No. of occasions on which penalty imposed by EIL/ Owner			
21) No. of Audits conducted			
22) No. of pending NCs in above Audits			
23) Compensation cases raised with Insurance			
24) Compensation cases resolved and paid to workmen			
25) No of Vehicular Accident cases			
26) No of fire/Explosion cases			
27) Whether workmen compensation policy taken		Yes	No
28) Whether workmen compensation policy is valid		Yes	No
29) Whether workmen registered under ESI Act, as applicable		Yes	No
30) Whether HIRAC Register prepared and updated		Yes	No
31) Whether Environment Aspect Impact Register prepared and updated		Yes	No
32) Whether Legal Register prepared and updated		Yes	No
Remarks, if any			

Date:

Prepared by Safety Officer
(Signature and Name)

Approved by Site Head / Resident Construction Manager
(Signature and Name)

To: -
- RCM EIL

FORMAT NO. : HSE-6 REV 0

PERMIT FOR WORKING AT HEIGHTS (ABOVE 2.0 METER)

(In duplicate to be issued daily for site and for office)

Permit No..... Name of Main Contractor.....
Name of work executing agency / sub agency / vendor:.....
Date..... Exact Location of work.....
Nature of work Duration of work (from) (to)
Number of workers covered within this permit.....
(List enclosed with name & gate pass numbers.)

Sl. No.	Items / Subjects	Status of compliance (Yes / No)	
1	Work areas / Equipments inspected		
2	Work area cordoned off		
3	Adequate lighting is provided		
4	Precautions against public traffic taken		
5	Concerned persons in & around have been alerted & cautioned		
6	Hazards / risks involved in routine / non-routine task assessed and control measures have been implemented at specific task		
7	ELCB provided for electrical connection & found working		
8	Ladder safely attached / fixed		
9	Scaffoldings are checked and TAGs are found used correctly		
10	Working platforms are provided and are found sound /safe for use		
11	Safe access & egress arrangements (e.g. ladders, fall arresters, life-lines etc.) are satisfactorily incorporated		
12	a. Openings on platform / floors are effectively cordoned / covered		
	b. Safety Nets are provided wherever required		
13	Use of following safety gadgets by people working at area under this permit, is checked and found satisfactory - Safety helmet Safety harness (full body) with double lanyard Safety Shoes Safety gloves Safety goggles		
14	Housekeeping of work area found satisfactorily tidy / clean & clear		
15	Adequate measures have been taken for works being continued at the ground level, when simultaneous works are permitted overhead at that very location.		
16	Materials are not thrown from heights on to ground		
17	Medical examination of workers are made & found satisfactory		
18	Responsible job engineer / supervisor found physically present at work spot for overall administration of work as well as safety of people.		

Above items have been checked & compliance has been found in place. Hence work is permitted to start / continue at the above-mentioned location. Work shall not start till identified lapses are rectified.

Additional Precautions, if any

Work Permit issued by
Contractor Engineer/RCM

Verification By
Contractor Safety Officer

AT THE END OF THE DAY/ WORK:

All works at height are completed & workmen have returned safely from work location at
(time)..... (date).....

(Sig. Contractor Engineer)

FORMAT NO. : HSE-7 REV 0

CONFINED SPACE ENTRY PERMIT

Project site _____

Sr.No. _____

Name of the work _____

Date _____

Name of Contractor _____

Nature of work _____

Exact location of work _____

Safety Requirements POSITIVE ISOLATION OF THE VESSEL IS MANDATORY							
(A) Has the equipment been ?							
Y NR	Y NR	Y NR					
☐ ☐ Isolated from power/steam/air	☐ ☐ water flushed &/or steamed	☐ ☐ radiation sources removed					
☐ ☐ isolated from liquid or gases	☐ ☐ Man ways open & ventilated	☐ ☐ proper lighting provided					
☐ ☐ depressurized &/or drained	☐ ☐ cont. inert gas flow arranged	☐ ☐					
☐ ☐ blanked/ blinded/ disconnected	☐ ☐ adequately cooled	☐ ☐					
(B) Expected Residual Hazards							
☐ ☐ lack of O ₂	☐ ☐ combustible gas/ liquid	☐ ☐ H ₂ S / toxic gases					
☐ ☐ corrosive chemicals	☐ ☐ pyrophoric iron / scales	☐ ☐ electricity / static					
☐ ☐ heat/ steam / frost	☐ ☐ high humidity	☐ ☐ ionizing radiation					
☐ ☐	☐ ☐	☐ ☐					
(C) Protection Measures							
☐ ☐ gloves	☐ ☐ ear plug / muff	☐ ☐ goggles / face shield					
☐ ☐ protective clothing	☐ ☐ dust / gas / air line mask	☐ ☐ personal gas alarm					
☐ ☐ grounded air duct/blower /AC	☐ ☐ attendant with SCBA/air mask	☐ ☐ rescue equipment/team					
☐ ☐ Fire fighting arrangements	☐ ☐ safety harness & lifeline	☐ ☐ communication equipment					
☐ ☐	☐ ☐	☐ ☐					
Authorization / Renewal (It is safe to enter the confined space)							
	No. of persons allowed	Name of persons allowed	Signature		Time		Signature
			Contractor's Supervisor	Contractor's Safety Officer	From	To	Workman
Permit Closure : (A) Entry ☐ was closed ☐ stopped ☐ will continue on ... (B) ☐ Site left in a safe condition ☐ Housekeeping done (C) Multilock ☐ removed ☐ key transferred ☐ Ensured all men have come out ☐ Man-ways barricaded Remarks, if any:							

FORMAT NO. : HSE-8 REV 0

RADIATION WORK PERMIT

Project : Sr.No. :
Name of the work : Date :
Name of site contractor : Job No. :

Location of work :

Source strength :

Cordoned distance (m) :

Name of Radiography agency : Approved by Owner/EIL ☐

No. of workers engaged :
(List enclosed with name & gate pass numbers.)

The following items have been checked & compliance shall be ensured during currency of the permit:

S. No.	Item description	Done
	Safety regulations as per BARC/AERB ensured while source in use/in transit & during storage	☐
	Area cordoned off / safe working platform provided	☐
	Lighting arrangements for working during nights ensured	☐
	Warning signs/ flash lights installed	☐
	Cold work permit taken (if applicable)	☐
	PPEs like film badges, dosimeters used	☐

Additional precautions, if any _____

(Radiography Agency's BARC/AERB authorized Supervisor)

Permission is granted.

Permit is valid from _____ AM/PM _____ Date to _____ AM/PM _____
Date

(Signature of permit issuing authority-RCM of contractor)

Name : Designation: Date:

Permit renewal:

Permit extended up to		Additional precautions	Sign of issuing authority with date (of site contractor)	
Date	Time	required, if any		

Work completed/ stopped/ area cleared at _____ Hrs of Date _____

(Sign. of permit issuing authority)

Name & Signature of site contractor:

FORMAT NO. : HSE-9 REV 0
DEMOLISHING/DISMANTLING WORK PERMIT

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :

Name of sub-contractor : No. of workers to be engaged:
(List enclosed with name & gate pass numbers.)

Line No./ Equipment No./ Structure to be dismantled :

Location details of dismantling/ demolition with sketch : (clearly indicate the area)

The following items have been checked & compliance shall be ensured during currency of the permit:

S. No.	Item description	Done	Not Applicable
	Services like power, gas supply, water, etc. disconnected	☐	☐
	Dismantling/ Demolishing method reviewed & approved	☐	☐
	Usage of appropriate PPEs ensured	☐	☐
	Precautions taken for neighboring structures	☐	☐
	First-Aid arrangements made	☐	☐
	Fire fighting arrangements ensured	☐	☐
	Precautions taken for blasting	☐	☐

(Contractor's Supervisor)

(Contractor's Safety Officer)

Permission is granted.

(Permit issuing authority-Client)

Name :
Date :

Completion report:

Dismantling/ Demolishing is completed on _____ Date at _____ Hrs.

Materials/ debris transported to identified location ☐ Tagging completed (as applicable) ☐

Services like power, gas supply, water, etc. restored ☐

(Permit issuing authority-Client)

CONTRACTOR's NAME

FORMAT NO. : HSE-10 REV 0

DAILY SAFETY CHECKLIST

(To make use of before start of day's work)

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :

Description of Job decided to perform : -

• Use of PPE / Safety Gadgets

Sl. No	PPEs	Compliance (Yes / No)	Sl. No	PPEs	Compliance (Yes / No)
1	Safety Helmets		6	Face Shield	
2	Safety Shoes		7	Full body harness	
3	Hand Gloves		8	Fall Arrest System	
4	Dust Mask		9	Safety net	
5	Safety Goggles		10	Horizontal life-line made of steel wire, (dia not less than 8.0 mm.)	

(Serial No. 1 & 2 are compulsory for everyone. Specify & ensure use of other safety gadgets as required for the job)

• Identify following important unsafe conditions: -

Sl. No	Conditions	Yes / No
1	Access to work site / emergency escape clear	
2	Soil / Loose earth kept away from excavated pit / slope / ladder provided	
3	Electrical wire / welding lead lying entangled on ground / welding m/c. booth accessible	
4	Elevated work platform / open ends are protected	
5	Ground area cordoned off before lifting works or erection at height / ground area checked & cordoned-off before start of height works	
6	Structural members / erected pipes / wooden boards/pieces etc. are safely anchored at heights and are not likely to fall down on people when working beneath	
7	Ladders tied-up on tall steel structures, long before are removed to get rid of their use	
8	Any Other	

• Indicate actions taken, if status of any of the above items is found "No"
.....

• Specific Safety guidelines / precautions, if any (communicated thro' TBT)
.....

• Above conditions and PPE compliances are checked by undersigned and correct status are indicated after verification

Prepared by
Contractor Site Engineer

Verification By
Contractor Safety Officer

FORMAT NO. : HSE-11 REV 0

(Sheet 1 of 2)

HOUSEKEEPING ASSESSMENT& COMPLIANCE

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :
Name of contractor : Fortnightly

Sl. No.	Subjects of Review	Satisfactory/ Yes	Non satisfactory/No	Remarks	Action
1.	Cleanliness at the Main entry / access of site				
2.	Ground condition / floor areas free from water-logging / oil spillage				
3.	Ground & elevated floors free from rubbish / wastes / accumulated debris / scraps.				
4.	Manholes / openings are covered / fenced				
5.	Trenches are barricaded / walkways are in place				
6.	Drains are cleaned / not choked / not occupied by dumped materials				
7.	Sufficient CAUTION boards / instructions displayed				
8.	Construction machinery are maintained & parked in orderly manner.				
9.	Movement of site people are not obstructed because of dumping / storing of construction materials				
10.	Access / egress to Electrical Distribution Boards / Panels clear from wires / cables / earth-strips etc.				
11.	Electrical panel rooms / sheds / MCC / Control rooms / Substations etc. are clean & tidy and not used for storing dress / clothes, tiffin-box or bicycles.				
12.	Passage behind Elec. panels are free for access				
13.	Fire extinguishers / fire-buckets are accessible without any difficulty.				
14.	Stair-steps, platforms & landings are clear & tidy				
15.	Sheds / rooms & work areas have got sufficient illumination as well as ventilation				
16.	Cables / Wires / welding leads are routed / hanged appropriately & are not creating unsafe condition.				
17.	Stacking / storing of insulation materials or their packing.				
18.	Removal or cleanliness of left-over sand, concrete, brick-bats, insulation-materials, excess earth, wastes etc.				
19.	Storing / stacking of sand, metal chips, re-bars, steel pipes, valves, fittings etc.				
20.	One escape route at ground & minimum two escape routes at elevation available.				

FORMAT NO. : HSE-11 REV 0

(Sheet 2 of 2)

Sl. No.	Subjects of Review	Satisfactory/ Yes	Non satisfactory/No	Remarks	Action
21.	Captions / Posters / Slogans on various safety instructions are displayed legibly in local language				
22.	Cable trenches are water-free or regular arrangement for taking out accumulated water exists.				
23.	Windows of rooms / offices are regularly cleaned				
24.	Facilities for cycle sheds, drinking water, washing, rest-rooms etc. are maintained in tidy manner.				
25.	Toilet, Urinals, Canteen / kitchen / pantry etc. are maintained & free from obnoxious smell.				
26.	Construction tools / tackles are stored systematically - the items are tagged / tested / certified by competent third party.				
27.	Sufficient numbers of Dust-bins / Waste-bins found at site and are regularly emptied.				

Additional remarks, if any -

.....
.....
.....

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

FORMAT NO. : HSE-12 REV 0

INSPECTION OF TEMPORARY ELECTRICAL BOOTH / INSTALLATION

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :
Sub Station No./Booth No Location:

SL NO	SUBJECTS	OBSERVATION (YES /NO)	ACTION TAKEN
1	Switchboards installed properly are in order and protected from rain & water-logging.		
2	Adequate illumination provided for switchboard operation during night hours & the lamps are protected from direct human contact.		
3	Voltage ratings, DANGER signs, Shock-Treatment-Chart displayed in the installation / booth		
4	Fire extinguisher (DCP or CO ₂) & Sand Bucket kept in close vicinity of Switchboards		
5	Valid License & Competent Electrician / Wireman available & name/ license no. displayed at booth / installation.		
6	General housekeeping in & around booth / installation found in order.		
7	Cable-route-markers for U/G cables provided.		
8	Monthly inspection report of Electrical hand tools available in booth / installation.		
9	Electrical Panel door to be in closed condition and Insulated Mat to be provided in front of panel.		
10	Rubber hand gloves available/ used by Electricians		
11	Availability of CAUTION boards for shutdown & / or repairing works.		
12	All incoming & outgoing feeders have proper MCCB / HRC fuses / Switches.		
13	Switchboards "earthed" at two distinctly isolated locations.		
14	Switchboards have adequate operating space at the front face & at the rear face too.		
15	All connections provided through 30mA ELCB.		
16	Testing records of all ELCBs available at site		
17	Only industrial type plugs & sockets are used.		
18	Temporary connections are 3-core double insulated & free from cuts & joints and 3 rd core is earthed at both ends		
19	Socket boards are properly mounted on stand & protected from water ingress.		
20	Electrical equipments operating above 250V have two earthing / double earthing.		
21	All incoming / outgoing cables are properly glanded & terminated with "lugs".		
22	Switch-boards are of industrial variety / type.		
23	Sketch for installation / connection (SLD) made & pasted& other safety labels/display boards		
24	Labeling of incoming / outgoing feeders made.		
25	All hand lamps are protected from direct contact.		
26	All electrical cable / joints are in safe condition		

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

FORMAT NO. : HSE-13 REV 0

(Sheet 1 of 2)

INSPECTION FOR SCAFFOLDING

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :

Sl. No	Description	Yes	No	N.A.	Actions taken
1	Whether work permit is obtained to take up work at height above 1.5 Mts?				
2	Whether atmospheric condition is "stormy" or "raining" and works at heights have been permitted?				
3	Whether steel pipes scaffoldings are used for units /off-site areas?				
4	Whether scaffolding has been erected on rigid/firm/leveled surfaces / ground? Whether "foot-seals" or "base-plates" are used beneath the up-rights (vertical steel pipes)				
5	Whether scaffold construction is as per IS specification with toe-board and hand-rails (top-rail as well as mid-rail)?				
6	Whether distance between two successive up-rights are less than 2.5 Mts (height of scaffold & load carrying capacity governs the distance between two uprights)				
7	Whether all uprights are extended at least 900 mm above the top most working platform (to enable fitting of handrails)?				
8	Whether vertical distance of two successive ledgers is satisfactory? (varying between 1.3 Mts. To 2.1 Mts)				
9	Whether the peripheral areas of working at height are cordoned-off? (for avoiding accident to people arising out of dropped / deflected materials)				
10	Whether platform is provided? Is it safely approachable?				
11	Whether end of scaffold platform / board are extended beyond transoms? (125mm to 150 mm)				
12	Whether CE / IS approved quality and worthy conditioned full-body safety harness (with double lanyard & karabiners) are used while working at heights?				
13	Whether life-line of safety harness is anchored to an independent secured support capable of withstanding load of a falling person?				
14	Whether the area around the scaffold is cordoned off to prohibit the entry of unauthorized person / vehicle?				
15	Whether clamps used are of good condition, of adequate strength and free from defects?				
16	Whether ladder is placed at secured and leveled surface?				
17	Whether water-pass and oil-spills are avoided around the scaffold structure?				
18	Whether ladder is extended 1.5mts. above the landing point at height?				
19	Whether more than one access/egress provided to the scaffold?				
20	Whether ladder used are of adequate length and overlapping of short ladders avoided?				
21	Whether metallic ladders are placed much away from near-by electrical transmission line?				
22	Whether rungs of ladder are inspected and found in good order?				
23	Whether fall-arresters provided on both the access/egress routes?				
24	Whether diagonal (cross) bracings are provided at regular interval on the scaffold?				
25	Whether working platform on the scaffold has been made free from "jolt" or "gap"?				
26	Whether tools or materials are removed after completion of the day's job at heights?				
27	Whether a valid Permit for Work (PFW) is obtained before taking up work over asbestos or fragile roof?				
28	Whether sufficient precaution is taken while working on fragile roof?				

FORMAT NO. : HSE-13 REV 0

(Sheet 2 of 2)

Sl. No	Description	Yes	No	N. A	Actions taken
29	Whether provision is made to arrange duck ladder, crawling board for working on fragile roof?				
30	Whether scaffold has been inspected by qualified civil engineers prior to their use?				
31	Whether the scaffolding has been designed for the load to be borne by the same?				
32	Whether the erection and dismantling of the scaffolding is being done by trained persons and under adequate supervision?				
33	Whether safety net with proper working arrangement and life-line has been provided?				
34	Whether TAGS (Green for acceptable and Red for incomplete/unsafe scaffolds) are used on scaffolds?				
35	Whether sufficient illumination is provided in and around the scaffold and access?				
36	Whether emergency rescue / response arrangements are made in place				

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

FORMAT NO. : HSE-14 REV 0

(sheet 1 of 2)

PERMIT FOR ERECTION / MODIFICATION & DISMANTLING OF SCAFFOLDING

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :
Nature of activities : Duration: From.....To.....

SL. No.	SUBJECTS / ITEMS	DONE	NOT DONE	REMARKS
1	Specific task of Erection / Modification / Dismantling of scaffolds, identified & TAGGED accordingly (before as well as after carrying-out jobs).			
2	People engaged in doing the job are identified & are certified by Job Engineer of Main Contractor as experienced / trained.			Names to be noted
3	Concerned persons are alerted by the Job Engineer of Main Contractor in connection with possible hazards & what the workmen MUST do / MUST not do.			
4	Verification by Job Engineer of Main Contractor made for confirming that all persons permitted to carry-out the jobs are making use of Helmet, Safety Shoes, Goggles, Gloves & Double lanyard safety harness and other relevant PPEs.			
5	Area of work is effectively cordoned-off / barricaded / illuminated.			
6	For taking-up / lowering down Scaffolding members / clamps / couplings etc. appropriate ropes / pulleys/ chains etc. have been arranged for use (not to throw any item) & the same have been verified as "fit for purpose".			
7	Items / members of scaffold, being lowered are removed from the area & stacked correctly.			
8	Ropes, chains, pulley blocks etc. being used for lifting or lowering scaffold items, are inspected by the Job Engineer & their certifications as well as physical conditions have been found O.K, before signing this PERMIT.			
9	Safety Net / Life-line / Fall Arresters etc. are arranged in position and Job Engineer has found working conditions favorable for activities to start.			
10	Scaffold erection or dismantling tasks are being supervised by Experienced Engineer / Competent person.			
11	Only competent & experienced people have been selected / engaged in Scaffolding erection, modification or dismantling tasks.			
12	Adequate & effective actions for traffic and movement of people around the cordoned-off area taken to avoid inadvertent incident			
13	Working platforms are protected with handrails & toe-boards.			
14	Access & Exit (for reach & escape) are safe for use by people.			
15	Tools, tackles to be used for above jobs are verified by job Engineers of Main contractor as genuinely good and tied-up at height (to prevent their fall).			
16	Site important Telephone Nos. are made known to everyone			
17	SOP (Safe Operating Procedure) for the specific task is made & followed too.			
18	Emergency vehicle has been arranged at work locations.			

- This permit for work shall be available at specific work location all the time.
- After completion of work, permit shall be returned to safety cell of main contractor, without fail.
- This Permit shall be issued maximum upto (Monday to Sunday).
- Additional Precautions, if any

-
• **ACCORD OF PERMISSION** (to be ticked) - YES () / NO ()

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer]

FORMAT NO. : HSE-14 REV 0

(sheet 2 of 2)

Everyday Site working conditions & performance of workmen shall be assessed / checked by Contractor Site Engr. and Safety Officer shall verify the same.

	Name / Sign.	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Site Engr.								
Safety Off.								

FORMAT NO. : HSE-15 REV 0

PERMIT FOR HEAVY LIFT/CRITICAL ERECTION

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :
Nature of activities : Duration: From.....To.....
Location of work : Name /Type of crane :
Equipment/Structure to be erected: Wt. of equipment/ structure to be erected

SL. NO.	Description of Item	COMPLIANCE STATUS			Remarks
		Yes	No	Not applicable	
1)	Is the crane type suitable for lift or as per erection procedure?				
2)	Is the crane have the correct number of counterweights fitted?				
3)	Availability of Load Certification of crane from authorized agency.				
4)	Is the load chart of crane available in crane cabin/or with Crane operator?				
5)	Is the device to check the Wind speed in crane is working? Is the safety features in crane are working?				
6)	Availability of Load certification of slings and other accessories from authorized agency				
7)	Availability of Licensee/certificate for crane operator from authorized agency.				
8)	Availability of approved HIRAC for the subject activities.				
9)	Availability of approved erection/rigging procedures.				
10)	Availability of temporary gratings/ platforms for critical lifting(as applicable)				
11)	Tool Box conducted before erection?				
12)	Has the area been cordoned off?				
13)	Are the authorized persons during erection are identified?				
14)	Does each person identified for erection understand their roles and responsibilities?				
15)	Is the ground on which crane will rest or outrigger support are correct?				
16)	Is hard stand requirement (if any) complied?				
17)	Is the communication system (viz walkie-talkies, etc.) are working properly?				
18)	If more than one crane is lifting the load, is an Intermediate rigger will supervise the lift?				
19)	If there is other obstruction within the operating radius of the crane, have correct precautions been taken to prevent collision?				
20)	All the persons are wearing the requisite PPE?				

Inspected & Issued by
Contractor Engineer/RCM

Verification By
Contractor Safety Officer

FORMAT NO. : HSE-16 REV 0

PERMIT FOR ENERGY ISOLATION & DE-ISOLATION

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :

ENERGY ISOLATION PERMIT	
- Clearance required from:.....HrsDate ToHrsDate - Name of equipment/ energy source etc. - Nature of job to be done: - Area.....Location:.....	
PERMIT VALIDATION I hereby authorize thepersonnel(performer) to isolate the above equipment/energy source from all sources of power and handover the equipment/energy source for maintenance/repair. Issuing authority Area –Incharge/RCM Signature: Date: Name:	PERFORMING AUTHORITY The work and precautions will be carried out under my overall responsibility.(Testing/execution engineer) Signature: Date: Name:
SAFETY PRECAUTIONS FOR CLEARANCE 1. Notify workers of intent to de- energize ☐ 2. Obtain lock, tag or locking/tagging devices ☐ 3. Shut down, deenergize, dissipate any residual energies. ☐ 4. Apply lock ,tag and locking and/or tagging devices ☐ 5. *Any other job specific precautions ☐ 6. Verify effectiveness of lockout by attempting to restart. ☐ 7. Proper PPE is ensured ☐ I certify that the energy source mentioned above is isolated from all sources and is safe to start the work. Tag No:..... Lock No:..... Issuing authority Area –Incharge/RCM Signature: Date: Name: (*to be included by contractor in consultation with EIL/owner)	NORMALISING AFTER CLEARANCE 1. Notify workers of intent to re- energize ☐ 2. Conduct visual inspection to confirm that the danger zone is clear of workers ☐ 3. Conduct visual inspection to confirm that tools, equipments danger zone is clear of workers ☐ 4. Reposition the safety devices(interlocks, valves, guards, covers ,sensors, as applicable, etc.) ☐ 5. *Any other job specific normalizing details ☐ 6. Remove lock, tag and locking and/or tagging devices. ☐ 7. Re-energize. ☐ 8. Confirm system is operating properly& safely I certify that the energy source mentioned above is isolated from all sources and is safe to start the work. Tag No:..... Lock No:..... Issuing authority Area –Incharge/RCM Signature: Date: Name: (*to be included by contractor in consultation with EIL/owner)
ENERGY DE-ISOLATION PERMIT	
PERMIT VALIDATION I hereby authorize thepersonnel(performer) to de- isolate the above equipment/energy source from all sources of power and handover the equipment/energy source for normal operation.. Issuing authority Area –Incharge/RCM Signature: Date: Name:	PERFORMING AUTHORITY I hereby certify that the equipment/energy source mentioned above has been de-isolated and is ready for normal operation.(Testing/execution engineer) Signature: Date: Name: Countersigned by Issuing authority

FORMAT NO. : HSE-17 REV 0

PERMIT FOR EXCAVATION

(depth 2m and above)

(Sheet 1 of 2)

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :
Job Description : Location:
Size of excavation :

SL. NO.	Description of Item	COMPLIANCE STATUS			Remarks
		Yes	No	Not applicable	
1)	Suitable and sufficient risk assessments and method statements has been carried to ensure that the work shall be undertaken in accordance with specification and standard.				
2)	Are plans/details of underground services available and the same has been reviewed?				
3)	Has survey done to locate the services/obstacles etc.				
4)	Has the live services (electrical, water line, air line, telephone line, etc) has been disabled for carrying out the job.				
5)	Is adequate barriers/fences to protect the excavation are in place?				
6)	Is Adequate warning signs are in place?				
7)	Is Assessment of ground conditions done and remedial action (if any) taken?				
8)	Safe access / egress (e.g. ramp / steps / ladders etc.) provided for site workmen & supervisors.				
9)	Is the excavation work being undertaken in proximity of structure, etc.? If Yes, it's effect is considered?				
10)	Availability of competent person for supervising the excavation work?				
11)	Adequate safe arrangement to prevent collapse of edges (e.g. shoring / strutting / benching / sloping etc.) made at site.				
12)	Hard barricades (at least 1.0M away from edge & for excavation near site access roads) with warning signs/caution boards are provided				
13)	Accumulation / passage-ways of water at periphery of excavation / trench stopped/ restricted.				
14)	Is the equipment being used for excavation has been checked for adequacy and is in good working condition having all the safety features?				
15)	Age & fitness of workmen ensured by medical test before engagement in job ?				
16)	Arrangement of Monitoring of possible oxygen deficiency or obnoxious gases done & action taken?				

PERMIT GRANTED - Yes / No

(List enclosed with name & gate pass numbers.)

Name & Signature of Site Engr.

Name & Signature of Area – In charge/RCM of

Contractor (Initiator)

Contractor (Issuing authority)

Verification by Contractor Safety Officer

FORMAT NO. : HSE-17 REV 0

PERMIT FOR EXCAVATION

(Sheet 2 of 2)

NOTES: -

1. Slopes or benches for excavation beyond 2.0M depth shall be designed & approved by Contractor's site head.
2. Excavated earth to be kept at least 1.5M away from edges
3. Safety helmets, Safety shoes or gum-boots, gloves, goggles, Face shield, Safety Harness shall be essential PPEs.
4. Permit shall be made in **duplicate** and original shall be available at site of work.
5. Permit shall be issued for maximum **one week** only (Monday to Sunday)
6. After completion of works, permit shall be closed & preserved for record purpose

GRANT OF PERMIT AND EXTENSIONS

Sl. No.	Validity period From ____ To ____	Working Time From ____ To ____	Initiator (site Engr. of Main Contractor)	Issuing authority (Area In charge/RCM of Main Contractor)	Review by EIL / Owner (Remarks with date)
1.					
2.					
3.					
4.					
5.					
6.					
7.					

Additional safety instructions if any: -

- 1.
- 2.
- 3.

FORMAT NO. : HSE-18 REV 0

(Sheet 1of 2)

IDENTIFICATION OF ENVIRONMENTAL ASPECTS, IMPACT ASSESSMENT AND CONTROL MEASURES

S.No	Activity	Environmental Aspect	N/A/E	Environment Impact	Control Measures	Consequences						Risk Level	Significant	Gaps/ Recommendations
						A	B	C	D	E	F	G	Yes/No	

(Sheet 2 of 2)

INITIAL ENVIRONMENT REVIEW TECHNIQUE

Environmental Impacts	AP = Air Pollution	WP = Water Pollution	LC = Land Contamination	DNR = Depletion of Natural Resources	NP = Noise Pollution
------------------------------	--------------------	-------------------------	-------------------------	---	----------------------

Scale	Quantity (A)	Occurrence (B)	Severity of Impact (C)	Detection (D)	Control (E)	Legal and other requirements (F)
1	Negligible	Very Rare	Negligible visual impact	Immediately	Available & effective at place	In compliance or not applicable
2	Low	Once a month or less	Causes Discomfort or Nuisance	Within 1 hour	Has in-built Secondary control	
3	Moderate	Once a day	Resource Depletion	Within 8 hours	Needs human Intervention	
4	High	Several times a Day	Affects Aquatic Life, flora, fauna or global issue	Within 24 hours	Mechanism in place but not reliable	
5	Excessive	Continuous	Human health effect	More than 24 hours	Absent or no effective control	Not in compliance

Risk Level - G : A x B x C x D x E x FAspects with score of **100 and above** are considered as significant.Also, Irrespective of the score, all legal noncompliance's to be considered as significant

Condition	
N	NORMAL
A	ABNORMAL
E	EMERGENCY

FORMAT NO. : HSE-19 REV 0 HIRAC

Risk Identification						Desired Controls & Existing Gaps, If Any		Risk Assessment				Recommended Control Actions To Reduce The Risk Level	Action By	Remarks
SN	Activity	Activity Type (R/Nr)	Hazards	Condition (N/An/E)	Associated Risk	Desired Control Measures	Gaps If Any	Probability (P)	Impact (I)	Risk R= P*I	Risk Classification			

Likelihood – Possibility of occurrence of risks based on present gaps (technological / operational / competence / measurement and monitoring);

UL: Unlikely, **L:** Likely, **VL:** Very Likely, **FR:** Frequent, **C:** Continuous

Impact –

SI: Slight Injury, **MI:** Minor Injury, **MJ:** Major Injury, **SF:** Single Fatality, **MF:** Multiple Fatalities

Level of consequence – Refer Guidance criteria for this i.e. possible degree of damage;

Condition- **N:** Normal, **AN:** Abnormal, **E:** Emergency

Activity Type: **R-** Routine, **NR-** Non Routine

RISK –

L: Low Risk, **M:** Moderate Risk, **H:** High Risk

FORMAT NO.:

HSE-20 REV 0

Inspection of Tower Crane

Name of Contractor:

Project:

Name of Work:

Job No:

Vehicle Identification/Registration No:

Date:

Sr. No.	Description	Observation	Remarks & Suggestions
1	Serial number plate & SWL marking		
2	Valid TPI Certificate		
3	Valid Insurance		
4	Safe access and egress are provided to the crane operator.		
5	Front glass of Operator cabin		
6	Operator crane cabin is provided with a locking mechanism so as to prevent unauthorised entry.		
7	A safety bar is fitted across the operator's cabin window where there is likelihood of the operator falling through it.		
8	Manufacturer Operating Manual and Maintenance Manual are made available.		
9	An updated Operation and Maintenance log book is available in the operator cabin.		
10	All mounting bolts are in good condition.		
11	Load chart provided		
12	SLI available		
13	Crane hooks have got smooth surface and no dent		
14	Hook-latch / Dog-clamp in hook is effective		
15	Over hoist limit switch		
16	Double body earthing of Tower Crane		
17	Jib angle indicator is provided (For Luffing Jib Tower Crane).		
18	Emergency stop button, which will terminate the operation of the crane engine, is installed in the operator cabin and correctly identified.		
19	Effective braking mechanisms for Hoisting, Derricking, Slewing, Trolley Travelling maintained:		
20	Trolley Travelling limiter to prevent over-travelling of trolley is functional.		
21	Limit switches to prevent over-derricking and over-lowering of jib (For Luffing Jib Tower Crane) is functional.		
22	Slewing limiter to restrict slewing of crane is functional.		
23	Over load Limiter to prevent overloading of crane is functional.		
24	Load Moment Limiter to prevent over-turning moment is functional.		
25	Anti-collision devices are tested to stop the tower crane's operation such that the crane-to-crane interference must be maintained at not less than 3 m.		
26	Condition of boom		
27	Counter weight placement and pins		
28	Winches, pulleys and wire ropes are in good working condition.		
29	Colour coding		
30	Leakage in hydraulic cylinder		
31	Fire Extinguisher		

32	Tower crane is adequately grounded or protected against lightning.		
33	Wind anemometer is installed and is in good working condition.		
34	Aviation lamp is functional (Reqd. for 30mt and above)		
35	Pre Medical Check-up & Periodic Medical check-up (every 6 months) including vision test for Operator		
36	Safety Induction for Operator		
37	Others		

**Signature & Name of
Operator:**

**Signature and name of Job
Engineer**

Signature & Name of Contractor's Safety Officer

FORMAT NO. : HSE-21 REV 0

Crane Inspection Checklist

Name of Contractor:

Project:

Name of

Work:

Job No:

Vehicle Identification/Registration No:

Date:

Sr. No.	Description	Observation	Remarks & Suggestions
1	Crane hooks have got smooth surface and no dent		
2	Hook-latch / Dog-clamp in hook is effective		
3	Over hoist limit switch		
4	Over Load Indicator		
5	Over Boom limit switch		
6	Boom angle indicator		
7	Colour coding		
8	Condition of boom		
9	Condition of wire rope		
10	Rope drum / sheaves are in good working condition		
11	Swing break & lock		
12	Swing Alarm		
13	Over hoist break & lock		
14	Boom break & lock (For Telescopic Boom)		
15	Leakage in hydraulic cylinder		
16	Condition of Outrigger (For Tyre Mounted Crane)		
17	Outrigger fully extended Marking (For Tyre Mounted Crane)		
18	Condition of Tyre (For Tyre Mounted Crane)		
19	Wheel chokes are present and are used whenever required (For Tyre mounted)		
20	Battery & lamps		
21	Moving & rotating parts guarded		
22	Load chart provided		
23	Reverse horn (For Tyre Mounted Crane)		
24	Body Condition of crane		
25	Front glass of Operator cabin		
26	Both side Mirror		
27	Number Plate (For Tyre Mounted Crane)		
28	Fire Extinguisher		
29	Horn		
30	Windshield and wipers		
31	Working of light & Indicator		
32	SLI		
33	Spark Arrestor(For Running Refinery/ Petrochemical/Chemical Plant)		

34	Foot-steps and hand-holds are in good working condition for exit /enter in to cabin		
35	TPI Certificate		
36	RC Document (For Tyre Mounted Crane)		
37	Fitness Certificate of Vehicle by authority		
38	Insurance		
39	PUC		
40	HMV License for Operator		
41	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
42	Safety Induction for Operator		
43	Others		

**Signature & Name of
Operator:**

**Signature & Name of Contractor's
Concern Engineer**

**Signature & Name of Contractor's Safety
Officer**

FORMAT NO. : HSE-22 REV 0

Hydra Crane Inspection Checklist

Name of Contractor:

Project:

Name of Work:

Job No:

Vehicle Identification/Registration No:

Date:

Sr. No.	Description	Observation	Remarks & Suggestions
1	Identification number of Hydra crane boldly scribed in front and rear end of machine		
2	Hydra Operator has got adequate document in support of his competency (i.e. HMV driving license, knowledge & training)		
3	Marking of SWL on hook position is clearly visible		
4	Test & examination of Hydra crane by statutory / competent authority is carried out & document is valid		
5	Colour Coding		
6	RC Document		
7	Fitness Certificate of Vehicle by authority		
8	Valid Insurance		
9	Valid PUC		
10	Pre Medical Check-up & Periodic Medical check-up (every 6 months) including vision test for Operator		
11	Safety Induction for Operator		
12	Crane hooks have got smooth surface and no dent		
13	Hook-latch / Dog-clamp in hook is effective		
14	Over hoist limit switch		
15	Over Load Indicator		
16	SLI		
17	Condition of boom		
18	Condition of wire rope		
19	Rope drum / sheaves are in good working condition		
20	Leakage in hydraulic cylinder		
21	Tyre condition		
22	Battery		

23	Moving & rotating parts guarded		
24	Break		
25	Parking Break		
26	Front horn		
27	Reverse horn		
28	Hydra cabin body and frame of machine is in good order		
29	Both side Mirror		
30	Fire Extinguisher		
31	Front glass pane of the Hydra operator's cabin is clean & clear (i.e. not cracked / damaged / broken)		
32	Windshield and wipers condition		
33	Working of front & back lights, turn Indicators, parking lights & fog lamps		
34	Spark Arrestor(For Running Refinery/ Petrochemical/Chemical Plant)		
35	Wheel chokes are present and are used whenever required		
36	Foot-steps and hand-holds are in good working condition for exit /enter in to cabin		
37	Others		

Signature & Name of Operator

**Signature & Name of
Contractor's Concern
Engineer**

Signature & Name of Contractor's Safety Officer

FORMAT NO. : HSE-23 REV 0

Hydraulic Rig Inspection Checklist

Name of Contractor:

Project:

Name of Work:

Job No:

Vehicle Identification/Registration No:

Date:

Sr. No.	Description	Observation	Remarks & Suggestions
1	Control panel is clean & all buttons/switches are clearly visible (no paint over spray, etc.)		
2	All switch & mechanical guards are in good condition and properly installed		
3	All Safety Indicator lights work		
4	Drive controls function properly & accurately labelled (up, down, right, left, forward, back)		
5	Motion alarms are functional		
6	Safety decals are in place and readable		
7	Any defects such as cracked welds, fuel leaks, hydraulic leaks, damaged control cables or wire harness, etc.		
8	Braking devices are operating properly		
9	Winches, pulleys and wire ropes are in good working condition.		
10	Function of interlocks and limit switch		
11	The manufacturer's operations manual (in all languages of the operators)		
12	Oil level, Hydraulic Oil Level, Fuel Level, Coolant Level		
13	Battery Charge		
14	Outriggers in place or functioning. Associated alarms working		
15	Moving & rotating parts guarded		
16	Load chart provided		

17	Fire Extinguisher		
18	Spark Arrestor, if operated by using fuel(For Running Refinery/ Petrochemical/Chemical Plant)		
19	Serial number plate		
20	SLI		
21	TPI Certificate		
22	Colour Coding		
23	Insurance		
24	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
25	Safety Induction for Operator		
26	Others		

**Signature & Name
of Operator:**

**Signature & Name of Contractor's Concern
Engineer**

Signature & Name of Contractor's Safety Officer

FORMAT NO. : HSE-24 REV 0

Boom Lift Inspection Checklist

Name of Contractor:

Project:

Name of Work:

Job No:

Vehicle Identification/Registration No:

Date:

Sr. No.	Description	Observation	Remarks & Suggestions
1	Operating and emergency controls are in proper working condition, EMO button or Emergency Stop Device		
2	Functional upper drive control interlock (i.e. foot pedal, spring lock, or two hand controls)		
3	Emergency Lowering function operates properly		
4	Lower operating controls successfully override the upper controls		
5	Both upper and lower controls are adequately protected from inadvertent operation.		
6	Control panel is clean & all buttons/switches are clearly visible (no paint over spray, etc.)		
7	All switch & mechanical guards are in good condition and properly installed		
8	All Safety Indicator lights work		
9	Drive controls function properly & accurately labelled (up, down, right, left, forward, back)		
10	Motion alarms are functional		
11	Safety decals are in place and readable		
12	Guardrails and anchor points are in place, and in good condition		
13	Work platform & extension slides are clean, dry, & clear of debris		
14	Work platform extension slides in and out freely with safety locking pins in place to lock setting on models with extension platforms.		
15	Any defects such as cracked welds, fuel leaks, hydraulic leaks, damaged control cables or wire harness, etc.		
16	Braking devices are operating properly		
17	The manufacturer's operations manual is stored on AWP (in all languages of the operators)		
18	Oil level, Hydraulic Oil Level, Fuel Level, Coolant Level		
19	Battery Charge		

20	Outriggers in place or functioning. Associated alarms working		
21	Tyres and wheels are in good condition, with adequate air pressure if pneumatic		
22	Wheel chokes are present and are used whenever required		
23	Moving & rotating parts guarded		
24	Load chart provided		
25	Fire Extinguisher		
26	Spark Arrestor, if operated by using fuel(For Running Refinery/ Petrochemical/Chemical Plant)		
27	Serial number plate with Load capacity		
28	TPI Certificate		
29	Colour Coding		
30	Insurance		
31	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
32	Safety Induction for Operator		
33	Others		

**Signature & Name of
Operator:**

**Signature & Name of
Contractor's Concern
Engineer**

**Signature & Name of Contractor's Safety
Officer**

GUIDELINES ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

**[ANNEXURE – A - XVI TO SPECIAL CONDITIONS OF
CONTRACT]**

Guidelines on Personal Protective Equipment (PPE)

<u>INDEX</u>			
SN	DESCRIPTION	PPE TO BE USED	Page No
1	Work at Height (height > 2 M)	• Safety Shoe (A) • Full Body Safety Harness With shock absorbers (Two alternatives), • Shock absorbing lanyard double 'Y' type • Restrain Lanyard, • Rope Grab (In case of vertical life line being used) • Helmet (A)	4-11
2	a) Excavation. b) Fire pump Operation. c) Testing of Pressure Gauge	• Helmet (B) • Safety Shoe (A)	12-13
3	Excavation involving dewatering works	• Helmet (B) • Gumboot • Gloves (Two alternatives) • Goggles	14-18
4	Blast Cleaning	• Helmet (B) • Safety Shoe(A) • Goggles • Ear Muff • Gloves (Two Alternatives) • Apron (Three Alternatives) • Half face mask	19-26
5	Painting (Confined space / external)	• Helmet (A) • Safety Shoe • Gloves (Two alternative) • Half face mask • Apron (Two Alternatives)	27-30

Guidelines on Personal Protective Equipment (PPE)

<u>INDEX</u>			
SN	DESCRIPTION	PPE TO BE USED	Page No
6	a) Working in Confined space b) Testing of Gas sensor c) Tank Gauging d) De Gassing of LPG Cylinder e) Shuttering works f) Brick masonry g) Handling of Battery	• Helmet (B) • Safety Shoe (A) • Gloves (Two Alternatives)	31-32
7	a) Road work. b) Reinforcement c) Concreting	• Helmet (B) • Gum Boot • Goggles • Gloves (Two Alternatives)	33-34
8	a) Grass Cutting b) Blinding & de-blinding work	• Helmet (B) • Gum Boot	35
9	Electrical Work	• Safety Shoe (B) • Helmet (B) • Gloves (Electrical)	36-38
10	Working with possibility of	• Helmet (B) • Safety Shoe (A) • Goggles • Apron (Two Alternatives)	39-41

Guidelines on Personal Protective Equipment (PPE)

<u>INDEX</u>			
SN	DESCRIPTION	PPE TO BE USED	Page No
11	Welding and Cutting works	• Welding shield • Safety Shoe (A) • Apron Welding • Gloves (Welding) • Helmet (B)	42-44
12	Tank Cleaning	• Helmet (B) • Gum Boot • Apron (Two Alternatives) • Gloves (Two Alternatives)	45-47
13	Product pump house operation	• Helmet (B) • Safety Shoe (A) • Goggles • Gloves (Two Alternatives)	48-19
14	DG Operation	• Helmet (B) • Safety shoe (B) • Ear muff • Electrical glove	50

- 1) **Additional PPE to be provided for various activities as per requirement of Job Safety Analysis (JSA), OISD and Statutory stipulations.**
- 2) Training inputs as required to be given for proper usage, maintenance of PPE.
- 3) Various EN Standards / BIS codes mentioned are available on line on IOCL CO, HSE website.

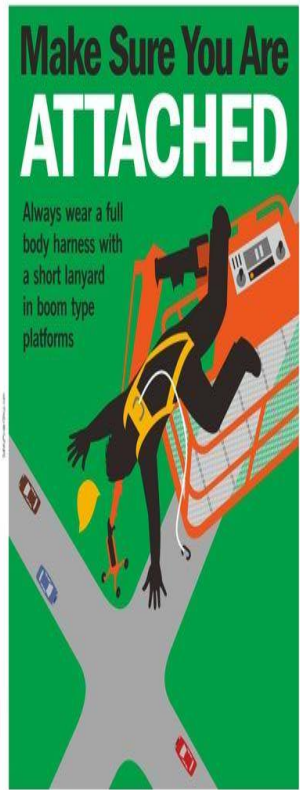
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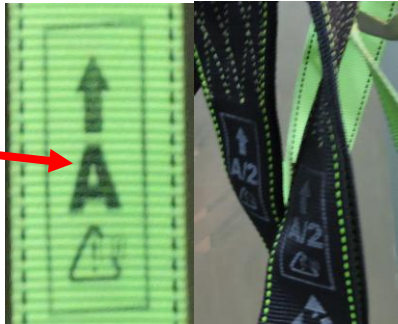
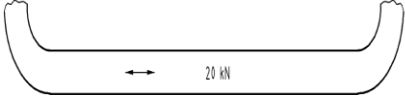
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
1	Work at Height (height > 2 M) Contd... 	I) Safety Shoe (A)   A Typical specimen of marking.	The safety shoe shall have following marking as per IS 15298 (part -2) : - size; - manufacturer's identification mark; - Year of manufacture and at least quarter; - License No (CM/L) - IS Mark Category of Safety Shoe Category of Safety shoe (S1,S2,S3 etc) as required as per Table 16 of IS 15298 (part 2) : 2011 S1 : Closed seat region, Antistatic properties , Energy absorption of seat region S2 : S1 plus Water penetration and water absorption. S3 : S2 plus Penetration resistance (S3) Cleated outsole	- Striking against stationary object. - Striking by moving object - Stepping on hot object - Stepping on sharp object - Penetration (S3 category) - Water penetration and absorption. (S2 & S3 category)	- Not suitable for hazards like Chemical burns , electrical flash, welding spark and heat radiation - Not suitable if it is necessary to minimise electrostatic charges in the shortest possible time . - Not suitable for work in explosive work area.		- Exceeding one year from the date of first use of the shoe . - sign of crack / damage . - Excessive wear - As per Manufactures recommendations.

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Work at Height (height > 2 M) Contd... 	II) Full body Safety Harness with energy absorber : (Alternative -I) Lanyard along with 5 Point (1 Dorsal + 2 Textile loops+ 2 sternal D ring) harness to be used for rescue or tower climbing The ABC's of Fall Protection 	1. The full body harness shall conform to EN 361 Marking on the full body harness shall conform to 2.2 of EN 365:1992 and any text shall be in English. In addition to conforming to 2.2 of EN 365:1992 the marking shall include the following. - On the full body harness, a pictogram to indicate that users shall read the information supplied by the manufacturer.  - A capital letter "A" at each fall arrest attachment element; - The model/type identification mark of the full body harness; - The number of this European Standard, i.e. EN 361. 2. Connector shall conform to EN 362 and Marking on the connector shall conform to EN 365. The marking shall include: - The model/type identification mark of the connector. - EN number & the letter of the class e.g. EN 362:2004/A	Accidental fall - Direct the loads to legs. - Keeping body upright. - Prevent the neck damage - slightly opens the breathing way. - Prevents from colliding with the ground or structure in case of a fall. - Antistatic characteristics	- Shall be of no use if anchor point / life line / lanyard is not properly designed. - There should be proper arrangement for rescue - After accidental fall & before safety harness becoming effective, the person should not strike ground / object. (Prevent risk of bottoming out) SAFETY BELT NOT TO BE USED		- Sign of crack / damage/ stitching giving way - Webbing and rope for cuts, tears, excessive wear and damages - If in doubt "Throw it Out" - As per Manufact ures recomme ndations

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Work at Height (height > 2 M) Contd...	A Typical specimen of marking.  CE marking EN Marking Pictogram  Capital letter A marking at attachment Element	- Marking of major axis strength with gate closed & locked.   Marking of Strength Please see required PPE of "Energy absorbing lanyard " for attaching to safety Harness. Energy absorbing lanyard double 'Y' Type To be attached to full body harness at one end and life line at other end - Must if full body harness being used for protection against fall. - The total length of a lanyard connected to an energy absorber (including terminations and connectors) shall not exceed 2 m.				

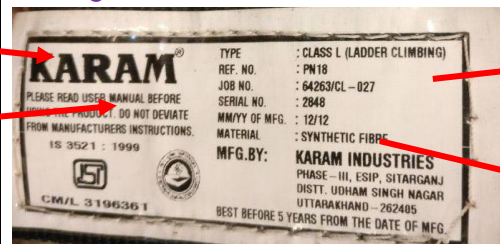
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Work at Height (height > 2 M) - Contd... 	III) Full body Safety Harness with energy absorber (Alternative -II) 	Full body harness conforming to IS 3521 may be allowed in "Green field project" where antistatic safety harness are not required. Following marking to be ensured in case of IS marked full body Harness. - The name, trade-mark or other means of identification of the manufacturer or the supplier who is responsible for acting on behalf of the manufacturer for claiming compliance with this standard; - Manufacturer's product identification information that shall include the manufacturer's batch or serial number that enables the origin of the item to be traced; - The year of manufacture; The identity of the fibre used as the material of construction; - Information that states by appropriate means the intended purpose of each attachment element and to identify specifically those attachment elements that are designed to be used as part of a complete fall arrest system; and - Warning for not to deviate from the manufacturer's instructions.	Accidental fall - Direct the loads to legs. - Keeping body upright. - Prevent the neck damage - slightly opens the breathing way. - Prevents from colliding with the ground or structure in case of a fall.	- Shall of no use if anchor point / life line / lanyard is not properly designed. - There should be proper arrangement for rescue - After accidental fall & before safety harness becoming effective, the person should not strike ground / object. (Prevent risk of bottoming out) SAFETY BELT NOT TO BE USED ISI marked full body harness are not antistatic hence not recommended in running plants.		- Sign of crack / damage/ stitching giving way - Webbing and rope for cuts, tears, excessive wear and damages - If in doubt "Throw it Out" - As per Manufactures recommendations

Name of Manufacture and other details

ISI Mark and number

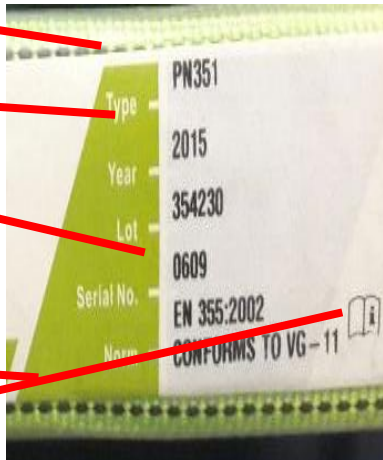
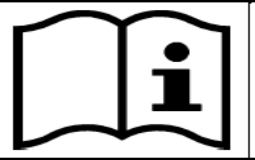
A Typical specimen of marking



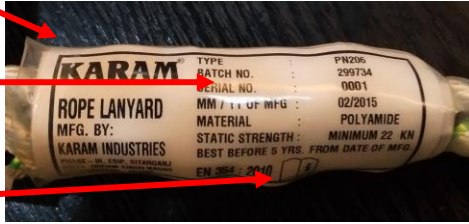
Other details such year of manufactures , batch number etc

Material used

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Work at Height (height > 2 M) - Contd...  Model / Type and identification mark Year of manufacturing EN number Maximum length Pictogram	Energy absorbing lanyard double 'Y' Type To be attached to full body harness at one end and life line at other end • Must if full body harness being used for protection against fall. • The total length of a lanyard connected to an energy absorber (including terminations and connectors) shall not exceed 2 m. A Typical specimen of marking 	Energy absorbing lanyard shall conform to EN 355 and shall have the following marking : a) On the energy absorber, a pictogram to indicate that users shall read the information supplied by the manufacturer (see figure);  b) the maximum length allowed of the energy absorber including lanyard; c) the model/type identification mark of the energy absorber; d) the number of this European Standard, i.e. EN 355. The marking shall conform to EN 365 and additionally shall include the following : - Means of identification, e.g. manufacturer's name, supplier's name, or trademark; - Manufacturer's production batch or serial number or other means of traceability; - Model and type/identification; - Number and year of the document to which the equipment conforms; - Pictogram or other method to indicate the necessity for users to read the instructions for use.	Accidental Fall	• Shall of no use if anchor point / life line is not properly designed. • There should be proper arrangement for rescue • After accidental fall & before safety harness becoming effective, the person should not strike ground / object. (Prevent risk of bottoming out)		• Sign of cut / damage • After every fall. • As per manufacturer's recommendation.

Guidelines on Personal Protective Equipment (PPE)

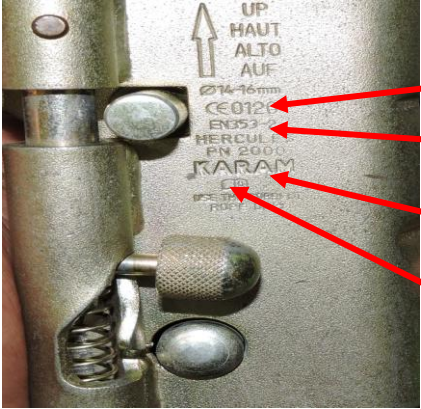
SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Work at Height (height > 2 M) - Contd... 	IV) Restraint lanyard - To be secured to properly designed anchorage - The restraint lanyards need not have shock absorption element incorporated in them	Lanyard shall conform to EN 354 (latest edition). Connector incorporated in lanyard shall conform to EN 362. Marking on the lanyard shall conform to EN 365 and, in addition, shall include at least the following: a) the maximum lanyard length, in accordance with 4.1.6; b) the month and year of manufacture. As per EN 365 marking shall include : - Means of identification, e.g. manufacturer's name, supplier's name, or trademark; - Manufacturer's production batch or serial number or other means of traceability; - Model and type/identification; - Number and year of the document to which the equipment conforms; - Pictogram or other method to indicate the necessity for users to read the instructions for use. A Typical specimen of marking 	Accidental fall - Lets a worker travel just far enough to reach the edge but not far enough to fall over	- Shall be of no use if life line & anchor points are not properly designed. - To ensure that fall restraint lanyards are never used for the purpose of fall arrest		Check metal fittings for sharp edges, excessive wear, correct operation and distortion. - If in doubt "Throw it Out"  Age Indicator - As per Manufactures recommendations

Name of manufacture

Batch Number, serial Number, Material, Static strength, Pictogram

Pictogram

Guidelines on Personal Protective Equipment (PPE)

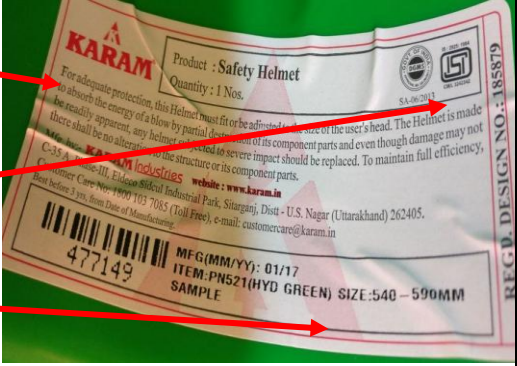
SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Work at Height (height > 2 M) - Contd... 	(V) Rope Grab (in case of vertical lifeline being used) The rope grab immediately grabs on the line in the event of a fall, thereby arresting the fall   Pictogram	Rope grab shall conform to EN 353-2 : 2002 & Marking on the guided type fall arrester and the flexible anchor line shall conform to EN 365 . In addition shall include the following: - Means of identification, e.g. manufacturer's name, supplier's name, or trademark; - Manufacturer's production batch or serial number or other means of traceability; - Model and type/identification; - Number and year of the document to which the equipment conforms; - Pictogram or other method to indicate the necessity for users to read the instructions for use. A Typical specimen of marking 	- Accidental fall - The anchorage line in connection with the given rope grab provides necessary shock absorption.	Shall be of no use if life line & anchor points are not properly designed.		- Check metal fittings for sharp edges, excessive wear, correct operation and distortion. - If in doubt "Throw it Out" - Coloured tracer strand which loses its colour in due course of time to show that the rope is now is unfit for future use - As per Manufactures recommendations

Note : PPE mentioned at III, IV & V above may not be required simultaneously while working at height. These use shall depend upon type of activity

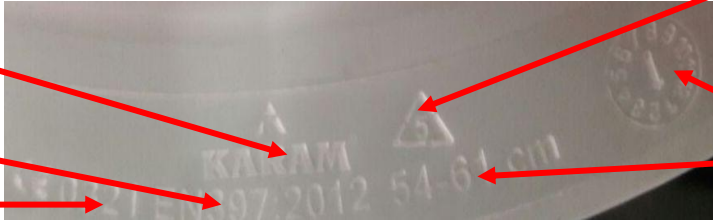
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
1	Work at Height (height > 2 M) 	VI) Helmet (A) 	The helmet shall conform to EN 12492 and shall have following markings : a) the number of this European Standard; b) the name or trademark of the manufacturer and/or his authorized representative; c) the designation of the model; d) the year and quarter of manufacture; e) the size or size range (in cm).	- Shock absorption - Penetration - Impact Within limits stipulated in EN 12492	- The protection given by a helmet depends on the circumstances of the accident and wearing a helmet cannot always prevent death or long term disability. - There may be a foreseeable risk that helmets could become trapped and thereby cause a risk of strangulation. - Cannot provide protection against hazard like splash of hot liquid, work in hot area, cryogenic or corrosive liquid , flying hot particles like chipping, welding, direct fire hazard, contact with bare live electrical conductor .	 	- Sign of crack / damage . - De-colouration - failing in lab test to be done every 1-2 years depending on condition - cradle to be changed after every one year - On sustaining a severe blow even if damage is not apparent - As per Manufactures recommendations. For cleaning, maintenance or disinfection, use only substances (No Solvent) that have no adverse effect on the helmet and are not known to be likely to have any adverse effect upon the wearer, when applied in accordance with the manufacturer's instructions and information).

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
2	a) Excavation. b) Fire pump Operation. c) Testing of Pressure Gauge	1) Helmet (B) 	The helmet shall conform to either IS 2925 or EN 397 a) The helmet conforming to IS 2925 shall have following marking - Manufacturer's name or trade-mark, - Size of helmet. - The helmets may also be marked with the ISI Certification - Mark. A Typical specimen of marking  Name of manufactures → ISI Mark → Size →	- Shock Absorption Resistance - Penetration Resistance - Impact Protection as per EN 397 - Shock absorption - Penetration resistance - Impact The above protection shall be within the limitations of various test as stipulated in IS 2925 /EN-397. Marking for Optional test as per EN 397 as per clause no 7.2.2. Each helmet shall carry moulded or impressed marking or shall carry a durable self-adhesive label stating the optional requirements complied with, as follows: Optional requirement Marking/Label - Very low temperature - 20 °C or - 30 °C as appropriate - Very high temperature + 150 °C - Electrical insulation 440 V a.c. - Lateral deformation LD - Molten metal splash MM	Not suitable for hazards like splash of hot liquid, work in hot area, cryogenic or corrosive liquid, flying hot particles like chipping, welding, direct fire hazard, contact with bare live electrical conductor	 - Sign of crack / damage . - De-colouration - cradle to be changed after every one year - On sustaining a severe blow even if damage is not apparent - As per Manufactures recommendati ons <i>For cleaning, maintenance or disinfection, use only substances (No Solvent) that have no adverse effect on the helmet and are not known to be likely to have any adverse effect upon the wearer, when applied in accordance with the manufacturer's instructions and information).</i>	

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
2	Contd a) Excavation. b) Fire pump Operation. c) Testing of Pressure Gauge		b) In case helmet conforming to EN 397 to be used to facilitate various attachment for providing protection against hazards like splash of hot liquid, flying hot particles like chipping, welding, direct fire hazard the following moulded or impressed marking to be ensured. a) number of this European Standard ie 397 b) name or identification mark of the manufacturer; c) year and quarter of manufacture; d) type of helmet (manufacturer's designation). This shall be marked on both the shell and the harness; e) size or size range (in centimetres). This shall be marked on both the shell and the harness. f) abbreviation for the material of the shell shall be in accordance with EN ISO 472. (For example, ABS, PC, HDPE, etc.) A Typical specimen of marking 	Type of Helmet Year of Manufacture Size			
		II) Safety shoe- (A) 	• Please refer (I) on page 4				Please refer (I) on page 4

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
3	Excavation work Involving dewatering works : Contd.. 	I) Helmet as per IS and EN (B) 	Please refer (I) on page 12 &13				Please refer (I) on page 12 &13.

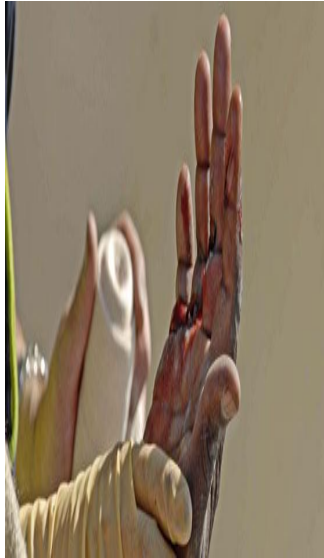
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
3	Excavation work Involving dewatering works : Contd 	II) Gum Boot -Safety   A Typical specimen of marking  	The gum shall conform to IS 12254 and have following marking : - Name of the manufacturer or its recognised trade-mark, if any; - Size No.; - Batch No., and - Month and year of manufacture.	- Striking against stationary object. - Striking by moving object - Stepping on sharp object - Water, alcohols, acids and alkalis	- Not suitable for hazards like Chemical burns , electrical flash, welding spark and heat radiation - Not suitable if it is necessary to minimise electrostatic charges in the shortest possible time . - Not suitable for work in explosive work area.		- exceeding one year from the date of first use of the shoe . - sign of crack / damage / cut - Excessive wear - As per Manufactures recommendations

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Typical Industrial Operation	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Excavation work Involving dewatering works : Contd.. 	III) Goggle :  A Typical specimen of marking  Scratch Resistance Optical Class CE Marking Manufacture Name	The goggles shall conform to EN 166 and EN 170 & shall have following markings : - Marking on the lens as Impact resistance (B) Optical Class (1) , anti fogging (N), Anti Scratch resistance (K), no 2-1.2 marked 2C - shade as per EN 170, Manufacture's Name CE and any other point as per discretion of IOCL in line with EN 166 and 170	surround the eye area, give more protection in situations where one encounters splashing liquids, fumes, vapors, powders, dusts, and mists	Limitation : Uncomfortable to wear with other head gear like helmet, ear muffs or respirator		- exceeding one year from the date of first use of the goggles . - sign of crack / damage . - Excessive wear As per Manufactures recommendations

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
3	Excavation work Involving dewatering works : Contd..  Name of Manufacture —→ CE Marking —→ Size —→ EN Number and pictograms —→ EN Pictogram —→ 	IV) Gloves Alternative - I : Gloves as per EN stand 374 and 388.  A Typical specimen of marking 	Gloves shall conform to EN 374 and 388 & gloves shall have the following markings as per as per EN 420 a) Name, trade mark or other means of identification of manufacturer or his authorized representative; b) Glove designation (commercial name or code allowing the user to identify clearly the product within the manufacturer's/authorized representative's range); c) Size designation; d) Date of obsolescence a if applicable per clause 7.2.3 e) Pictogram (s) appropriate to the standards accompanied by the reference of the applicable standards and performance levels which shall always be in the same fixed sequence as defined in the corresponding standard Cat -III Certificate to be ensured.	• Tear • cut • Abrasion • Puncture	Not suitable for hazards like electrical flash, welding spark and heat radiation		• sign of crack / damage / cut • Excessive wear • IMPORTANT All gloves must be thrown away (in the hazardous waste bin if required) no more than 8 hours after initial contact with the chemical. • Achieving date of obsolescence • As per Manufactures recommendations WARNING If you work with moving machine parts, choosing a glove that is the right size and made from a less durable material is vital, since the glove easily tears apart if you get caught in the machinery.

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
3	Excavation work Involving dewatering works : Contd.. 	Alternative - II Gloves as per IS 6994. 	Alternative -II Alternatively Gloves shall conform to IS : 6994 (Part I) - 1973 & shall have the following marking . a) The manufacturer's name or recognized trade-mark; b) The type and nominal size of the gloves; C) Year of manufacture; and d) Where applicable, the words 'light mass', 'medium mass', or 'heavy mass ' The gloves may also be marked with the Standard Mark. Light Abrasion ix of table 2 Recommended type of Gloves. is 1, 2, 8, 14. 15. 16	• Light handling operation • Tear • Puncture • Cut	Not suitable for hazards like electrical flash, welding spark and heat radiation		• sign of crack / damage / cut • Excessive wear • As per Manufactures recommendations IMPORTANT All gloves must be thrown away (in the hazardous waste bin if required) no more than 8 hours after initial contact with the chemical. WARNING If you work with moving machine parts, choosing a glove that is the right size and made from a less durable material is vital, since the glove easily tears apart if you get caught in the machinery.
As of May 2017 there is no party having BIS license. Use of this product is permitted assuming that in future some party may get BIS license.							

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Typical Industrial Operation	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
4	Blast cleaning - (confined space / external) 	I) Helmet (A) 	Please refer (VI) on page 11					Please refer (VI) on page 11
		II) Safety Shoe 	Please refer (I) on page 4					Please refer (I) on page 4
		III) Goggle 	Please refer (III) on page 16					Please refer (III) on page 16

Guidelines on Personal Protective Equipment (PPE)

	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard																						
4	Blast cleaning - (confined space / external) - Contd <table><tr><th colspan="2">Permissible Noise exposure as per OSHA 29 CFR 1910.95</th></tr><tr><th>DB</th><th>Hours</th></tr><tr><td>90</td><td>8</td></tr><tr><td>92</td><td>6</td></tr><tr><td>95</td><td>4</td></tr><tr><td>97</td><td>3</td></tr><tr><td>100</td><td>2</td></tr><tr><td>102</td><td>1.5</td></tr><tr><td>105</td><td>1</td></tr><tr><td>110</td><td>0.30</td></tr><tr><td>115</td><td>0.15 or less</td></tr></table> Name of manufacture CE Marking EN Number	Permissible Noise exposure as per OSHA 29 CFR 1910.95		DB	Hours	90	8	92	6	95	4	97	3	100	2	102	1.5	105	1	110	0.30	115	0.15 or less	IV) Ear Muff of suitable size "Medium size range "fit satisfactorily in majority of Industrial Application  A Typical specimen of marking	Ear muff shall conform to EN 352 shall have following marking : a) the name, trade mark or other identification of the manufacturer or his authorised representative; b) the model designation; c) the number of this EN Standard, i.e "EN 352" d) in the case of ear-muffs intended by the manufacturer to be worn in a particular orientation, an indication of the FRONT and/or TOP of the cups, and/or an indication of LEFT and RIGHT cup. Check the NRR (Noise Reduction Rating,) to ensure noise exposure within permissible limits Model No	• Extreme noise • Noise induced hearing losses Note : In addition to hearing loss, excessive noise exposure may contribute to mental and physical stress, certain illnesses, and accidents	• Over 8 hours may be uncomfortable in hot environments • Eyeglass wearers may not get a good seal Resonate (vibrate) at lower sound frequencies		• Ear muff with cracked, cut, or missing gaskets • Excessive wear & tear • Damage if any. • As per Manufactures recommendations
Permissible Noise exposure as per OSHA 29 CFR 1910.95																													
DB	Hours																												
90	8																												
92	6																												
95	4																												
97	3																												
100	2																												
102	1.5																												
105	1																												
110	0.30																												
115	0.15 or less																												

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
4	Blast cleaning - (confined space / external) Contd 	V) Gloves Alternative -I Hand gloves - involving high pressure as per EN 388 and 374. 	• Please refer (IV) on page 17				Please refer (IV) on page 17.
	Blast cleaning - (confined space / external) Contd 	Alternative -II - Gloves as per IS 6994 	• Please refer (IV) on page 18 Gross Abrasion sr no. VIII of table 2 Recommended type of Gloves. is 2,8				Please refer (IV) on page 18.

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
4	Blast cleaning - (confined space / external) - Contd 	VI) Apron Alternative -I : Apron as per EN 13982 -1 	The apron shall conform to EN 13892-1 and shall have following markings : - The marking shall be clearly visible and as durable as adequate for the life of the clothing. a) name, trademark or other means of identification of the manufacturer; b) manufacturer's type number, identification number or model number; c) type of this chemical protective clothing, i.e. type 5; d) reference number and date of publication of this part of ISO 13982 (i.e. ISO 13982-1:2004); e) year of manufacture and, if appropriate, the expected shelf-life of the clothing (this information may be marked on every commercial packaging unit instead of being marked on every item of clothing); f) size designation as defined in EN 340:2003, Clause 6; g) pictogram showing that the suit is for protection against chemicals [ISO 7000-2414; see Figure 1 a)] and pictogram to show that the manufacturer's instructions should be read [ISO 7000-1641; see Figure 1 b)];  a)  b)	Protection to the full body against airborne solid particulates.	Not suitable for flame and Hot material	Damage / infection to skin etc 	- exceeding six month from the date of first use of the apron . - sign of crack / damage . - Excessive wear As per Manufactureres recommendations - Do not use compressed air to clean as this will create dust in the air. - Clean and decontaminate tarps and other equipment on the worksite.

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitati on of PPE	Hazard of Not wearing of PPE	When to be discard
4	Blast cleaning - (confined space / external) : Contd	A Typical specimen of marking  Name of Manufacture Size CE marking Other information Pictograms as per EN Year of manufactures	2.  Type 5 – Protection against airborne solid particulate chemicals (Norm: EN ISO 13982-1) 3. Apron / instructions shall have following pictogram indicating the intended purpose . (Table E-2 of EN 340)  Protective clothing (equipment) for abrasive blasting operation ISO 7000-2482				

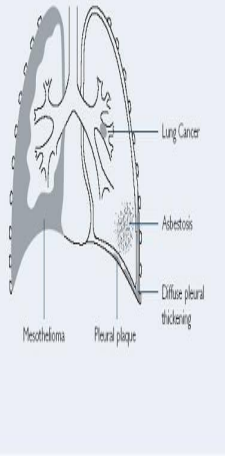
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Blast cleaning - (confined space / external) Contd 	Alternative -II : Apron as per IS 4501 	Alternative -II : Alternatively suit shall conform to IS : 4501 : 1981 shall have the following marking . The marking shall be clearly visible and as durable as adequate for the life of the clothing. - marked inside with manufacturer's name or recognized trade mark, if any. The ink shall be non-irritating to skin and shall not impair the quality of aprons. - The aprons may also be marked with the ISI Certification Mark. - The finished material shall be white or of a suitable colour on two sides as agreed to between the purchaser and the supplier. As of May 2017 there is no party having BIS license. Use of this product is permitted assuming that in future some party may get BIS license.	Protection to the full body against airborne solid particulates.	Not suitable for flame and Hot material	Damage / infection to skin etc 	- exceeding six month from the date of first use of the apron . - sign of crack / damage . - Excessive wear As per Manufactureres recommendations - Do not use compressed air to clean as this will create dust in the air. - Clean and decontaminate tarps and other equipment on the worksite.

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Blast cleaning - (confined space / external) Contd	Alternative -III : Boiler suit / coverall 	Alternative -III : Cloth and stitching should be of good quality on visual inspection	Protection to the full body against airborne solid particulates.	Not suitable for flame and Hot material	Damage / infection to skin etc 	- exceeding six month from the date of first use of the apron . - sign of crack / damage . - Excessive wear - As per Manufactures recommendations - Do not use compressed air to clean as this will create dust in the air. - Avoid blasting in windy conditions to prevent the spread of any hazardous materials.

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Blast cleaning - confined space - Contd  Name of Manufactures EN Number CE Marking	VII) Half face mask A Typical specimen of marking  	1. The half air mask shall conform to EN 140 and shall have following : - The manufacturer shall be identified by name, trade mark or other means of identification. - All units of the same model shall be provided with a type-identifying marking. - Size (if more than one size is available). - The number and the year of this European Standard. ie EN 140 - Where the reliable performance of components may be affected by ageing, means of identifying the date (at least the year) of manufacture shall be given Parts which are designed to be replaced by the authorized user and sub-assemblies with considerable bearing on safety shall be readily identifiable. For parts which cannot reasonably be marked e.g. straps of head harness, the relevant information shall be included in the information supplied by the manufacturer. The end of shelf life may be indicated on packing eg e.g. by the following pictogram.  <u>Code for dates</u> xx/xx Month Year	Respiratory protection. Protection against inhaling dust, etc.	Not suitable for heavy gas concentration	Silicosis Occupational lung diseases. Deposition of particulate matter in Lung. 	- Sign of crack / damage - Excessive wear - Damage of strap - After end of shelf life - Change of filter / cartridges at least every six month - Performance of the components may be affected by aging As per Manufactures recommendations Cleaning Always clean the half-mask after use. First remove the filter and remove dust with compressed air. Use a cloth to remove any stubborn deposits. If necessary, dismantle the parts and rinse in warm water with a small quantity of mild detergent. Never use solvents. The inhale and exhale valves should be removed and cleaned thoroughly .

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
5	Painting - confined space / external 	I) Helmet (A) 	• Please refer (VI) on page 11				Please refer (VI) on page 11
		II) Safety Shoe 	• Please refer (I) on page 4				Please refer (I) on page 4
		III) Goggles 	• Please refer (III) on page 16				Please refer (III) on page 16

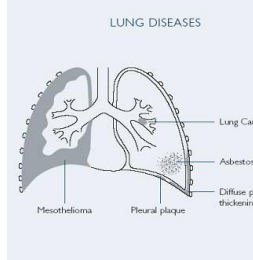
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
5	Painting -(confined space / external) : Contd 	VI) Gloves Alternative -I Hand gloves - involving high pressure as per EN 388 and 374 		• Please refer (IV) on page 17			Please refer (IV) on page 17
		Alternative -II - Gloves as per IS 6994 		• Please refer (IV) on page 18 Spraying paints or cellulose lacquers sr no. XIV of table 2 : Recommended type of Gloves. is 1,8			Please refer (IV) on page 18

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Painting -(confined space / external) : Contd 	V) Apron :Alternative -I Apron as per EN 13982 	Please refer (VI) on page 22 and 23				Please refer (VI) on page 22 and 23
		Alternative -II Apron as per IS 4501 					Please refer (VI) on page 24

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Painting -(confined space / external 	VI) Half face mask 	• Please refer (VII) on page 26				Please refer (VII) on page 26

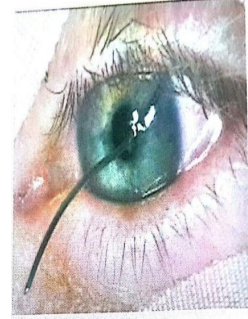
Guidelines on Personal Protective Equipment (PPE)

	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
6	a) Working in Confined space b) Testing of Gas sensor c) Tank Gauging d) De Gassing of LPG Cylinder e) Shuttering works	I) Safety Helmet (B) 		• Please refer (I) on page 12 &13			Please refer (I) on page 12 &13
	f) Brick masonry g) Handling of Battery	II) Safety Shoe (A) 		• Please refer (I) on page 4			Please refer (I) on page 4

Guidelines on Personal Protective Equipment (PPE)

	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
6	Contd.. a) Working in Confined space b) Testing of Gas sensor c) Tank Gauging d) De Gassing of LPG Cylinder e) Shuttering works f) Brick masonry g) Handling of Battery	III) Gloves Alternative -I : Hand gloves - involving high pressure as per EN 388 and 374 		Please refer (IV) on page 17			Please refer (IV) on page 17
		Alternative -II Gloves as per IS 6994 		Please refer (IV) on page 18 Light Abrasion ix of table 2 Recommended type of Gloves. is 1, 2, 8, 14. 15. 16			Please refer (IV) on page 18

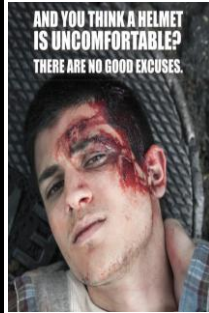
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
7	a) Road work b) Reinforcement c) Concreting	I) Helmet (B) 		Please refer (I) on page 12 &13			Please refer (I) on page 12 &13
		II) Gum Boot 					Please refer (II) on page 15
		III) Goggles 					Please refer (III) on page 16

Guidelines on Personal Protective Equipment (PPE)

	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
7	Contd.. a) Road work b) Reinforcement c) Concreting	VI) Gloves Alternative -I : Hand gloves - involving high pressure as per EN 388 and 374 	Please refer (IV) on page 17				
		Alternative II as per IS 6994 	Please refer (IV) on page 18 Light Abrasion ix of table 2 Recommended type of Gloves. is 1, 2, 8, 14. 15. 16				

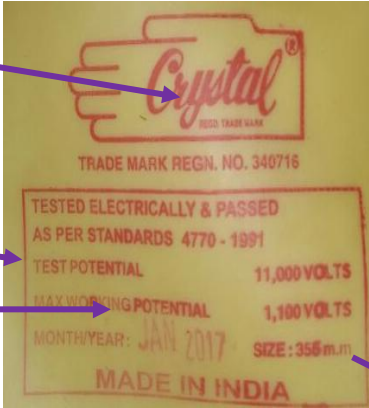
Guidelines on Personal Protective Equipment (PPE)

N	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
8	a) Grass Cutting	I) Gum Boot 	• Please refer (II) on page 15				Please refer (II) on page 15
	b) Blinding and de-blinding flange work	II) Helment (B) 	• Please refer (I) on page 12 & 13				Please refer (I) on page 12 & 13

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
9	Electrical works Electrical sub-station current carrying equipment 	II) Safety Shoe (B)   	The safety shoe shall have following marking as per IS 15298 (part -2) : a) size; b) manufacturer's identification mark; c) Year of manufacture and at least quarter; d) License No (CM/L) e) IS Mark Category of Safety shoe (,S3 etc) as required as per Table 16 of IS 15298 (part 2) : 2011 <i>The sole shall be regulated to high voltage test upto 15 KV voltage applied across the sole for 1 min. Necessary test certificate for this test from FDI/NABL accredited party to be furnished .</i>	• Striking against stationary object. • Striking by moving object • Electrical resistance	• Not suitable for work in explosive work area. - Or • Work activities requiring antistatic work		• Exceeding one year from the date of first use of the shoe . • Sign of crack / damage • Excessive wear • As per Manufactureres recommendations

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
9	Electrical works : Electrical sub-station current carrying equipment Contd 	II) Electrical Hand gloves Insulating Rubber Electrical Gloves  Manufacture Name Test Potential Maximum working potential	The gloves shall be marked indelibly at the back with the following information as per IS 4770 - Size and type of glove; - Maximum working potential in Volts, - followed by the word 'working' in brackets; - Identification of the source of manufacture; and - Month and year of manufacture moisture absorption certificate to be checked. A Typical specimen of marking  Type -1 Gloves not to used	<u>Type 2</u>—For use at voltage not exceeding 1 100 ac rms <u>Type 3</u>—For use at voltage not exceeding 7 500 ac rms <u>Type 4</u>—For use at voltage not exceeding 17 000 ac rms.	1) Type of the PPE restricts the maximum voltage at which it can be used 2) Other precautions to be taken while working on electrical installation		- Frequently used Gloves to be re-tested at intervals of not more than 6 months. - Gloves issued for occasional use shall be re-tested after use or in any case at intervals of not more than 12 months. - Gloves Showing any defects - As per Manufactures recommendations

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
9	Electrical works : Electrical sub- station current carrying equipment Contd 	Helmet as per EN 397 	Please refer (I) on page 12 & 13				Please refer (I) on page 12 and 13

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
10	Working with possibility of splashes of hot, cryogenic or corrosive liquids 	I) Helmet (B) as per EN 397 	Please refer (I) on page 12 and 13				Please refer (I) on page 12 and 13
		II) Safety Shoe 	Please refer (I) on page 4				Please refer (I) on page 4
		III) Goggles 	Please refer (III) on page 16				Please refer (III) on page 16

Guidelines on Personal Protective Equipment (PPE)

	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
10	Working with possibility of splashes of hot, cryogenic or corrosive liquids. Contd 	IV) Gloves Alternative -I : Hand gloves - involving high pressure as per EN 388 and 374 	• Please refer (IV) on page 17				Please refer (IV) on page 17
		Alternative - II Gloves as per IS 6994. 					• Please refer (IV) on page 18 Light Abrasion ix of table 2 Recommended type of Gloves. is 1, 2, 8, 14. 15. 16

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
	Working with possibility of splashes of hot, cryogenic or corrosive liquids Contd	V) Apron Alternative -I Apron as per EN 13982 	Please refer (VI) on page 22 &23				Please refer (VI) on page 22 &23
		Alternative -II Apron as per IS 4501 	Please refer (VI) on page 24				Please refer (VI) on page 24

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
11	Welding and cutting work 	I) Helmet attachable welding shield (A)  II) Welding Helmet with welding Shield (B)  Name of Manufacture CE Mark and EN Mark  Name of Manufacture EN166 FT	a) Helmet mountable welding shield. - Conforms to EN 175 - Protective lens made of clear high impact resistant. polycarbonate conforming to EN 166 and ANSI Z 87.1 - polypropylene Impact Resistance Shell conform to EN 175 F - The welding shield shall be CE marked - Marking on protective shall be fully visible - Ocular marking shall be as per clause 9.2 of EN 166 b) Welding Helmet with welding Shield - Protective lens made of clear high impact resistant. polycarbonate conforming to EN 166 and ANSI Z 87.1 - polypropylene Impact Resistance Shell conform to EN 175 F - Marking on protective shall be fully visible - Ocular marking shall be as per clause 9.2 of EN 166	Protection during welding. Liftable welding lens allows clear view while restricting harmful dust particles.	To be used only in conjunction with safety helmet & should not be used independently. However welding helmets can be used independently.		- Exceeding one year from the date of first use of the goggles . - sign of crack / damage on lenses - Excessive wear - As per Manufact ures recomme ndations

Guidelines on Personal Protective Equipment (PPE)

	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
11	Welding and cutting work : Contd	II) Safety Shoe 	Please refer (I) on page 4				Please refer (I) on page 4
		Helmet as per EN 397 (in case Helmet attachable welding shield being used) 	Please refer (I) on page 12 & 13				Please refer (I) on page 12 and 13

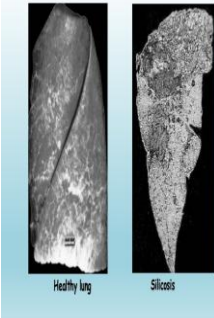
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
11	Welding and cutting work Contd. 	III) Apron  A Typical specimen of marking 15 EN ISO 11611:2015 F1 class 1 A1 + A2 	- Apron shall conform to EN ISO 11611 & shall have the following markings : - classification: : - Class 1: the number and year of this International Standard (ISO 11611) followed by the graphical symbol shown in below and the indication "Class 1" and the indication "A1" or "A1 + A2" as appropriate for Limited Flame Spread; - Class 2: the number and year of this International Standard (ISO 11611) followed by the graphical symbol shown in Figure 1 and the indication "Class 2" and the indication "A1" or "A1 + A2" as appropriate; garments conforming to Class 2 shall meet Class 2 for all performance requirements; - instructions for cleaning shall be marked (e.g. on a label). 	minimize skin burns caused by sparks, spatter, or radiation	- Additional electrical insulation layers will be required where there is an increased risk of electric shock; garments meeting the requirements of clause 6.10 of EN ISO 11611 (6.10) are designed to provide protection against short term, accidental contact with live electric conductors at voltages up to approximately 100 V d.c. - any identified hazards against which the clothing is intended to protect (e.g. flames, molten metal spatter, radiant heat, and short term accidental electrical contact); for protective clothing, a warning that additional partial body protection may be required, e.g. for welding overhead;		- On contaminated with flammable material. - Manufacturers shall include the information that welder's protective clothing be cleaned regularly in accordance with the manufacturer's recommendations. After cleaning, the clothing shall be visually inspected for any sign of damage. - Similarly, users should be advised that if they experience sunburn-like symptoms, UVB is penetrating. - In either case, the garment should be repaired (if practicable) or replaced and consideration given to the use of additional, more resistant, protective layers in future. - As per Manufactures recommendations

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
12	Tank cleaning 	I) Helmet (B) 	Please refer (I) on page 12 & 13				Please refer (I) on page 12 & 13
		II) Gum Boot 	Please refer (II) on page 15				Please refer (II) on page 15

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
12	Tank cleaning Contd. 	III) Apron Alternative -I Apron as per EN 13982  Alternative -II Apron as per IS 4501 		Please refer (VI) on page 22-23 & 24			Please refer (VI) on page 22-23 & 24

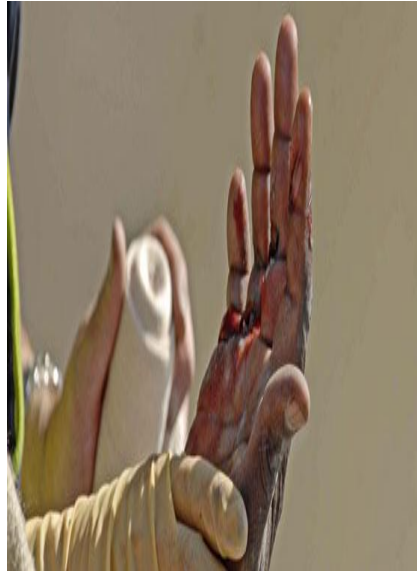
Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
12	Tank cleaning : Contd 	IV) Gloves Alternative -I : Hand gloves - involving high pressure as per EN 388 and 374 	Please refer (IV) on page 17				Please refer (IV) on page 17
		Alternative - II Gloves as per IS 6994. 	Please refer (IV) on page 18 Light Abrasion ix of table 2 Recommended type of Gloves. is 1, 2, 8, 14. 15. 16				Please refer (IV) on page 18

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
13		I) Helmet (B) 	. Please refer (I) on page 12 & 13				Please refer (I) on page 12 & 13
		II) Safety Shoe 	. Please refer (I) on page 4				Please refer (I) on page 4
		III) Goggles 	. Please refer (III) on page 16				Please refer (III) on page 16

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
13	Product pump house operation Contd 	IV) Gloves :Alternative -I : Hand gloves - involving high pressure as per EN 388 and 374 	• Please refer (IV) on page 17				Please refer (IV) on page 17 & 18
		Alternative - II Gloves as per IS 6994. 	• Please refer (IV) on page 18 Light Abrasion ix of table 2 Recommended type of Gloves. is 1, 2, 8, 14. 15. 16				

Guidelines on Personal Protective Equipment (PPE)

SN	Activity (Pictorial Display)	Required PPEs	Quality assurance	Protection Against hazard	Limitation of PPE	Hazard of Not wearing of PPE	When to be discard
14		I) Helmet (B) 	Please refer (I) on page 12 &13				Please refer (I) on page 12 &13
		II) Safety Shoe (B) 	Please refer (II) on page 36				Please refer (II) on page 36
		III) Ear Muff 	Please refer (IV) on page 20				Please refer (IV) on page 20
		IV) Electrical Gloves 	Please refer (II) on page 37				Please refer (IV) on page 37