COMMERCIAL AMENDMENT No.1
(B224/7201/2001/C-01)

FOR

BIDDING DOCUMENT NO.: AKR/B224-101-PM-TN-7201/2001

INDEX

COMMERCIAL AMENDMENT NO. B224/7201/2001/C-01

(BIDDING DOCUMENT NO.: AKR/B224-101-PM-T-7201/2001)

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COMMERCIAL AMENDMENT NO. B224/7201/2001/C-01

TO

EPCC-01 PACKAGE FOR

CDU/VDU WITH HWOG TREATMENT UNIT, SAT. LPG TREATING UNIT & SAT. FUEL GAS TREATING UNIT FOR RAJASTHAN REFINERY PROJECT (RRP) OF M/S HPCL RAJASTHAN REFINERY LIMITED (HRRL) AT PACHPADRA TEHSIL, BARMER DISTRICT, RAJASTHAN, INDIA

(BIDDING DOCUMENT NO.: AKR/B224-101-PM-T-7201/2001)

COMMERCIAL AMENDMENT NO.1 (B224/7201/2001/C-01)
TO

BIDDING DOCUMENT NO.: AKR/B224-101-PM-T-7201/2001

NAME OF WORK : EPCC-01 PACKAGE FOR CDU/VDU WITH HWOG TREATMENT UNIT, SAT. LPG TREATING UNIT & SAT. FUEL GAS TREATING UNIT

PROJECT: RAJASTHAN REFINERY PROJECT (RRP) OF M/S HPCL RAJASTHAN REFINERY LIMITED (HRRL)

The terms, conditions and specifications of Bidding Document, Amendments issued earlier(if any) stand modified to the extent indicated under column "MODIFICATIONS/ ADDITIONS/ DELETIONS". All other terms & conditions, stipulations, specifications etc. of Bidding Document including Amendments, if any, issued earlier shall remain unaltered.

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
1.	Part-I Commercial Section	Invitation for Bids (IFB)	Clause No. 5.1.1	Documents against BQC – Consortium case	The typographical error in last line *"……(documentary evidence to be provided as per Clause no.5.1.9 below)"* of the fourth paragraph under clause 5.1.1 stands corrected as below:- *"……(documentary evidence to be provided as per Clause no.5.5.5 below)"*
2.	Part-I Commercial Section	Instructions to Bidder (ITB)	Clause No. 4.0	Entry of Foreign Nationals to Refinery/ Project Premises	ITB clause no 4.0 stands replaced by following:- "*4.0 ENTRY OF FOREIGN NATIONALS TO REFINERY/ PROJECT PREMISES* *4.1 Bidders are requested to note the followings with regard to entry of Foreign Nationals to Refinery/Project Premises in relation to subject tender:* *4.1.1 It may please be noted that all the refineries are declared as "prohibited place" under Official secrets Act 1923, where entry of personnel is restricted/conditioned. It may also be noted that the visa to be issued by Govt. of India, normally contains the clause towards no permission for entry/visit to such place, a default condition which if not removed/struck-off by visa issuing authorities, will create impediment/restriction in movement of personnel of foreign origin deployed at a particular Refinery, to carry out an activity in terms of engagement/contract with* ***M/s HPCL Rajasthan***

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
					***Refinery Limited**. The same should be kept in mind while submitting request for issue of visa by your office.* *4.1.2 For details refer APPENDIX –XII to ITB."*
3.	Part-I Commercial Section	Instructions to Bidder (ITB)	Clause No. 6.6	Pre-Bid Meeting	Clause 6.6 is modified as under:- a) The word "*complied*" appearing in the 2nd line stands replaced with the word *"compiled".* b) The following is added at end of the paragraph:- *"Replies to Pre-bid Queries are for the purpose of clarification only and shall not form part of Bidding Document and subsequent Contract."*
4.	Part-I Commercial Section	Instructions to Bidder (ITB)	Clause No. 6.8	Pre-Bid Meeting	In the 1st line, the words "*Based on the pre-bid discussions, techno-commercial compliance…."* stands replaced with the words "*Techno-commercial compliance….."*
5.	Part-I Commercial Section	Instructions to Bidder (ITB)	Clause No. 9.6	Techno-Commercial unpriced bid - Section V. ii. c)	Section V. ii. c) is modified as under:- *"Copy of Article of Association and Memorandum of Association (MOA) of the Company and Board Resolution mentioning Chairman/Chief Executive Officer / Managing Director of the Company."*
6.	Part-I Commercial Section	Instructions to Bidder (ITB)	ITB Clause No. 20.1 (iv) to (vii)	Submission Of Original Documents (In Hard Copy)	ITB clause no 20.1 - (iv) to (vii) stands replaced by following:- *(iv) The Bidder shall submit the same format of signed Integrity Pact (as provided in the Bidding Document duly signed by HRRL) duly filled-in, signed & stamped by the authorised signatory of Bidder.* *(v) Affidavit of Self certification regarding Domestic Value Addition in Iron & Steel Products to be provided as per enclosed FORM-1 of APPENDIX-VII to ITB.*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
					vi) MOU in case of Consortium and Engineering Sub-contractor (as per provisions of the Bidding Document) as applicable. *vii) Affidavit regarding Indian Establishment (if applicable).* *viii) Any other document to be submitted in original as per Bidding Document.*
7.	Part-I Commercial Section	Instructions to Bidder (ITB)	ITB Clause No. 20.3	Address for submission of original documents	ITB clause no 20.3 stands replaced by following:- *"20.3 The address for submission of original documents is as follow :* *DAK RECEIPT SECTION,* *ENGINEERS INDIA LIMITED* *EIL OFFICE COMPLEX, SECTOR-16 (On N.H.-8)* *TOWER-2 (GROUND FLOOR),* *GURGAON-122 001* *HARYANA (INDIA)* *Attn.: Mr. A Sengupta, CGM (SCM)* *Tel No.: +91-124- 3802084"*
8.	Part-I Commercial Section	Instructions to Bidders (ITB)	21	NDA / Secrecy Agreement for Engineering Sub-contractor.	New Clause 21.3 added :- *"In case LSTK Bidder intends to engage an Engineering sub-contractor then the LSTK Bidder shall arrange submission of 3 sets of original Tri-partite NDAs (as per format enclosed at **Annexure-1** to this amendment) to EIL, duly signed by both the LSTK Bidder and the proposed Engineering sub-contractor for acceptance and signature by EIL, along with an undertaking that no change has*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
					been made in the NDA format. LSTK Bidder shall be communicated accordingly once the Tripartite NDA has been signed by EIL. *LSTK Bidder shall disclose the Technical Part of Bidding Document to the proposed Engineering sub-contractor only after signing of this Tripartite NDA by all three parties."*
9.	Part-I Commercial Section	Instructions to Bidders (ITB) APPENDIX-I TO ITB, Commercial Questionnaire	Sl. No. 25	Bid validity	EIL's Query under table Sl. No. 25 stands replaced with below :- *"Confirm that your bid is valid for 8 months from the Bid Due Date/ final Bid Due Date"*
10.	Part-I Commercial Section	Instructions to Bidders (ITB) APPENDIX-II TO ITB,	(E.2) (c)	Contents of Bid and Check List (Commercial)	Row (E.2) (c) is modified as under:- *"Copy of Article of Association and Memorandum of Association (MOA) of the Company and Board Resolution mentioning Chairman/Chief Executive Officer / Managing Director of the Company."*
11.	Part-I Commercial Section	Instructions to Bidders (ITB) APPENDIX-II TO ITB,	(E.9)	Contents of Bid and Check List (Commercial)	Row (E.9) stands deleted. (Bidder to refer A.7)
12.	Part-I Commercial Section	Instructions to Bidders (ITB) APPENDIX-X TO ITB BIDDING FORMS – FORM A "Form of Bid"	Form of Bid - Sheet 4 of 51	Bid validity	The 2nd paragraph i.e. *"I/ We further undertake to keep my/our this Bid/offer open for a period of not less than 6 months from the date of opening of bids specified in the IFB / extended Bid due date forming part of the Bidding Documents."* stands replaced by following:- *"I/ We further undertake to keep my/our this Bid/offer open for a period of not less than 8 (Eight) months from the final Bid Due Date {Bid submission End Date mentioned in IFB, if no extension in Bid Due Date (BDD) or extended Bid Due Date in case BDD is extended."}*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
13.	Part-I Commercial Section	Instructions to Bidders (ITB) APPENDIX-X TO ITB BIDDING FORMS – FORM B(I) "Information about Bidder (Other Details)"	Form of Bid - Sheet 10 of 51 Sl. No. 3.4 to 3.8	General	The Sl. Nos 3.4 to 3.8 are modified as under :- *a)* Row Sl. No. 3.4: *"Sales tax Registration no. of the firm"* stands replaced with *"GST Registration no. of the firm"* b) Rows Sl. no. 3.5 to 3.8 stands deleted.
14.	Part-I Commercial Section	Instructions to Bidders (ITB) APPENDIX-X TO ITB BIDDING FORMS	Sl. No. 10 at sheet 42 of 51 of Bidding Forms	FORM N(ii) – Information about Bidder	The words "IFB Clause no. 5.1.6" appearing in 4th row under table Sl. No. 10 stands deleted.
15.	Part-I Commercial Section	Instructions to Bidders (ITB) APPENDIX-X TO ITB BIDDING FORMS –	Sl. No. 3 at sheet 48 of 51 of Bidding Forms	FORM P "Self Declaration/Certification"	*"EIL/Client"* appearing at 8th line stands replaced with *"EIL/HRRL/HPCL"*
16.	Part-I Commercial Section	Instructions to Bidder (ITB)	ITB Appendix-XI	Format of Parent Company Corporate Guarantee (PCCG)	ITB Appendix-XI "Parent Company Corporate Guarantee (PCCG) Format", is hereby issued - enclosed as **Annexure-2** to this Commercial Amendment.
17.	Part-I Commercial Section	Instructions to Bidder (ITB)	ITB Appendix-XII	New Appendix:- Site Visit By Foreign Nationals	New Appendix ITB Appendix-XII "SITE VISIT BY FOREIGN NATIONALS", is hereby issued - enclosed as **Annexure-3** to this Commercial Amendment.

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
18.	Part-I Commercial Section	General Terms & Conditions of Works Contract (GTC)	-	Format: Bank Guarantee in Lieu of Earnest Money	The format of "BANK GUARANTEE IN LIEU OF EARNEST MONEY", enclosed with the GTC stands replaced and is enclosed herewith as **Annexure-4** to this Commercial Amendment. (To correct the Bid validity and claim period requirements)
19.	Part-I Commercial Section	Special Conditions of Contract (SCC)	4.1	Security Deposit (SD)/Contract Performance Bank Guarantee (CPBG)	The words "*date of issue of the Acceptance"* appearing at 1st-2nd line of clause 4.1 stands replaced with words "*date of issue of the Letter of Acceptance"*
20.	Part-I Commercial Section	Special Conditions of Contract (SCC)	4.2	Security Deposit (SD)/Contract Performance Bank Guarantee (CPBG)	The words "*date of issue of the Acceptance"* appearing at 2nd line of clause 4.2 stands replaced with words "*date of issue of the Letter of Acceptance"*
21.	Part-I Commercial Section	Special Conditions of Contract (SCC)	12.3	Work Front	The last three lines of clause 12.3 i.e. *"with the work, the provisions of Clause 23.6.6 and 23.6.7 for extension of time if so required as the CONTRACTOR's sole remedy in accordance with the provisions of clause 11.7.1 hereof"* Stands replaced by following:- *"with the work, the CONTRACTOR shall be entitled to resort to the provisions of Clause 23.6.6 and 23.6.7 for extension of time, if so required, as the CONTRACTOR's sole remedy."*
22.	Part-I Commercial Section	Special Conditions of Contract (SCC)	13.2.4 (I)	Materials	The reference to "Education Cess" (EC) and "Secondary and Higher Education Cess" (SHEC)" appearing in 1st and 2nd line stands replaced with "Social Welfare Surcharge".
23.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 14.2.3.1	SCC	Last sentence of clause 14.2.3.1 i.e. *"There view and approval of the Bill of Materials and……."* stands replaced with *"The review and approval of the Bill of Materials and……."*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
24.	Part-I Commercial Section	Special Conditions of Contract (SCC)	21.4.1	Miscellaneous Imports	The reference to "EC" and "SHEC" appearing in 3rd line stands replaced with "Social Welfare Surcharge".
25.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 22 a)	Taxes, Duties and other Levies	Complete clause 22 a) stands replaced as under: "*Clause No. 7.d.1, 7.d.2. of GTC and 15.6 of GTC stands modified to the extent of provisions as per Annexure – XXIV (Taxes & Duties) of this SCC."*
26.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 23.10.4	Taxes, Duties and other Levies	The first sentence of clause 23.10.4 is modified to the following extent : • The words "*as per the requirements specified in Techical Section of the Bidding Document"* is added after the words "*inspection activities"* • The word "*imported*" is deleted
27.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 32.5	Completion Certificate	Complete clause no. 32.5 stands replaced as under: *OWNER shall arrange Insurance as per provision of clause no. 65 of SCC.* ***PROVIDED ALWAYS THAT:*** (i) *Notwithstanding anything herein provided, the CONTRACTOR shall be and remain solely and exclusively liable to repair, restore or replace, as the case may be, works (including the materials therein incorporated) damaged or destroyed as a result of any force majeure or other act or omission, notwithstanding the existence or otherwise of any policy(ies) of insurance aforesaid, with the intent that any policy(ies) of insurance aforesaid taken out by the CONTRACTOR or by the OWNER, shall not anywise*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
					absolve the CONTRACTOR from his full liability under Clause 32.4 hereof or otherwise but shall constitute merely an additional security and not a substitution of liability. (ii) *It shall be the exclusive responsibility of the CONTRACTOR to lodge and pursue any or all claims in respect of the insurance aforesaid.*
28.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 34.6.2	Commissioning	*"3 (three) months*" specified in 1st line of Clause 34.6.2, stands replaced with *"Time period for Commissioning specified in Annexure-I to SCC"*
29.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 34.6.5	Commissioning	SCC Clause 34.6.5 stands replaced by following clause:- *"The relevant terms and conditions regarding provision of utilities, consumables, catalysts, feed, raw material etc. for pre-commissioning, commissioning and guarantee test run etc. shall be as per Technical Section of the Bidding Document."*
30.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 35.6.3	Mode of Payment And Tax Deductions	The words *"prevailing on the date of Payment by OWNER*" appearing at 8th line of Clause 35.6.3, stands replaced with words *"prevailing on the date of Payment by CONTRACTOR".*
31.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 40.1.3 (b) & (c)	Termination	The interest rate appearing in clause No. 40.1.3 (b) & (c) i.e. *"10.05%"* stands replaced by *"at the rate of [SBI PLR + 1%] per annum as on the date on which tender is invited (floated)"*
32.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No 65.9	Insurance	SCC Clause 65.9 stands replaced by following clause:- *"The insured amount under the Erection All Risk Cover Insurance shall be for full replacement value. The above cover shall be subject to deductibles on account of excess, which shall be borne by the CONTRACTOR and are as follows:* a | Normal Period/Policy excess | 5% of Claim amount subject to minimum INR 75,00,000/-

<table>
<tr><th>Sl. NO.</th><th>Part of Bidding Document</th><th>Document Reference</th><th>Clause /Item No.</th><th>Subject</th><th>MODIFICATIONS/ ADDITIONS/ DELETIONS</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>b</td><td>Fire/Explosion excess</td><td>5% of Claim amount subject to minimum INR 150,00,000/-</td></tr>
<tr><td>c</td><td>Theft & Burglary excess</td><td>5% of Claim amount subject to minimum INR 50,00,000/-</td></tr>
<tr><td>d</td><td>Testing Period excess</td><td>5% of Claim amount subject to minimum INR 150,00,000/-</td></tr>
<tr><td>e</td><td>Act of God claims</td><td>10% of Claim amount subject to minimum INR 150,00,000/-</td></tr>
<tr><td>f</td><td>Third Party Liability</td><td>INR 25 lakhs each occurrence</td></tr>
<tr><td>g</td><td>Marine claims</td><td>0.25% of consignment amount subject to a minimum of INR 5,00,000/- in case of indigenous and INR 15,00,000/- in case of imported in transit</td></tr>
<tr><td>h</td><td>Catalyst</td><td>5% of claim amount minimum INR 1,50,00,000 over and above policy excess</td></tr>
</table>

The excess shall be applicable per event per insured.”</td></tr>
<tr><td>33.</td><td>Part-I Commercial Section</td><td>Special Conditions of Contract (SCC)</td><td>Clause No. 65.12</td><td>Insurance</td><td>Following is added at the end of 2nd paragraph of SCC Clause 65.12:-

“The EAR policy shall also cover materials required for permanent incorporation for the contracted work at the fabrication yard and warehouse at the land (within India) arranged by Contractor as per Clause No. 1.8.2 of Annexure-XXVI to SCC (Land, Power , Water and Other facilities). The coverage of Insurance loss is limited to Rs. 25 crores for each and every loss.”</td></tr>
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Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
34.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 65.14	Insurance	SCC Clause 65.14 stands replaced by following clause:- *"65.14. The GTC clause no. 6.e.2 v. stands replaced by the following clause:-* *65.14.1 Contractor shall ensure that all its personnel deployed under this contract have obtained additional insurance coverage under the Pradhan Mantri Suraksha Bima Yojana (PMSBY) and Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) through the participating banks and submit the proof of such insurance coverage to the satisfaction of OWNER. The Cost of the insurance premium amount for both the above schemes shall be borne by the contractor giving evidence / proof to OWNER in this respect and Contractor shall suitably consider the same in their bid.* *Details of these schemes are to be regulated continuously on yearly basis and the same should be renewed on each successive relevant date in the subsequent years."*
35.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 90.0	Special Requirement	The clause 90.0 is modified to the following extent : • The sub-clause (k) stands deleted. • Following new sub-clause "(p)" is added :- *"In case of any discrepancy between provisions of above clause 90.0 and provisions as per Technical Section of the Bidding Document, CONTRACTOR shall follow the provisions as per Technical Section of the Bidding Document."*
36.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 92.0	General Requirements For Radiography & Other NDT	Following new sub-clause "92.5" is added :- *"In case of any discrepancy between provisions of above clause 92.0 and provisions as per Technical Section of the Bidding Document, CONTRACTOR shall follow the provisions as per Technical Section of the Bidding Document."*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
37.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No. 99.1.7	Arbitration	SCC Clause 99.1.7 stands replaced by following clause:- "*99.1.7. Clause No. 14.10 (of GTC) stands replaced as under:* *The Contract shall be governed and construed according to the laws in force in India. The Parties hereby submit to the exclusive jurisdiction of the Courts situated at New Delhi. The Seat of arbitration will be New Delhi (India). The Arbitration shall be held at New Delhi, India" and conducted in English language."*
38.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Clause No 104	Purchase Preference Linked With Local Content	Following sub-clauses are added under clause no. 104 after sub-clause 104.1: *104.2 The Local Content Certificate shall be submitted along with each invoice raised. However, the percentage (%) of local content may vary with each invoice while maintaining the overall percentage (%) of local content for the total work / purchase of the pro-rata local content requirement. In case, it is not satisfied cumulatively in the invoices raised up to that stage, the Contractor/ Supplier shall indicate how the local content requirement would be met in the subsequent stages.* *104.3 The Procuring Company/Owner shall also have the authority to audit as well as witness production process to certify the achievement of the requisite local content.*
39.	Part-I Commercial Section	Special Conditions of Contract (SCC)	New Clause: 109.0	Requirement of Employment Visa for Foreign Nationals	Following new clause "109.0" is added :- *"109.0 Requirement of Employment Visa for Foreign Nationals* *All foreign nationals coming to India for execution of Projects/Contracts will have to apply for Employment Visa only and that grant of Employment Visa would be subject to strict adherence of following norms:* *i) Employment Visa is granted only for the skilled and qualified professionals or to a person who is being*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
					engaged or appointed by a Company, Organisation, Industry or Undertaking etc. in India on contract or employment basis at a senior level, skilled position such as technical expert, senior executive or in managerial position etc. *ii) Request for Employment Visa for jobs for which large number of qualified Indians are available, is not considered.* *iii) Under no circumstances an Employment Visa is granted for routine, ordinary secretarial / clerical jobs.* *Bidders are advised in their own interest to check latest Visa rules from Indian Embassy / High Commission in their country in case foreign nationals are required to be deputed to India during execution of the Contract."*
40.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-I	Time Schedule	a) Bidding Document No. reference under "DESCRIPTION OF WORK" stands corrected as below :- *"AKR/B224-101-PM-TN-7201/1001*" stands replaced by *"AKR/B224-101-PM-T-7201/2001"* b) Note specified below the table stands revised as under: *"Note: The time of completion shall be reckoned from the date of issue of Letter/Fax of Acceptance (LOA/FOA)."*
41.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-II	Loading And Guarantees	Annexure-II to SCC (LOADING & GUARANTEES FOR EPCC-01 CDU/VDU/HWOG Unit/SR LPG Treating Unit & Sat. FGTU) is hereby issued and is enclosed as **Annexure-5** to this Commercial Amendment.
42.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-VII	Free Issue Material Details	The Annexure VII to the SCC stands deleted. Bidder to refer Technical Section of the Bidding Document for list of Free Issue Items.

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
43.	Part-I Commercial Section	Special Conditions of Contract (SCC) Annexure-X	2.4	Terms of Payment	The interest rate appearing in clause 2.4 of Terms of Payment, i.e. *"10.05%(as on the date of payment of mobilization advance)"* stands replaced with *"at the rate of [SBI PLR + 1%] per annum as on the date of payment of mobilization advance"*
44.	Part-I Commercial Section	Special Conditions of Contract (SCC) Annexure-X	2.5	Terms of Payment	The interest rate appearing in clause 2.5 of Terms of Payment, i.e. *"10.05% per annum"* stands replaced with *"at the rate of [SBI PLR + 1%] per annum as on the date of payment of mobilization advance"*
45.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-X	Terms of Payment Notes at Page 11 of 11	Following are added as a new note "V" and "VI":- *"V. In case activities corresponding to Terms of Payment at Clause 3.2.3.2 (ii) , 3.2.3.3 A. (i) and 3.2.3.3 C. (i) & (ii) are being performed outside the refinery premises at Contractor's fabrication yard as per provisions of clasue 1.8.2 of Annexure-XXVI of SCC, the respective payments shall be made against Bank Guarantee of equivalent amount valid till receipt and acceptance of such works at site plus 3 months claim period.* *VI. For claiming payment against works being performed at Contractor's fabrication yard as per provisions of clause 1.8.2 of Annexure-XXVI of SCC, Contractor has option to maintain with Owner a rolling BG of equivalent amount with validity upto mechanical completion."*
46.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-XIV	OISD Guidelines 192, OISD Guidelines 207	OISD GUIDELINES-192, OISD GUIDELINES-207 enclosed at SCC Annexure-XIV stands replaced by updated revisions of these documents, enclosed herewith as **Annexure-6** to this Commercial Amendment.
47.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-XIX Page 2 of 2	Price Adjustment For Slippage In Completion	The words *"Works Completion Schedule"* appearing at 2nd line of clause (a) stands replaced with words *"Time Schedule"*

Sl. NO.	Part of Bidding Document	Document Reference	Clause /Item No.	Subject	MODIFICATIONS/ ADDITIONS/ DELETIONS
48.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-XXIV	Taxes & Duties	Annexure-XXIV (Taxes & Duties) to SCC enclosed with the Bidding Document stands replaced by the "Taxes & Duties Rev.1" enclosed herewith as **Annexure-7**to this Commercial Amendment. The above document "Taxes & Duties Rev.1" is further modified to the following extent :- **(I) Clause No. B.2.(a) stands replaced as under:-** *"As per notification 50/2017 dt. 30th June 2017 (Sr. No. 409), the goods specified in list 13 required for setting up crude petroleum refinery can be imported at concession custom duty @ 5 %.* *The project rate duty benefit of 5% custom duty can also be utilized under CTH 9801 (SL no. 601 of the notification) for imported goods and material. For this purpose bidder are required to furnish the details like Description, Custom Tariff Code (HSN Code) , Value , quantity, country of origin, currency, port of discharge etc."* **(II) Clause No. B.2.(j) stands replaced as under:-** *"Owner will be providing Essentiality Certificate from Sponsoring Authority to the Contractor for registering the contracts with Customs authorities under Project Import Regulations. The Owner's responsibility shall be limited to providing Essentiality Certificate from Respective Authority only. It shall be the responsibility of the contractor to get the project registered at the Port with the Custom Authorities and obtain the project import certificate (PIC). Any documentation or attestation required for the purposes of registering the contract by the contractor shall be the responsibility of the Owner. In order to issue Essentiality Certificate by Owner to contractor, the contractor shall furnish in advance all necessary information/documentation / contract / purchase order including documentation / contract / purchase order*

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					entered into with the sub – contractors by the contractor, if any required for issuance of Essentiality Certificate and accordingly the benefit of the project rate of custom duty shall also be available to the sub -contractor of the contractor, provided the trail of all the contracts / purchase orders amongst vendor, sub – contractor, contractor and project owner is submitted with the Respective authority."
49.	Part-I Commercial Section	Special Conditions of Contract (SCC)	Annexure-XXV (PWCAMC)	New Clause (g)	Following clause stands added as clause no. g) :- *"Owner may decide to enter into separate contract with AMC service provider / OEM/ OES at its discretion on the same prices and terms & conditions."*
50.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-XXVI	Land, Power, Water And Other Facilities	Annexure-XXIV (LAND, POWER, WATER AND OTHER FACILITIES) to SCC enclosed with the Bidding Document stands replaced by the "LAND, POWER, WATER AND OTHER FACILITIES REV.1" enclosed herewith as **Annexure-8** to this Commercial Amendment.
51.	Part-I Commercial Section	Special Conditions of Contract (SCC)	SCC Annexure-XXVIII	Price Reduction For Delay In Achieving Intermediate Major Milestone	Annexure-XXVIII (Price Reduction for Delay in Achieving Intermediate Major Milestone) to SCC is hereby issued and is enclosed as **Annexure-9** to this Commercial Amendment.
52.	Price Part	Schedule of Prices (SOP) Rev.0	-	Schedule of Price (SOP)	Entire SOP Rev.0 provided with the Bidding Document stands replaced by "**Schedule of Prices (SOP) Rev.1**" enclosed herewith as **Annexure-10 (37 pages)** to this Commercial Amendment. Bidder shall submit their price bid as per SOP Rev.1 only.

Bidder accepts the above addition/modification in totality including all its' Appendices/Annexures etc. without any deviation/ clarification/presumption/conditions etc. Bidders quoted lumpsum price is based on Bidding Documents and its Amendment(s).

ANNEXURE-1 to CA-1

FORMAT – TRIPARTITE NDA

SECRECY AGREEMENT

This SECRECY AGREEMENT ("Agreement") is made by and between **Engineers India Limited**, a company organized and existing under the laws of India having its principal place of business at No.1, Bhikaji Cama Place, New Delhi 110 066, India (hereinafter referred to as the "Disclosing Party")

and

_____, a company organized and existing under the laws of India having its registered place of business at _____, India (hereinafter referred to as LSTK Bidder)

and

_____, a company organized and existing under the laws of India having its registered place of business at _____, India (hereinafter referred to as DEC Bidder)

(LSTK Bidder and DEC Bidder will be hereinafter collectively referred to as the "Receiving Parties")

WHEREAS the Disclosing Party has certain license rights and know-how for **EngTreat^{L}** and EngHOG technology.

EngTreat^{L} is a Propriety Technology of the Disclosing Party for Treating of LPG using Caustic wash and caustic Regeneration for Removal of Sulphur components (H_2S and Mercaptan) to meet the process specifications like reduction in sulphur components, EngHOG is a Disclosing Party's technology for removal of hydrogen sulphide from low pressure off gases from hot well of VDU. Both EngTreat and EngHOG are collectively called as the "Technology".

WHEREAS HRRL, a company organized and existing under the laws of India and having its registered office at_ Tel Bhavan, Sahkar Marg, Lal Kothi Vistar, Jyoti Nagar, Jaipur - 302005 (Owner) has engaged the Disclosing Party as licensor for the Technology.

WHEREAS, Owner intends to engage an LSTK Contractor for their Saturated LPG Treating Unit based on EngTreat^{L} Technology and Treatment of VDU offgases using EngHOG Technology for their Rajasthan Refinery Project.

WHEREAS the "LSTK Bidder" is bidding for LSTK contract for the said Project and in order to prepare the bid, the LSTK bidder desires to have access to the information pertaining to the Disclosing Party's proprietary Technology and if selected to perform as LSTK Contractor for the Project, shall desire access to the Disclosing Party's

proprietary Technology towards performance of its duties as LSTK Contractor till completion of the project. (Purpose).

WHEREAS the “LSTK Bidder” intends to engage a Detailed Engineering Contractor for preparation of bid for the said LSTK Contract for the said project and it has been approached by “DEC Bidder” for the said purpose. In order to prepare its proposal to “LSTK Bidder”, “DEC Bidder” desires to have access to the information pertaining to the Disclosing Party’s proprietary Technology and if selected to perform as Detailed Engineering Contractor by the “LSTK Bidder” (who, if selected as LSTK Contractor), shall desire access to the Disclosing Party’s proprietary Technology towards performance of its duties as Detailed Engineering Contractor till completion of the project. (Purpose).

WHEREAS with the intent to protect the Technology of the Disclosing Party, the Disclosing Party and the LSTK Bidder have entered into a Secrecy Agreement on _____. Pursuant to clause 7. b) of the said Secrecy Agreement, the Disclosing Party has agreed to enter into this tri-partite Secrecy Agreement with the LSTK Bidder and the DEC Bidder so that the confidentiality of the Disclosing Party’s Technology is ensured not only by the LSTK Bidder but also by the DEC Bidder.

NOW THEREFORE in consideration of the promises and mutual covenants herein contained, the parties hereto agree to the following.

1. Disclosure of information

The Disclosing Party will furnish at its sole discretion and decide the extent of Confidential Information as defined in article 2 hereunder to be furnished to the Receiving Parties.

2. Confidential Information

All information, whether, technical, commercial, or otherwise, whether written or oral provided, directly or indirectly, by the Disclosing Party to the Receiving Parties under this Agreement, or which the Receiving Parties might acquire or discover during visits to facilities of the Disclosing Party, or third parties where such information is designed or exploited, or during discussions with the Disclosing Party, together with all analyses, compilations, forecasts, studies or other documents that contain or otherwise reflect such information, shall be deemed the Confidential Information hereunder.

3. Use of Confidential Information

All Confidential Information received hereunder shall be kept confidential and shall not without the prior written consent of the Disclosing Party, be disclosed by the Receiving Parties in any manner whatsoever, in whole or in part, and it shall not be used by the Receiving Parties, other than for the Purpose. Moreover, the Receiving Parties shall only disclose the Confidential Information to their officers, directors and employees who need to know such Confidential Information for the Purpose who are informed by them of the confidential nature of the Confidential Information and who shall be bound to act in accordance with the terms and conditions of the Agreement. Notwithstanding anything contained elsewhere, it is agreed by the Parties that not only the two Receiving Parties shall be individually responsible to the Disclosing Party for any individual breach of the confidentiality obligations under this Agreement, but also the LSTK Bidder and the DEC Bidder both shall be equally responsible to the Disclosing Party for any breach of the confidentiality obligation under this Agreement by the DEC Bidder. Further, the LSTK Bidder shall be solely responsible for all the payment etc. to be made to the DEC Bidder under agreement between the LSTK Bidder and the DEC Bidder. The Disclosing Party in no manner shall be concerned with any such issue whatsoever.

4. Ownership of Confidential Information

The Receiving Parties hereby agree that the Confidential Information disclosed hereunder is and will remain the property of the Disclosing Party and that drawings or other written printed or electronic data included therein are not to be copied or reproduced, mechanically or otherwise, without the express permission of the Disclosing Party, except for such copies that the Receiving Parties may reasonably require for the purpose.

5. Non-Confidential Information

The term “Confidential Information” shall not include such Information furnished hereunder that the Receiving Parties can prove:

a) was at the time of disclosure, in the public domain or which subsequently enters the public domain through no act or failure to act by the Receiving Parties or

b) was developed by or was in the possession of the Receiving Parties prior to being furnished to the Receiving Parties by the Disclosing Party or on its behalf, provided that the source of such Confidential Information was not known to the Receiving Parties to be prohibited from disclosing the Confidential Information to the Receiving Parties by a legal, contractual or judiciary obligation to the Disclosing Party; or

c) was or became available to the Receiving Parties on a non-confidential basis from a third party that is not known to “the Receiving Parties to be prohibited from disclosing the Confidential Information to the Receiving Parties by a legal, contractual or fiduciary obligation to the Disclosing Party.

However, in situations a) through c) above (the “Non-Confidential Information”) the Receiving Parties undertake not to disclose that any of such Non-Confidential Information lawfully in its possession is included in the Confidential Information.

6. Exceptions of Article 5

The exceptions of article 5 shall not apply to any information furnished hereunder which:

a) is specific and, at the time of its disclosure hereunder, merely embraced by general information within the exceptions, or

b) is a combination of features of the Confidential Information, unless the combination itself, its principle of operation and method of use are within the exceptions.

7. Legally Compelled Disclosure

In the event that the Receiving Parties who is provided with the Confidential Information pursuant to this Agreement becomes legally compelled (by oral questions, interrogatories, requests for information or documents, subpoena, civil investigations demand or similar process) to disclose any of the Confidential Information to third parties other than those identified above, the Receiving Parties will provide the Disclosing Party with prompt notice so that

the Disclosing Party may seek a protective order or other appropriate remedy and/or waive compliance with the provisions of this Agreement. In any such event, the Receiving Parties will use their best efforts to ensure that the Confidential Information will be accorded confidential treatment.

8. Disclaimer or Warranties

The Disclosing Party makes no representations and extends no warranties or conditions of any kind either express or implied, by operation of law or otherwise, with respect to the accuracy or completeness of the Confidential Information furnished hereunder. Further, in no event shall the Disclosing Party nor any of its affiliates or subsidiaries be liable to the Receiving Parties for special, indirect, incidental or consequential damages, including, without limitations, loss of profits or goodwill, capital, loss of work expenses or claims, with respect to the Confidential Information.

9. Equitable Relief

The Receiving Parties acknowledge that remedies at law are inadequate to protect against breach of this Agreement and agrees in advance, without prejudice to any rights to judicial relief the Disclosing Party may otherwise have to the granting of equitable relief, including an injunction and specific performance, in the Disclosing Party's favor without proof of actual damages or posting a bond.

10. Return of Confidential Information

Upon completion of the Purpose, or should Owner decides not to incorporate Technology or not to proceed with the construction of the unit under construction with the Receiving Parties, whichever occurs first, the Receiving Parties will return to the Disclosing Party or destroy, at the Disclosing Party's option, all of the Confidential information in the Receiving Parties' possession (including, all originals, and all copies and derivations there from, in any medium); provided, however, that the Receiving Parties may retain one copy of the Confidential Information in a locked and limited access file for the sole purpose of determining the Receiving Parties compliance under this Agreement and the same shall be treated as confidential as per the terms of this Agreement. If requested by the Disclosing Party, an appropriate officer of the Receiving Parties will certify to the Disclosing Party that all such material has been so returned or destroyed.

11. Term

The Receiving Parties' obligations under this Agreement to protect the confidential information shall remain valid for 15 (Fifteen) years from the Receiving Parties' receipt of the Confidential Information.

12. No-License

Nothing in this Agreement shall be construed as granting the Receiving Parties a license, an option on a license or any right to operate under any patent, technology or know-how, which the Disclosing Party may, now or hereafter, have the right to license.

13. Governing Language

The governing language of this Agreement shall be English.

14. Governing Law

This Agreement and any dispute arising from the performance or breach hereof shall be governed by and construed and enforced in accordance with the laws of India and Courts of Delhi shall have exclusive jurisdiction.

15. Dispute Resolution

All disputes or claims arising out of or in connection with this AGREEMENT or the breach, termination or validity thereof shall exclusively and finally be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996 (and its amendments thereto). The arbitral tribunal shall consist of three (3) arbitrators appointed in accordance with the said Act. The place of arbitration shall be New Delhi, India. The arbitral tribunal shall have the competence to decide whether the PARTIES entered into a valid and enforceable arbitration agreement. The language of the arbitration shall be English, unless otherwise agreed upon by the PARTIES. The cost of the arbitration, including expenses and reasonable attorney's fees shall be allocated among the PARTIES in correlation to winning and losing; the arbitral tribunal shall allocate the bearing of the costs in exercising its discretion solely guided by its decision. The arbitration shall be in lieu of any other remedy and the award shall be final, binding and enforceable by any court having jurisdiction for that purpose.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duty-authorized representative as of the date last written below.

AGREED AND ACCEPTED BY:

……..	……
Name:	Name:
Title:	Title:
Date: _____	Date: _____

Engineers India Limited	**……**
Name:	
Title:	
Date:	

ISSUED AS ANNEXURE-2 to CA-1

APPENDIX-XI TO ITB

FORMAT - PARENT COMPANY CORPORATE GUARANTEE (PCCG)

PROMOTER MEMBER/ PARENT COMPANY GUARANTEE

This GUARANTEE ("Guarantee") is issued on the _____ day of _____ , 20… by _____ ,a Company organized and existing under the laws of India, having its Registered Office at _____ (hereinafter referred to as "Guarantor"), at the request and/or behest of _____ , a Joint Venture / Subsidiary/Group / Affiliate Company organized and existing under the laws of _____, having its Office at_____, of which the Guarantor is a promoter/ Parent Company (hereinafter referred to as "Bidder"), in favour of HPCL Rajasthan Refinery Limited, a Joint Venture between Hindustan Petroleum Corporation (HPCL) and Government of state of Rajasthan, India organized under the laws of India having its Registered Office at Tel Bhavan, Sahkar Marg, Lal Kothi Vistar Jyoti Nagar, Jaipur Rajasthan, India, PIN - 302005 (hereinafter referred to as "Beneficiary" or "HRRL").

WHEREAS:
The Beneficiary floated a tender dated _____ inviting offers from Vendors for _____ (purpose). The Bidder (Joint Venture/Subsidiary/Group/ Affiliate Company) has submitted its quotation and advised the Beneficiary that the Bidder is a Joint Venture / Subsidiary/Group/Affiliate Company in which the Guarantor is the promoter/ parent and a majority/ ultimate share holder and the Guarantor has effective control of the Bidder. The Bidder seeks to take benefit of the experience and qualifications of the Guarantor, in order to qualify in the tender. In terms of the tender conditions, if the Bidder is to be given the benefit of the qualifications of the promoter member/ parent company, then the said promoter member/ parent company is supposed to provide adequate guarantees to the Beneficiary, in respect of technical, financial and other support to the Bidder, in order to complete the job, if the Bidder is successful and the contract is awarded to the Bidder. For this reason, the Guarantor is ready and willing to give a Promoter Member Guarantee (PMG) inter alia for the performance of the obligations of the Bidder to the terms and conditions of the tender and on Bidder's failure, to assume the said obligations.

We, the Guarantor are hereby recording the terms and conditions governing our obligations under this Guarantee with the intent of being legally bound by the same and hereby agree, covenant and bind ourselves as follows:-

1. The Guarantor hereby irrevocably and unconditionally guarantees to HRRL that its joint venture/subsidiary/group/affiliate Bidder company will perform its obligations under the terms and conditions of the tender, if the contract is being awarded to them in future for _____ and agrees to provide further comfort letters/ guarantees, if so desired by Beneficiary, in terms of the tender.

2. The Guarantor unconditionally and irrevocably guarantees to the Beneficiary that it will make available or cause to be made available to the Bidder all financial, technical and other resources required to ensure that the Bidder can carry out its obligations as per the tender terms and conditions and that the Bidder at all times fully and effectively discharge its obligations under the terms and conditions of tender, including by discharging the obligations within the time and cost so stipulated. This Guarantee is an absolute, unconditional and continuing guarantee of the full and punctual payment and performance of obligations under this Guarantee and is in no way conditioned upon any requirement that the Beneficiary/HRRL first attempt to enforce any of the obligations against the Bidder, any other guarantors of the Bidder or any other person or entity or resort to any other means of obtaining performance of any obligations of the Bidder.

3. The Guarantor hereby agrees that if the Bidder shall in any respect commit any breach or fails to fulfill any of the terms of the Contract/Tender or complete it in all respects or if there

is a failure to make any supplies or if any material, equipment or machinery under the contract so supplied is not of the required specifications or does not perform as envisaged under the contract/tender, then the Guarantor will forthwith perform the same and fulfill all the obligations required under tender terms & conditions on behalf of their Bidder, without any extra cost and time implications.

4. The Guarantor further undertakes to indemnify all losses, damages, expenses, claims, costs and proceedings which may be suffered or incurred by Beneficiary due to the failure or breach on the part of its Bidder Company.

5. The Guarantor assures and undertakes that during the term of the contract or of any guarantee for performance as per the contract, the Guarantor shall continue to be the promoter member/ parent company of the Bidder and further, that the Guarantor's liability shall not be affected due to any incapacity or lack of power or legal personality or change in the status of the Bidder or the Guarantor.

6. The Guarantor's liabilities under this Guarantee shall not exceed the liability of the Bidder under the tender terms and conditions but this shall in any manner not affect the Guarantor's own responsibilities and liabilities under the Guarantee. Guarantor shall be entitled to all the rights and limitations as available/applicable to the Bidder under the Agreement, when called upon under this Guarantee to complete / perform any obligations of the Bidder under the Agreement.

7. The obligation of the Guarantor shall take effect from the date of this Guarantee and shall remain in full force until all the obligations of the Bidder have been fully performed and discharged and/or all sums of money payable to Beneficiary have been fully paid under the contract being entered into by Beneficiary with the Bidder. The Guarantor further undertakes to perform forthwith under this Guarantee without insisting on any proof of breach of Contract by the Bidder and purely relying on Beneficiary's written demand.

8. The liabilities of the Guarantor shall not be discharged, diminished or otherwise affected by:-

    a. Any change in the Articles of Association or Bye-Laws or constitution of the Bidder Company or the Guarantor or the Beneficiary.

    b. Any time, indulgence, waiver or consent given to the Bidder Company by the Beneficiary.

    c. Any amendment to the Contract or any security or other guarantee or indemnity to which Bidder Company has agreed.

    d. The dissolution, amalgamation, reconstruction or reorganization of Bidder Company or Guarantor.

9. NOTICE:

Any notice, demand, declaration or other communication to be given by the Beneficiary or the Guarantor to the other shall be in writing, in English language and delivered in person or by Air Mail or by Courier Services or by Facsimile or by E-Mail to the address given in the tender documents or in the beginning of this Guarantee.

10. GOVERNING LAW AND JURISDICTION:

This Guarantee shall be exclusively governed by and construed in accordance with the laws of India without giving effect to the principles of conflict of laws therein. No party shall take a plea that any forum is inconvenient. It may be enforced in terms of the Indian laws.

11. DISPUTE RESOLUTION

All and any disputes or differences arising out of or in relation to this Guarantee shall be finally settled and resolved through Arbitration in terms of the Arbitration Clause contained in the tender documents and agreed to between the Bidder and the Beneficiary. If the disputes are raised by the Guarantor, then the same shall settled by Arbitration assuming that the Guarantor is the Bidder under the said clause.

12. This Guarantee may be executed in one or more counterparts, all of which shall be read and construed as one document and any fax copy or scanned copy or print of a scanned copy of a signed Guarantee shall be deemed to be an original signature.

13. No modification, alteration or amendment of this Guarantee or any of its terms or provisions shall be valid or legally binding unless the Beneficiary consents to the same in writing.

14. No failure to take any action with respect to a breach of this Guarantee or a default by any other party shall constitute a waiver of the Beneficiary's right to enforce any provision of this Guarantee or to take action with respect to such breach or default or any subsequent breach or default.

15. Waiver of any breach or failure to comply with any provisions of this Guarantee shall not be construed as, or constitute, a continuing waiver of such provision, or a waiver of any other breach of or failure to comply with any other provision of this Guarantee, unless any such waiver has been consented to by the concerned party in writing.

16. This document has been executed by a duly authorized signatory on behalf of the Guarantor having the requisite power to do so.

IN WITNESS WHEEOF the Guarantor has duly executed this Guarantee as at the date first above written.

For and on behalf of Guarantor

Witness

(Signature):	Signature:
Name:	Name:
Designation:	Designation:

ISSUED AS ANNEXURE-3 to CA-1

SITE VISIT BY FOREIGN NATIONALS

APPENDIX –XII TO ITB

SITE VISIT BY FOREIGN NATIONALS

If any foreign national representing the Bidder intends to visit the site, the following details must be submitted alongwith his request for site visit.

a. Clearance from Indian Ministry as per the requirement of Government of India.
b. Copy of Passport of visitor(s)
c. Visa Document
d. Duration of visit
e. Purpose of visit
f. Details regarding stay

The above details shall be furnished to Resident Construction Manager-EIL/HRRL as per the contact address for site visit mentioned in the Invitation to Bid (IFB), one week before the date of site visit.

ISSUED AS ANNEXURE-4 to CA-1

FORMAT OF BANK GUARANTEE IN LIEU OF EARNEST MONEY REV.1

BANK GUARANTEE IN LIEU OF EARNEST MONEY

(On Non-Judicial stamp paper of appropriate value)

TO : HPCL Rajasthan Refinery Limited

(Address as applicable)

IN CONSIDERATION OF MESSRS. HPCL Rajasthan Refinery Limited, incorporated on 18th September, 2013, as a Joint Venture between Hindustan Petroleum Corporation Limited (HPCL) and Government of Rajasthan (GOR), having its registered office at Tel Bhavan, Sahkar Marg, Lal Kothi Vistar Jyoti Nagar, Jaipur Rajasthan, India (hereinafter called "The Corporation" which expression shall include its successor in business and assigns) issued a tender on Messrs. ..... a partnership firm/sole proprietor business/a company registered under the Companies Act, 1956 having its office at (hereinafter called "the Tenderer" which expression shall include its executors, administrators and assigns) against Tender no..... dated ..... (hereinafter called "the tender" which expression shall include any amendments/ alterations to "the tender" issued by "the Corporation") for the supply of goods to/execution of services for "the Corporation" and "the Corporation" having agreed not to insist upon immediate payment of Earnest Money for the fulfilment of the said tender in terms thereof on production of an acceptable Bank Guarantee for an amount of `..... (Rupees ..... only).

1. We, ... Bank having office at ..... Bombay (hereinafter referred to as "the Bank" which expression shall include its successors and assigns) at the request and on behalf of "the Tenderer" hereby agree to pay to the Corporation without any demur on first demand an amount not exceeding `..... (Rupees ..... only) against any loss or damage, costs, charges and expenses caused to or suffered by "the Corporation" by reason of non-performance and fulfilment or for any breach on the part of "the Tenderer" of any of the terms and conditions of the said "tender".

2. We, ... Bank further agree that "the Corporation" shall be sole Judge whether the said "Tenderer" has failed to perform or fulfill the said "tender" in terms thereof or committed breach of any of the terms and conditions of "the order" and the extent of loss, damage, cost, charges and expenses suffered or incurred or would be suffered or incurred by "the Corporation" on account thereof and we waive in favour of "the Corporation" all the rights and defences to which we as guarantors and/or "the Tenderer" may be entitled to.

3. We, ... Bank further agree that the amount demanded by "the Corporation" as such shall be final and binding on "the Bank" as to "the Bank" 's liability to pay and the amount demanded and "the Bank" to undertake to pay "the Corporation" the amount so demanded on first demand and without any demur notwithstanding any dispute raised by "the Tenderer" or any suit or other legal proceedings including arbitration pending before any court, tribunal or arbitrator relating thereto, our liability under this guarantee being absolute and unconditional.

4. We, ... Bank further agree with "the Corporation" that "the Corporation" shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said "tender"/or to extend time of performance by "the Tenderer" from time to time or to postpone for any time to time any of the powers exercisable by "the Corporation" against "the Tenderer" and to forbear to enforce any of the terms and conditions relating to "the tender" and we shall not be relieved from our liability by reason of any such variation or extension being granted to "the Tenderer" or for any forbearance, act or ommission on the part of "the Corporation" or any indulgence by "the Corporation" to "the tenderer" or by any such matter or things whatsoever which under the law relating to sureties would but for this provision have the effect of relieving us.

5. NOTWITHSTANDING anything hereinbefore contained, our liability under this Guarantee is restricted to ` ..... (Rupees..... only). Our liability under this guarantee shall remain in force until expiration of eight months plus two months claim period, from the due date of opening of the said "tender". Unless a demand or claim under this guarantee is made on us in writing within said period, that is, on or before ..... all rights of "the Corporation" under the said guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

6. We, ... Bank further undertake not to revoke this guarantee during its currency except with the previous consent of "the Corporation" in Writing.

7. We, ... Bank lastly agree that "the Bank" 's liability under this guarantee shall not be affected by any change in the constitution of "the Tenderer".

8. "The Bank" has power to issue this guarantee in favour of "the Corporation" in terms of the documents and/or the Agreement/Contract or MOU entered into between "the Tenderer" and "the Bank" in this regard.

IN WITNESS WHEREOF the Bank has executed this document on this ..... day of .....

For ..... Bank

(by its constituted attorney)

(Signature of a person authorised

to sign on behalf of "the Bank")

ISSUED AS ANNEXURE-5 to CA-1

LOADING & GUARANTEES FOR EPCC-01 CDU/VDU/HWOG UNIT/SR LPG TREATING UNIT & SAT. FGTU

[ANNEXURE- II TO SPECIAL CONDITIONS OF CONTRACT]

LOADING & GUARANTEES

FOR

EPCC-01 CDU/VDU/HWOG Unit/SR LPG Treating Unit & Sat. FGTU

[ANNEXURE –II TO SPECIAL CONDITIONS OF CONTRACT]

LOADING FOR UTILITY CONSUMPTION FOR EPCC-01 PACKAGE

1. SCOPE

Cost of loading because of differential guaranteed figures towards Technical Parameters (Utilities etc.) shall be carried out in accordance with loading criteria specified below

2. Loading for Utility Consumption

For the purpose of the loading following utilities are considered

1. **Power Consumption** for following equipments/systems at rated conditions for CDU/VDU, LPG Treater, HWOG Unit & Sat. Fuel Gas Treating unit.
    a. Rotating equipment as identified in this section (Refer **Annexure 1**)
    b. Desalter package (101-LZ-101/102) (Annexure-2)
    c. Ejector system (Ejector system 101-LZ-103 comprising of LRVP 101-LZ-104)(**Annexure-2**)
2. **Steam Consumption (MP)** for the Vacuum system (Ejector system 101-LZ-103) and Steam (atomizing) consumption for the burners for heaters as mentioned in **Annexure-3**.

Minimum utility Consumption for the Sr.no.1, 2 & 4 utilities ***quoted by bidder amongst all technically acceptable bids*** shall be considered as ***datum line*** and used in below mentioned **LOADING FORMULA** during price bid evaluation. Excess of the utility consumption figures **AGAINST datum** shall be calculated. ***Bidders are required to quote for these utilities in the Schedule of Price (SOP) based on the selection of equipment as per the technical details furnished in this tender.***

Further following utilities for which **Maximum Utility** consumption is provided, bidders are required to confirm the same,

3. **Fuel Consumption** of the equipments as identified in this document (**Annexure-4**)

Maximum Utility consumption for Fuel is indicated. Bidders are required to confirm their Guaranteed Fuel Consumption.

However in case of any deviation with respect to bidder maximum utility as defined, maximum Fuel utility as defined in this section shall be considered as datum line and used in below mentioned LOADING FORMULA during price bid evaluation.

4. **Cooling Water consumption** of the EPCC-01 unit.

Excess of the utility consumption figures AGAINST datum shall be calculated

Loading for the period of 10 years @ 8000 hours per year with following applicable rates and formula shall be considered while evaluating the bid:

3.1 Differential operating cost

3.1.1 Differential operating cost is defined as under:

Loading on account of parameters as defined above shall be calculated using following formulas

$$C \text{ (In Rupees)} = C_{Power} + C_{Steam} + C_{Fuel} + C_{Cw}$$

Wherein $C_{Power} = C_{P1} + C_{P2} + C_{P3}$

C_{P1} = Cost of ***Differential Power of identified*** Rotating Equipment for which Bidders are required to Quote

C_{P2} = Cost of ***Differential Power of Desalter Package*** for which Bidders are required to Quote

C_{P3} = Cost of ***Differential Power of Ejector Package*** for which Bidders are required to Quote

Wherein C_{Steam}

C_{Steam} = Cost of ***Differential Steam (MP) Consumption*** for Ejector Package & Atomising steams for heater as identified in Annexure-3 for which Bidders are required to Quote

Wherein C_{Fuel} = Cost of ***Differential Fuel Consumption*** as identified for which Bidders are required to Quote against the Maximum Consumption defined.

Wherein C_{Cw} = Cost of ***Differential Cooling Water Consumption*** for all the Cooling water consuming items of EPCC-01

Following shall be used for calculation of above factors

A. $C_{P1} = (KW_{REQ} - KW_{RER}) \times C_P \times 8000 \times D_F$

KW_{REQ} = Total Guaranteed Power (kW) of the identified Rotating Equipment quoted by the bidder under evaluation.
KW_{RER} = Lowest quoted Power Consumption of the identified Rotating equipment (KW) (amongst the technically acceptable bidders).

B. $C_{P2} = (KW_{DPQ} - KW_{DPR}) \times C_P \times 8000 \times D_F$

KW_{DPQ} = Total Guaranteed Power (kW) of the Desalter Package quoted by the bidder under evaluation.
KW_{DPR} = Lowest quoted Power Consumption of the Desalter Package (KW) (amongst the technically acceptable bidders).

C. $C_{P3} = (KW_{EPQ} - KW_{EPR}) \times C_P \times 8000 \times D_F$

KW_{EPQ} = Total Guaranteed Power (KW) of the Ejector Package quoted by the bidder under evaluation.
KW_{EPR} = Lowest quoted Power Consumption of the Ejector Package (KW) (amongst the technically acceptable bidders).

Where

C_P= Cost of Electric Power 8.225 Rupees per kWh.

D. $C_{Steam} = (SC_{EPQ} - SC_{EPR}) \times C_S \times 8000 \times D_F$

SC_{EPQ} = Total Steam Consumption (MT/Hr) of the Ejector Package & identified equipments (refer Annexure-3) as quoted by the bidder under evaluation.

SC_{EPR} = Lowest quoted Steam Consumption of the Ejector Package (MT/Hr) & identified equipments (refer Annexure-3, amongst the technically acceptable bidders).

Where

C_S = Cost of MP Steam **2114** Rupees per MT.

E. $C_{CW}=(EC_{CWQ} - EC_{CWPR}) \times C_W \times 8000 \times D_F$

EC_{CWQ} = Cooling water Consumption of all the consumers of EPCC-01 quoted (M3/Hr) by the bidder under evaluation

EC_{CWPR} = Lowest quoted Cooling water Consumption amongst bidders of the EPCC-01 (M3/Hr)

Where

C_W= Cost of Cooling water is 2.805 Rupees **per M3**.

F. $C_{Fuel} =(EC_{IFQ} - EC_{IFR}) \times C_F \times 8000 \times D_F /1000$

EC_{IFQ} = Fuel Consumption of the Identified Equipment quoted (Kg/Hr) by the bidder under evaluation.

EC_{IFR} = Maximum Fuel Consumption (Kg/Hr) as mentioned in this document

Where

C_F= Cost of Fuel Oil is 30336 Rupees **per MT**.

In addition to above description of other factors mentioned in above formula's are indicated below

8000 = Number of operating hours per year.

D_F = Discounting factor to arrive at Net Present Value (NPV) based on number of operating years as defined under clause 3.1.2

3.1.2 Discounting factor (D_F) is defined as under:

$$D_F = \sum_{n=4}^{n=k+3} [1 / \{1+ (X/100)\}^n]$$

Where:
k = Number of operating years for which loading is to be done as specified i.e. **10** Years.

X = Percentage rate of interest **12%**
D_F = 4.02
[The above formula considers Three year time for start-up of operation.]

3.1.3 The maximum loading to be applied however shall not exceed 10 % of the total Lumpsum price as quoted by bidder in SP-0.

3.1.4 The Bidder is required to furnish the guarantee of Utility consumption in the price schedule format SP-10 of Schedule of Prices.

3.1.5 This technical loading calculated using above shall be loaded on the evaluated price based on the other loading defined elsewhere in the document.

3.1.6 Maximum Utility Consumption

Bidders are required to confirm the maximum fuel consumption as under

S.No.	Utilities	Unit	Maximum Utility Consumption	
			Design Case-1	Design Case-2
1	Energy Consumption for the heaters as identified in this document (Annexure-4)	Kg/Hr	13986	13974

For the purposes of loading bidder is required to confirm & Quote the Fuel consumption as indicated for Design Case -1 indicated in the table above.

The Maximum Guarantee fuel consumption specified is based on Fuel Oil with LHV 9750 Kcal/Kg with fuel specification as per BEDB Part B included with this tender

Guarantee Point is defined in Annexure-4

In case bidder Quoted lesser value of fuel consumptions than as mentioned in the table above, no negative loading value shall be considered for price evaluation. However the quoted value shall be taken as bidders guarantee and shall be the revised guarantee point for the bidder, which bidder needs to demonstrate during PGTR without any tolerance.

3.1.7 Process Conditions for Guarantees

1. For equipment specific guarantees, bidder are required to refer corresponding equipment datasheet for operating conditions.
2. Battery limit conditions of utilities are as defined in the Tender.

3. In case of any deviation with respect to meeting the minimum process guarantees as defined in this package, Bidder are required to submit the detailed calculation for justification of deviations.

Note: Contractor to note that the guaranteed figures quoted by the bidder in the SP Forms shall only be used for the purpose of loading & reduction of price as defined in this section. However Bidder is required to ensure that equipment / system are designed and shall meet the necessary technical requirements as spelt out in the tender documents for smooth operation for meeting all process requirements of the unit in all cases as considered in the BEDP/FEED.

GUARANTEES FOR EPCC-01 PACKAGE

1.0 GENERAL

This document describes the guarantee parameters, which the CONTRACTOR must fulfil to meet his contractual obligations. The price reduction criteria for shortfall in the guarantee parameters and the rejection criteria of the various facilities being supplied by the CONTRACTOR under this package are outlined in this document.

CONTRACTOR is required to comply the requirements as spelt out in this document as minimum, however it does not absolve the CONTRACTOR of his responsibilities towards meeting the quality and performance linked guarantees outlined extensively elsewhere in the bid document. Guarantee requirements as spelt out in this document shall have to be demonstrated by the CONTRACTOR for acceptance of the various facilities of the package by the owner.

The guarantee parameters as outlined in this document shall be adjusted suitably in the event of variation in the utility supply conditions, if any. CONTRACTOR shall furnish all calculations as may be required for this purpose.

CONTRACTOR shall be required to arrange all necessary instruments and facilities as may be required to establish the guarantee parameters during the performance tests. Owner's obligations in terms of providing utilities etc. shall be limited to as outlined in the bid document.

The total reduction in price on all accounts as defined in the various clauses of this document shall be limited to 10% of the total contract price of the package. This ceiling does not includes repair/rectification guarantee covered under 1.1 below

1.1 CONTRACTOR shall guarantee the equipment / complete system for the design, materials, workmanship, size, capacity, performance, quality of utility & their consumptions, efficiency and compliance with various technical requirements forming the part of the CONTRACTOR'S scope and outlined variously in the bid document. This guarantee shall also include the sub ordered/bought out items forming a part of the CONTRACTOR's supplies. The CONTRACTOR shall repair / replace any part of equipment / component / sub system / complete system free of cost and without loss of time if :

1.1.1 There is fault in design OR

1.1.2 There is defect in material or workmanship and / or it does not comply with fabrication requirements or a wrong selection of material for the process requirements as established, OR

1.1.3 It fails to meet the size, capacity, performance and efficiency requirements or it is identified that the material /equipments supplied is faulty, OR

1.1.4 It does not comply with requirements of the bid package / Contract, OR

1.1.5 The material supplied is damaged during transit or during execution of the work.

1.2 Owner's / Consultant's inspection or review of the CONTRACTOR's design / documents / drawing or deviations shall in no way absolve the CONTRACTOR from his responsibilities towards meeting the guarantees for the various systems outlined in this document.

1.3 Contractor to submit sample calculation for guarantees along with the unpriced bid which should include all constants / graphs and charts.

1.4 Contractor to note that the data submitted as per the para 1.3 above will be utilized during performance guarantee test run(PGTR).

2.0 GUARANTEES PARAMETER FOR UTILITY CONSUMPTION

During the performance test if contractor fails to meet the guaranteed values, the following procedure shall be followed.

3.0 REDUCTION IN PRICE FOR EXCESS UTILITY CONSUMPTION

A. REDUCTION IN PRICE WITH RESPECT TO POWER CONSUMPTION

1. All centrifugal pumps and fans shall be performance tested at OEM vendor's works and performance demonstrated. Further, for all the other power consuming equipments / packages as defined in this section, bidder is required to establish the performance of the equipments / packages during PGTR. In case the total KW consumed by the equipments / packages exceeds the stipulated guaranteed value by more than 4%, the subject equipment/Package shall be rejected.

   However for excess power (kW) consumed over and above the guaranteed/quoted KW as per SP form upto a maximum of four (4%) percent, reduction in overall prices shall be applicable for excess power consumption as per the following formula on extra Power consumption of the equipment & Packages as identified in this section. Electric power consumption shall be measured at CDU/VDU sub-station.

a. C_{P1} **= (**$KW_{REA} - KW_{REQ}$) x C_P x 8000 x D_F

KW_{REQ} = Guaranteed Power (kW) of the identified Equipment quoted by the bidder

KW_{REA} = Power Consumption of the identified equipment (KW) as observed from the shop test.

b. C_{P2} **= (**$KW_{DPA} - KW_{DPQ}$) x C_P x 8000 x D_F

KW_{DPQ} = Total Guaranteed Power (kW) of the Desalter Package quoted by the bidder.

KW_{DPA} = Power Consumption of the Desalter Package (KW) as observed during Guarantee test run

c. C_{P3} **= (**$KW_{EPA} - KW_{EPQ}$) x C_P x 8000 x D_F

KW_{EPQ} = Total Guaranteed Power (KW) of the Ejector Package quoted
KW_{EPA} = Power Consumption of the Ejector Package (KW) as observed during field testing

Where

C_P = Cost of Electric Power 8.225 Rupees per kWh

B. REDUCTION IN PRICE WITH RESPECT TO STEAM CONSUMPTION

1. For all the Steam Consuming Equipments / Packages as defined in this section, in case during performance tests the Steam consumed (MT/Hr) by the equipments exceeds the stipulated guaranteed value by more than 5%, the subject equipment/Package shall be rejected.

   However for excess Steam Consumption over and above the guaranteed steam consumption upto a maximum of five percent, reduction shall be applicable for excess steam consumption as per the following formula for the equipments & Packages as identified in this section

a. $\mathbf{C_{Steam} = (SC_{EPA} - SC_{EPQ}) \times C_S \times 8000 \times D_F}$

$\mathbf{SC_{EPQ}}$ = Total Steam Consumption (MT/Hr) of the Ejector Package & Identified equipment as quoted by the bidder.
$\mathbf{SC_{EPA}}$ = Total Steam Consumption of the Ejector Package & Identified equipment (MT/Hr) as observed during Guarantee test run

Where

C_S= Cost of MP Steam **2114** Rupees per MT

C. REDUCTION IN PRICE WITH RESPECT TO COOLING WATER CONSUMPTION

For all the Cooling Water Consumers for EPCC-01, in case during performance tests the Cooling Water consumed (M3/Hr) by the equipments exceeds the stipulated guaranteed value by more than 5%, the subject equipments/Package shall be rectified by the EPCC Contractor without any cost implication to Owner. Reduction shall be applicable for excess Cooling water consumption as per the following formula for the of EPCC-01 till the completion of rectification is done by the EPCC Contractor.

$\mathbf{C_{Cw} = (C_{CWPA} - C_{CWPQ}) \times C_W \times N}$

However for excess Cooling Water Consumption over and above the guaranteed Cooling Water consumption upto a maximum of five percent, reduction shall be applicable for excess Cooling water consumption as per the following formula for the of EPCC-01.

$\mathbf{C_{Cw} = (C_{CWPA} - C_{CWPQ}) \times C_W \times 8000 \times D_F}$

$\mathbf{C_{CWPQ}}$ = Total Cooling Water Consumption (M3/Hr) of EPCC-01 as quoted by the bidder.
$\mathbf{C_{CWPA}}$ = Total Cooling Water Consumption of EPCC-01 (M3/Hr) as observed during Guarantee test run
N = Number of Hours the equipments/packages will be in service till rectification from the date of commissioning of the unit

Where

C_W= Cost of Cooling water is 2.805 Rupees **per M3**.

In addition to above description of other factors mentioned in above formula's are indicated below

8000 = Number of operating hours per year.
D_F = 4.02 As defined in this document

The total reduction in Price on account (A+B+C) & Clause no. 4.3 below as defined above for not meeting the guarantees as quoted by bidders shall be limited to 10% of the total Contract Price. The above reduction in lumpsum price shall be in addition to any price reduction mentioned elsewhere in tender document.

4.0 ADDITIONAL GUARANTEES WITH RESPECT TO EQUIPMENT PERFORMANCE

4.1 CONTRACTOR during the performance of contract required to carry out hydraulics and required to guarantee the hydraulics for meeting the throughput & Specification requirement as defined in the process package (BEDP) Contractor to meet the hydraulic guarantee of crude throughput of the unit of 1125 TPH for both Design Feed Case-1 & Case-2 as specified in BEDP with corresponding capacity of 24.55 TPH of LPG from LPG treatment unit

4.2 CONTRACTOR is required to demonstrate thermal performance of heaters along with fuel consumption for the cases defined below and Annexure-4 without any tolerance

S.No.	Utilities	Unit	Maximum Utility Consumption	
			Design Case-1	Design Case-2
1	Fuel Consumption of the equipments as identified in this document (Annexure-4)	Kg/Hr	13986	13974

4.3 However in case CONTRACTOR fails to demonstrate the Guaranteed Fuel Consumption during Guarantee Test Run, Reduction in Price shall be applicable on account of excess fuel consumption. This reduction in the price shall be applicable till the time rectification is done by the contractor. Reduction on the Price shall be calculated considering the following formula:

$$C_{Fuel} = (EC_{IF} - EC_{IFQ}) \times C_F \times N / 1000$$

EC_{IF} = Fuel Consumption (Kg/Hr) as recorded during Guarantee Test Run.
EC_{IFQ} = Fuel Consumption of the Indentified Equipment (Kg/Hr) quoted by bidder in price bid form SP-10

Where

C_F = Cost of Fuel Oil is 30336 Rupees **per MT** escalation shall be applied @ 12 % Per Annum from the date of Bid submission date
N = Number of Hours the equipment will be in service till rectification from the date of commissioning of the unit

Extent of Reduction in Price on account of Fuel Consumption is as per defined in clause no. 3.0 above.

4.4 CONTRACTOR is required strictly to comply with Emission guarantee as specified in the tender document without any tolerance.

4.5 In the event of deviation with respect to guarantees as specified above (Clause 4.1, 4.2 & 4.3), CONTRACTOR is required to rectify the same without any implication. In case of CONTRACTOR is not able to rectify the same (refer Clause 5.0), equipment(s) not meeting the guarantees shall be rejected and required to be replaced by contractor without any implication to OWNER.

5.0 REPAIR / RECTIFICATION / MODIFICATION

In case the shortfall in the guaranteed parameters, CONTRACTOR may carry out necessary repair / rectification / modification / replacement at his own cost and through his own agency on urgent basis and complete the repair / rectification / modification / replacement within a maximum period of three months to improve the supplied systems to prove guaranteed parameters in the final performance guarantee test. Should the systems continue to underperform, reduction in price shall be leviable after this as specified for shortfall in guaranteed parameters above.

However, if the shortfall in guaranteed parameters is beyond the rejection parameters, CONTRACTOR and OWNER will mutually agree on the method and possibilities of rectification and if the plant is still not capable of performing within the acceptance limits, it will be OWNER's decision with respect to rejection or penalties which shall be final and binding on the CONTRACTOR.

6.0 TEST RUN REQUIREMENTS

6.1 Detailed procedure for PGTR shall be discussed with bidder and finalized mutually, however for field tested equipments/Packages the individual utility consumption shall be recorded jointly for a period of 72 hours continuous run of the unit. After the completion of successful performance test, average consumption of individual utilities will be worked out. These shall be considered as actual consumption for computation of price adjustment.

6.2 All instruments required, if any, to establish the performance are within the CONTRACTOR'S scope of work / supply at no extra cost to OWNER.

6.3 In an event that unit operates in a mode / feed case different than specified above or at a throughput lower than design throughput, the utility numbers shall be prorated for reduced capacity for the purpose of guarantee in mutual discussion with PMC/Owner.

7.0 CONTRACTOR shall furnish along with the unpriced bid the detailed calculations by which the guarantee parameters as stipulated above for plant at normal conditions are established.

ANNEXURE-1

ROTATING EQUIPMENT CONSIDERED FOR POWER GUARANTEE

ROTATING EQUIPMENTS CONSIDERED FOR POWER GUARANTEE

1. FOR CDU/VDU

A. AIR COOLERS

S. No.	Tag. No	Description	Datasheet No.
1	101-A-101 A/B/C/D	CRUDE COLUMN OVERHEAD AIR COOLER	B068-101-79-DS-1471
2	101-A-102 A/B/C/D	OVERHEAD NAPHTHA AIR COOLER	B068-101-79-DS-1472
3	101-A-103 A/B	VAC DIESEL PDT + CR AIR COOLER	B068-101-79-DS-1473
4	101-A-107	HGO PDT AIR COOLER	B068-101-79-DS-1477
5	101-A-108 A/B/C/D/E/F	TEMPERED WATER AIR COOLER	B068-101-79-DS-1478
6	101-A-109	ATMOSPHERIC VENT CONDENSOR	B068-101-79-DS-1479

B. PUMPS

S. No.	Tag. No	Description	Normal BKW
1	101-P-101 A	CRUDE CHARGE PUMP	B068-101-79-DS-1601
2	101-P-101 B	CRUDE CHARGE PUMP	B068-101-79-DS-1601
2	101-P-102 A	2ND STAGE DESALTING/DESLUDGING WATER PUMP	B068-101-79-DS-1602
3	101-P-103 A	1ST STAGE DESALTING WATER PUMP	B068-101-79-DS-1603
4	101-P-104 A	CRUDE BOOSTER PUMP	B068-101-79-DS-1604
5	101-P-104 B	CRUDE BOOSTER PUMP	B068-101-79-DS-1604
6	101-P-105A	CRUDE OVHD WASH WATER PUMP	B068-101-79-DS-1605
7	101-P-106A	KERO CR PUMP	B068-101-79-DS-1606
8	101-P-107A	LGO CR PUMP	B068-101-79-DS-1607
9	101-P-108A	HGO CR PUMP	B068-101-79-DS-1608
10	101-P-109A	RCO PUMP	B068-101-79-DS-1609
11	101-P-110A	CRUDE COLUMN REFLUX PUMP	B068-101-79-DS-1610
12	101-P-111A	CRUDE COLUMN SOUR WATER PUMP	B068-101-79-DS-1611
13	101-P-112A	OVHD NAPHTHA DRUM SOUR WATER PUMP	B068-101-79-DS-1612
14	101-P-113A	STABILIZER FEED PUMP	B068-101-79-DS-1613
15	101-P-114A	SWING NAPHTHA PDT PUMP	B068-101-79-DS-1614
16	101-P-115A	KERO PDT PUMP	B068-101-79-DS-1615
17	101-P-116A	LGO PDT PUMP	B068-101-79-DS-1616
18	101-P-117A	HGO PDT PUMP	B068-101-79-DS-1617
19	101-P-118A	LPG PDT PUMP	B068-101-79-DS-1618
20	101-P-119A	STABILIZER REFLUX PUMP	B068-101-79-DS-1619
21	101-P-120A	STAB NAPHTHA PDT PUMP	B068-101-79-DS-1620
22	101-P-121A	VAC DIESEL PDT+CR+IR PUMP	B068-101-79-DS-1621
23	101-P-122A	LIGHT LVGO PUMP	B068-101-79-DS-1622
24	101-P-123A	LVGO PDT+CR+IR PUMP	B068-101-79-DS-1623
25	101-P-124A	HVGO CR+IR PUMP	B068-101-79-DS-1624
26	101-P-124B	HVGO CR+IR PUMP	B068-101-79-DS-1624
27	101-P-125A	HVGO PDT PUMP	B068-101-79-DS-1625
28	101-P-126A	SLOP DISTILLATE PUMP	B068-101-79-DS-1626
29	101-P-127A	VR PDT +QUENCH PUMP	B068-101-79-DS-1627

S. No.	Tag. No	Description	Normal BKW
30	101-P-127B	VR PDT +QUENCH PUMP	B068-101-79-DS-1627
31	101-P-128A	HOTWELL SLOP OIL PUMP	B068-101-79-DS-1628
32	101-P-129A	HOTWELL SOUR WATER PUMP	B068-101-79-DS-1629
33	101-P-130A	TEMPERED WATER PUMP	B068-101-79-DS-1630
34	101-P-130B	TEMPERED WATER PUMP	B068-101-79-DS-1630
35	101-P-131A	NEUTRALIZATION AMINE INJECTION-I (PART OF 101-LZ-105 PACKAGE)	
36	101-P-132A	NEUTRALIZATION AMINE INJECTION-II (PART OF 101-LZ-105 PACKAGE)	
37	101-P-133A	TSP DOSING PUMP (PART OF 101-LZ-108 PACKAGE)	
38	101-P-134A	FILMING AMINE INJECTION-I (PART OF 101-LZ-106 PACKAGE)	
39	101-P-135A	FILMING AMINE INJECTION-II (PART OF 101-LZ-106 PACKAGE)	
40	101-P-136A	DEMULSIFIER INJECTION PUMP (PART OF 101-LZ-107 PACKAGE)	
41	101-P-137A	ANTIFOULANT INJECTION PUMP I (PART OF 101-LZ-109 PACKAGE)	
42	101-P-138A	ANTIFOULANT INJECTION PUMP II (PART OF 101-LZ-109 PACKAGE)	
43	101-P-139A	NEUTRALIZATION AMINE INJECTION-III (PART OF 101-LZ-105 PACKAGE)	
44	101-P-140A	FILMING AMINE INJECTION-III (PART OF 101-LZ-106 PACKAGE)	

C. FANS

S. No.	Tag. No		Datasheet No.
		CRUDE HEATER A/B	B068-101-79-DS-1301,B224-101-02-44-DS-74, B224-101-02-44-DS-75
45	101-F-101A/B	ID FAN (1 NO)	
46		FD FAN (2 NO)	
		VACUUM HEATER	B068-101-79-DS-1302,B224-101-02-44-DS-84, B224-101-02-44-DS-85
47	101-F-102	ID FAN (1 NO)	
48		FD FAN (2 NO)	

2. HOTWELL OFFGAS TREATMENT UNIT (EngHOGTM)

A. PUMPS

S. No.	Tag. No	Description	Datasheet No.
1	101-P-145A	Rich Amine Pump	B068-101-03-DS-1645

3. SATURATED FUEL GAS TREATING UNIT

A. PUMPS

S. No.	Tag. No	Description	Datasheet No.
1	117-P-1101 A	Lean Amine Pump	B224-117-79-DS-1601
2	117-P-1102 A	Rich Amine Pump	B224-117-79-DS-1602

4. SATURATED LPG TREATING UNIT (EngTreatL)TM

A. PUMPS AND COMPRESSORS

S. No.	Tag. No	Description	Datasheet No.
1	103-P-101 A	Lean Amine Booster Pumps	B068-103-03-DS-1601
2	103-P-102 A	Rich Amine Pumps	B068-103-03-DS-1602
3	103-P-104 A	Interstage Caustic Circulation Pumps	B068-103-03-DS-1604
4	103-P-105 A	Regenerated Caustic Circulation Pumps	B068-103-03-DS-1605
5	103-P-106 A	Solvent Circulation Pumps	B068-103-03-DS-1606
6	103-P-107 A	Oxidised Caustic Pumps	B068-103-03-DS-1607
7	103-P-110 A	20 Wt % Fresh Caustic Metering Pumps	B068-103-03-DS-1610
8	103-K-101 A	Air Compressor	B068-103-03-DS-1612

Note:

A. FOR PUMPS

1. For power consumption guarantee of the pumps bidder to refer the datasheet as indicated in above table
2. Guaranteed Point for the pumps to be considered as following operating condition
    a. Maximum Flow as mentioned in the reference datasheet
    b. Differential Head as mentioned in the reference datasheet
3. For Guarantee points of Crude & Vacuum heaters ID/FD Fans refer Annexure-4

ANNEXURE-2

PACKAGE CONSIDERED FOR POWER GUARANTEE

S.No.	Item No	Service	Guarantee Point	Reference Document
1	101-LZ-101/102	Desalter Package	To meet requirements of Design Case-1 and Design Case-2 with **Maximum Crude Flow Rate**	B068-101-79-DS-1801
2	101-LZ-103/104	Ejector Package	To meet the requirement of Design Case-1 and Design Case-2 at **Rated condition**	B068-101-79-DS-1803

ANNEXURE-3

EQUIPMENT CONSIDERED FOR MP STEAM CONSUMPTION GAURANTEE

S. No.	Item No	Service	Guarantee Points	Reference Documents
1	101-F-101 A & B	Crude Heater-A & B (Atomizing Steam)	**DESIGN CASE-1** Arab Mix + Rajasthan corresponding to heat absorption of 82.3 MMKCal/hr HC **DESIGN CASE-2** Arab Mix Corresponding to heat absorption of 84.7 MMKcal/hr HC	B068-101-79-DS-1301 & B224-101-02-44-DS-71
2	101-F-102	Vacuum Heater (Atomizing Steam)	**DESIGN CASE-1** Arab Mix + Rajasthan Corresponding to heat absorption of 38.8 MMKcal/hr HC + 1.63 MMKcal/hr LPSSH **DESIGN CASE-2** Arab Mix corresponding to heat absorption of 36.29 MMKCal/hr HC + 1.63 MMKCal/hr LPSSH	B068-101-79-DS-1302 & B224-101-02-44-DS-81
3	101-LZ-103/104	EJECTOR Package	To meet the requirement of **Design Case-1 and Design Case-2** at rated condition	B068-101-79-DS-1803

ANNEXURE-4

EQUIPMENT CONSIDERED FOR FUEL CONSUMPTION GUARANTEE

S.No.	Item No	EQUIPMENT	Guarantee Point		Reference Document
			Crude Case-1 Arab Mix + Rajasthan	**Crude Case-2** Arab Mix	
1	101-F-101A & B (Combined)	Crude Heater A & B	Corresponding to heat absorption of 82.3 MMKcal/hr HC	Corresponding to heat absorption of 84.7 MMKcal/hr HC	B068-101-79-DS-1301 & B224-101-02-44-DS-71
3	101-F-102	Vacuum Heater	Corresponding to heat absorption of 38.8 MMKcal/hr HC + 1.63 MMKcal/hr LPSSH	Corresponding to heat absorption of 36.29 MMKcal/hr HC + 1.63 MMKcal/hr LPSSH	B068-101-79-DS-1302 & B224-101-02-44-DS-81

ISSUED AS ANNEXURE-6 to CA-1

OISD GUIDELINES-192, OISD GUIDELINE-207

[ANNEXURE- XIV TO SPECIAL CONDITIONS OF CONTRACT]

OISD - GDN - 192

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Engineers India Ltd

SAFETY PRACTICES DURING CONSTRUCTION

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Preamble

Indian petroleum industry is the energy lifeline of the nation and its continuous performance is essential for sovereignty and prosperity of the country. As the industry essentially deals with inherently inflammable substances throughout its value chain – upstream, midstream and downstream – Safety is of paramount importance to this industry as only safe performance at all times can ensure optimum ROI of these national assets and resources including sustainability.

While statutory organizations were in place all along to oversee safety aspects of Indian petroleum industry, Oil Industry Safety Directorate (OISD) was set up in 1986 Ministry of Petroleum and Natural Gas, Government of India as a knowledge centre for formulation of constantly updated world-scale standards for design, layout and operation of various equipment, facility and activities involved in this industry. Moreover, OISD was also given responsibility of monitoring implementation status of these standards through safety audits.

In more than 25 years of its existence, OISD has developed a rigorous, multi-layer, iterative and participative process of development of standards – starting with research by in-house experts and iterating through seeking & validating inputs from all stake-holders – operators, designers, national level knowledge authorities and public at large – with a feedback loop of constant updation based on ground level experience obtained through audits, incident analysis and environment scanning.

The participative process followed in standard formulation has resulted in excellent level of compliance by the industry culminating in a safer environment in the industry. OISD – except in the Upstream Petroleum Sector – is still a regulatory (and not a statutory) body but that has not affected implementation of the OISD standards. It also goes to prove the old adage that self-regulation is the best regulation. The quality and relevance of OISD standards had been further endorsed by their adoption in various statutory rules of the land.

Petroleum industry in India is significantly globalized at present in terms of technology content requiring its operation to keep pace with the relevant world scale standards & practices. This matches the OISD philosophy of continuous improvement keeping pace with the global developments in its target environment. To this end, OISD keeps track of changes through participation as member in large number of International and national level Knowledge Organizations – both in the field of standard development and implementation & monitoring in addition to updation of internal knowledge base through continuous research and application surveillance, thereby ensuring that this OISD Standard, along with all other extant ones, remains relevant, updated and effective on a real time basis in the applicable areas.

Together we strive to achieve NIL incidents in the entire Hydrocarbon Value Chain. This, besides other issues, calls for total engagement from all levels of the stake holder organizations, which we, at OISD, fervently look forward to.

Jai Hind!!!

Executive Director
Oil Industry Safety Directorate

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FOREWORD

At the time of development of this document, 113 OISD standards, recommended practices and guidelines are applicable to the Oil and Gas installations of Public sector Oil Companies in India. 11 of these standards have been adopted by Petroleum and Explosives Safety Organisation (PESO) in various rules administered by them and thus the provisions of these standards are mandatory for entire Oil & Gas sector to that extent.

A few serious accidents have occurred in the recent past in India and abroad including vapour cloud explosion and fire at Oil terminal near Jaipur emphasised the need for the industry to review the existing provisions of various guidelines and statutory requirements.

With the above in view the Government of India directed the Oil Industry Safety directorate to develop a comprehensive document covering all the facets of Safety in Design, Operation and Maintenance, of depots and terminals being run by marketing divisions of Oil companies with an objective to strengthen the existing system.

The present guideline on “Safety Practices During Construction” has been prepared by the functional committee based on, existing standards, guidelines & recommended practices of OISD, the recommendations arising out of recent major accidents and their analysis, the accumulated knowledge and experience of industry members in India and updation of National and International codes and practices.

The provisions of this document, if implemented objectively, may go a long way in enhancing overall safety standard and reduce accidents in Oil Installations.

Users are cautioned that no standard can be substitute to the “judgment and experience of Engineers”

This document will be reviewed periodically for improvements based on the new experiences and better understanding. Suggestions are also invited from the users after it is put into practice to improve the document further. Suggestions may be addressed to:

The Co-ordinator
Committee on “Safety Practices during Construction”

Oil Industry Safety Directorate

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This document in no way supersedes the statutory regulations of Chief Controller of Explosives (CCE), Factory Inspectorate or any other statutory body, which must be followed as applicable.

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NOTE

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Though every effort has been made to assure the accuracy and reliability of the data contained in these documents, OISD hereby expressly disclaims any liability or responsibility for loss or damage resulting from their use.

These documents are intended to supplement rather than replace the prevailing statutory requirements.

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In addition to the above, several other experts from Industry contributed in the preparation, review and finalisation of this Guideline.

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SAFETY PRACTICES DURING CONSTRUCTION

1.0 INTRODUCTION

Safety in Construction Management deserves utmost attention especially in the hydrocarbon industry, such as Exploration, Refineries, Pipelines and Marketing installations, Gas Processing units etc. Construction is widely recognised as one of the accident prone activities. Most of the accidents are caused by inadequate planning, failure during the construction process and/or because of design deficiencies. Besides property loss, accidents also result in injuries and fatalities to the personnel, damage to environment which needs to be prevented.

The reasons for accidents during construction activities are related to unique nature of the industry, human behaviour, difficult work-site conditions, extended odd duty hours, lack of training & awareness and inadequate safety management. Unsafe working methods, lack of proper JSA (Job Safety Analysis) and use of improper / inadequate PPEs, equipment failure and improper housekeeping also tend to increase the accident rate in construction.

Ensuring good quality of materials, equipment and competent supervision along with compliance of standard engineering practices shall go a long way to in built safety into the system.

The objective of this document is to provide practical guidance on technical and educational framework for health, safety and environment in construction with a view to:

(a) prevent accidents and harmful effects on the health of workers arising from employment in construction;
(b) ensure appropriate safety during implementation of construction;
(c) provide safety practice guidelines for appropriate measures of planning, control and enforcement.
(d) protect environment.

2.0 SCOPE

This document specifies broad guidelines on HEALTH, SAFETY AND ENVIRONMENT practices to be adhered to during construction activities including green field projects in oil industry. However, before commencing any job, specific hazards and its effects should be assessed and necessary corrective/preventive actions should be taken by all concerned. The document is intended only to supplement and not to replace or supersede the prevailing statutory requirements, which shall also be followed as applicable. For Personal Protective Equipment, OISD-STD-155 (Part I&II) shall be referred to. The scope of this document does not include the design aspects and quality checks during construction.

3.0 DEFINITIONS

Definitions of various terminology are given below:

- **Adequate, appropriate or suitable** are used to describe qualitatively or quantitatively the means or method used to protect the men, machinery, material, property and enviroment.

- **By hand:** The work is done without the help of a mechanised tool.

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- **Competent Authority:** A stautory agency having the power to issue regulations, orders or other instructions having the force of law.

- **Competent person:** A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill for the safe performance of the specific work. The competent authorities may define appropriate criteria for the designation of such persons and may determine the duties to be assigned to them.

- **Construction site:**

  A worksite involving new construction, modification or maintenance of existing facility, shutdown related activity, demolition, housekeeping etc.

- **Environment:**

  Environment includes water, air and land and the interrelationship which exists among and between water, air and land and human beings, other living creatures, plants, microorganisms and property.

- **Execution agency:**

  Any entity / person, having contractual obligation with the owner and who employs one or more workers on a construction site.

- **Hazard:** A condition or a set of conditions which has potential of causing injury to person, damage to property or environment.
- **Health:** Soundness of body covering Physical, Emotional, Psychological and Intellectual conditions of a worker which assists the attainment of the objectives.
- **Means of access or egress:** Passageways, corridors, stairs, platforms, ladders and any other means for entering or leaving the workplace or for escaping in case of danger.

- **Owner:** Any entity **/** person for whom construction job is carried out.

  It shall also include owner's designated representative/ consultant/ nominee/ agent, authorised from time to time to act for and on its behalf for supervising/ coordinating the activities of the execution agency.

- **Scaffold:** Any fixed, suspended or mobile temporary structure supporting workers and material or to gain access to any such structure and which is not a lifting appliance.
- **Safety :** Prevention & protection from exposure to Hazard.

- **Worker:** Any person engaged in construction activity.

- **Workplace:** Owner's designated premises where workers need to be present by virtue of their involvement in the construction activity**.**

4.0 GENERAL DUTIES

4.1 GENERAL DUTIES OF EXECUTION AGENCIES

4.1.1 Execution agency should:

i) provide means and organisation to comply with the Health, safety and environment protection measures required at the workplace.

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ii) provide and maintain workplaces, plant, equipment, tools and machinery and organise construction work so that, there is no risk of accident or injury to health of workers. In particular, construction work should be planned, prepared and undertaken so that:

(a) dangers liable to arise at the workplace, are prevented;
(b) excessively or unnecessarily strenuous work positions and movements are avoided;

- organisation of work takes into account the safety and health of workers and also environment protection;
- materials and products used are suitable from Health safety and environment protection point of view;

(c) working methods are adopted to safeguard workers against the harmful effects of chemical, physical and biological agents.

iii) establish committees with representatives of workers and management or make other arrangement for the participation of workers in ensuring safe working conditions.

iv) arrange for periodic safety inspections by competent persons of all buildings, plant, equipment, tools, machinery, workplaces and review of systems of work, regulations, standards or codes of practice. The competent person should examine and ascertain the safety of construction machinery and equipment.

v) provide such supervision to ensure that workers perform their work with due regard to safety and health of theirs as well as that of others.

vi) employ only those workers who are qualified, trained and suited by their age, physique, state of health and skill.

vii) satisfy themselves that all workers are informed and instructed in the hazards connected with their work and environment and trained in the precautions necessary to avoid accidents and injury to health.

viii) ensure that buildings, plant, equipment, tools, machinery or workplaces in which a dangerous defect has been found should not be used until the defect has been rectified.

ix) organise for and remain always prepared to take immediate steps to stop the operation and evacuate workers as appropriate, where there is an imminent danger to the safety of workers.

x) establish a checking system by which it can be ascertained that all the members of a shift, including operators of mobile equipment, have returned to the camp or base at the close of work on dispersed sites and where small groups of workers operate in isolation.

- provide appropriate first aid, training and welfare facilities to workers as per various statutes like the Factories Act 1948, Building & Construction Workers Regulation (BOCWR), etc. and, whenever collective measures are not feasible or are insufficient, provide and maintain personal protective equipment and clothing in line with the requirement as per OISD-STD-155 (Part I & II) on Personnel Protective

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Equipment. They should also provide access to workers to occupational health services.

- educate workers about their right and the duty at any workplace to participate in ensuring safe working conditions to the extent of their control over the equipment and methods of work and to express views on working procedures adopted as may affect health, safety and environment.

xi) ensure that except in an emergency, workers unless duly authorised, should not interfere with, remove, alter or displace any safety device or other appliance furnished for their protection or the protection of others, or interfere with any method or process adopted with a view to avoiding accidents and injury to health.

xii) ensure that workers do not operate or interfere with plant and equipment that they have not been duly authorised to operate, maintain or use.

xiii) ensure that workers do not sleep, rest or cook etc in dangerous places such as scaffolds, railway tracks, garages, confined spaces or in the vicinity of fires, dangerous or toxic substances, machines or vehicles and heavy equipment etc.

xiv) obtain the necessary clearance/permits as required and specified by owner.

Arrangement for drinking water, toilet facilities, a creche and transport arrangement etc. to be provided as per statutory requirement.

xv) deploy a safety officer at site as per the requirement of Factory Act 1948/ Building & Construction Workers Regulation (BOCWR)/ Criticality of the job.

xvi) ensure that all employees/workmen undergo medical examination as required under the law or under the contract provision and keep a record of the same.

xvii) obtain the police verification of the workers/ supervisors arranged by him and the same is to be submitted to the owner.

xviii) not permit any employee/workmen/visitor to enter the work area under the influence of alcohol or any drugs.

4.2 GENERAL DUTIES OF OWNERS

4.2.1 Owners should:

i) co-ordinate or nominate a competent person to co-ordinate all activities relating to HEALTH, SAFETY AND ENVIRONMENT on their construction projects;

ii) inform all contractors on the work site / project of special risks to HEALTH, SAFETY AND ENVIRONMENT;

iii) ensure that executing agency is aware of the owner's requirements and the executing agency's responsibilities with respect to HEALTH, SAFETY AND ENVIRONMENT practices before starting the job.

5.0 SAFETY PRACTICES AT WORK PLACES

5.1. GENERAL PROVISIONS

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5.1.1 All openings and other areas likely to pose danger to workers should be clearly indicated and accident prevention measures taken as required. The working area should be clearly de-marketed to keep the workers in that area only.

5.1.2 Workers & Supervisors should use the safety helmet and other requisite Personal Protective Equipment according to job & site requirement as per OISD-STD-155 (Part I & II). They should be trained to use personal protective equipment including their limitations.

5.1.3 Never use solvents, alkalis and other oils to clean the skin.

5.1.4 Lift the load with back straight and knees bent. The contractor shall ensure at his construction site, no worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or pipelines exceeding in weight as per The Factory Act 1948 / Rule 38 of Building & Construction Workers Regulation (BOCWR), unless aided by another worker or device.

5.1.5 Ensure the usage of correct and tested tools and tackles. Don't allow the make shift tools and tackles. Also the tools should be suitable for a particular job and rated accordingly.

5.1.6 No loose clothing should be allowed while at construction site.

5.1.7 Start work only after proper authorization viz Work permit etc.

5.1.8 Job safety analysis to be done for all critical works.

5.1.9 Hydra should not be used for transportation of hook loaded materials.

5.1.10 Rope ladders should not be used at construction sites.

5.2 MEANS OF ACCESS AND EGRESS

Adequate and safe means of access (atleast two, differently located) to and egress from all workplaces should be provided. Same should be displayed and maintained. Escape routes should be marked prominently in workers friendly language. The escape routes should not be blocked at any point of time and same to be made understand to the workers.

5.3 HOUSEKEEPING

5.3.1 General Housekeeping shall be carried out by the contractor and he will ensure;

i) proper storage of materials and equipment;

ii) removal of scrap, inflammable material, waste and debris at appropriate intervals including slippery materials. (construction sand on road, oil/ lubricants, resins, etc.).

iii) to provide containers for segregation of disposal of debris at required places and regular cleaning of the same.

5.3.2 Removal of loose materials, which are not required for use, to be ensured. Accumulation of these at the site can obstruct means of access to and egress from workplaces and passageways.

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5.3.3 Workplaces and passageways, that are slippery owing to oil, grease or other causes, should be cleaned up or strewn with sand, sawdust, ash etc.

5.3.4 All surplus earth and debris are removed/disposed off from the working areas to officially designated dumpsites. The debris like plastics, packing material, rubber items should not be allowed to burn. Trucks carrying sand, earth and any pulverized materials etc. in order to avoid dust or odour impact, shall be covered while moving.

5.4 PRECAUTIONS AGAINST THE FALL OF MATERIALS & PERSONS AND COLLAPSE OF STRUCTURES

5.4.1 Precautions should be taken such as the provision of fencing, look-out men or barriers to protect any person against injury by the fall of materials, or tools or equipment being raised or lowered.

5.4.2 Where necessary to prevent danger, guys, stays or supports should be used or other effective precautions should be taken to prevent the collapse of structures or parts of structures that are being erected, maintained, repaired, dismantled or demolished.

5.4.3 All openings through which workers are liable to fall should be kept effectively covered or fenced and displayed prominently.

5.4.4 SOP of crane operation should be adhered to. The crane jacks/legs should be parked on compacted surface to avoid tilting.

5.5 PREVENTION OF UNAUTHORISED ENTRY

5.5.1 Construction sites located in built-up areas and alongside vehicular and pedestrian traffic routes should be fenced to prevent the entry of unauthorised persons.

5.5.2 Visitors should not be allowed access to site(s) unless accompanied by or authorised by a competent person. All authorized visitors should report at the site office. Contractor shall provide visitor's helmet (helmet with visitor sticker) and other PPEs like Safety Shoe, reflective jacket, respiratory protection etc. as per requirement of the site. All the workers to have photo IDs including the staff of vehicles used in the job.

5.6 FIRE PREVENTION AND FIRE FIGHTING

5.6.1 All necessary measures should be taken by the executing agency and owner to:

i) avoid the risk of fire;
ii) control quickly and efficiently any outbreak of fire;
iii) bring out a quick and safe evacuation of persons.
iv) Inform unit/fire station control room, where construction work is carried out within existing operating area.
v) DMP should be in place for the same.

5.6.2 Combustible materials such as packing materials, sawdust, greasy/oily waste and scrap wood or plastics should not be allowed to accumulate in workplaces but should be kept in closed metal containers in a safe place. To be disposed periodically away from site at designated place and assigned manner.

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5.6.3 Places where workers are employed on works prone to danger of fire should be provided with:

i) suitable and sufficient fire-extinguishing equipment, which should be easily visible and accessible;
ii) an adequate water supply at sufficient pressure meeting the requirements of various OISD standards.
iii) required PPEs.

5.6.4 To guard against danger at places having combustible material, workers should be trained in the action to be taken in the event of fire, including the use of means of escape.

5.6.5 At sites having combustible material, suitable visual sign boards should be provided to indicate clearly the direction of escape in case of fire.

5.6.6 Means of escape should be kept clear at all times. Escape routes should be frequently inspected and if possible marked in fluorescent colours particularly in high structures and where access is restricted.

5.7 LIGHTING

5.7.1 Where natural lighting is not adequate, working light fittings or portable hand-lamps should be provided at workplace on the construction site where a worker will do a job.

5.7.2 Emergency lighting should be provided for personnel safety during night time to facilitate standby lighting source, if normal system fails.

5.7.2 Artificial lighting should not produce glare or disturbing shadows.

5.7.3 Lamps should be protected by guards against accidental breakage.

5.7.4 The cables of portable electrical lighting equipment should be of adequate size & characteristics for the power requirements and of adequate mechanical strength to withstand severe conditions in construction operations.

5.7.5 For temporary lighting connection, mostly neutral and phases are connected and insulation tapes are provided. It is better to stagger the neutral and phase connection so that even if the tape gets removed from the joints, there will be no short circuit/ spark between neutral and phase due to staggering of neutral and phase.

5.7.6 All the temporary lighting/ machine connections are to be provided from a three core cable for better safety.

5.8 PLANT, MACHINERY, EQUIPMENT AND HAND TOOLS

5.8.1 General Provisions

i) Plant, machinery and equipment including hand tools, both manual and power driven, should:
   a) be of proper design and construction, taking into account health, Safety and ergonomic principles.
   b) be maintained in good working order;
   c) be used only for work for which they have been designed.
   d) be operated only by workers who have been authorised and given appropriate training.

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e) be provided with protective guards, shields or other devices as required.

ii) Adequate instructions for safe use should be provided.

iii) Standard operating procedures should be established and used for all plant, machinery and equipment.

iv) Operators of plant, machinery and equipment should not be distracted while work is in progress.

v) Plant, machinery and equipment should be switched off when not in use and isolated before any adjustment, clearing or maintenance is done.

vi) Where trailing cables or hose pipes are used they should be kept as short as practicable and not allowed to create a hazard.

vii) All moving parts of machinery and equipment should be enclosed or adequately guarded.

viii) Every power-driven machine and equipment should be provided with adequate means, immediately accessible and readily identifiable to the operator, of stopping it quickly and preventing it from being started again inadvertently.

ix) Operators of plant, machinery, equipment and tools should be provided with PPEs, including where necessary, suitable ear protection.

5.8.2 Hand tools

i) Hand tools should be repaired by competent persons.

ii) Heads of hammers and other shock tools should be dressed or ground to a suitable radius on the edge as soon as they begin to mushroom or crack.

iii) When not in use and while being carried or transported, sharp tools should be kept in sheaths, shields, chests or other suitable containers.

iv) Only insulated or non-conducting tools should be used on or near live electrical installations.

v) Only non-sparking tools should be used near or in the presence of flammable or explosive dusts or vapours.

5.8.3 Pneumatic Tools

i) Operating triggers on portable pneumatic tools should be:
   a) so placed as to minimise the risk of accidental starting of the machine.
   b) so arranged as to close the air inlet valve automatically when the pressure of the operator's hand is removed.

ii) Hose and hose connections for compressed air supply to portable pneumatic tools should be:

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a) designed and tested for the pressure and service for which they are intended;
b) fastened securely on the pipe outlet and equipped with the safety chain, as appropriate.

iii) Pneumatic shock tools should be equipped with safety clips or retainers to prevent dies and tools from being accidentally expelled from the barrel.

iv) Pneumatic tools should be disconnected from power and the pressure in hose lines released before any adjustment or repair is made.

5.8.4 Electrical Tools

i) Low voltage portable electrical tools should generally be used.

ii) All electrical tools should be earthed, unless they are "all insulated" or "double insulated" tools which do not require earthing.

iii) All electrical tools should get inspected and maintained on a regular basis by a competent electrician and complete records kept.

iv) No temporary connected appliance shoud be left connected in the socket. Its plug should be immediately removed after use.

5.8.5 Engines

i) Engines should:

a) be installed so that they can be started safely and the maximum safe speed cannot be exceeded.
b) have controls for limiting speed.
c) have devices to stop them from a safe place in an emergency.
d) have their batteries top covered with insulating material.
e) have radiator fan covers in place.

ii) IC engines should not be run in confined spaces unless adequate exhaust ventilation is provided or the exhaust should be installed outside the confined place at suitable height.

iii) When IC engines are being fuelled:

a) the engine should be shut off.
b) care should be taken to avoid spilling fuel.
c) no person should smoke or have an naked light in the vicinity.
d) a fire extinguisher should be kept readily available.

iv) Secondary fuel reservoir should be placed outside the engine room.

6.0 CONSTRUCTION ACTIVITIES

The various common activities in construction are as under:

- Excavation
- Scaffolding, Platforms & Ladders
- Structural Work, Laying of Reinforcement & Concreting
- Road Work (Laying of roads)
- Cutting /Welding
- Working in Confined Space

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- Proof/Pressure Testing
- Working at Heights
- Handling & Lifting Equipment
- Vehicle Movement
- Electrical
- Offshore
- Demolition
- Radiography
- Shot blasting/ spray painting
- Work above water

Work permit system as per requirement of OISD-STD-105 shall be followed for various construction activities. As regards the activities at work places including grass root project sites if not covered under OISD-STD-105, owner shall develop a suitable methodology for execution of various construction activities under work permit system for safe execution of the works.

The safe practices to be followed during the implementation of above construction activities are given below:

6.1 EXCAVATION

6.1.1 All excavation work should be planned and the method of excavation and the type of support work required should be decided considering the following:

i) the stability of the ground including the chances of seepage of water;
ii) the excavation will not affect adjoining buildings, structures or roadways;
iii) to prevent hazard, the Hydrocarbon lines, water, electrical and other above ground & underground public utilities should be shut off, re-routed or disconnected, if necessary; If such a presence is envisaged, clearance to be taken from respective competent authority/ person.
iv) the position of culvert/bridges, temporary roads and spoil heaps should be determined;
v) a signed rough sketch of the excavation site to be prepared and made the workers understand

6.1.2 Before digging begins on site, all excavation work should be planned and the method of excavation and the type of support work required should be decided based on good engineering practices and recorded.

6.1.3 All excavation work should be supervised by a competent person.

6.1.4 Sites of excavations should be thoroughly inspected:

i) daily, prior to each shift and after interruption in work of more than one day;
ii) after every blasting operation;
iii) after an unexpected fall of ground;
iv) after substantial damage to supports;
v) after a heavy rain, frost or snow;
vi) when boulder formations are encountered.
vii) for cracks in the nearby buildings or area as the excavation progresses and the same to be reviewed.

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6.1.5 Safe angle of repose while excavating trenches exceeding 1.5m depth upto 3.0m should be maintained. Based on site conditions, provide proper slope, usually 45^0,and suitable bench of 0.5m width at every 1.5m depth of excavation in all soils except hard rock or provide proper shoring and strutting to prevent cave-in or slides.

6.1.6 As far as possible, excavated earth should not be placed within one meter of the edge of the trench or depth of trench whichever is greater.

6.1.7 Don't allow vehicles to operate too close to excavated area. Maintain atleast 2m distance from edge of excavation or depth of trench whichever is greater. No load, plant or equipment should be placed or moved near the edge of any excavation where it is likely to cause its collapse and thereby endanger any person unless precautions such as the provision of shoring or piling are taken to prevent the sides from collapsing.

6.1.8 Adequately anchored stop blocks and barriers should be provided to prevent vehicles being driven into the excavation. Heavy vehicles should not be allowed near the excavation unless the support work has been specially designed to permit it.

6.1.9 If an excavation is likely to affect the stability of a structure on which persons are working, precautions should be taken to protect the structure from collapse.

6.1.10 Barricade at 1m height (with red & white band/self glowing caution board) should be provided for excavations beyond 1.0 m depth. Provide two entries/exits for such excavation through proper means. Lighting arrangements to be made to avoid any accidental fall in the excavated portion even when work is not in progress.

6.1.11 Necessary precautions should be taken for underground utility lines like cables, sewers etc. and necessary approvals/clearances from the concerned authorities shall be obtained before commencement of the excavation job.

6.1.12 Water shall be pumped/ bailed out, if any accumulates in the trench. Necessary precautions should be taken to prevent entry of surface water in trenches.

6.1.13 During / after rains, the soil becomes loose. Take additional precaution against collapse of side wall. During rains excavation should be avoided.

6.1.14 In hazardous areas, air should be tested to ascertain its quality. No one should be allowed entry till it is suitable for breathing.

6.1.15 In case of mechanised excavation, precaution shall be taken to not to allow anybody to come within one meter of extreme reach of the mechanical shovel. This area of reach of mechanical shovel should be marked / barricaded suitably. The mechanised excavator shall be operated by a well-trained experienced operator. When not in operation, the machine shall be kept on firm leveled ground with mechanical shovel resting on ground. Wheel or belt shall be suitably jammed to prevent any accidental movement of the machine. Suitable precautions as per manufacturer guidelines should be taken for dozers, graders and other heavy machines.

6.1.16 In case of blasting, follow strictly IS:4081-1986 & Indian Explosive Act and rules for storage, handling and carrying of explosive materials and execution of blasting operation.

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6.2 SCAFFOLDING, PLATFORMS & LADDERS

System of tagging shall be followed to indicate status of `Fit-for-Purpose' certification by a competent person for the scaffoldings. Green Tag shall indicate `Fit-for-Purpose' whereas Red Tag shall indicate `Unfit-for-purpose'. Accordingly only Red Tag shall be displayed during Erection & Dismantling.

All personnel engaged in erecting, using, dismantling scaffolds shall use full body safety harness with double lanyard with shock absorber connected with personal fall arrestor which should be secured to a properly designed anchor.

6.2.1 Scaffold related guidelines

General Requirements

Categories and Classification

Most scaffolds fall into one of the four primary categories:

- Tube and coupler scaffold
- System scaffolds e.g. Cup lock, Ring lock, H frame scaffold
- Suspension(or Suspended) scaffold
- Mobile scaffold
- Special scaffold

Scaffolds are classified according to their intended use as:

- Light duty
- Medium duty (General Purpose)
- Heavy duty

Type of Scaffolding	Load duty	Light		Medium	Heavy/Special		
	Maximum Safe load in Kg/m^2	75	150	225	300	450	600
Tubular with clamps	Max. bay length (distance between two verticals) in Meter	2.7	2.2	1.8	1.4	1.0	0.8
Cup / Ring lock		2.5	2.0	1.5	1.25	1.0	NA

Conditions where special scaffolding procedure is required:

1. Height of the scaffolding is more than 30 meters.

2. Scaffolding is special in nature/ type: cantilever more than 1 .5 meters, bridge more than 4 meters, scaffolding for machine/ equipment maintenance requiring frequent modifications, offshore scaffold, hanging scaffold; wooden scaffold (for specific use e.g. cooling tower), etc.

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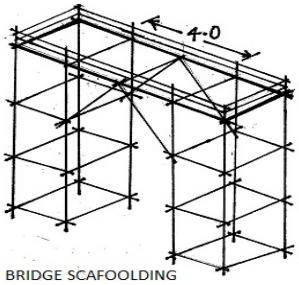
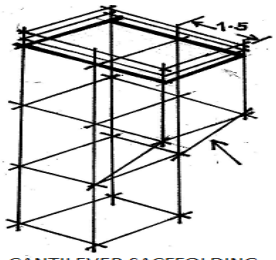


BRIDGE SCAFOOLDING



CANTILEVER SACFFOLDING

For all such cases, but not limited to, in addition to checklist, a plant specific procedure cum checklist based on additional risk is to be prepared & validated by a competent person (example: procedure for erection/ dismantling shall be prepared and followed. If need felt, help from Engineering Cell/Third Party may be taken for checking proposed scaffold in respect of design and load carrying capacity etc.).

Specifications of Scaffolds

Applicable to all Scaffolds

1. All elevated structures/ working platform areas should be guarded on all sides.

2. Railings and toe boards should be provided on the platform.

3. Scaffolds shall be designed to support at least 4 times the anticipated weight of Men, material and wind force.

4. Make certain that all scaffolds are in plumb and level at all times.

5. Scaffolds shall be secured from tipping when the scaffold height exceeds four times its minimum base dimension.

6. Scaffolds must be constructed at least **3** planks wide unless location makes this physically impossible.

7. Landing platform should be provided at every 9 meter of height or less.

8. The members of scaffolds should extend at least 6" on either ends but not more than 12". They should be fastened on both ends and laid tight by clamps.

9. All scaffoldings having height to base ratio more than 4 shall be secured firmly with permanent structure in X and Y direction at least every 6 meters.

10. Scaffold which spread to 20 meter or more should have two accesses preferably opposite side.

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11. Plastic Checklist holder with red marked to be used as a “Not Fit-for-Purpose” warning signboard and Green colour combined checklist to be used as “Fit-for-Purpose” signboard.

12. Keep distance of at least 150mm between high temp Pipelines or equipment and scaffolding.

13. Safe distance from overhead electrical lines to be maintained as per Site electrical safety procedures.

Applicable to Tube-and-coupler scaffold

1. Tube and coupler scaffolds over 30 meter in height must be Designed by a competent professional engineer (who by extensive knowledge, training, and experience have successfully demonstrated his ability to carry out scaffold design and load calculations).
2. Maximum height of first horizontal member (Ledger) of scaffolds from the Ground shall be 2.2 meters. Lower lift can be considered for heavy loads depending upon the scaffold design. When scaffold is more than 6 meter height for carrying heavy load, kicker lift should be provided at a height of 150mm from ground.

3. The top rail shall be at height of 900-1200 mm and Mid rails must be installed approximately halfway between the top rail and the platform surface. Toe boards (150mm) should be securely attached to the working platform. Toe boards are generally applicable to working platform and not for landing platforms.

4. The bay length & width depends on the height and the load to be carried by the scaffold.

5. Bracings shall be fitted up to full height of scaffold.

6. Standards should be joined having overlap of min 600 mm using three equally spaced swivel clamps or end to end using sleeve/pin type coupler.

7. Ledgers should be joined having overlap of min 600 mm using three equally spaced swivel clamps or end to end using sleeve coupler.

8. Base plate 150 x 150 x 6mm shall be used to support all vertical pipes of Scaffolds.

9. Sole plate shall be used at all unpaved area to support base late.

10. Scaffolding platform Grating shall be tied with clamp at both ends, and scaffolding platform Grating shall not overhang more than 150 mm and shall be at least 150 mm away from hot surface.

11. Every scaffold shall be provided with certified ladder and extending its free end shall be above platform by 1000 mm/ four rungs.

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Applicable to Mobile scaffolds

1. Attach castors with plain stems to the panel or adjustment screw by pins or other suitable means.

2. Apply castor brakes/lock at all times when scaffolding is not being moved.

3. Do not ride rolling scaffoldings.

4. Remove all material and equipment from platform before moving scaffolding.

5. Do not try to move rolling scaffolding without sufficient help. Watch out for holes protrusions in the floor and for overhead obstructions.

6. Do not use brackets on rolling scaffoldings without first considering the overturning effect.

Design Criteria

- All types of scaffolds shall be strong enough of carrying and transmitting all types of loads to the ground. All scaffolds shall be adequately secured, stiffened, both longitudinally and transversely.

- Scaffolding determines as per the requirement and use of scaffold such as:

    - Purpose of scaffolding
    - Loading on scaffold platform
    - Required height
    - Sufficient work place
    - Surrounding environment

Storage and inspection of materials

- All scaffolding material shall be stored at designated location to protect them from adverse environment conditions such as corrosion, weather.

- Storage racks/ Locations/ areas shall be clearly identified.

- Storage facility of scaffold material shall be properly constructed for its stability and load bearing capability.

- Steel pipes and scaffolding platform Grating shall be stacked horizontally according to length. Fittings, Couplers shall be stored in separate bins.

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- Defective material shall be removed from site.
- Scaffolding material such as tubular, planks, clamps etc. shall be inspected annually for contractor owned material by contractor. The visual inspection shall cover 100% scaffold materials.

Transportation and handling of scaffolding material

- Make sure that scaffold pipe shifting done in vehicle of appropriate length.
- Special safety care to be taken while shifting or lifting pipes manually.
- Rope and pulley should be used to lift pipe from height.

Safety requirements

A risk assessment to access scaffold hazards through inspection and work method statement for relevant work activities shall be made before erecting, dismantling, moving, or modifying scaffold. Examples of hazards to be considered include the following:

- Working at/from heights.
- The presence of nearby electrical lines or process equipment (e.g. hot line, vents, drains, etc.). Necessary safety distances shall be maintained as specified in site level electrical safety procedure.
- Possible emergency scenario, escape routes and responses.
- The condition and loading of working surfaces /platform /scaffold pipes and other components or loose material such as clamps/ bolts on the working platforms.
- The presence and activity of other people and equipment in the vicinity of the work.
- The weather (Heavy rain, high wind velocity-more than 20 knots, etc).
- Erection during dark hours.
- Scaffold collapse.
- Manual task (Manual Material Handling).
- Access and egress during normal and emergency condition.
- The effect of heavy equipment movement in close vicinity such as within 4 meters to be considered for direct hit and sagging of land in case of unpaved area.

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This assessment is a part of the work permit process but should also be extended to the specific job planning of the crew performing the work. Appropriate actions shall be taken to mitigate the hazards identified during the assessment.

Fall protection when erecting, dismantling, and modifying scaffolds shall be under the direction of a competent person (Scaffold Supervisor). Scaffold erectors (Scaffolder) shall use personal fall-protection systems that provide continuous fall protection while erecting, dismantling or modifying scaffolds unless the determination is made by a competent person that fall protection is not feasible or it creates a greater hazard. Fall protection can be accomplished through the use of adequate anchorages that are independent of the scaffold or by using scaffold systems and components that are approved by the manufacturer as adequate anchorages. Employees/workmen shall use appropriate fall-arrest equipment.

The footing for supported scaffolds shall be sound, rigid, and capable of supporting the maximum intended load, including the weight of the scaffold.

Scaffold platform grating shall be fastened on both ends and laid tight by scaffold clamps/couplers.

Manufacturer's guidelines for proprietary scaffolds (e.g. Cup lock, ring lock, H frame, Insulating modular scaffolds) shall be followed unless a competent person approves the variance and provided the variance complies with applicable regulations and generally accepted scaffold engineering practices.

Proprietary/special scaffold manufacturer's guidelines for erection and inspection should be available with users, and with plant maintenance engineer for reference.

The following safe practices with respect to scaffolds shall be followed:

- There shall be firm foundation for all scaffoldings. All scaffolding shall be made of sound material. Scaffolding material shall be inspected and used, only if found in good condition. Avoid using equipment whose strength is not known.

- Provide adequate Base for scaffolding posts. Metal base plate is used under all upright or standard scaffoldings. Correct type of couplers shall be used for all connections. Use right angle couplers for joining vertical to horizontal members and swivel type couplers for joining bracing with ledgers. For joining vertical load bearing members (standards), "joint pin" type couplers can also be used. The couplers shall be of a structural metal, such as drop-forged steel, malleable iron, or structural grade aluminum (use of gray cast iron is prohibited).

- Plumb and level scaffoldings as erection proceeds, so that braces will fit without forcing. Fasten all braces securely.

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- Where scaffoldings are erected above walkways or work areas, the space between toe board and railing should be screened (e.g. Safety net, Metal sheets).

- Whenever work is being done over men who are working on scaffolding, overhead protection should be provided on the scaffolding.

- Restrain free-standing scaffolding towers from tipping by guying or other means.

- A safe and convenient means of access shall be provided to the platform level. Means of access may be a portable ladder, fixed ladder, ramp or runway or stairway. The ladder shall be so installed that there supporting member (pipe) is just below ladder rung. This is to avoid tripping hazard, especially while using the ladder.

- During erection, the ladder shall be installed as early as practicable, but not later than first two horizontal members (Ledgers). This is to facilitate Scaffolder while erecting the scaffold.

- During erection/ dismantling, scaffolder shall use 'T' steps to minimize risk of accidental fall/ slip.

- Ladder should be provided with tie rods/studs at top and bottom rungs and secured to scaffolding with ladder clamps, at least 2 locations for a ladder of length up to 4 m & at 3 locations for more than 4 m long ladder.

- The horizontal member/ ledger on which ladder is to be fixed, must be clamped to two subsequent standard using fixed clamps.

- Do not cantilever or extend putlogs / trusses as side brackets, without thoroughly considering the loads to be applied.

- Do not climb scaffold using cross braces.

- Do not use ladders or makeshift devices on top of scaffoldings to increase the height.

- Have at least 12" overlap and 6" extension beyond centerline of support or cleat at both ends to prevent sliding.

- Do not allow unsupported ends of planking to extend an unsafe distance beyond supports.

- Planks shall be non-greasy and free from defects.

- Access to working platform shall be suitably protected against inadvertent fall by providing swing members/ swing gate or chains.

- When scaffolding is no longer required, request for dismantling of scaffold shall be sent to scaffolding supervisor through work permit.

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- Scaffold shall be removed from top bracings. Ties, rackers etc. should not be removed from section lower than the one which is being dismantled.

- Do not throw or allow falling to ground any scaffold member, board or fittings.

- Dismantled scaffold material shall be neatly stacked, away from the site until whole of scaffold has been dismantled.

6.2.2 Metal as material of construction

i) A scaffold should be provided and maintained or other equally safe and suitable provision should be made where work cannot safely be done on or from the ground or from part of a building or other permanent structure.

ii) Scaffolds should be provided with safe means of access, such as stairs, ladders or ramps. Ladders should be secured against inadvertent movement.

iii) Every scaffold should be constructed, erected, properly secured/ tied and maintained so as to prevent collapse or accidental displacement during erection, while in use, in idle state or dismantling.

iv) Every scaffold and part thereof should be constructed :

(a) in such a way so as not to cause hazards for workers during erection and dismantling;
(b) in such a way so as guard rails and other protective devices, platforms, ladders, stairs or ramps can be easily put together;
(c) with sound material and of requisite size and strength for the purpose for which it is to be used and maintained in a proper condition.

v) Boards and planks used for scaffolds should be protected against splitting.

vi) Materials used in the construction of scaffolds should be stored under good conditions and apart from any material unsuitable for scaffolds.

vii) Couplers should not cause deformation in tubes. Couplers should be made of drop forged steel or equivalent material.

viii) Tubes should be free from cracks, splits and excessive corrosion and be straight to the eye, and tube ends cut cleanly square with the tube axis.

ix) Scaffolds should be designed for their maximum load as per relevant codes.

x) Scaffolds should be adequately braced.

xi) Scaffolds which are not designed to be independent should be rigidly connected to the building at designated vertical and horizontal places.

xii) A scaffold should never extend above the highest anchorage to an extent which might endanger its stability and strength.

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xiii) Loose bricks, drainpipes, chimney-pots or other unsuitable material should not be used for the construction or support of any part of a scaffold.

xiv) Scaffolds should be inspected and certified:

(a) before being taken into use;
(b) at periodic intervals thereafter as prescribed for different types of scaffolds;
(c) after any alteration, interruption in use, exposure to weather or seismic conditions or any other occurrence likely to have affected their strength or stability.

xv) Inspection should more particularly ascertain that:

(a) the scaffold is of suitable type and adequate for the job;
(b) materials used in its construction are sound and of sufficient strength;
(c) it is of sound construction and stable;
(d) that the required safeguards are in position.

xvi) A scaffold should not be erected, substantially altered or dismantled except by or under the supervision.

xvii) If out-rigger scaffolding is to be used, it should be specifically designed and inspected before putting in use.

6.2.3 Lifting appliances on scaffolds (CHAIN PULLEY BLOCKS, PULLERS)

i) When a lifting appliance is to be used on a scaffold:

(a) the parts of the scaffold should be carefully inspected to determine the additional strengthening and other safety measures required;
(b) any movement of the scaffold members should be prevented;
(c) if practicable, the uprights should be rigidly connected to a solid part of the building at the place where the lifting appliance is erected.

6.2.4 Prefabricated scaffolds

i) In the case of prefabricated scaffold systems, the instructions provided by the manufacturers or suppliers should be strictly adhered to. Prefabricated scaffolds should have adequate arrangements for fixing bracing.

ii) Frames of different types should not be intermingled in a single scaffold.

iii) Scaffolding shall be erected on firm and level ground. In case of loose or uneven terrain, care should be taken to see that the scaffolding is on firm footing by leveling / compacting or other means.

iv) All members of metal scaffolding shall be checked periodically to screen out defective / rusted members. All joints should be properly lubricated for easy tightening.

v) Entry to scaffolding should be restricted.

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vi) Erection, alteration and removal shall be done under supervision of experienced personnel.

vii) Use of barrels, boxes, loose bricks etc., for supporting scaffolds shall not be permitted.

viii) Each supporting member of platform shall be securely fastened and braced.

ix) Where planks are butt-joined, two parallel putlogs shall be used, not more than 100mm apart, to give support to each plank.

x) Platform plank shall not project beyond its end support to a distance exceeding 4 times the thickness of plank, unless it is effectively secured to prevent tipping. Cantilever planks should be avoided. If it is unavoidable overhang should be effectively secured to prevent tipping.

xi) The platform edges shall be provided with 150mm high toe board to eliminate hazards of tools or other objects falling from platform.

xii) Erect ladders in the “four up-one out position”

xiii) Ladder shall be properly secured with the structure.

xiv) Use non-slip devices, such as, rubber shoes or pointed steel ferules at the ladder foot, rubber wheels at ladder top, fixing wooden battens, cleats etc.

xv) When ladder is used for climbing over a platform, the ladder must be of sufficient length, to extend at least one meter above the platform, when erected against the platform in “four up-one out position.”

xvi) Portable ladders shall be used for heights not more than 4mt. Above 4mt flights, fixed ladders shall be provided with at least 600 mm landings at every 6mt or less.

xvii) The width of ladder shall not be less than 300mm and rungs shall be spaced not more than 300mm.

xviii) Every platform and means of access shall be kept free from obstruction.

xix) If grease, mud, gravel, mortar etc., fall on platform or scaffolds, these shall be removed immediately to avoid slippage.

xx) Workers shall not be allowed to work on scaffolds during storms or high wind. After heavy rain or storms, scaffolds shall be inspected before reuse.

xxi) Don't overload the scaffolding. Remove excess material and scrap immediately.

xxii) Dismantling of scaffolds shall be done in a pre-planned sequential manner.

6.2.5 Suspended scaffolds/ boatwain's chair

In addition to the requirements for scaffolds in general as regards soundness, stability and protection against the risk of falls, suspended scaffolds should meet the following specific requirements.

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(a) platforms should be designed and built with dimensions that are compatible with the stability of the structure as a whole, especially the length;
(b) the number or anchorage should be compatible with the dimensions of the platform;
(c) the safety of workers should be safeguarded by an extra rope having a point of attachment independent of the anchorage arrangements of the scaffold;
(d) the anchorage and other elements of support of the scaffold should be designed and built in such a way as to ensure sufficient strength;
(e) the ropes, winches, pulleys or pulley blocks should be designed, assembled, used and maintained according to the requirements established for lifting gear adapted to the lifting of persons according to national laws and regulations;
(f) before use, the whole structure should be checked by a competent person.

6.2.6 Bamboo Scaffolding

i) It should not be used in oil & gas installations and in the areas where hot work is to be done.

ii) For construction and maintenance of low rise residential and office buildings, situated outside explosive licensed area, bamboo scaffold, if unavoidable, should conform to provisions given in IS-3696 (Part 1)-1987.

6.3 STRUCTURAL WORK, LAYING OF REINFORCEMENT & CONCRETING

6.3.1 General provisions

i) The erection or dismantling of buildings, structures, civil engineering works, formwork, falsework and shoring should be carried out by trained workers only under the supervision of a competent person.

ii) Precautions should be taken to guard against danger to workers arising from any temporary state of weakness or instability of a structure.

iii) Formwork, falsework and shoring should be so designed, constructed and maintained that it will safely support all loads that may be imposed on it. Conformity with design during job execution shall be certified by the competent person and the relevant records shall be maintained.

iv) Formwork should be so designed and erected that working platforms, means of access, bracing and means of handling and stabilising are easily fixed to the formwork structure.

v) Proper methodology based on the design of the building / structure to be developed and approved by competent person before resorting to dismantling / modifications.

vi) All works / facilities should be certified for structural stabilities by a competent person and on statutory requirement completed before putting to use.

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6.3.2 Erection and dismantling of steel and prefabricated structures

i) The safety of workers employed on the erection and dismantling of steel and prefabricated structures should be ensured by appropriate means, such as provision and use of:

(a) ladders, gangways or fixed platforms;
(b) platforms, buckets, boatswain's chairs or other appropriate means suspended from lifting appliances;
(c) safety harnesses and lifelines supported on properly designed anchor, catch nets or catch platforms;
(d) Mechanical / Power-operated mobile working platforms;
(e) Proper Personal Protective Equipment.

ii) Steel and prefabricated structures should be so designed and made that they can be safely transported and erected. Route survey to be carried out from works to construction site route considering the load bearing capacity of the bridges, height of the bridges en-route and maximum width and length permissible without causing any hazard to public, the route and the equipment.

iii) In addition to the need for the stability of the part when erected, the design should explicitly take following into account:

(a) the conditions and methods of attachment in the operations of transport, storing and temporary support during erection or dismantling as applicable;
(b) Methods for the provision of safeguards such as railings and working platforms, and, when necessary, for mounting them easily on the structural steel or prefabricated parts.

iv) The hooks and other devices built in or provided on the structural steel or prefabricated parts that are required for lifting and transporting them should be so shaped, dimensioned and positioned as:

(a) to withstand with a sufficient margin the stresses to which they are subjected;
(b) Not to set up stresses in the part that could cause failures, or stresses in the structure itself not provided for in the plans, and be designed to permit easy release from the lifting appli-ance. Lifting points for floor and staircase units should be located (recessed if necessary) so that they do not protrude above the surface;
(c) To avoid imbalance or distortion of the lifted load.

v) Storeplaces should be so constructed that:

(a) there is no risk of structural steel or prefabricated parts falling or overturning;
(b) storage conditions generally ensure stability and avoid damage having regard to the method of storage and atmo-spheric conditions;
(c) racks are designed and secured on firm ground so that units cannot move accidentally.

vi) While they are being stored, transported, raised or set down, structural steel or prefabricated parts should not be subjected to stresses prejudicial to their stability.

vii) Every lifting appliance should:

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(a) be suitable for the operations and not be capable of accidental disconnection;
(b) be approved or tested as per statutory requirement.

viii) Lifting hooks should have safety latch (self closing type).

ix) Lifting hooks, Tongs, clamps and other appliances for lifting structural steel and prefabricated parts should:

(a) be of such shape and dimensions as to ensure a secure grip without damaging the part;
(b) be marked with the maximum permissible load in the most unfavourable lifting conditions.
(c) be periodically inspected and certified to ensure further usage as per requirement of factory act / Building & Construction Workers Regulation (BOCWR).

x) Structural steel or prefabricated parts should be lifted only after rigging plan approved by competent person to prevent them from spinning, slipping or dropping accidentally.

xi) When necessary to prevent danger, before they are raised from the ground, structural steel or prefabricated parts should be provided with safety devices such as railings and working platforms to prevent falls of persons.

xii) While structural steel or prefabricated parts are being erected, the workers should be provided with appliances such as guiding ropes for guiding them as they are being lifted and set down, so as to avoid crushing of hands and to facilitate the operations. Use of such appliances should be ensured.

xiii) A raised structural steel or prefabricated part should be so secured and wall units so propped that their stability cannot be affected, even by external factors such as wind and passing loads before its release from the lifting appliance.

xiv) At work places, instruction should be given to the workers on the methods, arrangements and means required for the storage, transport, lifting and erection of structural steel or prefabricated parts, and, before erection starts, a meeting of all those responsible should be held to discuss and confirm the requirements for safe erection.

xv) During transportation within the construction area, attachments such as slings and straps mounted on structural steel or prefabricated parts should be securely fastened to the parts. Vehicle loading should be such that the vehicle and the load remain stable at all positions during transportation and unloading.

xvi) Structural steel or prefabricated parts should be so transported that the conditions do not affect the stability of the parts or the means of transport result in jolting, vibration or stresses due to blows, or loads of material or persons.

xvii) When the method of erection does not permit the provision of other means of protection against fall of persons, the workplaces should be protected by guardrails, and if appropriate by toe-boards.

xviii) When adverse weather conditions such as snow, hailstorm, rain and wind or reduced visibility, etc. entail risks of accidents, the rigging work should be interrupted after taking necessary safety precautions.

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xix) If necessary, to prevent danger, structural steel parts should be equipped with attachments for suspended scaffolds, lifelines or safety harnesses and other means of protection.

xx) The risks of falling, to which workers moving on high or sloping girders are exposed, should be limited by all means of adequate collective protection or, where this is impossible, by the use of a safety harness that is well secured to a properly designed support.

xxi) Structural steel parts that are to be erected at a height should as far as practicable be assembled on the ground.

xxii) When structural steel or prefabricated parts are being erected, a sufficiently extended area underneath the workplace should be barricaded or guarded

xxiii) Steel trusses that are being erected should be adequately shored, braced or guyed until they are permanently secured in position.

xxiv) Load-bearing structural member should not be dangerously weakened by cutting, holing or other means.

xxv) Structural members should not be forced into place by the hoisting machine while any worker is in such a position that he could be injured by the operation.

xxvi) Open-web steel joists that are hoisted singly should be directly placed in position and secured against dislodgment.

xxvii) All structures should be designed for either permanent anchors or provision for erection of anchors as and when required to support life line during any Maintenance work etc. during life of the structure. The point of provision of anchor should be indicated through suitable signage for ease of use as and when required.

6.3.3 Reinforcement

i) Ensure that workers use Personnel Protective equipment like safety helmet with chin straps, safety shoes, gloves, full body safety harness, safety goggles, etc.

ii) Don't place the hand below the rods for checking clear distance. Use measuring devices.

iii) Don't wear loose clothes while checking the rods.

iv) Don't stand unnecessarily on cantilever rods.

v) To carry out welding/cutting of rods, safety procedures/precautions as mentioned in Item No. 6.5 to be followed.

vi) For supplying of rods at heights, proper staging and/or bundling to be provided.

vii) Ensure barricading and staging for supplying and fixing of rods at height.

viii) For short distance carrying of materials on shoulders, suitable pads to be provided.

ix) While transporting material by trucks/trailers, the rods shall not protrude in front of or by the sides of driver's cabin. In case such protrusion cannot be avoided behind the deck, then it should not

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extend 1/3rd of deck length or 1.5 Meters whichever is less and tied with red flags/lights.

x) Reinforcement rods, cut pieces etc. should be properly stored at identified locations and the scrap should be disposed off promptly on regular basis.

6.3.4 Concreting

i) Ensure stability of shuttering work before allowing concreting.

ii) Barricade the concreting area while pouring at height/depths.

iii) Keep vibrator hoses, pumping concrete accessories in healthy conditions and mechanically locked.

iv) Pipelines in concrete pumping system shall not be attached to temporary structures such as scaffolds and formwork support as the forces and movements may affect their integrity.

v) Check safety cages & guards around moving motors/parts etc. provided in concreting mixers.

vi) Use Personal Protective Equipment like gloves, safety shoes, full body safety harness, safety goggles, etc. while dealing with concrete and wear respirators for dealing with cement.

vii) Earthing of electrical mixers, vibrators, etc. should be done and verified.

viii) Cleaning of rotating drums of concrete mixers shall be done from outside. Lockout devices shall be provided where workers need to enter the drum for cleaning / inspection.

ix) Where concrete mixers are driven by internal combustion engine, exhaust points shall be located away from the worker's workstation so as to eliminate their exposure to obnoxious fumes.

x) Don't allow unauthorised person to stand under the concreting area.

xi) Ensure adequate lighting arrangements for carrying out concrete work during night.

xii) Don't allow the same workers to pour concrete round the clock. Insist on shift pattern.

xiii) During pouring, shuttering and its supports should be continuously watched for defects.

xiv) Never look into the drum mounted on truck (such as in case of Ready Mix Concrete).

6.4 ROAD WORK

6.4.1 Site shall be barricaded and provided with warning signs, including night warning lamps at appropriate locations for traffic diversion. This should be done sufficiently advance as a warning to the approaching drivers for the impending dander ahead.

6.4.2 Filled and empty bitumen drums shall be stacked separately at designated places.

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6.4.3 Mixing aggregate with bitumen shall preferably be done with the help of bitumen batch mixing plant, unless operationally non-feasible.

6.4.4 Road rollers, Bitumen sprayers, Pavement finishers shall be driven by experienced drivers with valid driving license.

6.4.5 Workers handling hot bitumen sprayers or spreading bitumen aggregate mix or mixing bitumen with aggregate shall be provided with PVC hand gloves and rubber shoes with legging up to knee joints.

6.4.6 At the end of day's work, surplus hot bitumen in tar boiler shall be properly covered by a metal sheet, to prevent anything falling in it,

6.4.7 If bitumen accidentally falls on ground, it shall be immediately covered by sprinkling sand, to prevent anybody stepping on it. Then it shall be removed with the help of spade.

6.4.8 For cement concrete roads, besides site barricading and installation of warning signs for traffic diversion, safe practices mentioned in the chapter on "Concreting", shall also be applicable.

6.4.9 Any excavation for road work should be done only after surveying underground utilities and after taking suitable precautions. The underground utilities to be rerouted as required after approval of competent person / authority.

6.4.10 All the raw material for road construction/ maintenance to be stored on designated place which should be away from the running road. The running road should not be used for storing the sand, hot bitumen, etc..

6.4.11 Precaution should be taken that no construction material/ slab/ pre-fabricated object can come on the running road accidently or due to slipping. In such case, an erection plan should be designed and got approved from the competent authority.

6.5 CUTTING / WELDING

6.5.1 Common hazards involved in welding/cutting are sparks, molten metal, flying particles, harmful light rays, electric shocks , depletion in O_2 concentration due to generation of toxic gases, etc. Following precautions should be taken: -

i) A dry chemical powder (DCP) type fire extinguisher shall be made available in the work area.

ii) Adequate ventilation shall be ensured by opening manholes and fixing a shield or forced circulation of air etc, while doing a job in confined space.

iii) Ensure that only approved and well-maintained apparatus, such as torches, manifolds, regulators or pressure reducing valves, and acetylene generators, be used. Also their regular calibration where ever necessary.

iv) All panels and covers shall be kept in place, when operating an electric Arc welding machine. 30mA rating ELCB shall be ensured in the power receptacle of the welding machine.

v) The work piece should be connected directly to Power supply, and not indirectly through pipelines/ structures/ equipment etc.

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vi) The welding receptacles shall be rated for 63 A suitable for 415V, 3-Phase system with a scraping earth. Receptacles shall have necessary mechanical interlocks and earthing facilities.

vii) All cables, including welding and ground cables shall be checked for any worn out or cracked insulation before starting the job and such cables shall not be used. Ground cable should be separate without any loose joints.

viii) Cable coiling shall be maintained at minimum level, if not avoidable. Criss-crossing of welding/electrical power supply cables & gas cutting hoses shall be avoided. Care to be taken against damage of gas cutting hoses.

ix) An energised electrode shall not be left unattended.

x) The power source shall be turned off at the end of job.

xi) All gas cylinders shall be properly secured in upright position.

xii) Acetylene cylinder shall be turned and kept in such a way that the valve outlet points away from oxygen cylinder.

xiii) Acetylene cylinder key for opening valve shall be kept on valve stem, while cylinder is in use, so that the acetylene cylinder could be quickly turned off in case of emergency. Use flash back arrestors to prevent back-fire in acetylene/oxygen cylinder.

xiv) When not in use, valves of all cylinders shall be kept closed.

xv) All types of cylinders, whether full or empty, shall be stored at cool, dry place under shed.

xvi) Forced opening of any cylinder valve should not be attempted.

xvii) Lighted gas torch shall never be left unattended.

xviii) Store acetylene and oxygen cylinders separately.

xix) Store full and empty cylinders separately.

xx) Avoid cylinders coming into contact with heat.

xxi) Cylinders that are heavy or difficult to carry by hand may be rolled on their bottom edge but never dragged.

xxii) If cylinders have to be moved, be sure that the cylinder valves are shut off.

xxiii) Before changing torches, shut off the gas at the pressure reducing regulators and not by crimping the hose.

xxiv) Do not use matches to light torches, use a friction lighter. Gas torch should be ignited with the lighter only. It should not be ignited by touching other hot surfaces.

xxv) Move out any leaking cylinder immediately and cap it. No hot work should be permitted in the vicinity of such leaked cylinders.

xxvi) Use trolleys for oxygen & acetylene cylinder and chain them.

xxvii) Always use Red hose for acetylene and other fuel gases and Black for oxygen, and ensure that both are in equal length.

xxviii) Ensure that hoses are free from burns, cuts and cracks and properly clamped.

xxix) Avoid dragging hoses over sharp edges and objects

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xxx) Do not wrap hoses around cylinders when in use or stored.

xxxi) Protect hoses from flying sparks, hot slag, and other hot objects. Protect cylinders by covering welding blanket while hot work in the vicinity.

xxxii) Lubricants shall not be used on Ox-fuel gas equipment.

xxxiii) During cutting/welding, use required PPEs like hand gloves, full body clothing of fire retardant / suitable material, safety shoes, full body safety harness, mask, goggles / face shields, welding screen of required DIN glass as per approved Weld Preparation Scheme.

xxxiv) Hot work permit to be taken if working in hazardous area.

6.6 WORKING IN CONFINED SPACES

6.6.1 Following safety practices for working in confined space like towers, columns, tanks and other vessels should be followed in addition to the safety guidelines for specific jobs like scaffolding, cutting/welding etc.

i) Shut down, positively isolate, depressurise and purge the vessel as per laid down procedures.

ii) Entry inside the vessel to carry out any job shall be done after issuance of valid permit only in line with the requirement of OISD-STD-105.

iii) Ensure proper and accessible means of exit before entry inside a confined space.

iv) The number of persons allowed inside the vessel should be limited to avoid overcrowding. Record of entering person shall be maintained with in and out time.

v) When the work is going on in the confined space, there should always be two men standby at the nearby manway / manhole equipped with communication arrangement to contact seniors and to evacuate the worker inside confined space in case of emergency.

vi) Before entering inside the vessels underground or located at lower elevation, probability of dense vapours accumulating nearby should also be considered in addition to inside the vessel and corrective action should be ensured.

vii) Ensure requisite O_2 level before entry in the confined space and monitor level periodically or other wise use required respiratory devices.

viii) Check for no Hydrocarbon or toxic substances before entry and monitor level periodically or use requisite Personal Protective Equipment.

ix) Ensure adequate ventilation or use respiratory devices.

x) Depending upon need, necessary respirator system, gas masks and suit shall be worn by everyone entering confined space. In case of sewer, OWS or in the confined area where there is a possibility of toxic or inert gas, required respiratory device, shall be used by everyone while entering.

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xi) Barricade the confined spaces during hoisting, radiography, blasting, pressure testing etc.

xii) Use 24V flameproof lamp fittings only for illumination.

xiii) Use tools with air motors or electric tools with maximum voltage of 24V.

xiv) House keeping shall be well maintained.

xv) Required PPEs like Safety helmet, safety shoes and full body harness shall be worn by everyone entering the confined space.

xvi) Don't wear loose clothing while working in a confined space.

xvii) In case of the vessels which are likely to contain pyropheric substances (like Iron Sulphide), special care need to be taken before opening the vessel. Attempt should be made to remove the pyropheric substances. Otherwise, these should be always kept wet by suitable means.

xviii) The cutting torches should also be kept outside the vessel immediately after the cutting.

xix) The gas cylinders used for cutting/welding shall be kept outside. Care to be taken for the integrity of gas hoses and welding cables while work is in progress.

xx) All cables, hoses, welding equipment etc., shall be removed from confined space at end of each work day, even if the work is to be resumed in the same space the next day.

xxi) To the extent possible sludge shall be cleared and removed from outside before entering.

xxii) No naked light or flame or hot work such as welding, cutting and soldering should be permitted inside a confined space or area unless it has been made completely free of the flammable atmosphere, tested and found safe by a competent person. Only non-sparking tools and flameproof hand lamps protected with guard and safety torches should be used inside such confined space or area for initial inspection, cleaning or other work required to be done for making the area safe.

xxiii) Communication should be always maintained between the worker and the attendant.

xxiv) Inside the confined space spray painting should be avoided. If absolutely essential it should be done after ensuring adequate precautions including exhaust of paint vapours and continuous monitoring of concentration of oxygen and toxic gases.

xxv) Before issuing the vessel entry permit, it should be ensured that all the incoming and outgoing lines to and from the vessel are positively isolated. Where this is not applicable like dampers in HRSG system, Sufficient time is to be allowed to observe the leakage of hot gases from the dampers/ passing valves before taking any decision on vessel entry permit.

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6.7 PROOF/PRESSURE TESTING

6.7.1 Review test procedure before allowing testing with water or air or any other fluid. Testing should be done only after proper Job Safety Analysis (JSA) and its approval.

6.7.2 Provide relief valves of adequate size while testing with air or other gases.

6.7.3 Ensure compliance of necessary precautions, step wise loading, tightening of fasteners, grouting etc. before and during testing.

6.7.4 Inform all concerned in advance of the testing.

6.7.5 Keep the vents open before opening any valve for filling/draining of liquid used for hydrotesting. The filling/draining should not exceed the designed rate for pressure testing.

6.7.6 Provide separate gauges of suitable range for pressurising pump and the equipment to be tested.

6.7.7 Provide gauges at designated locations for monitoring of pressures.

6.7.8 Check the calibration of all pressurising equipment and accessories and maintain records.

6.7.9 Take readings at pre-defined intervals.

6.7.10 Arrangement to be made to ensure that the pressurizing system i.e. motor-pump set is out of circuit so that the system under hydro testing is not re-pressurized by the contractor due to pressure drop before a pre-defined time.

6.8 WORKING AT HEIGHTS

6.8.1 General Provision

i) While working at a height of more than 2.2 meters, ISI approved full body harness shall be used.

ii) While working at a height of more than 2.2 meters, permit should be issued by competent person before commencement of the job.

iii) Worker should be well trained on usage of full body harness including its proper usage at the time of ascending/descending.

iv) All tools should be carried in tool bag/belt to avoid their falling.

v) If the job is on fragile/sloping roof, roof walk ladders shall be used.

vi) Provide lifeline properly designed, secured and anchored, wherever required. Mock Drill of use of lifeline at regular intervals to be carried out.

vii) Additional safety measures like providing Fall Arrestor type full body harness, safety net should be provided depending upon site conditions, job requirements.

viii) Keep working area neat and clean. Remove scrap material immediately.

ix) Don't throw or drop material/equipment from height.

x) Avoid jumping from one member to another. Use proper passageway.

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xi) Keep both hands free while climbing. Don't try to bypass the steps of the ladder. Same to be followed while climbing down. Further on climbing down, front of the body to be towards the ladder.

xii) Try to maintain calm at height. Avoid over exertion.

xiii) Avoid movements on any structural member without fall protection.

xiv) Elevated workplaces including roofs should be provided with safe means of access and egress such as stairs, ramps or ladders.

xv) Fall protection hierarchy to be followed as below:

(a) Elimination: Explore possibility whether job can be done avoiding work at height.

(b) Prevention: Prevent fall of a worker by providing appropriate fall prevention system.

(c) Fall arrest system: Arrest the fall using suitable fall arrest system. Ensure to have a strong suitably designed anchor point.

(d) Warning Lines: Use a warning line using a rope or wire barrier around roof to warn workers that they are getting close to the roof edge.

(e) Safety Monitoring: Use a safety monitor to warn the workers.

(f) Administration: Prepare a written administrative procedure to ensure workers are doing the best that they can.

6.8.2 Roof Work

i) All roof-work operations should be pre-planned and properly supervised.

ii) Roof work should only be undertaken by workers who are physically and psychologically fit and have the necessary knowledge and experience for such work.

iii) Work on roofs shouldn't be carried on in weather conditions that threaten the safety of workers.

iv) Crawling boards, walkways and roof ladders should be securely fastened to a firm structure.

v) Roofing brackets should fit the slope of the roof and be securely supported.

vi) Where it is necessary for a person to kneel or crouch near the edge of the roof, necessary precautions should be taken.

vii) On a large roof where work have to be carried out at or near the edge, a simple barrier consisting of crossed scaffold tubes supporting a tubing guardrail may be provided.

viii) All covers for openings in roofs should be of substantial construction and be secured in position.

ix) Roofs with a pitch of more than 10 should be treated as sloping.

x) When work is being carried out on sloping roofs, sufficient and suitable crawling boards or roof ladders should be provided and firmly secured in position.

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xi) During extensive work on the roof, strong barriers or guardrails and toe-boards should be provided to stop a person from falling off the roof.

xii) Where workers are required to work on or near roofs or other places covered with fragile material, through which they are liable to fall, they should be provided with suitable roof ladders or crawling boards strong enough and when spanning across the supports for the roof covering to support those workers.

xiii) A minimum of two boards should be provided so that it is not necessary for a person to stand on a fragile roof to move a board or a ladder, or for any other reason.

6.8.3 Work on tall chimneys

i) For the erection and repair of tall chimneys, scaffolding should be provided. A safety net should be maintained at a suitable distance below the scaffold.

ii) The scaffold floor should always be at least 65 cm below the top of the chimney.

iii) Under the working floor of the scaffolding the next lower floor should be left in position as a catch platform.

iv) The distance between the inside edge of the scaffold and the wall of the chimney should not exceed 20 cm at any point.

v) Catch platforms should be erected over:

(a) the entrance to the chimney;
(b) Passageways and working places where workers could be endangered by falling objects.

vi) For climbing tall chimneys, access should be provided by:

(a) stairs or ladders;
(b) a column of iron rungs securely embedded in the chimney wall;
(c) Other appropriate means.

vii) When workers use the outside rungs to climb the chimney, a securely fastened steel core rope looped at the free end and hanging down at least 3 m should be provided at the top to help the workers to climb on to the chimney.

viii) While work is being done on independent chimneys the area surrounding the chimney should be enclosed by fencing at a safe distance.

ix) Workers employed on the construction, alteration, maintenance or repair of tall chimneys should not:

a) work on the outside without a safety harness attached by a lifeline to a rung, ring or other secure anchorage;
b) put tools between the safety harness and the body or in pockets not intended for the purpose;
c) haul heavy materials or equipment up and down by hand to or from the workplace on the chimney;
d) fasten pulleys or scaffolding to reinforcing rings without first verifying their stability;
e) work alone;

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f) climb a chimney that is not provided with securely anchored ladders or rungs;
g) Work on chimneys in use unless the necessary precautions to avoid danger from smoke and gases have been taken. Ensure that the outside surface temperature of the chimney is at
h) room temperature before taking up any job after shut down of the (system) chimney.

x) Work on independent chimneys should not be carried on in high winds, icy conditions, fog or during electrical storms.

6.9 HANDLING AND LIFTING EQUIPMENT:

6.9.1 General Provisions

Following are the general guidelines to be followed with regard to all types of handling and lifting equipment in addition to the guidelines for specific type of equipments dealt later on.

i) There should be a well-planned safety programme to ensure that all the lifting appliances and lifting gear are selected, installed, examined, tested, maintained, operated and dismantled with a view to preventing the occurrence of any accident;

ii) All lifting appliances shall be examined by competent persons at frequencies as specified in "The Factories act".

iii) Check thoroughly quality, size and condition of all lifting tools like chain pulley blocks, slings, U-clamps, D-shackles etc. before putting them in use.

iv) Safe lifting capacity of all lifting & handling equipment, tools and shackles should be got verified and certificates obtained from competent authorities before its use. The safe working load shall be marked on them.

v) Check periodically the oil, brakes, gears, horns and tyre pressure, lighting fixtures of all moving equipments like cranes, forklifts, trailers, etc. as per manufacturer's recommendations.

vi) Check the weights to be lifted and accordingly decide about the crane capacity, boom length and angle of erection.

vii) Allow lifting slings as short as possible and check packing at the friction points.

viii) While lifting/placing of the load, no unauthorised person shall remain within the radius of the boom and underneath the load.

ix) While loading, unloading and stacking of pipes, proper wedges shall be placed to prevent rolling down of the pipes.

x) Control longer jobs being lifted up from both ends.

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xi) Only trained operators and riggers should carry out the job. While the crane is moving or lifting the load, the trained rigger should be there for keeping a vigil against hitting any other object.

xii) During high wind conditions and nights, lifting of heavy equipments should be avoided. If unavoidable to do erection in night, operator and rigger should be fully trained for night signaling. Also proper illumination should be there.

xiii) Allow crane to move on hard, firm and leveled ground. Ensure that all the crane pedestals/ hydraulic jacks taking weight of the crane and load are on a firm compacted surface.

xiv) When crane is in idle condition for long periods or unattended, crane boom should either be lowered or locked as per manufacturer's guidelines.

xv) Hook and load being lifted shall remain in full visibility of crane operators, while lifting, to the extent possible.

xvi) Don't allow booms or other parts of crane to come within 3 meters reach of overhead electrical cables.

xvii) No structural alterations or repairs should be made to any part of a lifting appliance, which may affect the safety of the appliance without the permission and supervision of the competent person.

6.9.2 Hoists

i) Hoist shafts should be enclosed with rigid panels or other adequate fencing at:

(a) ground level on all sides;
(b) all other levels at all points at which access is provided;
(c) all points at which persons are liable to be struck by any moving part.

ii) The enclosure of hoist shafts, except at approaches should extend where practicable at least 2 meters above the floor, platform or other place to which access is provided except where a lesser height is sufficient to prevent any person falling down the hoistway and there is no risk of any person coming into contact with any moving part of the hoist, but in no case should the enclosure be less than 1 meter in height.

iii) The guides of hoist platforms should offer sufficient resistance to bending and, in the case of jamming by a safety catch, to buckling.

iv) Where necessary to prevent danger, adequate covering should be provided above the top of hoist shafts to prevent material falling down them.

v) Outdoor hoist towers should be erected on firm foundations, and securely braced, guyed and anchored.

vi) A ladderway should extend from the bottom to the top of outdoor hoist towers, if no other ladderway exists within easy reach.

vii) Hoisting engines should be of ample capacity to control the heaviest load that they will have to move.

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viii) Hoists should be provided with devices that stop the hoisting engine as soon as the platform reaches its highest stopping place.

ix) Winches should be so constructed that the brake is applied when the control handle is not held in the operating position.

x) It should not be possible to set in motion from the platform a hoist, which is not designed for the conveyance of persons.

xi) Winches should not be fitted with pawl and ratchet gears on which the pawl must be disengaged before the platform is lowered.

xii) Hoist platforms should be capable of supporting the maximum load that they will have to carry with a safety factor.

xiii) Hoist platforms should be equipped with safety gear that will hold the platform with the maximum load if the hoisting rope breaks.

xiv) If workers have to enter the cage or go on the platform at landings there should be a locking arrangement preventing the cage or platform from moving while any worker is in or on it.

xv) On sides not used for loading and unloading, hoist platforms should be provided with toe-boards and enclosures of wire mesh or other suitable material to prevent the fall of parts of loads.

xvi) Where necessary to prevent danger from falling objects, hoist platforms should be provided with adequate covering.

xvii) Counterweights consisting of an assemblage of several parts should be made of specially constructed parts rigidly connected together.

xviii) Counterweights should run in guides.

xix) Platforms should be provided at all landings used by workers.

xx) Following notices should be posted up conspicuously and in very legible characters:

(a) on all hoists:

- on the platform: the carrying capacity in kilograms or other appropriate standard unit of weight;
- on the hoisting engine: the lifting capacity in kilograms or other appropriate standard unit of weight;

(b) on hoists authorised or certified for the conveyance of persons:

- on the platform or cage: the maximum number of persons to be carried at one time;

(c) on hoists for goods only:

- on every approach to the hoist and on the platform: prohibition of use by persons.

xxi) Hoists intended for the carriage of persons should be provided with a cage so constructed as to prevent any person from falling out or being trapped between the cage and any fixed part of the structure when the cage gate is shut, or from being struck by the counterbalance weight or by articles or materials tailing down the hoistway.

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xxii) On each side in which access is provided, the cage should have a gate fitted with devices which ensure that the gate cannot be opened except when the cage is at a landing and that the gate must be closed before the cage can move away from the landing.

xxiii) Every gate in the enclosure of the hoist shaft which gives access from a landing place to the cage should be fitted with devices to ensure that the gate cannot be opened except when the cage is at that landing place, and that the cage cannot be moved away from that landing place until the gate is closed.

6.9.3 Derricks

Stiff-leg derricks

i) Derricks should be erected on a firm base capable of taking the combined weight of the crane structure and maximum rated load.

ii) Devices should be used to prevent masts from lifting out of their seating.

iii) Electrically operated derricks should be effectively earthed from the sole plate or framework.

iv) Counterweights should be so arranged that they do not subject the backstays, sleepers or pivots to excessive strain.

v) When derricks are mounted on wheels:

a) a rigid member should be used to maintain the correct distance between the wheels;
b) they should be equipped with struts to prevent them from dropping if a wheel breaks or the derrick is derailed.

vi) The length of a derrick jib should not be altered without consulting the manufacturer.

vii) The jib of a scotch derrick crane should not be erected within the backstays of the crane.

Guy derricks

i) The restraint of the guy ropes should be ensured by fitting stirrups or anchor plates in concrete foundations.

ii) The mast of guy derricks should be supported by six top guys spaced approximately equally.

iii) The spread of the guys of a guy derrick crane from the mast should not be more than 45^0 from the horizontal.

iv) Guy ropes of derricks should be equipped with a stretching screw or turnbuckle or other device to regulate the tension.

v) Gudgeon pins, sheave pins and fool bearings should be lubricated frequently.

vi) When a derrick is not in use, the boom should be anchored to prevent it from swinging.

6.9.4 Gin poles

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i) Gin poles should:

(a) be straight;
(b) consist of steel or other suitable metal;
(c) be adequately guyed and anchored;
(d) be vertical or raked slightly towards the load;
(e) be of adequate strength for the loads that they will be required to lift/move.

ii) Gin poles should not be spliced and if a gin pole is composed of different elements, they should be assembled in conformity with their intrinsic material strength.

iii) Gin poles should be fastened at their feet to prevent displacement in operation.

iv) Gin poles, which are moved from place to place and re-erected, should not be taken into use again before the pole, lifting ropes, guys, blocks and other parts have been inspected, and the whole appliance has been tested under load.

v) When platforms or skips are hoisted by gin poles, precautions should be taken to prevent them from spinning and to provide for proper landing.

6.9.5 Tower cranes

i) Where tower cranes have cabs at high level, persons, capable and trained to work at heights, should only be employed as crane operators.

ii) The characteristics of the various machines available should be considered against the operating requirements and the surroundings in which the crane will operate before a particular type of crane is selected.

iii) Care should be taken in the assessment of wind loads both during operations and out of service. Account should also be taken of the effects of high structures on wind forces in the vicinity of the crane.

iv) The ground on which the tower crane stands should have the requisite bearing capacity. Account should be taken of seasonal variations in ground conditions.

v) Bases for tower cranes and tracks for rail-mounted tower cranes should be firm and level. Tower cranes should only operate on gradients within limits specified by the manufacturer. Tower cranes should only be erected at a safe distance from excavations and ditches.

vi) Tower cranes should be sited where there is clear space available for erection, operation and dismantling. As far as possible, cranes should be sited so that loads do not have to be handled over occupied premises, over public thoroughfares, other construction works and railways or near power cables.

vii) Where two or more tower cranes are sited in positions where their jibs could touch any part of the other crane, there should be direct means of communication between them and a distinct warning system operated from the cab so that one driver may alert the other of impending danger.

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viii) The manufacturers' instructions on the methods and sequence of erection and dismantling should be followed. The crane should be tested before being taken into use.

ix) The climbing operation of climbing tower cranes should be carried out in accordance with manufacturers' instructions. The free-standing height of the tower crane should not extend beyond what is safe and permissible in the manufacturers' instructions.

x) When the tower crane is left unattended, loads should be removed from the hook, the hook raised, the power switched off and the boom brought to the horizontal. For longer periods or at times when adverse weather conditions are expected, out of service procedures should be followed. The main jib should be slewed to the side of the tower away from the wind, put into free slew and the crane immobilised.

xi) A windspeed measuring device should be provided at an elevated position on the tower crane with the indicator fitted in the drivers' cab.

xii) Devices should be provided to prevent loads being moved to a point where the corresponding safe working load of the crane would be exceeded. Name boards or other items liable to catch the wind should not be mounted on a tower crane other than in accordance with the manufacturers' instructions.

xiii) Tower cranes should not be used for magnet, or demolition ball service, piling operations or other duties, which could impose excessive loading on the crane structure.

6.9.6 Lifting ropes

i) Only ropes with a known safe working capacity should be used as lifting ropes.

ii) Lifting ropes should be installed, maintained and inspected in accordance with manufacturers' instructions.

iii) Repaired steel ropes should not be used on hoists.

iv) Where multiple independent ropes are used, for the purpose of stability, to lift a work platform, each rope should be capable of carrying the load independently.

6.10 VEHICLE MOVEMENT

6.10.1 Park vehicles only at designated places. Don't block roads to create hindrance for other vehicles.

6.10.2 Don't overload the vehicle.

6.10.3 Obey speed limits and traffic rules.

6.10.4 Always expect the unexpected and be a defensive driver.

6.10.5 Drive carefully during adverse weather and road conditions.

6.10.6 Read the road ahead and ride to the left.

6.10.7 Be extra cautious at nights. Keep wind screens clean and lights in working condition.

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6.10.8 All vehicles used for carrying workers and construction materials must undergo predictive/preventive maintenance and daily checks

6.10.9 Driver with proper valid driving license shall only be allowed to drive the vehicle

6.10.10 Routes shall be leveled marked and planned in such a way so as to avoid potential hazards such as overhead power lines and sloping ground etc.

6.10.11 While reversing the vehicles, help of another worker should be ensured at all times

6.10.12 An unattended vehicle should have the engine switched off

6.10.13 Wherever possible one-way system shall be followed

6.10.14 Barriers/fixed stops should be provided for excavation/openings to prevent fall of vehicle

6.10.15 Load should be properly secured

6.10.16 The body of the tipper lorry should always be lowered before driving the vehicle off.

6.10.17 Signs/signals/caution boards etc. should be provided on routes.

6.10.18 All vehicles in a running process plants to use spark arrester on the exhaust.

6.10.19 No material should be protruding outside the vehicle for the safety of the public. If necessary, same to be marked as per RTO regulations.

6.10.20 Proper caution tag should be available on the vehicle for hazardous material like oil,.LPG, explosives, nuclear material, toxic fluids etc and the vehicle staff should be well informed about the potential danger of the material being transported by them.

6.10.21 An earth chain for the discharge of static electricity generated during transportation of specific material with the vehicle to be provided.

6.10.22 Drunken driving should be prohibited.

6.11 ELECTRICAL

6.11.1 General Provisions

i) Only persons having valid licenses shall be allowed to work on electrical facilities as per prevailing IE Act and rules thereunder including CEA rules/regulations.

ii) No person should be allowed to work on live circuit. The same, if unavoidable, special care and written authorisation need to be taken.

iii) Treat all circuits as "LIVE" unless ensured otherwise.

iv) Electrical " Lock Out - Tag Out (LOTO)" procedure "MUST" be followed for work on electrical system.

v) Display voltage ratings prominently with "Danger" signs in local language also.

vi) Put caution/notice signs before starting the repair works.

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vii) All electrical equipment operating above 250V shall have two separate and distinct connections to earth grid.

viii) Proper grounding to be ensured for all switch boards and equipment including Portable ones prior to taking into service.

ix) Make sure that electrical switch boards, portable tools, equipment (like grinding machine etc.) don't get wet during their usage. If it happens, stop the main supply, make the tools dry, check for specified insulation value and then only use them. Check proper earthing.

All temporary switch boards/ KIOSKS put up at work site should be suitably protected from rain and the level of same should be high enough to avoid contact with water due to water logging.

x) Don't work wet on electrical system.

xi) Don't overload the electrical system.

xii) Use only proper rated HRC fuses / ELCB / MCB.

xiii) Only ISI marked or equivalent industrial type extension boards and Plug sockets are to be used.

xiv) ELCB for all temporary connections must be provided using 3 pin plug.

xv) All power supply cables should be laid properly and neatly so that they don't cause hindrance to persons working and no physical damage also takes place to the cables during various construction activities.

xvi) All Power cables to be properly terminated using glands and lugs of proper size, type and crimped.

xvii) Use electrical fittings in Hazard zones as per area classification under OISD-STD-113.

xviii) Ensure pipe sleeve / conduit to protect underground cables at crossings.

xix) Don't lay unarmored cable directly on ground, wall, roof or trees. All temporary cables should be laid at least 750 mm below ground and cable markers should be provided. Proper sleeves should be provided at road crossings. In case temporary cables are to be laid on wooden poles/steel poles, the minimum cable heights should be 4.5 M.

xx) Maintain safe overhead distance of HT transmission lines as per latest CEA Safety Regulation.

xxi) Don't use pipelines/structures for earthing.

xxii) Don't make any unsafe temporary connections, e.g. naked joints etc.

xxiii) Ensure that temporary cables are free from cuts, damaged insulation, kinks or improper insulated joints.

xxiv) Check at periodic intervals that pins of sockets and joints are not loose.

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xxv) Protect electrical wires/equipment from water and naked flames.

xxvi) Illuminate level in all the work areas should be in line with OISD-RP-149.

xxvii) All switchboards should be of MS structure only and incoming/outgoing feeders should be marked.

xxviii) Hand lamps/ Torch should not be of more than 24V rating, and E'x' type should be in line with hazardous area classification.

xxix) Fire extinguishers (DCP/CO_2/Sand buckets) should be kept near temporary switch boards being used for construction purposes. Don't use water for fighting electrical fires.

xxx) ISI marked Insulating mats shall be provided in the front and back end of switch boards.

xxxi) All parts of electrical installations should be so constructed, installed and maintained as to prevent danger of electric shock, fire and explosion.

Periodic checking of electrical safety appliances such as gloves, insulating mats, hoods etc. to be done/witnessed in line with OISD-STD-137, and records to be maintained duly endorsed by the concerned.

xxxii) A notice displaying following, should be kept exhibited at suitable places in local language also:

a) prohibiting unauthorized persons from entering electrical equipment rooms or from handling or interfering with electrical apparatus;
b) containing directions as to procedures in case of fire, rescue of persons in contact with live conductors and the restoration of persons suffering from electric shock;
c) specifying the person to be notified in case of electrical accident or dangerous occurrence, and indicating how to communicate with him.

xxxiii) No other cables/pipes to be laid in trench used for electrical cables.

xxxiv) Utmost care should be taken while excavating Earth from cable trench to avoid damage or any accident.

xxxv) Sub-station floor cut-outs meant for switch board installations to be covered wherever installation is incomplete.

xxxvi) Flameproofness integrity of all flameproof equipment / fittings/fixtures to be ensured at all times.

NOTE: A Residual Current Operated Circuit Breaker (RCCB) or Earth Leakage Circuit Breaker (ELCB), when installed, protects a human being to the widest extent. RCCB or ELCB should be provided as per latest CEA Safety Regulation.

6.11.2 Inspection and maintenance

i) All electrical equipment should be inspected before taking into use to ensure suitability for its proposed use.

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ii) At the beginning of every shift, the person using the electrical equipment should make a careful external examination of the equipment and conductors, especially the flexible cables.

iii) Apart from some exceptional cases subject to work permits, work on or near live parts of electrical equipment should be forbidden.

Before starting any work on conductors and/or equipment, it is to be ensured that: power supply should be isolated by an authorized person following the concept of LOTO;

iv) After work has been done on conductors and/or equipment, the power supply should only be switched on again after work permit is returned back, lock/tag on isolated feeder are removed and the workplace is reported safe.

v) Electricians should be provided with approved and tested tools and personal protective equipment such as rubber gloves, arc flash suit etc.

vi) All conductors and equipment should be considered to be live unless there is a proof of the contrary.

vii) When work has to be done in dangerous proximity to live parts the power supply should be cut off. If for operational reasons this is not possible, the live parts should be fenced off or enclosed by qualified staff from the sub-station concerned.

6.11.3. Testing

i) Electrical installations should be inspected and tested as per approved plan and the results recorded.

ii) Periodic testing for proper functioning of the earth leakage protective devices should be carried out.

iii) Particular attention should be paid to the earthing of apparatus, the continuity of protective conductors, polarity and insulation resistance, protection against mechanical damage and condition of connections at points of entry.

6.12 OFFSHORE

6.12.1 General

The isolated nature of offshore installations are hazardous. They call for greater need for health safety and survival at offshore. Safety at offshore is safety of installations and safety of personnel. Safety problems and accidents at offshore have high risks due to limited space, helicopter operation, sea transport etc. Following are the general health and safety guidelines to be followed in addition to the safety guidelines stipulated for specific jobs dealt later on:

i) Workers should be well trained to do their job independently with high degree of self-control and self-discipline.

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ii) On arrival at offshore, everyone should be briefed about the safety rules to be followed at offshore, evacuation system etc. All personnel should wear overall (dangri), helmet and shoes for personnel protection.

iii) In case of emergency, workers should follow instruction of Field Production Superintendent (F.P.S.). In certain cases instructions may be given to abandon the offshore installation and evacuate the persons to safe location.

iv) To overcome above problems, offshore personnel must receive training for using life saving appliances and other personal survival techniques.

v) Any person working at offshore should have one person as standby for any eventuality.

vi) Periodical health check-up of all personal on platforms shall be ensured and remedial measures shall be taken as per statutory and other requirements.

6.12.2 Drilling Rigs

i) Location of jack up rigs should not be less than 5 Kms from shipping route. Orientation of the rig, wind direction, etc. are required for safe landing of helicopter. Information w.r.t. sea currents, wind speed, Hi- Low tide, etc. are required for mooring of supply vessels.

ii) Sea bed condition at every location should be ensured for safety of rig.

iii) Radio and other communication facilities should be such to maintain contact with base all times.

iv) During toeing of rig, the rig deck should be clear of load, toeing lines should be in good condition and tensions in various toeing lines should be constantly monitored.

v) Few steps during toeing are:

a) crane booms should be secured to their vesta,
b) all hatches and water tight doors should be closed,
c) number of personnel on board should be restricted,
d) evacuate in case of emergency and operation should be completed preferably in day light.

6.12.3 Drilling

i) In view of CO_2 and H_2S gas cut from well, effective ventilation should be provided where drilling is in progress.

ii) Safety alarm shall be checked in advance in view of failure of ventilation system.

iii) Suitable sensors for H_2S and Methane should be function tested time to time and suitable colour code should be given.

iv) Working areas of the crane should be illuminated during night to avoid accident.

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v) Clear space should be available for despatch and receipt of load and, in particular, basket transfer of passengers. Persons engaged in loading/unloading of materials should be protected from falling into the sea.

vi) Signal light should be fitted at the top of the jib.

vii) Crane hook should be fitted with safety latches.

viii) Experienced person should be engaged in operation of specific equipment like winches, cranes etc.

ix) At least three cable turns shall always be there on the winch drum.

x) Adequate communication like walkie talkie, round robin phone should be available between the crane operator, supervisor and helper.

xi) Crane operation should be completely stopped during helicopter landing/ taking off.

xii) Except for helicopter landing deck, all decks, platforms, bridges, ladders should have rigid and fixed guard rails atleast one meter high and should have one intermediate rail midway between the handrail and 100 mm toe board.

xiii) Wooden ladders shall not be used at offshore.

xiv) Flow sensor in the flow line should be ensured for safe working and to avoid blow out.

xv) Hydrogen sulphuide gas In offshore is of great risk and at 10 ppm (0.001%) concentration in air, a person should not be exposed for more than 8 hours, If concentration is more, then breathing apparatus should be used. Corrosion of equipment is also caused by H_2S.

xvi) Portable H_2S gas detector should be continously used.

6.12.4 Production Platforms

i) In case hydrocarbon Is released due to overpressure, leak, overflow, gas blow etc., shut down process to stop flow *of* hydrocarbon. Prevent ignition of released hydrocarbon and in case of fire shut in the process complex and follow emergency contigency plan.

ii) Sub surface safetv valve (SSSV)) below the well head should be actuated during uncontrolled well -flow and they should be regularly checked.

iii) Surface safety valve or SDV should be checked for no gas leakage from bleed port / flange etc., in the well head area. It should not be in "mechanical override" or bypassed from panel.

iv) High pressure gas lift lines - blowdown system should be O.K.

* Auto actuation of SDVs in the inlet of pressure vessels should be O.K. and in "normal position" from shutdown panels. A record of status of switches normal/bypassed

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in auto-con* panels (PSH, PSL, LSL, ILSL) should be maintained.

*Shut Down Panels

v) Welders rectifier set and electrical connections to it should be checked and approved by electrical-in- charge for proper electrical safely.

vi) "SCADA" telementry system if available should be operational for remote opening and closing of wells at unmanned platforms (through RPMC).

vii) Local ESD/FSD (near the work site) should be provided for jobs of very critical nature, so that the persons working can access it immediately in emergency for safety. Safety officer should judge the requirement & inform FPS for the same.

viii) Railings and Gratings etc. in and around work area should be O.K. and inspected to avoid slippage of man into sea.

ix) Emergency Shut Down (ESD) system is initiated when an abnormal condition is detected. ESD should be checked once in six months.

x) Platform should be manned round the clock.

xi) Welding and cutting work should be regulated by hot work permit.

xii) All detectors should be calibrated as per recommendation of the manufacturer.

xiii) No system should be by-passed which affects the system of platform.

xiv) In H_2S field platforms, due care shall be taken as per recommendations.

xv) Follow the instructions of F.P.S. during stay at platform

6.12.5 Fire Prevention And Control

i) Provision be made for safe handling and storage of dirty rags, trash, and waste oil. Flammable liquids and chemicals applied on platform should be immediately cleaned.

ii) Paint containers and hydrocarbon samples, gas cylinders for welding and cutting should be stored properly. Cylinders should be transported in hand-cart.

iii) Smoking should be restricted and no smoking area should be identified.

iv) Special attention should be given to crude oil pump seals; diesel and gas engines which are potential source of ignition in the event of failure.

v) Fire and smoke detectors i.e. ultraviolet heat, thermal and smoke detector should be function tested once in three months.

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vi) Fire is controlled in offshore by water spraying, Halon, CO_2 flooding, DCP and sprinkler system.

vii) Foaming agent is applied for controlling fire in liquid hydrocarbon. The system is not effective in gas fire.

viii) Light weight breathing system should be used.

ix) The fire control plan at offshore should reveal control station, fire alarms and fire detectors, deluge valves and sprinkler, fire extinguishing appliances, fireman outfit and ventilation system.

x) Fire fighting equipment should be maintained in ready to use condition.

6.12.6 Life Saving Appliances

i) Life boats with a speed of 6 knots and carrying capacity upto 50 persons are used in offshore.

ii) No. of life boats on one installation should have a capacity to accommodate twice the number of persons onboard installation.

iii) Launching appliances and life boat equipment should be checked every week.

iv) Boat landing areas should be adequately illuminated.

v) Life raft has no power and they rely on drift.

vi) Life jacket lifts the wearer after entering water.

vii) Life buoys are used to rescue persons if any person accidentally falls in the sea.

viii) All life saving appliances should be inspected by the MMD surveyor /sr. officials once a year.

ix) Every life boat shall be inspected once a week.

x) Every life boat and life raft should be serviced once a year by a competent authority.

6.12.7 Safety Precautions during Helicopter Transportation

i) Passenger briefing regarding safety rules while travelling in helicopter should be carried out before boarding the helicopter.

ii) Emergency procedure should be briefed to all the passengers in case helicopter is to ditch into the sea.

iii) Heli-pad should have a non-skid surface. Nylon rope net should be stretched on the deck.

iv) Proper drainage should be available on helideck.

v) There should be no obstruction on the helideck itself and within 3 meters of its perimeter. Closest super structure above the helideck should have red obstruction light.

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vi) While landing on helicopter, fire crew of two persons should be standby adjacent to helideck.

vii) Heli-deck should be properly illuminated for night landing.

viii) During switching off helicopter, persons should not be allowed to go out/ towards helicopter

6.13 DEMOLITION

6.13.1. General provisions

i) When the demolition of any building or structure might present danger to workers or to the public:

(a) necessary precautions, methods and procedures should be adopted, including those for the disposal of waste or residues;
(b) the work should be planned and undertaken only under the supervision of a competent person.

ii) Before demolition operations begin:

(a) structural details and builders' drawings should be obtained wherever possible;
(b) details of the previous use should be obtained to identify any possible contamination and hazards from chemicals, flammables, etc.;
(c) an initial survey should be carried out to identify any structural problems and risks associated with flammable substances and substances hazardous to health. The survey should note the type of ground on which the structure is erected, the condition of the roof trusses, the type of framing used in framed structures and the load-bearing walls;
(d) a method of demolition should be formulated after the survey and recorded in a method statement having taken all the various considerations into account and identifying the problems and their solutions;

iii) All electric, gas, water and steam service lines should be shut off and, as necessary, capped or otherwise controlled at or outside the construction site before work commences.

iv) If it is necessary to maintain any electric power, water or other services during demolition operations, they should be adequately protected against damage.

v) As far as practicable, the danger zone round the building should be adequately fenced off and sign posted. To protect the public a fence 2m high should be erected enclosing the demolition operations and the access gates should be secured outside working hours.

vi) The fabric of buildings contaminated with substances hazardous to health should be decontaminated. Protective clothing and respiratory devices should be provided and worn.

vii) Where plant has contained flammable materials, special precautions should be taken to avoid fire and explosion.

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viii) The plant to be demolished should be isolated from all other plant that may contain flammable materials. Any residual flammable material in the plant should be rendered safe by cleaning, purging or the application of an inert atmosphere as appropriate.

ix) Care should be taken not to demolish any parts, which would destroy the stability of other parts.

x) Demolition activities should not be continued under adverse climatic conditions such as high winds, which could cause the collapse of already weakened structures.

xi) To prevent hazards parts of structures should be adequately shored, braced or otherwise supported.

xii) Structures should not be left in a condition in which they could be brought down by wind pressure or vibration.

xiii) Where a deliberate controlled collapse technique is to be used, expert engineering advice should be obtained, and:

(a) it should only be used where the whole structure is to come down because it relies on the removal of key structural members to effect a total collapse;
(b) it should only be used on sites that are fairly level and where there is enough surrounding space for all operatives and equipment to be withdrawn to a safe distance.

xiv) When equipment such as power shovels and bulldozers are used for demolition, due consideration should be given to the nature of the building or structure, its dimensions, as well as to the power of the equipment being used.

xv) If a swinging weight is used for demolition, a safety zone having a width of at least one-and-a-half times the height of the building or structure should be maintained around the points of impact.

6.13.2. Demolition of structural steelwork

i) All precautions should be taken to prevent danger from any sudden twist, spring or collapse of steelwork, ironwork or reinforced concrete when it is cut or released.

ii) Steel construction should be demolished tier by tier.

iii) Structural steel parts should be lowered and not dropped from a height.

6.14 RADIOGRAPHY

6.14.1 All radiography jobs shall be carried out as per BARC Safety Regulations

6.14.2 During field radiography, nearby area around the radiation source should be cordoned off.

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6.14.3 If the field radiography is to be done at the same location repeatedly, it is advisable to provide either a wire fencing around or a temporary brick enclosure.

6.14.4 Special permission/permit should be taken for radiography from area-in-charge.

6.14.5 As far as possible, field radiography should be done only during night time when there is little or no occupancy there.

6.14.6 Radiation warning signals should be pasted all along the cordoned off area.

6.14.7 Entry into the restricted area by unauthorised persons should be strictly prohibited during exposure.

6.14.8 The radiation level alongwith the cordon should be monitored by a suitable and well-calibrated radiation survey meter.

6.14.9 All personnel working with radiography sources should wear appropriate protective equipment and film badges issued by BARC.

6.14.10 Protection facilities such as manipulator rod, remote handling tongs, lead pots, radiation hazard placards and means of cordon off shall be available at each site.

6.14.11 The radiography source shall never be touched or handled directly with hands.

6.14.12 The package containing radiography cameras and sources should never be carried by public transport like bus, train etc.

6.14.13 Radiography sources and cameras, when not in use, should be stored inside a source pit with lock and key arrangement as approved by BARC. The storage room should preferably be located in an isolated area of minimum occupancy and radiation level outside the storage room should not exceed 0.25 mR/hr as per BARC Regulations.

6.14.14 In case of an accident (due to loss or of damage to radiography source), action should be taken in line with BARC Safety Rules/Guidelines.

6.14.15 Technologically advance methods should be preferred for reduced radiation effect wherever safety so warrants.

6.15 GRIT SHOT/ SLAG BLASTING/ SPRAY PAINTING

6.15.1 Blasting for surface preparation should be used only after approval from competent person.

6.15.2 Air Compressor used for grit/shot/slag blasting/painting should have guard and positioned away from the work place.

6.15.3 Exhaust of the prime mover, if IC engine is used, should be fitted with PESO approved spark arrester (in case of work in hazardous area) and directed away from the work place.

6.15.4 In case of motor driven compressor, the body of the motor as well as the compressor to be properly earthed.

6.15.5 The hoses used for compressed air should be of proper quality, and health of the same to be ensured through regular check/ test.

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6.15.6 The operator of grit/shot/slag blasting/painting should wear suitable PPE's including mask and the area should be cordoned off.

6.15.7 Adequate measures to be taken to suppress dust/spray particle.

6.15.8 When these activities are done in confined places, adequate measure to be taken including monitoring Oxygen level and ensuring proper ventilation.

6.15.9 Proper fire fighting arrangements are to be made where spray painting is in progress.

6.15.10 Some paints and their supplements are toxic also and emit offensive smell. PPE to workers should be suitable to address this issue.

6.15.11 "No Smoking Zone" boards should be displayed prominantly in paints shop/ spray paint area.

6.16 WORK ABOVE WATER

6.16.1 General Provisions

i) Where work is done over or in close proximity to water & where possibility of drowning exists, provision should be made for:
   a) preventing workers from falling into water;
   b) the rescue of workers in danger of drowning;
   c) safe and sufficient transport.
   d) deputation of lifeguards/divers.
   e) preventing of persons suffering from hydrophobia on deputation to work above water.

ii) Provisions for the safe performance of work over or in close proximity to water should include, where appropriate, the provision and use of suitable and adequate:
   a) fencing, safety nets and safety harnesses;
   b) lifebuoys, life jackets and manned boats;
   c) protection against such hazards as reptiles bushes/ polluted water and other animals.
   d) deputation of lifeguards/divers.

iii) Gangways, pontoons, bridges, footbridges and other walkways or work places over water should:
   a) possess adequate strength and stability;
   b) be sufficiently wide to allow safe movement of workers;
   c) have level surfaces free from tripping hazards;
   d) be adequately lit when natural light is insufficient;
   e) where practicable and necessary, to prevent danger, be provided with toe-boards, guard rails, hand ropes etc.
   f) be secured to prevent dislodgment by rising water or high winds;
   g) if necessary, be equipped with ladders which should be sound, of sufficient strength and length and be securely lashed to prevent slipping.

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iv) All deck openings including those for buckets should be fenced.

v) All the employees (owner, contractor and contractor workers) working above and under the water should comply with the requirements of Standards of Training, Certification and Watchkeeping 95 (STCW 95).

6.16.2 Rescue & Emergency procedures

i) Persons who work over water should be provided with some form of buoyancy aid. Life jackets should be provided for sufficient freedom of movement, have sufficient buoyancy to bring persons to the surface and keep them afloat face upwards, be easily secured to the body, be readily visible by way of self luminous paint/strip.

ii) Nobody should work alone on or above water.

iii) Each worker should be trained in the procedure to be followed in the event of an emergency.

iv) Necessary rescue arrangements like divers, rescue boats etc to be in place.

v) Persons to be trained for CPR/ Artificial resuscitation as an first aid to the rescued person.

vi) Also for off shore operations. Speed of water current and water temperature to be considered.

7.0 ADDITIONAL SAFETY PRECAUTION FOR UNITS WITH HYDROCARBONS

In addition to general safety precautions as outlined above for the activities in Clause 6.0, following additional safety precautions need to be taken for the sites within the operating area or nearby, where presence of Hydrocarbons cannot be ruled out.

i) No job shall be carried out without a valid permit. Permit should be in line with OISD-STD-105 "Work Permit System".

ii) Smoking should be prohibited in all places containing readily combustible or flammable materials and "No Smoking" notices be prominently displayed.

iii) In confined spaces and other places where flammable gases, vapours or dusts can cause danger, following measures should be taken:

(a) only approved type electrical installations and equipment, including portable lamps, should be used;
(b) there should be no naked flames or source of ignition;
(c) oily rags, waste and clothes or other substances liable to spontaneous ignition should be removed without delay to a safe place;
(d) Air operated ventilation system should be provided.

iv) Regular inspections should be made of places where there are fire risks. These include the vicinity of heating appliances, electrical installations and conductors, stores of flammable and combustible materials, welding and cutting operations.

v) Welding, flame/gas cutting and other hot work should only be done after issuance of work permit in line with the requirement of OISD-STD-105

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after appropriate precautions, as required, are taken to reduce the risk of fire. For carrying out other jobs also, OISD-STD-105 should be followed strictly.

vi) Fire-extinguishing equipment should be well maintained and inspected at suitable intervals by a competent person. Access to fire-extinguishing equipment such as hydrants, portable extinguishers and connections for hoses should be kept clear at all times.

vii) All supervisors and workers should be trained in the use of fire-extinguishing equipment, so that adequate trained personnel are readily available during all working periods.

viii) Audio means to give warning in case of fire should be provided where this is necessary to prevent danger. Such warning should be clearly audible in all parts of the site where persons are liable to work. There should be an effective evacuation plan so that all persons are evacuated.

ix) Notices should be posted at conspicuous places indicating:

(a) the nearest fire alarm;
(b) the telephone number and address of the nearest emergency services.

x) The work site shall be cleared of all combustible materials, as Sparks and molten metal coming from the welding job can easily ignite combustible materials near or below the welding site. If the combustible materials cannot be removed from the area, the same shall be properly shielded.

xi) A dry chemical type fire extinguisher (DCP) shall be made available in the work area. Also fire protection facilities like running hoses etc. as per permit should be complied with.

xii) Wherever required, welding screens shall be put up to protect other equipment in adjoining areas against flying sparks. Material used should be metal/ fire proof blanket/water curtain.

xiii) Welding or cutting of vessels/ equipments used in Hydrocarbon/ hazardous flammable chemicals shall be done after ensuring hydrocarbon free area and verifying the same with the suitable hydrocarbon detector.

xiv) The confined space/equipment shall be made gas free (hydrocarbon and toxic) and cleaned and shall be ensured, with the help of suitable gas detectors.

xv) Used and hot electrode stubs shall be discarded in a metal bucket.

xvi) Use PESO approved and certified spark arrestors for vehicles, wherever applicable.

xvii) Relevant work permit (hot work, cold work, vessel entry etc. as the case maybe) to be obtained, if construction work is carried out within existing operating area.

xviii) Precaution against pyrophoric material shall be ensured.

8.0 Environment Protection

8.1 Waste

The contractor is required to develop, institute and maintain a Waste Management Programme (WMP) during the construction of the project for his works and obtain approval of the owner. WMP may include: -

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i) Identification of disposal sites.
ii) Identification of waste/surplus quantities to be disposed off.
iii) Identification of amounts intended to be stored temporarily on site location of such storage.
iv) Use of proper PPEs.
v) Identification of intended transport means and route.
vi) Obtaining permission, where required, for disposal.

Such a mechanism is intended to ensure that the designation of areas for the segregation and temporary storage of reusable and recyclable materials are incorporate into the WMP. The WMP should be prepared and submitted to the Engineer for approval.

The Contractor shall handle waste in a manner that ensures they are held securely without loss or leakage thus minimizing potential for pollution and fire. The Contractor shall maintain and clean waste storage areas regularly.

The Contractor shall make arrangement to stack the metal scrap at designated location and maintain the site free from obstruction. The scrap to be disposed as per owner instruction at regular interval.

8.2 Hazardous Waste Management

If encountered or generated as a result of Contractor's activity, then waste classified as hazardous under the "Hazardous Wastes (Management & Handling) Rules, 1989, and amendments thereunder time to time" shall be disposed off in a manner in compliance with the procedure given in the rules under the aforesaid act.

Chemicals classified as hazardous chemicals under "Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 of Environment (Protection) Act, 1986 (latest) shall be disposed off in a manner in compliance with the procedure given in the rules under the aforesaid act.

8.3 Air Quality

The Contractor shall take all necessary precautions to minimise fugitive dust emissions from operations involving excavation, grading, and clearing of land and disposal of waste. He shall not allow emissions of fugitive dust from any transport, handling, construction or storage activity to remain visible in atmosphere beyond the property line of emission source for any prolonged period of time without notification to the Employer.

The Contractor shall use construction equipment designed and equipped to minimise or control air pollution. He shall maintain evidence of such design and equipment and make these available for inspection by Employer.

If after commencement of construction activity, Employer believes that the contractor's equipment or methods of working are causing unacceptable air pollution impacts then these shall be inspected and remedial proposals shall be drawn up by the Contractor, submitted for review to the Employer and implemented.

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The Contractor shall maintain the MSDS of the chemicals used / stacked at site and same shall be handled as per the standard prescribed procedure. The quantity shall be stored strictly as per the norms and emergency handling procedure shall be known and displayed prominently.

8.4 Noise

The Contractor shall consider noise as an environmental constraint in his design, planning and execution of the Works and provide demonstrable evidence of the same. The Contractor shall, take all appropriate measures to ensure that work carried out by the Contractor, whether on or off the Site, will not cause any unnecessary or excessive noise.

8.5 Occupational Noise

i) Protection against the effects of occupational noise exposure should be provided when the sound levels exceed the threshold values as prescribed.
ii) When employees are subjected to expose the sound levels beyond the prescribed limit, feasible administrative or engineering controls should be ensured.
iii) If such controls fail to reduce sound levels within the levels, personal protective equipment shall be provided and used to reduce sound levels within the prescribed limit.

9.0 OCCUPATIONAL HEALTH

9.1 Medical Examination

The contractor shall arrange a medical examination of all his employees before employing, after illness or injury, if it appears that the illness or injury might have affected his fitness and, thereafter, at periodicity stipulated under Factories Act / Building & Construction Workers Regulation (BOCWR).

The Contractor shall maintain the confidential records of medical examination by the physician authorized by the Employer.

9.2 Occupational Health Centre

The contractor shall ensure at a construction site an occupational health centre, mobile or static is provided and maintained in good order. Services and facilities as per the scale lay down under Factories Act / Building & Construction Workers Regulation (BOCWR). A construction medical officer appointed in an occupational health centre possess the qualification as laid down under Factories Act / Building & Construction Workers Regulation (BOCWR).

9.3 First Aid

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First aid facilities should be provided in line with various statutory regulations like The Factory Act etc. However following care should be taken:

i) First aid, including the provision of trained personnel should be ensured at work sites. Arrangement should be made for ensuring the medical attention of the injured workers.

ii) Suitable rescue equipment, like stretchers should be kept readily available at the construction site.

iii) First-aid kits or boxes, as appropriate and as per statutory requirements, should be provided at workplaces and be protected against contamination by dust, moisture etc.

iv) First-aid kit or boxes should not contain anything besides material for first aid in emergencies.

v) First-aid kits and boxes should contain simple and clear instructions to be followed, be kept under the charge of a responsible person qualified to render the first aid and be regularly inspected and replenished.

vi) Where the work involves risk of drowning, asphyxiation or electric shock, first-aid personnel should be proficient in the use of resuscitation and other life saving techniques as specified in rescue procedures.

vii) Emergency telephone numbers of nearby Hospitals, Police, Fire Station and Administration should be prominently displayed.

10.0 DOCUMENTATION

The intention of keeping documentation of all types of accident(s) is to prevent recurrence of similar accident(s). All accidents should be reported as per OISD Guidelines and The Factories Act, 1948/ BOCWR.

All accidents (major, minor or near miss) should be investigated, analysed and recommendations should be documented along with implementation status.

All related data should be well-documented and further analysis highlighting the major cause(s) of accidents be done. This will help in identifying thrust areas and training needs for prevention of accidents.

11.0 SAFETY AWARENESS & TRAINING

Safety awareness to all section of personnel ranging from site-in-charge to workmen helps not only preventing the risk but also build up the confidence. Time and expenditures also get saved as a result.

Safety awareness basically seeks to persuade/inform people on safety besides supplementing skill also. Awareness programme may include followings:

i) **Poster:** Posters with safety slogan in humorous, gruesome demonstrating manner may be used to discourage bad habits attributable to accidents by appealing to the workers' pride, self-love, affection curiosity or human aspects. These should be displayed in prominent location(s).

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ii) **Safety Sign Boards**: Different type of message of cautioning, attention, notice etc. should be displayed at the appropriate places for learning/ awareness of the workmen while working at site.

iii) **Films & Slides:** Film(s) narrating the accident case study including the causes and possible remedial ways of preventing the recurrence of a similar accident should be displayed at regular intervals. Slides consisting main points of the film show may also be shown to workers.

iv) **Talks, lectures & conferences:** The success of these events would depend much on audience's understandings of the speaker (s). The speakers are to be knowledgeable and good presenter. Speakers should know to hold the attention and to influence the audiences.

v) **Competitions:** Organise competition(s) between the different deptts/categories of workers. The sense of reward/recognition also will improve safety awareness and result in enhancing safety levels.

vi) **Exhibitions:** Exhibitions also make the workers acquainted with hazards and means of preventive measures.

vii) **Safety Publication:** Safety publications including pocket books dealing with ways of investigation and prevention in the field of safety and so on, may be distributed to workers to promote the safety awareness.

viii) **Safety Drives:** From time to time, an intensive safety drive by organising a safety day or a safety week etc. should be launched.

ix) **Training:** Training for covering the hazards for different trade should be imparted. Training should also include the specific hazards related to a job in addition to the general safety training as has been dealt in various chapters and should include all workers. Reference may be drawn from OISD-STD-154.

12.0 REFERRENCES

i) *Factory Act, 1948*

ii) *Indian Electricity Rules*

iii) *Safety & Health in Construction by ILO*

iv) *The Building & Other Construction Workers (Regulation, Employment and Conditions of Service) Act 1996 and Central Rules 1998*

v) CSB guidelines

vi) *IS 1161: 2006 or latest edition - Steel tubes for structural purposes — specification*

vii) *IS 2750: 1964 or latest edition - Specification for steel scaffolding.*

viii) *IS : 3696 (Part 1) – 1987 (Scaffolds) Safety code of scaffolds and ladders*

ix) *IS : 3696 (Part 2) – 1987 (Ladders)Safety code of scaffolds and ladders*

x) *IS 4014 Part I: 2006 or latest edition - Code of practice for steel tubular scaffolding - definitions and materials.*

xi) *IS 4014 Part II: 2005 or latest edition - Code of practice for Steel tubular scaffolding - Safety regulations for scaffolding.*

xii) *Building & Other Construction Workers(Regulation on employment &conditions of service) central rules, 1998 (Provision related to Scaffold).*

xiii) *OHSA Standard on Scaffold (CFR 1926.452)*

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ANNEXURE I

LIST OF SAFETY CODES FOR CIVIL WORKS PUBLISHED BY BUREAU OF INDIAN STANDARDS

Sr.no	Code No.	Title
01.	IS : 818	Code of Practice for Safety and Health Requirements in Electric and Gas Welding and Cutting Operations – First Revision.
02.	IS : 875	Code of practice for Structural safety of buildings: Masonry walls
03.	IS : 933	Specification for Portable Chemical Fire Extinguisher, Foam Type – Second Revision.
04.	IS : 1179	Specification for Equipment for Eye and Face Protection during Welding – First Revision.
05.	IS : 1904	Code of practice for Structural safety of buildings: Shallow foundations
06.	IS : 1905	Code of practice for Structural safety of buildings: Masonry walls
07.	IS : 2171	Specification for Portable Fire Extinguishers, Dry Powder Type – Second Revision.
08.	IS : 2361	Specification for Building Grips – First Revision.
09.	IS : 2750	Specification for Steel Scaffoldings.
10.	IS : 2925	Specification for Industrial Safety Helmets – First Revision.
11.	IS : 3016	Code of Practice for Fires Precautions in Welding and Cutting Operations – First Revision.
12.	IS : 3521	Industrial safety belts and harnesses
13.	IS : 3696 – Part I	Safety Code for Scaffolds and Ladders : Part I – Scaffolds.
14.	IS : 3696 – Part II	Safety Code for Scaffolds and Ladders : Part II – Ladders.
15.	IS : 3764	Safety Code for Excavation Work.
16.	IS : 4014 -Part I & II	Code of practice for Steel tubular scaffolding
17.	IS : 4081	Safety Code for Blasting and Related Drilling Operations.
18.	IS : 4082	Recommendations on staking and storage of construction materials at site
19.	IS : 4130	Safety Code for Demolition of Buildings – First Revision.
20.	IS : 4138	Safety Code Working in Compressed Air-First Revision
21.	IS : 4756	Safety code for Tunneling works
22.	IS : 4912	Safety requirements for Floor and Wall Openings, Railings and toe Boards –First Revision.
23.	IS : 5121	Safety Code for Piling and other Deep Foundations.
24.	IS : 5916	Safety Code for Construction involving use of Hot Bituminous Materials.
25.	IS : 5983	Specification for Eye Protectors – First Revision.
26.	IS : 6922	Structures subject to underground blasts, criteria for safety and design of
27.	IS : 7155	Code of recommended practices for conveyor safety
28.	IS : 7205	Safety Code for Erection on Structural Steel Works.

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Sr.no	Code No.	Title
29.	IS : 7069	Safety Code for Handling and Storage of Building Materials.
30.	IS : 7293	Safety Code for Working with Construction Machinery.
31.	IS : 7323	Guidelines for operation of Reservoirs
32.	IS : 7969	Safety code for handling and storage of building material
33.	IS : 8758	Recommendation for Fire Precautionary Measures in construction of Temporary Structures and Pandals.
34.	IS : 8989	Safety Code for Erection of Concrete Framed Structures.
35.	IS : 9706	Code of Practices for construction of Arial ropeways for transportation of material
36.	IS : 9759	Guidelines for de-watering during construction
37.	IS : 9944	Recommendations on safe working load for natural and man-made fibre rope slings
38.	IS : 10291	Safety code for dress divers in civil engineering works
39.	IS :10386 – Part I	Safety Code for Construction, Operation and Maintenance for River Valley Projects.
40.	IS :10386 – Part II	Safety Code for Construction, Operation and Maintenance of River Valley Projects.
41.	IS : 11057	Code of practice for Industrial safety nets
42.	IS : 13415	Code of Practice on safety for Protective barriers in and around building
43.	IS : 13416	Recommendations for preventive measures against hazards at working places

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CONTRACTOR SAFETY

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CONTRACTOR SAFETY

Prepared by

FUNCTIONAL COMMITTEE ON CONTRACTOR SAFETY

Engineers India Ltd

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Preamble

Indian petroleum industry is the energy lifeline of the nation and its continuous performance is essential for sovereignty and prosperity of the country. As the industry essentially deals with inherently inflammable substances throughout its value chain – upstream, midstream and downstream – Safety is of paramount importance to this industry as only safe performance at all times can ensure optimum ROI of these national assets and resources including sustainability.

While statutory organizations were in place all along to oversee safety aspects of Indian petroleum industry, Oil Industry Safety Directorate (OISD) was set up in 1986 Ministry of Petroleum and Natural Gas, Government of India as a knowledge centre for formulation of constantly updated world-scale standards for design, layout and operation of various equipment, facility and activities involved in this industry. Moreover, OISD was also given responsibility of monitoring implementation status of these standards through safety audits.

In more than 25 years of its existence, OISD has developed a rigorous, multi-layer, iterative and participative process of development of standards – starting with research by in-house experts and iterating through seeking & validating inputs from all stake-holders – operators, designers, national level knowledge authorities and public at large – with a feedback loop of constant updation based on ground level experience obtained through audits, incident analysis and environment scanning.

The participative process followed in standard formulation has resulted in excellent level of compliance by the industry culminating in a safer environment in the industry. OISD – except in the Upstream Petroleum Sector – is still a regulatory (and not a statutory) body but that has not affected implementation of the OISD standards. It also goes to prove the old adage that self-regulation is the best regulation. The quality and relevance of OISD standards had been further endorsed by their adoption in various statutory rules of the land.

Petroleum industry in India is significantly globalized at present in terms of technology content requiring its operation to keep pace with the relevant world scale standards & practices. This matches the OISD philosophy of continuous improvement keeping pace with the global developments in its target environment. To this end, OISD keeps track of changes through participation as member in large number of International and national level Knowledge Organizations – both in the field of standard development and implementation & monitoring in addition to updation of internal knowledge base through continuous research and application surveillance, thereby ensuring that this OISD Standard, along with all other extant ones, remains relevant, updated and effective on a real time basis in the applicable areas.

Together we strive to achieve NIL incidents in the entire Hydrocarbon Value Chain. This, besides other issues, calls for total engagement from all levels of the stake holder organizations, which we, at OISD, fervently look forward to.

Jai Hind!!!

Executive Director
Oil Industry Safety Directorate

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FOREWORD

At the time of development of this document, 113 OISD standards, recommended practices and guidelines are applicable to the Oil and Gas installations of Public sector Oil Companies in India. 11 of these standards have been adopted by Petroleum and Explosives Safety Organisation (PESO) in various rules administered by them and thus the provisions of these standards are mandatory for entire Oil & Gas sector to that extent.

A few serious accidents have occurred in the recent past in India and abroad including vapour cloud explosion and fire at Oil terminal near Jaipur emphasised the need for the industry to review the existing provisions of various guidelines and statutory requirements.

With the above in view the Government of India directed the Oil Industry Safety directorate to develop a comprehensive document covering all the facets of Safety in Design, Operation and Maintenance, of depots and terminals being run by marketing divisions of Oil companies with an objective to strengthen the existing system.

The present guideline on "Contractor Safety" has been prepared by the functional committee based on, existing standards, guidelines & recommended practices of OISD, the recommendations arising out of recent major accidents and their analysis, the accumulated knowledge and experience of industry members in India and updation of National and International codes and practices.

The provisions of this document, if implemented objectively, may go a long way in enhancing overall safety standard and reduce accidents in Oil Installations.

Users are cautioned that no standard can be substitute to the "judgement and experience of Engineers"

This document will be reviewed periodically for improvements based on the new experiences and better understanding. Suggestions are also invited from the users after it is put into practice to improve the document further. Suggestions may be addressed to:

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This guideline in no way supercedes the statutory regulations of Chief Controller of Explosives (CCE), Factory Inspectorate or any other statutory body, which shall be followed as applicable.

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NOTE

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Though every effort has been made to assure the accuracy and reliability of the data contained in these documents, OISD hereby expressedly disclaims any liability or responsibility for loss or damage resulting from their use.

These documents are intended to supplement rather than replace the prevailing statutory requirements.

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In addition to the above, several other experts from Industry contributed in the preparation, review and finalisation of this Guideline.

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R Chakravarty	Numaligarh Refineries Ltd.	Member
N R Adsul	Bharat Petroleum Corporation Ltd.	Member
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C M Sharma	Oil Industry Safety Directorate	Member
A K Ranjan	Oil Industry Safety Directorate	Member Coordinator

In addition to the above, several other experts from Industry contributed in the preparation, review and finalisation of this Guideline.

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CONTRACTOR SAFETY

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CONTRACTOR SAFETY

1.0 INTRODUCTION

Oil and Gas operations like Drilling, Production, Refining, Storage**,** Transportation and Distribution, etc. are inherently hazardous. A large number of contractor workforce is deployed to carry out construction, maintenance and other jobs. The analysis of the incidents in the Petroleum Sector indicates that a large number of incidents involved contractor workforce and have resulted in either casualty or injury besides leading to property damage and operational interruptions and environmental degradation.

In order to improve the safety levels of hydrocarbon installations, the contractor safety is of utmost importance and there is a need to institute a good contractor safety system.

2.0 SCOPE

This document covers broadly the guidelines on the HSE management system for enhancing the safety levels of the contractor workforce deployed in construction, maintenance and operation activities in the hydrocarbon industry.

The safety precautions to be taken while carrying out different activities during construction / maintenance have separately been covered in OISD-GDN-192 on "Safety Practices during Construction".

3.0 DEFINITIONS

Work station / Work site

A place / unit where the job is carried out by contractor/executing agency in specified manner with safety, during construction phase or in operation phase.

Owner
Any physical or legal person/entity for whom prescribed job is carried out.

It shall also include owner's designated representative / consultant /nominee / agent, authorised from time to time to act for and on its behalf, for supervising / co-ordinating the activities of the contractor/execution agency.

Contractor / Executing Agency

A physical or legal person/entity having contractual obligation with the owner, and who deploys one or more worker on the site.

Contractor Worker

It covers all workmen who are either self-employed or employed through contractor, the casual workers and includes contractor's supervisor, working at a location / site employed directly by Owner or through their contractor.

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Incident

An incident is an unplanned, uncontrolled, unintended or unforeseen event, caused by unsafe acts and / or unsafe conditions, resulting in or having the potential to result in personal injury and/or property damage.

Consultant

Consultant is a physical or legal person/entity engaged by owner to provide the consultancy services to owner for management of the contract on their behalf or as specified.

Designer

Designer is a physical or legal person / entity engaged by owner to provide design services of a work site.

Owner's Representative / Engineer In Charge

The Owner's representative/Engineer-in-charge is the one, who has been designated by the owner to manage the contract.

Owner's Safety Officer

A properly trained person designated by owner who ensures safety at work site.

4.0 DUTIES/ RESPONSIBILITIES

4.1 OWNER

4.1.1 Owner's Management

The commitment to safety has to be emphasized by the owner by practice by its own management and employees at all levels. The duties and responsibilities of owner should include:

i) To institute a mechanism for identification and compliance of all applicable statutory rules & regulations (Refer Annexure I for a list of few important Bureau of Indian Standards & statutory regulations).

ii) To provide specific information to contractors and make workers aware on the hazards associated with job assigned.

iii) To provide information about Risk Mitigation measures available at the place of work.

iv) To provide the contractor with information on Owners Safety Plan & Regulations, Emergency Management Plan, lockout / tag out procedure, confined space entry, work permit system, excavation / trench permit system etc.

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v) To specify rules (e.g. for security including access arrangements) and safety rules such as fire protection, first aid arrangements, Work Permit systems etc.

vi) To provide comprehensive list of statutory regulations / standards and specification, to be complied with during execution of contract, in the tender document itself.

vii) To ensure training of the contractor workforce, medical examination, and proper usage of safety equipment.

viii) To specify the requirements of Health, Safety and Environment (HSE) (commensurate with the nature of job) in Pre- Qualification criteria.

ix) To designate Engineer-in-charge and safety officer.

x) To arrange for a multi-disciplinary safety audit team to conduct surprise / regular safety audits and monitor the implementation of the recommendations.

xi) To introduce suitable schemes for motivation of the contractor worker to adhere to safety guidelines.

xii) To review safety practices & their implementation through periodic surprise visit of the work sites and monthly review meeting.

xiii) To develop the HSE plans and incorporate the same in the tender document.

xiv) To liaise with external agencies like press, public etc and with law enforcement, regulatory, statutory agencies etc.

xv) To report to statutory agencies on safety compliance and accidents, if any.

4.1.2 Owner's Representative/Engineer-in-charge

The duties & responsibilities of engineer-in-charge should include:

i) To ensure that all Contract requirements including Health, Safety, Environment & Security are complied with.

ii) To ensure that contractor workforce deployed is adequately qualified, trained and in state of health to commensurate with the requirements of the job.

iii) To ensure that the Tools / Tackles and Machinery being used are properly tested and are in sound working conditions and necessary resources proposed for providing safe place of work and necessary PPE are being used.

iv) To take the required necessary corrective action immediately upon noticing or receipt of a report on noncompliance or any such condition which poses a threat to health, safety or environment. If during the course of execution of the contract, any situation of non-compliance with the contractor's safety and health plan are noticed / reported, the same will be taken up with the contractor for correction. In the event of repeated non compliance, suitable action to be initiated as per the contract.

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v) To ensure that the incidents are reported to all concerned within stipulated time frame.

vi) To ensure submission of a plan for safe working (Method Statement) from contractor and approval of the same by competent person / department.

vii) To ensure that Work Permit System in line with OISD-STD-105 is adhered to.

viii) To ensure availability of all the documentation needed for the execution of contract.

ix) To ensure that the quality controls have been maintained during fabrication/erection and all jobs required for safe commissioning have been carried out.

x) To ensure safe dismantling of all temporary facilities/connections put up by the contractor, after completion of work.

xi) To compile a report on the safety performance (at the conclusion of each contract or periodically such as annually for renewable and long-term contracts), which is to be considered in future when selecting contractors.

xii) To ensure that the Consultant, contractor and sub-contractor employ / designate qualified & trained Safety Engineer / Officer commensurate with requirement of the job.

xiii) To comply with all applicable safety and health standards, rules, regulations and orders issued by competent authority pertaining to the assigned activities.

4.1.3 Owner's Safety Officer

The duties & responsibilities of the Owner's Safety Officer should include:

i) To assess the hazards associated with jobs in consultation with all concerned and establish safe working procedure including identification of the escape routes.

ii) To establish a written record of factors which can cause injuries and illnesses and maintain statistical information for use in analysing all types of incidents and events involving contract personnel.

iii) To undertake routine/surprise inspections of all work sites and identify unsafe conditions & practices, if any. Check for compliance of the safety practices being followed with approved HSE Plan.

iv) To investigate promptly the incidents (including near-miss) in order to advise corrective and/or preventive action and assist management for its compliance.

v) To ensure periodic internal audits, review meetings, monitor and analyse HSE performance, nonconformities and suggest its corrective & preventive action.

vi) To encourage contractor and contract workers for reporting requirements ~~for~~ of occupational injuries and illnesses.

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vii) To advise whether the proposed working arrangements are safe and satisfactory, particularly at the interface between the contractor's planned work and owner's existing facilities.

viii) To communicate to the Contractor the imposed restrictions which may affect the work/personnel such as the temporary closure of a corridor or electrical isolation of equipment.

ix) To review and monitor the contractor's adherence to approved HSE plan and compliance thereof.

x) To design and conduct either independently or in collaboration with the training department, suitable HSE training programme for the prevention of personal injuries to Consultant, Contractor's Managers, Supervisors and workmen at all levels

xi) To identify areas of operations where specialized training is required to deal with potential dangers.

xii) To document and to bring to the attention of the Owner's Supervisor and Contractor any non-compliance/violation of the safety norms against approved safety and health plan or safety and health requirements and also raise these issues in the Safety Committee Meetings.

xiii) To take part in Tool Box Meetings at random and to ensure maintenance of records.

I. Establish, implement, maintain and review HSE objectives and programs including responsibility, authority, means & time frame at all relevant functions and levels.
II. Apprise the management about HSE status & help formulate appropriate policies for continual improvement.
III. Standardize PPE & Safety Devices, identify and develop approved vendors wherever required.

To organise campaigns, competitions, contests and other activities in association with the concerned departments, which will develop and maintain the interest of the contractor and contractor workers in establishing and maintaining safe conditions of work and procedures;

4.2 CONTRACTOR

4.2.1 Contractor's Management

Duties & responsibilities of the contractor should include the following:

i) To implement safe methods and practices, deploy appropriate machinery, tools & tackles, experienced supervisory personnel and skilled work force etc. required for execution.

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ii) To prepare a comprehensive and documented plan for implementation, monitoring and reporting of Health, Safety and Environment (HSE) and implement the same after its approval.

iii) To nominate qualified & trained Safety Engineers / Officers reporting to the Site in charge, for supervision, co-ordination and, liaison for the implementation of the safety plan.

Similar HSE Plan should be implemented at the sub- contractor's or supplier's site /office. However the compliance with the HSE Plan is to be the sole responsibility of the Contractor.

iv) To arrange facilities at suitable location in liaison with the owner for drinking water, toilets, lighting, canteen, lunch shelter, crèche etc. as applicable as per Laws/ Legislation at site and also arrange for workmen compensation insurance, third party liability insurance, registration under ESI / PF act etc as applicable.

v) To arrange for fire protection equipment as per the advice of owner.

vi) To ensure that its employees have completed appropriate health and safety training as required by the statute / regulation and also as per requirements of the Owner / Consultant. The documentation of such training imparted to all its employees should be maintained and produced for verification as required.

vii) To comply with all the security arrangements of owner.

viii) To ensure that the plant and equipment used on-site by contractor / employees is correctly registered, controlled and maintained in sound working condition.

ix) To ensure availability of First Aid boxes and First Aid trained attendant and other facilities as per requirement of factory Act / Building & Construction Workers Regulation (BOCWR).

x) To ensure that all incidents including near misses are reported immediately. Investigated with corrective and preventive action and learning are shared with all workers and all concerned at the earliest.

xi) To have HSE policy

xii) Maintain HSE performance data on yearly basis and submit to owner for evaluation

In construction projects where sub-contractors are engaged, the contractor should set out the responsibilities, duties and safety measures that are expected of the sub-contractor's workforce. These measures should include the provision and use of specific safety equipment, methods of carrying out specific tasks on safety and the inspection and appropriate use of tools.

The responsibilities indicated separately under contractor's Supervisor, Safety Officer and contract worker are contractually that of the Contractor and legally binding on the

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Contractor only. However the specific detailing as above has been given separately for guidance and operational convenience.

The selection of sub contractors, if employed, should be approved by the owner. Sub-contractor should comply fully with all safety rules and conditions applicable to the main contractor.

4.2.2 Contractor's Supervisor / Safety Officer

Duties & responsibilities of the Contractor's supervisor/Safety Officer should include the following:

i) To ensure strict compliance with work permit system by carrying out work only with appropriate work permits and after ensuring that all safety precautions / conditions in the permit are complied with and closing the same after job completion.

ii) To ensure that required guards and standard personal protective equipment are provided, used, and properly maintained including contingency requirement.

iii) To ensure inspection, tested, certification and maintenance of all tools and ensure removal of defective tools.

iv) To plan the workload and assign workers to jobs in commensuration with their qualification, experience and state of health.

v) To ensure that all the preventive measures for identified hazards (e.g. Job Safety Analysis, Job Hazard Analysis, HIRA, etc.) are in place and communicated to workers

vi) To take immediate corrective action against the violation of safety rules observed or reported.

vii) To ensure that the workers likely to be exposed to hazardous chemicals/materials have access to appropriate Material Safety Data Sheets (MSDS), and provide necessary mitigation measures.

viii) To ensure that appropriate warning signboards or tags are displayed.

ix) To ensure that all workers have proper training for their job assignments, including use of appropriate PPE, first aid and fire fighting equipment.

x) To ensure that only medically fit person shall be engaged in work and also ensure that sick / or injured workers during course of work should receive timely and appropriate first aid and/or medical attention.

xiii) To report each incident and/or injury in accordance with established procedures and assist in investigation.

I. Maintain Daily HSE observation log book at site
II. Conduct Tool Box talks along with Site Engineers/ supervisors.

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Maintain the published HSE literature, HSE regulations, codes and other communications. Advise management of compliance and conditions requiring attention.

A fulltime / dedicated Safety Officer should be assigned, where more than 100 workers are employed at site. For smaller jobs, the supervisor should assume the role of the safety officer also.

4.2.3 Contract workers

The duties & responsibilities of the contractor worker should include the following:

i) To perform work safely as per the job requirement and instructions.

ii) To inform all concerned regarding unsafe conditions / and unsafe acts.

iii) To wear PPE as stipulated and necessary for the job.

iv) To inform promptly to their supervisor regarding all work related incidents resulting in personal injury, illness and/or property damage.

v) To take all necessary and appropriate safety precautions to protect themselves, other personnel and the environment.

4.3 CONSULTANT

The activities and responsibilities covered under the scope of the Owner may be delegated to the consultant in those cases as applicable, based on the respective contract conditions. The primary responsibility of Consultant is to ensure compliance with agreed HSE plan for the contract by the Contractor. However those responsibilities conferred on Owner as Principal employer cannot be delegated to consultant.

Where the consultant‘s scope involves Engineering and Design, those factors under Designer (Para 4.4) should also be applicable.

In all cases, the Consultant's scope should include submission of latest HSE plans for work under his and Contractor's purview and implementing the same till job completion. It should conform to owner's overall HSE plan. This should include Guidelines and Implementation and Reporting Methodology to be followed with required report formats.

Adequate number of Safety Officers shall be provided by the Consultant with necessary skills required for the work to be performed.

The Consultant shall review the documents submitted by the contractor and advise owner on acceptance as well as advise suitability and number of Contractor's safety officers / supervisors.

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4.4 DESIGNER

The Process Designer should identify all hazards and risks likely to be encountered during fabrication, erection including dismantling, Pre-commissioning, commissioning and Performance run to meet the Guarantees and advise the risk mitigation measures.

All the hazards and safety measures to be adopted while handling Dangerous chemicals and Catalysts should be detailed by the Process Licensor and the same should be again included in the scope of the suppliers. Specific write ups/MSDS should be obtained from Patented single source suppliers also.

Designs should recognize, include and apply safe practice during preparation, construction and subsequent operational use and maintenance after completion of the Project.

All documents including drawings and calculations are to be originated, checked and approved in accordance with latest international codes, standards, specifications and design basis philosophy.

Use of low risk materials, non hazardous substances, use of low noise and dust-suppressed equipment etc. should be encouraged.

5.0 SAFETY MANAGEMENT

5.1 JOB SAFETY ANALYSIS (JSA)

Job safety analysis (JSA) provides a mechanism by which the contractor / owner, safety officer(s) and job supervisor(s) take a detailed look at how an individual task is performed , and its inherent hazards and preventive measures. This procedure helps in integrating accepted safety and health principles and practices into a particular operation. In a JSA, each step of the job is examined to identify potential hazards and to determine the safest way to do the job.

A job safety analysis includes five steps as below:

- Select a job
- Break the job down into a sequence of steps
- Identify the hazards against each of these steps (based on knowledge of accident, causes of injuries and personal experience) and determine the preventive measures to overcome these hazards
- Apply the controls to the hazards
- Evaluate the controls measures and revisit JSA if necessary

5.2 CRITERIA OF SELECTION OF A CONTRACTOR & SAFETY PERFORMANCE REVIEW

“Contractor Safety” can be ensured to a large extent if competent agency for execution of assignment or job, based on HSE system agreed upon by owner, is selected. It is necessary to assess his capabilities and competencies to perform work safely.

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A databank should be developed for all the contractors for their past performance on HSE aspects. An attempt should also be made to get similar data from other similar industries.

The data required will depend upon complexity involved in the job and type / size of resources required. Format needs to be suitably developed depending upon size, nature of the job & hazard associated therein. The format designed should also take care of the skill required to carry out the job.

Performance review is essential for all type of contractors. It helps in recording actual performance/experience with contractors while the contract is in progress. It is essential that resources agreed as per the contract are reviewed at mobilization stage for ensuring compliance from the day one and thorough effective supervision / monitoring system are at place.

This activity also helps in taking timely action in case of unsatisfactory performance to correct the situation and ensure safe work during execution period and deciding about suitability of the contractor for future jobs.

The periodicity of such performance review will depend upon size/type/complexity of contract. However, the performance should be reviewed periodically from mobilisation stage till the demobilization stage. Appropriate corrective action should be ensured.

5.3 SITE PLANNING AND LAYOUT

Before starting the construction/maintenance job at existing workplace in operation or green field locations, following should be ensured: -

i) Details regarding location of workshop/ fabrication yard, site office, stores, laboratory, electrical installations, placement of construction machinery, medical and welfare facilities, lighting underground and above ground piping route, cable route etc. should be decided prior to commencement of the work in consultation with owner / Consultants and implementation should be ensured. Layout should be displayed at strategic locations.

ii) The resources required to meet any emergency situations like fire fighting, first aid etc. should be planned and mobilized as per the job requirement.

iii) The sequence or order in which work to be done and any hazardous operations or processes should be identified.

iv) Free access to site shall be provided with clear roads, passage, gangways, staircases etc. Access to construction site should be leveled, open and free from any obstructions like construction material or scrap/waste, exposure to hazards such as falling materials, material handling equipment and vehicles. Any pit or ditch shall be covered or barricaded.

v) Arrangements should be made to maintain good housekeeping at site. Scrap and debris generated out of construction work should be removed/disposed off at a regular interval as directed. Emergency exit should be provided in case of blockade of primary exit.

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vi) Suitable warning notices and also the routes to and from welfare facilities should be displayed prominently.

vii) Pedestrian pathways and routes for vehicular traffic (light/heavy vehicles including material handling equipment) should be earmarked.

viii) Artificial lighting to be provided at places where work continues or workers pass by after sunset or in case natural light is insufficient like confined spaces.

ix) Keep all equipment /machines under cover to prevent them from dust, rain/flood water, heat etc. and follow storage instructions as applicable for each of them.

5.4 GATE ENTRY PROCEDURE

Gate entry at any site / workplace / unit is to be restricted to ensure entry of only authorised persons / vehicles.

5.4.1 Entry procedure for all contractor workers should be as follows:

A. Issuance of Pass

i) The passes are to be issued after the owner's representative/engineer-in-charge forwards the application of the contractor providing complete details of the workers being engaged. The contractor should be asked to submit Character & Antecedents (C&A) verification of individual worker from concerned authorities.

ii) The actual deployment of the workers at the construction site should be done after imparting the necessary safety induction training.

iii) With regard to issuance of passes for all vehicles including material handling equipment, owner's representative / engineer-in-charge should forward the application only after ensuring that all documents pertaining to the fitness of the vehicle/equipment and valid driving license of the driver**,** PUC of the vehicle, insurance of vehicle, etc. are available.

iv) The passes should be serially numbered with address, contractor name, identification mark, signature of the worker etc.

v) Special colour code for passes should be used for persons entering different areas like Administrative Block, Unit area, Project Area (wherever applicable).

vi) Contractor workers engaged on routine basis for long periods should be provided with monthly photo pass.

vii) Special permit is required separately for working beyond normal working hours and holidays.

B. Gate Entry

i) Entry of the contractor's employees should be permitted with valid gate passes only.

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ii) Entry of contractor's workers should be allowed in presence of authorized representative of contractor.

iii) Records of persons at the time of entry/exit should be maintained.

iv) At the entry gate of the location, a physical checking for non-carrying of lighter, matchboxes, explosives etc. should be carried out.

v) Gate passes/Identity Cards should be displayed on persons at all the times.

vi) For Mega-projects at existing / operating installations, it is preferable to have a separate gate for entry of contractor workers and also the project areas should be segregated fencing from operational area by fencing / other physical means.

vii) No vehicle should be allowed to enter in an operational area without proper flame arrestor.

viii) Awareness on Safety through training / posters etc. highlighting Do's and Don'ts should be spread within entire contractor workforce. Video/Audio tapes on Safety Topics should be played preferably.

ix) For occasionally engaged workers such as for material handling etc., spot photograph should preferably take with two copies (one for preparing the pass and other for attachment with gate register). Specific advice and recommendation of User Department should be given due cognizance. Relevant details are to be written. The pass should be collected back at the gate after day's work.

5.4.2 Tank Truck Loading (TTL) Operation :

At the loading / unloading location, a large no. of Tank Trucks of petroleum products enter the installation. Crew members are generally not regular entrants. The procedure should be as follows:

i) The gate pass should be issued to the individual crew members on written request of the transporter mentioning TT registration nos., License and certificate of training as per MV rule 9.

ii) Character & Antecedent (C & A) verification of the TTL crew through local police is to be done preferably and record maintained.

iii) For loading/unloading purpose, register entry at security gate is made before allowing entry into the premises with recording of names of crew members, time of entry, pass Sr. No., TT no. etc.

iv) For loading/unloading, crew is allowed entry alongwith TT only, after checking of TT from explosive/security point of view.

v) Out time, invoice no., Destination etc., are recorded while TTs go out of the security gate.

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5.5 TRAINING

Training is to educate contractor workforce on various hazards associated with the job/workplace and on the respective preventive / mitigation measures to avoid untoward incidents.

i) Workers should be adequately and suitably:

(a) informed of potential safety and health hazards to which they may be exposed to at their workplace;

(b) instructed and trained in the measures available for the prevention, control and protection against those hazards.

ii) No person should be employed in any work at a workplace unless that person has received the necessary information, instruction and training so as to be able to do the work competently and safely. The competent authority should, in collaboration with employers, promote training programs to enable all the workers to read and understand the information / instructions related to safety and health matters.

iii) The information, instruction and training should be given in a language understood by the worker and written, Oral, visual and participative approaches should be used to ensure that the worker has assimilated the information.

iv) Every worker should receive instruction and training regarding the general safety and health measures common to the workplace. This should include:

(a) general rights and duties of workers at the workplace;

(b) means of access and egress both during normal working and in an emergency;

(c) measures for good housekeeping;

(d) location and proper use of welfare amenities and first aid facilities provided;

(e) proper use and care of the items of personnel protective equipment and protective clothing provided to the worker;

(f) general measures for personal hygiene and health protection;

(g) fire precautions to be taken;

(h) action to be taken in case of an emergency;

(i) requirements of relevant safety and health rules and regulations.

(j) training on hazards and mitigation measures for specific area where worker is assigned to work shall be given as part of entry procedure

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(k) Job specific training / refresher course shall also be given at regular intervals.

(l) It is also expected that behaviour based safety culture shall be encouraged and all the workers will be involved.

Copies of the relevant safety and health rules, regulations and procedures should be available to workers upon the commencement of and upon any change of employment.

5.5.1 Training Techniques

a) Lectures

This technique should be applied when it is required to transfer information in local language to a large contractor workforce with controlled content and time.

b) Case Study

This is an effective technique based on the presentation of case of real events by Trainer to highlight probable causes like Human Error, ignorance about the job etc.

c) Videos

Videos, an effective technique of communication, should be used to display the right techniques of performing a task in a safe manner and hazards associated with a job.

d) Demonstration at site

Right way to do a job should invariably be demonstrated to workers at the site itself. The right way is also a safe way. Hazards due to wrong procedures, short cuts and their adverse effects etc. should also be highlighted.

5.5.2 Training/Awareness Module and Frequency

A. General Safety Training to all categories of contractor employees should be imparted before induction and annually thereafter. No person should be allowed to enter the installation without undergoing this training. This training program should cover:

i) Mandatory uses of PPE like Cotton clothes, Helmet, Safety Shoes, Full Body Safety harness, dust masks, safety goggles, etc.

ii) Probable Hazards related to industry

iii) Job specific hazards

iv) Important Telephone No / Escape route

v) First Aid

vi) Use of Fire extinguisher

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vii) Location of assembly points

viii) Procedure of calling fire crew in case of any emergency

ix) Wind direction

The contractor workers, if engaged in operation of the plants/facilities, should be trained in line with Clause No. 4.6 of OISD-GDN-206 on "Safety Management System". For other categories of contractor workers, training modules for different category employees are as follows:

B. Contractor Supervisor

Contractor Supervisor should be trained in accordance with the provision of clause no. 5.1.1.2, 5.2.7, 5.3.10, 5.6.12 and 5.7.8 of OISD-STD-154 on 'Safety Aspects in Functional Training'

C. Contractor Worker

Yearly training programme should be carried out for contractor worker and the records should be maintained. The training programme should cover at least the following:

i) Worker responsibility for safety of himself and work area.

ii) Associated hazards with the job and job area including electrical shock hazards.

iii) Importance of First Aid fire fighting equipment, their use & operations

iv) Communication system at the installation

v) Fire / Accident Reporting procedure

vi) General Safety rules

vii) Safety Measures during execution of job such as:

- Welding / Cutting / Grinding
- Working at height
- Confined space entry
- X ray / radiation
- Erection / Dismantling of scaffolding
- Tank construction and repairs
- Handling of chemicals etc.
- Hydrojetting
- Leak testing of pipelines and equipment (hydro and pneumatic testing)
- Grit / other methods of blasting for surface preparation blasting etc.
- Chemical cleaning & pickling
- Catalyst loading & storage
- ELCB

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viii) Importance & use of PPE

ix) Emergency Routes

x) Assembly Points

xi) Job Specific Training

D. Consultant / Contractor

Awareness program should be carried out for demarketed Consultant / Contractor at the time of induction. This program should cover at least the following:

i) Responsibility of contractor for safety of their personnel and work area

ii) Hazardous property of Petroleum products and chemical used

iii) Communication system

iv) Fire / Accident Reporting procedure

v) Medical facility available

vi) Statutory requirements

vii) Importance of First Aid equipment and required at the site

viii) Work Permit system

ix) Direct/ Indirect losses due to accident

x) Safety Measures while executing the jobs such as:

- Welding / Cutting / Grinding
- Working at height
- Confined space entry
- X ray / radiation
- Erection / Dismantling of scaffolding
- Tank construction and repairs
- Handling of chemicals etc.
- electrical jobs
- Hydrojetting
- Leak testing of pipelines and equipment (hydro and pneumatic testing)
- Grit / other methods of blasting for surface preparation blasting etc.
- Chemical cleaning & pickling
- Catalyst loading & storage
- ELCB

xi) Safety training needs of their supervisors and workers

xii) Importance & Use of PPE at the site

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xiii) General Safety rules at the installation –

General points:

Workers should not be allowed to take meals or take rest inside the construction / plant area.

E Security Personnel

Training program should be carried out for Security personnel at the time of induction and annually thereafter and the records should be maintained. The training program should cover at least the following:

i) Layout of Plant and Facilities
ii) Vulnerable locations
iii) Safety regulations (Statutory and in company)
iv) Fire Protection Facilities and Locations
v) Role in case of Fire / Disaster
vi) Emergency Procedure and Drills
vii) Industrial First Aid
viii) Use of Personnel Protective Equipment
ix) Disaster Management Plan

5.6 INSPECTION / AUDIT

Inspection / Audit is a tool to evaluate compliance of all safety requirements. Most of the information could be gathered through site inspection using ready-made check lists to ensure that contractors / agencies abide by the safety rules and norms while working at operating / construction sites.

A checklist, while carrying out different type of jobs, should be developed based on hazards associated with the job being performed and requirements as per OISD-GDN-192 on "Safety Practices during Construction". Typical format is enclosed at Annexure II, which should be modified to suit the requirement of the site / job to be done.

Before starting the work and at regular intervals thereafter, Contractor's Supervisor/safety Officer and Owner's representative / Engineer-in charge/safety Officer should inspect as per the checklist so prepared to ensure that contractor has prepared to start the work with all safety precaution required for safe execution of job.

5.7 FINANCIAL DETERRENTS FOR NON-COMPLIANCE OF SAFETY RULES/ PROCEDURES

Financial or other type of penalties like seizure of gate passes, stoppage of work for a limited period etc. should be levied on the contractors or their workers for non-compliance of safety rules. A provision of suitable accident severity based penalty clause for contractor should be incorporated to ensure adherence of systems and procedures.

The financial deterrent clauses shall be included in the general terms and conditions of the contract. The violators of the clauses shall be suitably punished. Following list shall be taken as a guide while preparing the financial deterrent clauses but need not be limited to these conditions only.

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A few of the usual non-compliance are as follows:

I. Working without valid work permit/ Violation of any of the conditions specified in the permit.

II. Throwing up/down any material from height or not making proper provision to bring down material safely from height

III. Non standard/unsafe platform/ladder, Non standard/unsafe Scaffolding

IV. Non-usage of PPEs like Safety helmet / Safety shoes / Safety goggles / Welding Shield / Respiratory protection etc. by the contractor personnel

V. Non use of ELCB , using poor joints of cable, using naked wire without top plug into the socket, laying wire/cables on the roads without sleeve.

VI. Carrying out electrical jobs by un-authorised person

VII. Non deployment of the licensed electricians for electrical job.

VIII. Unsatisfactory fencing / barricading of excavated areas, Not providing proper shoring /strutting /proper slope and Not keeping the excavated earth at least one meter away from excavated area

IX. Over speeding of vehicles, rash driving, wrong side parking & parking in front of any fire-fighting equipment.

X. Riding on material handling vehicles or trolleys or hydra.

XI. Non-deployment of safety supervisor / supervisor responsible for safety at work site

XII. Failure to maintain safety register and record by Contractor Safety Supervisor or Supervisor responsible for safety.

XIII. Acting in contravention to any of the provision mentioned in Factories Act 1948 and/or the rules framed there under including all amendments thereto.

XIV. Failure to furnish a first information report (FIR) as per prescribed Pro-Forma within 4 hours of the incident.

XV. Keep and maintain proper records of all incidents occurred at work site.

XVI. Working beyond statutory limits by contractor's workers.

XVII. Deployment of child or adolescent labour.

XVIII. Use of untested and uncertified pressure vessel. Use of untested and uncertified lifting tools/tackle.

XIX. Unsafe handling of compressed gas cylinders No trolley or jubilee clips or double gauge regulator or flash back arrestor on both gas lines & both ends or improper storage / handling or cylinders without caps when not in

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use/damaged hoses). Keeping compressed gas cylinders in horizontal position.

XX. Transporting metallic items below overhead lines, without isolation.

XXI. Damage to fire equipment like hydrant & monitors, fire extinguishers including non return of fire equipment

XXII. Horseplay at work site.

XXIII. Non-provision of basic safety requirement such as 24 V lamp for working in confined space, uncertified / non standard lifting tools, earth leakage protection & earthing connections for electrical appliances as per Indian Electricity Rules, emergency isolation switches etc.

XXIV. Keeping gas cylinders inside the confined spaces.

XXV. Non-usage of the full body safety harness and fall back arrester with life line properly anchored by the workers while working at height

XXVI. Violation of Safety Permit conditions like Firefighting equipment.

XXVII. Non-barricading of area while rigging, digging etc.

XXVIII. Working without valid work permit.

XXIX. Un-authorised road closure/blockage.

XXX. Not clearing the work site on regular basis.

XXXI. Leaving contractor owned leftover material at site at the time of demobilization.

5.7.1 REWARDS AND RECOGNITIONS

The contract employees should be suitably rewarded as per a scheme, with monetary benefits/ prizes for timely reporting of the Near miss incidents/ Unsafe conditions/ Unsafe Acts based on the accident potential if it could have occurred.

The compliance to safety procedures by the contractors shall be evaluated annually as per the scheme based on different leading and lagging indicators and shall be awarded during the safety week celebrations.

The best safety conscious worker as recommended by the safety officers of different contractors during short term jobs such as the turnaround maintenance activities shall be suitably rewarded for motivating the workers to comply with safety requirements.

The best safety officer/supervisors of the contractor shall be recognized and shall be suitably rewarded during the safety week celebrations.

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5.8 INCIDENT REPORTING AND INVESTIGATION SYSTEM

All the incidents including near-miss should be reported immediately by contractor's Supervisor to Contractor and owner's Supervisor / Engineer-in-charge, who should inform to Owner's Safety Officer and owner's Management. Owner's Safety Department will be required for onward reporting as per OISD, Statutory requirements.

All accidents regardless of the extent of injury or damage should be investigated in order to find probable causes, lessons learnt thereof and remedial measures required to prevent its recurrence.

The incident investigation should be done as per provision of clause no. 4.12 of OISD-GDN-206 on 'Safety Management System'.

All the recommendations of investigation / Enquiry Report need to be monitored closely for its implementation. A proper record should be maintained to ensure implementation of all the recommendations and same should be reviewed from time to time.

5.9 SAFETY COMMITTEE MEETINGS

Following three type of safety committee meetings should be held aiming at raising the level of safety consciousness at the site:

5.9.1 Toolbox meeting

To maintain awareness, update training and convey important safety and health information, contractor supervisors should conduct tool box meetings at least weekly and also prior to start of any work. All the contractor workers should attend this meeting. The owner's supervisor/Engineer-in-charge and safety officers should also attend these meetings on random basis. Tool box meeting should be conducted more frequently depending upon circumstances. Record of the same can be maintained in the following typical format.

TOOL BOX MEETING FORM

A Toolbox Talk is a safety meeting allowing open environment for discussion with the work force. It focuses on safety topics related to the specific job, such as workplace hazards and safe work practices. It is aimed to refresh workers' knowledge, cover last minute safety checks, to raise workers' awareness of specific problems on site. Toolbox Talks are also intended to facilitate health and safety discussions on the job site and promote safety culture. It also helps to remind workers that health and safety are an important part of the working day.

Toolbox talk should be short in duration and conducted at the job site prior to the commencement of a new job or work shift. Toolbox Talks can be used for post-accident communications / accident case study, re-enforcement of safe work practice and pre-task planning etc.

Contractor supervisors should conduct tool box meetings at least weekly and also prior to start of any work. All the contractor workers should attend this meeting. The owner's supervisor/Engineer-in-charge and safety officers should also attend these meetings on

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random basis. Tool box meeting should be conducted more frequently depending upon circumstances.

A toolbox talk should cover following topics;

- Review of the hazards related to job being done. What safety equipment and PPEs should be used? What procedures should be followed?
- Review and analyse recent safety violations— What was the violation? What hazard did it create? What injury could have occurred?
- Review and analyse recent injuries— What happened? Why did it happen? What should have been done?
- Ergonomics and behaviour related tips.
- Importance of PPEs and proper tool for specific jobs.
- Housekeeping

Records of such talks should be maintained. Following information should be included when completing a Toolbox Talk Form:

- Names and signatures of all persons present,
- Topics discussed,

Any job specific training or instructions that have been given in the meeting and who raised the issue or added to the discussion, to show that there has been active consultation with all persons attending the meeting and that all parties have had a chance to raise issues.

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TOOL BOX TALK RECORD

DATE_____ **TIME:**_____ **LOCATION:**_____
DELIVERED BY:_____**WITNESSED B Y:** _____
JOB DISCRIPTION:_____
NAME OF THE CONTRACTOR:_____

Toolbox Talk – Topics / Issues discussed
Other points or issues raised by attendees

NAME	SIGNATURE	NAME	SIGNATURE

5.9.2 Site Safety Committee Meeting

Primary purpose of this safety committee is to enable owner, contractor and workers to work together to monitor the site safety and health plan so as to prevent accidents and improve working condition on site. Its size and membership will depend on the size and nature of job.

The safety committee should include representatives of owner, consultant, contractor identified as safety officer / supervisor. It should be headed by Engineer-in-charge.

The safety committee should have regular and frequent meetings, atleast fortnightly, to discuss the safety and health program on site and to make suggestions for improvement. The meetings should be documented with a time bound action plan. The functions carried out by safety committee should include:

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i) Review compliance of pending items of last Safety meetings. All critical items should be identified and their compliance ensured.

ii) Consideration of the reports of safety personnel.

iii) Discussion of accident/near-miss and illness reports in order to make appropriate recommendation for prevention.

iv) Examination/evaluation of suggestions made by workers.

v) Dissemination of acquired knowledge through training programs and information sharing sessions.

vi) Discussion & review of Fire Prevention & Disaster Management Plan.

vii) To send recommendation to Apex Body for consideration / approvals.

5.9.3 Safety Review Meeting by Location Head

This meeting should be headed by the Location head and attended by Owner's Supervisor / Engineer-in-charge, owner's safety Officer and all concerned department heads. Prime purpose of this review is to ensure that all the recommendations of various committees are being complied with and to take decisions on critical points raised. This meeting should take place at least once in every quarter. All the investigation reports / audit findings with status of implementation of recommendations should be discussed.

5.10 SAFETY EQUIPMENT / PERSONNEL PROTECTIVE EQUIPMENT

The type of safety equipment to be used is decided based on the job requirement. Selection should be made based on OISD-GDN-192, OISD-STD-155 (Part I & II) and the job requirement. Safety equipment / Personnel Protective Equipment (PPE) shall be of approved make. Contractor shall provide necessary training to each employee regarding proper usage and upkeep of PPE including its limitation.

A register showing stock and issue of PPE should be maintained by the contractor at site and must be available for inspection. 10 to 20 % of PPE in excess of actual requirement to meet contingency requirement should be maintained at site.

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REFERENCES

1) OISD-GDN-206 on “Safety Management System”

2) OISD-GDN-192 on “Safety During Construction”

3) OISD-STD-155 Part (I & II) on “Personnel Protective Equipment”

4) Building & Other Construction workers (Regulation of Employment & Condition of Service) Act 1996 & Rules thereof

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ANNEXURE I

LIST OF SAFETY CODES FOR CIVIL WORKS PUBLISHED BY BUREAU OF INDIAN STANDARDS

Sl.no.	Code No.	Title
1	IS: 818	Code of Practice for Safety and Health Requirements in Electric and Gas Welding and Cutting Operations – First Revision.
2	IS: 875	Code of practice for Structural safety of buildings: Masonry walls
3	IS: 933	Specification for Portable Chemical Fire Extinguisher, Foam Type – Second Revision.
4	IS: 1179	Specification for Equipment for Eye and Face Protection during Welding – First Revision
5	IS: 1904	Code of practice for Structural safety of buildings: Shallow foundations
6	IS: 1905	Code of practice for Structural safety of buildings: Masonry walls
7	IS: 1989 – Part II	Leather Safety Boots and shoes for heavy metal industry
8	IS: 2171	Specification for Portable Fire Extinguishers, Dry Powder Type – Second Revision
9	IS: 2361	Specification of Building Grips – First Revision
10	IS: 2750	Specification for Steel Scaffoldings
11	IS: 2925	Specification for Industrial Safety Helmets – First Revision
12	IS: 3016	Code of Practice for Fires Precautions in Welding and Cutting Operations – First Revision
13	IS: 3521	Industrial Safety Belts and harnesses
14	IS: 3696 – Part I	Safety Code for Scaffolds and Ladders: Part I – Scaffolds
15	IS: 3696 – Part II	Safety Code for Scaffolds and Ladders: Part II – Ladders
16	IS: 3764	Safety Code for Excavation Work
17	IS: 4014 – Part I & II	Code of Practice for Steel Tubular Scaffolding
18	IS: 4081	Safety Code for Blasting and Related Drilling Operations
19	IS: 4082	Recommendations on stacking and storage of construction materials at site

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20	IS: 4130	Safety Code for Demolition of Buildings – First Revision
21	IS: 4138	Safety Code for working in compressed air – First Revision
22	IS: 4756	Safety Code for Tunneling works
23	IS: 4912	Safety requirements for Floor and Wall openings, Railings and toe boards – First Revision
24	IS: 5216 – Part I & II	Recommendations on safety procedures and practices in electrical work
25	IS: 5121	Safety code for piling and other deep foundations
26	IS: 5916	Safety Code for Construction involving use of Hot Bituminous materials
27	IS: 6994 – Part I	Specifications for safety gloves: Part I – Leather and Cotton gloves
28	IS: 5983	Specification for Eye Protectors – First Revision
29	IS: 6922	Criteria for safety and design of structures subject to underground blasts
30	IS: 7155	Code of recommended practices for conveyor safety
31	IS: 7205	Safety Code for Erection on Structural Steel Works
32	IS: 7069	Safety Code for Handling and Storage of Building Materials
33	IS: 7293	Safety Code for Working with Construction Machinery
34	IS: 7323	Guidelines for operation of Reservoirs
35	IS: 7969	Safety Code for handling and storage of building materials
36	IS: 8758	Recommendation for Fire Precautionary Measures in construction of Temporary Structures and Pandals
37	IS: 8989	Safety Code for Erection of Concrete Framed Structures
38	IS: 9706	Code of Practices for construction of Arial ropeways for transportation of material
39	IS: 9759	Guidelines for de-watering during construction
40	IS: 9944	Recommendations on safe working load for natural and manmade fibre rope slings
41	IS: 10667	Guide for selection of industrial safety equipment for protection foot and leg

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42	IS: 10291	Safety Code for dress divers in civil engineering works
43	IS: 10386 – Part I	Safety Code for Construction, Operation and Maintenance for River Valley Projects
44	IS: 10386 – Part II	Safety Code for Construction, Operation and Maintenance for River Valley Projects
45	IS: 11057	Code of Practice for Industrial Safety Nets
46	IS: 13415	Code of Practice on safety for Protective barriers in and around building
47	IS: 13416	Recommendations for preventive measures against hazards at working places

Statutory Regulations

Latest Statutory Acts and Rules, as given below, should be referred:-

1. The Petroleum Acts 1934 and Petroleum Rules 2002
2. The Factory Act, 1948 (As amended by Factory Amendment Act 1987) and concerned Factory Rules
3. The Water (Prevention and Control of Pollution) Act 1974 & Rules 1975
4. The Environment (Protection) Act 1986 and rules thereunder
5. The Manufacturing, Storage and Import of Hazardous Rules 1989
6. The Hazardous Wastes Management (Management & Handling) Rules 1989
7. The Indian Electricity Act 1901 and Rules 1956
8. The Indian Explosive Acts, 1884 & The Indian Explosive Rules 1983
9. The Gas Cylinder Rules 1981and the static & Mobile Pressure Vessels (Unfired) Rules 1981
10. The Indian Boiler Act 1923 and Regulations 1950
11. The Public Liability Act 1991 as amended in 1992
12. The Motor Vehicle act 1988 and Central Motor Vehicle rules 1989
13. Building & Other Construction workers (Regulation of Employment & Condition of Service) Act 1996

In addition to above, various other statutory acts like EPF, ESIS, Minimum wage act and other local statutory requirements shall also be complied with.

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ANNEXURE II

CHECK LIST FOR SAFETY INSPECTION / AUDIT

Job _____ Location _____ Date of Audit_____Frequency _____

Inspected by _____ Contractor (s) _____

Sl.no.	ITEM	YES	NO	NA	REMARKS / ACTION
1.0	**PERSONNEL PROTECTIVE EQUIPMENT (PPE):** Are following PPEs being used as per the job requirements?				
A.	**Minimum mandatory PPEs**				
A1	Safety Helmets (with chin strap)				
A2	Safety Shoes				
A3	Safety Goggles				
A4	Safety hand gloves				
B.	**Job specific PPEs**				
	Whether need of specialised safety PPE identified and documented?				
B1	Full body safety harness with double lanyard				
B2	Fall arrester				
B3	Ear Plug / Ear Muff				
B4	Gum Boots				
B5	Face shield				
B6	Shot/Grit/Slag blasting hood				
B7	Breathing Apparatus				
B8	Gas Filter Mask / Dust Mask				
B9	Hand Gloves (Chemical/ Welding/ Electrical/ anti-vibration/ High temperature/ cold burn etc.)				
B10	Boiler Suit / Fire-retardant suit / Electrical flash fire retardant suit /High pressure water cleaning (Hydrojetting-Turtle) suit /				

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	Chemical suit / Low temperature suit etc.				
B11	Others				
C.	Whether workers are trained / briefed to use the PPEs?				
D.	Whether system of checking the quality / quantity of PPEs provided by contractor exists and in practice?				
E.	Whether as per contract the contractor is obliged to arrange the required PPEs to its workmen and the same is being complied with ?				
2.0	**HOUSE KEEPING**				
2.1	Whether Standards of housekeeping are defined in contract and housekeeping is being maintained accordingly?				
2.2	Whether areas are identified and marked for stacking of material like scrap, pipes, plates, cement, sand, loose excavated material etc.?				
2.3	Whether surplus excavated material, debris and scrap material is being removed and disposed on regular basis as per contract?				
2.4	Whether path ways, roads, stairs etc. in the vicinity of work place are maintained free from obstructions?				
2.5	Whether appropriate actions are taken to avoid the slippery area due to water logging / oil spillage?				
2.6	Whether system for collecting and disposal of small size scraps like welding buds, small size metal pieces, insulation material in place.				
2.7	Whether area is maintained free from vegetation, garbage etc. and the work place is kept clean and free of any hazard?				
2.8	Others				
3.0	**EXCAVATION**				
3.1	Whether detailed plan of excavation including soil stability is made and approved by competent authority?				
3.2	Whether excavation hot work permit is taken?				

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3.3	Whether the workplace is thoroughly inspected before issuance of work permit, as stipulated in OISD-STD-105?				
3.4	Whether special conditions mentioned in the permit are clearly explained to the supervisor and in turn to the contractor workers and documented?				
3.5	Whether proper shoring for the excavation is provided to prevent cave-in for side of slope more than the safe angle of repose (generally around 45 degrees) of the soil being excavated?				
3.6	Whether proper precautions have been taken if the excavation is adjoining to heavy structure like building, street and roadways?				
3.7	While excavating whether proper slope usually 45^0 & suitable benches of 0.5 m width at each 1.5 m depth are provided?				
3.8	Whether barricading of 1m height with glowing caution board is provided for excavation beyond 1.5m depth?				
3.9	Whether excavating earth is placed beyond 1m or depth of the excavation whichever is more, from the edge of the trench?				
3.10	Whether heavy vehicle movement is restricted to come too close (minimum 2 M from the edge of excavation) to the excavating area?				
3.11	Whether adequately anchored stop blocks and barriers are provided to prevent vehicles being driven into the excavation? Heavy vehicles should not be allowed near the excavation unless the support work has been specially designed to permit it.				
3.12	Whether necessary precaution is taken for underground pipes, sewers, cables by contractors?				
3.13	Whether extra precaution is taken for bailing out water properly while excavating?				
3.14	During rains whether the excavation is				

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	done with extra precaution to prevent caving in?				
3.15	Whether two separate entry/ exit points with necessary ladders / steps, as per requirement, have been provided?				
3.16	Whether required no. of persons are available (as per OISD-STD-105) at all the time to communicate any hazards noticed with workers working in deep trenches or excavation?				
3.17	Whether necessary precautions like regular gas testing are being taken in areas having hydrocarbons and toxic gases so that no gas accumulation takes place in the trenches.				
3.18	Whether IS: 4081-1986 & Indian Explosive act & rules for storage, handling & carrying of explosive material and execution of blasting operation is followed?				
3.19	Whether in case of mechanised excavation, caution board is provided for do's and don'ts like 'Nobody to enter' within one meter of the extreme reach?				
3.20	Whether the following observations are being documented during excavation work and corrective actions taken :- a) Boulder formation encountered b) Collapsing / development of cracks of sides c) Marked damage to support d) Unexpected fall of ground e) Inspection of site after each blast. f) Water logging g) Unexpected utility/cabling				
3.21	Others				
4.0	**PERMITS**				
4.1	Whether valid work permit is issued in compliance to OISD-STD-105 to start any work?				
4.2	Whether before issuing the permit, JSA carried out and mitigation measures made				

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	part of work permit?				
4.3	Whether personnel working at site were given tool box talk about the hazards and emergency procedure with important do's and don'ts and record maintained?				
4.4	Whether all conditions of the permit are fulfilled before starting the job?				
4.5	As noted in the permit, whether compliance of all the recommendations are ensured during entire duration of the job?				
4.6	Whether permits are available at work site all the times?				
4.7	Whether hot work permit registered in fire station / designated safety officer?				
4.8	Whether permits are being closed after the completion of job?				
4.9	Others				
5.0	**SAFETY IN CUTTING / WELDING/GRINDING**				
5.1	Whether LPG / Oxygen / Acetylene/ Gas cylinders are kept outside only while working in confined space?				
5.2	Are Acetylene/ O_2 / LPG cylinders kept in upright position with required valve cap and secured at designated places under shed – wet fire retardant clothes ~~gunny bags~~ wrapped around it if the same is under sun at designated place?				
5.3	Check cylinder and cylinder valves for approved quality & any kind of damage?				
5.4	Whether protective valve ~~s~~ caps are kept on cylinders while not in use?				
5.5	Whether proper means and method for transportation of cylinders to avoid dropping and rolling are being adopted / followed?				
5.6	Whether gas cylinders, regulators are				

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	kept away from combustible materials and ~~/~~free from oil and grease?				
5.7	Whether all hoses are of approved quality and found to be free of any damage or crack?				
5.8	Whether oxygen and acetylene cylinders are stored separately at a distance of at least 5 feet from each other and kept under shade as per Gas Cylinder rules 2002?				
5.9	Whether gas cylinders are kept at safe location particularly in case job is being done at different elevations while in use?				
5.10	Whether color coding is being used for easy identification of different type of cylinders and hoses?				
5.11	Whether cylinder keys are available near the cylinder?				
5.12	Whether gas torches with flash back arrestors of approved make are only being used?				
5.13	Whether pressure gauges are in working condition and checked from time to time?				
5.14	Whether welding shields are used while welding?				
5.15	Whether proper earthing for welding machines are provided?				
5.16	Whether power is taken from approved sources (welding receptacles)?				
5.17	Whether welding receptacles are properly grounded?				
5.18	Whether welding cables are maintained in good condition and without any joints/ cuts?				
5.19	Whether to avoid short circuit, welding machines are protected against rain?				
5.20	Whether earth connectors are securely connected to the job and not to the				

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	adjoining pipeline or structure?				
5.21	Whether flame arrestor of DG set is of approved make and quality?				
5.22	Whether 30mA rating ELCB is provided on power supply.				
5.23	Whether separate power supply arrangement is provided for portable oven?				
5.24	Others				
6.0	**ABRASIVE (SHOT/GRIT/SLAG) BLASTING**				
6.1	Whether abrasive blasting is used only after getting approval from competent authority / work permit?				
6.2	Whether air compressor used for abrasive blasting are positioned away from work place?				
6.3	Whether exhaust of the prime mover is directed away from the work place?				
6.4	Whether in case of motor driven compressor, the body of the motor as well as the compressor is properly earthed?				
6.5	Whether line operator of abrasive blasting wear suitable PPEs including mask?				
6.6	Whether adequate measures are adopted to confine dust / flying particles?				
6.7	Whether adequate measures are taken for proper ventilation while the work is done in confined space?				
6.8	Whether the Air receiver vessel of the compressor is pressure tested.				
6.9	Others				
7.0	**SAFETY WHILE WORKING AT HEIGHTS / SCAFFOLDING / LADDERS**				
7.1	Whether work permit is obtained to take up work at height above 2.2 meters?				
7.2	Whether steel pipes scaffoldings are used in unit/off site areas?				

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7.3	Whether provision for suitable platform with all scaffoldings are made? Whether its construction is as per specification with toe board and railing?				
7.4	Whether the area below working at height is cordoned?				
7.5	Whether ISI approved quality and good condition full body safety harness with shock absorber are used while working at heights?				
7.6	Whether life line of full body safety harness with shock absorber is anchored to an independent secured support capable of withstanding load of a falling person?				
7.7	Whether the area around the scaffold is cordoned off to prohibit the entry of unauthorized person?				
7.8	Whether lifeline ropes used are of good condition and adequate strength free of defects?				
7.9	Whether ladder is placed at secured and leveled surface?				
7.10	Whether it is extended 1.0 Meters above the landing point?				
7.11	Whether ladder used are of adequate length and tying short ladder is avoided?				
7.12	Whether metallic ladders are placed away from electrical system?				
7.13	Whether tools or materials are removed after completion of the day's job at heights?				
7.14	Whether a valid permit is obtained before taking up work on asbestos or fragile roof?				
7.15	Whether sufficient precaution like roof ladders, nets, lifeline, full body harness, etc. is taken while working on fragile roof?				

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7.16	Whether provision is made to arrange duck ladder, crawling board for working at fragile roof?				
7.17	Whether scaffolding has been erected on rigid / firm / leveled surfaces only?				
7.18	Whether scaffold has been inspected by competent person & tagged accordingly prior to being put in use?				
7.19	Whether the scaffolding has been designed for the load to be borne?				
7.20	Whether the erection and dismantling of the scaffolding is being done only by trained persons and under competent supervision?				
7.21	Whether safety net with proper working arrangement and life line has been provided?				
7.22	Others				
8.0	**SAFETY IN CONFINED SPACE**				
8.1	Whether positive isolation is done as per approved blind list and crossed checked by competent person?				
8.2	Whether a permit is obtained to enter a confined space?				
8.3	Whether gas test for hydrocarbon, toxic gas, oxygen level is checked for acceptable limits before entering any confined space and recorded? If levels are beyond permissible limit, whether required PPE like BA, Gas Mask are used.				
8.4	Whether adequate oxygen level is ensured in confined space before entering? If not, whether all precaution like using of Breathing Apparatus set is ensured?				
8.5	In case of chance of ingress of hydrocarbon gases / toxic gases, whether Personnel Monitoring System (PMS) is used ?				

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8.6	Whether only in presence of a supervisor, worker enters in confined space?				
8.7	Whether provision of sufficient means of entry and exit is available?				
8.8	Whether provision of ventilation to remove welding fumes, dust, exhaust gases are made?				
8.9	Whether provision of 24V (Hand lamps with cage as per OISD-STD-155) light for working inside space is made?				
8.10	Is it strictly ensured that stand-by trained persons (2 nos.) are standing outside before a person enters a confined space and communication is being maintained all the time with workers working inside?				
8.11	Whether life belt with one end under control of stand-by person outside is kept while working in confined space?				
8.12	Whether Personnel protective Equipment as specified in the permit are in good condition?				
8.13	Whether boxing up is done only as per the approved procedures and under the supervision of competent persons?				
8.14	Whether all the safety precautions listed in OISD-GDN-192 are taken while working in sewers, OWS etc.?				
8.15	Whether proper house keeping is being maintained inside the confined space?				
8.16	Whether training has been provided to workers working in the confined space and the workers only of sound health are being asked to work in the confined space?				
8.17	Others				
9.0	**SAFETY IN MATERIAL HANDLING**				
9.1	Whether all lifting tools, tackles, machines, chains, ropes etc. are of sound construction, made of sound material and				

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	maintained in good condition?				
9.2	Whether lifting tools & tackles are tested as per norms and safe working load, date of testing visibly marked/painted on the equipment?				
9.3	Whether lifting tools, tackles are of adequate strength for the load to be handled?				
9.4	Whether all parts including the working gears fixed or movable of every lifting machine, chain, rope, tackles specify the following condition: a) Thoroughly examined by competent person at least once a year or such interval as required by statutory authority. b) Document of such examination are maintained and produced to owner supervisor before use of particular equipment?				
9.5	Whether chain blocks and cables are inspected before each use to assure their sound condition?				
9.6	Whether hoist and lift, if used are: a) Properly maintained and thoroughly examined by competent authority at least once in every year. b) A register to be maintained to record particulars of such examination in prescribed forms and shall be produced to the owner supervisor before use.				
9.7	Whether area below the movement of boom of crane is cleared to avoid injury from falling objects?				
9.8	In crane handling area whether it is ensured that crew of truck, leave the truck before starting loading / unloading?				
9.9	Whether transporting material from one place to another is done by suitable				

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	means?				
9.10	Whether carrier with sufficient capacity without projecting parts is used for transporting materials?				
9.11	Whether riggers engaged are well trained and conversant with signaling procedures including night signaling if required?				
9.12	Whether permission of authorized person is obtained before working on or near an overhead crane?				
9.13	Whether trained riggers are available all the time along with crane?				
9.14	Whether barricading has been done to ensure no unauthorised person enters in the working area of the crane?				
9.15	Whether lifting (rigging) plan has been prepared and approved before start of the work?				
9.16	Whether route of crane movement has been planned before the crane moves out of the garage?				
9.17	Whether it has been ensured that no electrical cable comes within 3 meters or safe distance from the boom of the crane?				
9.18	Whether boom is being kept in the horizontal position or locked while idling?				
9.19	Whether material is being stacked / destacked in trucks with the help of wedges to ensure no slippage while loading / unloading takes place?				
9.20	Whether the forklift / crane is being operated only by trained / authorized person?				
9.21	Others				
10.0	**ELECTRICAL SAFETY**				
10.1	Has the Electrical Line Clearance				

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	procedure been followed involving electrical and other concerned Dept. and filling of formats?				
	Whether the "LOTO" system is defined properly and all personnel are aware with the procedure?				
	Whether "LOTO" system is being used in all electrical isolation jobs, by all departments?				
10.2	Have Danger Signs with Voltage rating/ Men at work signboards been displayed at both Sub Station as well as the work site?				
10.3	Has the contractor worker understood the electrical circuit on which he is going to work with probable electrical hazards and mitigation measures to be adopted?				
10.4	Whether contractor has engaged electrician (s) having valid electrical license in line with provisions in Indian Electricity Rules?				
10.5	Have all checks prior to switching operation been carried out and authorisation of owner/ user section obtained subsequently?				
10.6	Have all earthing links on electrical conductors removed before charging the line/ apparatus?				
10.7	Are PPE as prescribed under Indian Electricity Rules available, kept healthy and being used?				
10.8	Are earthing and bonding arrangement of non-current carrying metallic parts in line with provisions of Indian Electricity Rules – 1956 amended time to time as IS: 3043?				
10.9	Have electrical part of OISD-GDN-192 and Clause No. 9.0 for Temporary installations in OISD-STD-173 been understood and followed wherever applicable?				
10.10	Are flexible wires having voltage of 240 volts above earth potential taken through				

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	PVC conduits?				
10.11	Whether portable hand lamps with a voltage rating of not more than 24 volts used with flameproof enclosures in confined spaces within columns, vessels etc?				
10.12	Have the Switches, MCBs, fuses etc. been inspected for proper ratings?				
10.13	Has Earth Leakage Circuit Breaker (ELCB) been used on the incoming side to protect against leakage of current? Is the device tested every time the work is started?				
10.14	Whether all portable appliances are provided with insulated Three pin plugs and socket arrangement?				
10.15	Whether industrial type extension boards and plug sockets are used?				
10.16	Has the electrical equipment brought to site by contractor been inspected by owner's supervisor/ safety officer for damage/cuts/abrasion etc? Is record of Insulation Resistance, wherever required being kept?				
10.17	Have standard practices for termination of conductors/ cables been followed (e.g. use of proper lugs, crimping tool, cable glands etc)? Is cable armour in continuity from feeding point to load?				
10.18	Are the Contractor supervisor and workmen well acquainted with first aid for electrical shock?				
10.19	Are the wires/ cables identifiable along their route towards the load by using colour coding and/or markers?				
10.20	Others				
11.0	**ROAD WORK**				
11.1	Whether site is barricaded and provided with warning signs including night warning lamps/ self glowing markers at appropriate location for diversion of traffic?				

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11.2	Whether mixing aggregates with bitumen is done with the help of batch mixing plants? If no, whether adequate precautions have been taken?				
11.3	Whether road rollers, bitumen sprayers, pavement finishers are driven by experienced drivers with valid driving licenses?				
11.4	Whether the worker handling hot bitumen sprayers or spreading bitumen aggregate mix or mixing bitumen with aggregate are provided with PVC hood, hand gloves rubber shoes (gum boot) with pegging upto knee joints?				
11.5	Others				
12.0	**FORM WORK, REINFORCEMENT**				
12.1	Whether form work, shuttering, shoring etc. are adequately designed and provided to erect the structure and to support the expected load?				
12.2	Whether staging (support) for shuttering is designed for loads like worker movement, impact load and other incidental loads during construction?				
12.3	Whether workers use PPEs at work site like safety shoes, gloves, helmet with chin strap, goggles and dust masks etc.?				
12.4	Whether all safety procedures are adopted while cutting rod?				
12.5	Whether proper staging and bundling is provided for supplying rods at height?				
12.6	Whether sufficient cross bracings are provided for high staging works as per design requirement?				
12.7	Others				
13.0	**CONCRETING**				
13.1	Whether the concreting area is barricaded?				

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13.2	Whether vibrator hoses, pumping concrete accessories are in healthy condition and mechanically strong?				
13.3	Whether it is ensured that no pipe line in concrete pumping system is attached to any temporary strut such as scaffolds etc.?				
13.4	Whether it is checked that safety guards around moving parts are provided in concrete mixer/ machines?				
13.5	Whether earthing of electrical mixers, vibrator etc. are provided?				
13.6	Whether entry of unauthorised person in the concreting area is restricted?				
13.7	Whether adequate lighting arrangement is made in the concreting area if working during night?				
13.8	Whether PPEs like gum boots, gloves, helmet with chin strap, goggles and dust masks etc. are being used?				
13.9	For overhead or underground work, whether form work and shuttering have been checked with respect to design?				
13.10	Whether boom placers are properly secured?				
13.11	Others				
14.0	**DEMOLISHING (DEMOLISHING BY BLAST NOT CONSIDERED)**				
14.1	Whether an initial survey carried out to identify any structural problems and risks associated with flammable substances and substances hazardous to health?				
14.2	Whether sequence of demolition is formulated and approved by competent person after the survey and recorded in a method statement having taken all the various considerations into account and identifying the problems and their solutions?				
14.3	Are non-sparking tools being used, if required?				

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14.4	Is intermittent clearing operation being done to keep the area reasonably tidy and clean?				
14.5	Whether effective barricading has been provided?				
14.6	Whether Electrical and other facilities like water, oil, gas pipelines, etc. have been isolated / protected?				
14.7	Whether required PPEs like helmet with chin strap, goggles, ear plug/muff, hand gloves, safety shoes, dust mask, etc. used?				
14.8	Others				
15.0	**RADIOGRAPHY**				
15.1	Are safety precautions for handling of source as per guidelines of BARC being followed?				
15.2	Is the potency of the source being used within acceptable limits as per the BARC regulations?				
15.3	Is the area being cordoned with proper signs during radiography as per guidelines of BARC?				
15.4	Does proper place exist as per BARC regulations for storage of source / Personnel safety equipment?				
15.5	Does the radiographer have valid certificate of radiography from competent authority (BARC)?				
15.6	Is radiographer using Exposure Meter / Dosi Meter?				
15.7	Whether minimum occupancy of the premises / workplace is being ensured while radiography is in progress?				
15.8	Is permit system being followed?				
15.9	Whether Radiation Safety Officer is				

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	available at site?				
15.10	Others				
16.0	**ADDITIONAL SAFETY PRECAUTION FOR UNITS WITH HYDROCARBONS**				
16.1	Are jobs being carried out with a valid work permit only as per OISD-STD-105 "Work Permit System".				
16.2	Is smoking prohibited in all places containing combustible or flammable materials and "No Smoking" notices prominently displayed?				
16.3	Are only approved type electrical installations and equipment, including portable lamps, being used?				
16.4	Are oily rags, waste, wooden materials and clothes or other substances liable to spontaneous ignition being removed?				
16.5	Are the combustible materials properly shielded in case same cannot be removed from the area?				
16.6	Has welding screens (like metal/ fire retardant cloth/ water curtain) been put up to protect other equipment / facilities/ OWS cement ceiling/ drains in adjoining areas against flying sparks, as may be required?				
16.7	Is Gas-testing being done with the means of a calibrated Gas detection Meter prior to start of Hot work and being done subsequently at regular intervals as per the requirement and recorded?				
16.8	Are regular inspections being done of places where there are fire risks like in the vicinity of heating appliances, electrical installations and conductors, stores of flammable and combustible materials, welding and cutting operations?				
16.9	Are fire-extinguishing equipment being placed at strategic locations and are kept well maintained and inspected at suitable intervals by a competent person?				

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16.10	Are accesses to fire - extinguishing equipment such as hydrants, portable extinguishers and connections for hoses kept clear at all times?				
16.11	Are all supervisors and a sufficient number of workers trained in the use of fire-extinguishing equipment?				
16.12	Are audio means, to give warning in case of fire provided, audible in all parts of the site where persons are liable to work?				
16.13	Is there an effective evacuation plan in place so that all persons are evacuated speedily without panic?				
16.14	Others				
17.0	**EMERGENCY PROCEDURES**				
17.1	Is signaling / siren system effective?				
17.2	Is arrangement for rescuing affected person adequate?				
17.3	Are signs showing emergency exit route installed?				
17.4	Is emergency exit route clear of obstacles?				
17.5	Is communication system adequate?				
17.6	Whether emergency vehicle with driver has been provided to meet any emergency situation?				
17.7	Does any tie-up with hospitals or local doctors exist?				
17.8	Has the assembly point for workers in case of emergency been identified and earmarked?				
17.9	Has training been provided to a few workers for First Aid?				
17.10	Emergency procedure and telephone numbers are known to all and same are prominently displayed at site? (Sample				

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	compliance check)				
17.11	Whether emergency mock drills are being regularly done?				
17.12	Others				
18.0	**WELFARE FACILITIES**				
18.1	Are hygienic conditions prevailing at labour camps?				
18.2	Are First Aid facilities available?				
18.3	Does proper sanitation exist at site office and labour camps?				
18.4	Does any arrangement of medical facilities like tie ups with nearby hospital exist?				
18.5	Is proper drinking water facility available for workmen & staff?				
18.6	Are crèches provided for children (if applicable)?				
18.7	Is any proper place/canteen/restroom provided for eating food and taking rest?				
18.8	Is any place earmarked for storing / keeping clothing?				
18.9	Is adequate washing facility available?				
18.10	Does proper ventilation at working place exist?				
18.11	Others				
19.0	**GENERAL**				
19.1	Are illumination levels at workplace and passages adequate?				
19.2	Is communication system adequate?				
19.3	Are display and caution boards provided at strategic locations?				
19.4	Are road barriers being used for blocking any roads/passage?				

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19.5	Has the structure been adequately secured against storm/high winds during construction/ erection?				
19.6	Are the equipment properly earthed?				
19.7	Are vehicles being checked like brakes, oil, lights etc. on regular basis?				
19.8	Is compressed air being used only for its intended purpose and not for any other purpose?				
19.9	Are only proper clothes and not loose clothes being used while working around machinery?				
19.10	Are nails or other sharp objects being removed or bent?				
19.11	Are machine guards over moving parts of machinery such as coupling, pulley, wheel etc. installed?				
19.12	Whether after maintenance of machinery the guards are securely fitted before putting into operation?				
19.13	Are working platforms / gangways provided with hand rails & toe guards?				
19.14	Are swing platforms provided with chains & secured adequately when not in use?				
19.15	Are the approaches to work sites being maintained & kept clear of obstacles?				
19.16	Whether engines of equipment entering into the operating area have exhaust and muffler system with approved spark arrestor?				
19.17	Whether vehicles/engine driven equipment, electrical equipment and tools used are certified?				
19.18	Whether contractors inform his workers about hazards and safe procedures?				

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19.19	Whether sufficient care is taken so that spark do not go outside working enclosure & falls below?				
19.20	Whether contractor's qualified / trained supervisor is present?				
19.21	Whether all exhausts of engines are provided with approved type of flame arrestors and exhaust is not facing toward the place where the workers are working?				
19.22	Others				

Signature of the Auditor

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ISSUED AS ANNEXURE-7 to CA-1

TAXES & DUTIES

[ANNEXURE- XXIV TO SPECIAL CONDITIONS OF CONTRACT]

FINANCE INPUTS ON TAXES & DUTIES FOR BARMER REFINERY OF HRRL (B224) ON PMC FOR TENDERs

Date
01/03/2019

A. Price basis w.r.t inclusion/exclusion of taxes

1. The quoted price shall be deemed to be inclusive of all the taxes and duties except 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). Further, prices, taxes, duties including GST on any transaction between contractor and their sub-contractor/sub-supplier shall be included in the total lumpsum price quoted by the contractor.

B. TAX CLAUSES

1. Goods and Services Tax

a. Contractor shall be required to issue tax invoice in accordance with GST act and/or rules. In the event that the contractor fail to provide the invoice in the form and manner prescribed under the GST act read with GST invoicing rules there under, Owner shall not be liable to make any payment on account of GST against such invoice.

b. GST shall be paid against receipt of tax invoice and proof of payment of GST to Government (or auto-population of input tax credit on GSTIN portal). In case of non-receipt of tax invoice and/or non-payment of GST by the contractor (or non-auto-population of input tax credit on GSTIN portal), owner shall withhold the payment of GST.

c. GST payable under reverse charge for specified services/goods under GST act or rules, if any shall not be paid to the contractor but will be directly deposited to the government by owner.

d. Where Owner has the obligation to discharge GST liability under reverse charge mechanism and Owner has paid or is liable to pay GST to the Government on which interest/penalty becomes payable as per GST law for any reason which is not attributable to Owner or Input Tax Credit w.r.t. such payment is not available to Owner for any reason which is not attributable to owner, then owner shall be entitled to deduct / set off /recover such amount against any amounts paid/payable by owner to contractor.

e. The contractor shall always comply with the requirements of applicable laws and provide necessary documents as prescribed under the rules and regulations, as applicable from time to time. In particular, if any tax credit, refund or any other benefit Is denied/delayed to Owner due to any non-compliance/ delayed compliance by the contractor under the GST act (including but not limited to failure to upload the details of the sale on GSTN portal, failure to pay GST to the government or due to non-furnishing or furnishing of incorrect or incomplete documents, non-filing of GST return by the bidder), the contractor shall be liable to reimburse Owner for all such losses and other consequences including but not limited to the tax loss, interest and penalty. Owner shall be entitled to recover such amount from the contractor by way of adjustment from the next invoice, encashment of PBG or by way of any other means.

f. TDS under GST, as applicable shall be deducted from contractors bills at applicable rates and a certificate as per rules for tax so deducted shall be provided to contractor.

g. The contractor will be under obligation for charging correct rate of tax as prescribed under the respective tax laws. Further the contractor shall avail and pass on benefits of all exemptions/concessions available under tax laws.

h. The contractor will be liable to ensure to have registered with the respective tax authorities and to submit self-attested copy of such registration certificates and the contractor will be responsible for procurement of material in its own registration (GSTIN).

i. In case bidder is covered under composition scheme under GST law, then bidder shall quote the price inclusive of GST. Further, such bidder should mention "cover under composition system" in column for GST of price schedule. In case, subsequently such contractor gets covered under regular GST regime, the price including GST under regular GST regime shall not exceed the price quoted by the bidder under composition scheme.

j. Bidders will be required to quote applicable tax rate (along with applicable SAC/ HSN Code) as per provisions of GST law.Any higher rate of tax actually invoiced in excess of quoted rate of tax (except in compliance with provisions of Statutory Variation clause) shall be adjusted in price.

k. It shall be the responsibility of contractor to obtain e-way bill in case of movement of goods exceeding limit as prescribed under the GST Act except in case of direct imports by Owner. Contractor would indemnify Owner in case of any non-compliance or default or due to lack of diligence on the part of the contractor to comply with the e-way bill requirements.

l. GST shall be paid in Indian rupees only. For reimbursement of taxes & duties the currency exchange rate as mentioned in GST Invoice shall be considered.

m. In case of Price Adjustment for delay in Completion applicable as per contract appropriate Debit Note/Credit Note shall be issued by owner/contractor as per GST laws.

2. IMPORT DUTIES

a. HRRL is eligible to avail concessional Customs Duty @ 5% under CTH 98.01 in terms of S.No 409 of Notification 50/2017 for goods specified in list 13 required for setting up crude refinery petroleum refinery – Customs dated 30th June 2017. The Project rate import duty benefit will be utilized for imported finished Goods/ Materials. Bidders are required to furnish the details like Description, Customs Tariff Code (HSN code), value, quantity, country of origin, currency, port of discharge etc.

b. Contractor shall be responsible for payment of customs duties (Basic Customs Duty as well as any other duties of Customs), Social Welfare Surcharge, IGST and GST Compensation Cess, if any for imports for the purpose of permanent incorporation in the works, in line with concessional

Customs Duty rate Scheme or any other applicable Scheme in force for the project.

c. In case of withdrawal of / modification in scheme, on a date after Price bid submission date, if Customs duties become payable more than the Project Import Duty @ 5% under CTH 98.01 the same shall be reimbursed by Owner at applicable rates as notified under the scheme provided that the goods have been procured within time allowed.

d. The Contractor shall pay the Customs Duties and all other duties/taxes/cess/surcharge applicable on the material imported for the purpose of permanent incorporation in the works. The contractor shall be fully responsible for Port and Customs clearance including stevedoring, handling, unloading, loading and storage and for satisfying all Port and Customs formalities for the clearance of the goods, including preparation of the Bill(s) of Entry and other documents required for import and/or clearance of the goods. The contractor shall also be fully responsible for any delays, penalties, demurrages, shortages and other charges and losses, if any, in this regard. The customs duties, Social Welfare Surcharge and other import duties payable on the CIF value of materials imported and IGST& Compensation Cess, if any, payable calculated on the CIF value and Customs Duties, and Social Welfare Surcharge taken together for the purpose of permanent incorporation in the work shall be paid directly by the contractor and are included in price of supplies. However, for arriving at CIF value for the payment of Customs Duties, valuation shall be as per prevailing Custom rules.

e. The contractor shall appoint a Customs House Clearing Agent of good standing and ensure speedy customs clearance.

f. The contractor shall be responsible to register the Import License with Customs Authorities at the Port of Import, and to answer and sort out technical queries (if any) raised by Customs Authorities in regard to any import(s).

g. If Contractor is importing material/equipment under Project Import Scheme, in such case on the completion of the Works/Unit, the contractor shall undertake a reconciliation of the materials imported for permanent incorporation of work and the submission of such a Reconciliation Statement shall be a pre-condition to the release of any payment against the Final Bill and/or release of any bank guarantee furnished by way of security deposit to the Owner.

h. Contractor's Lumpsum prices shall be inclusive of Basic Customs Duty and other Customs related duties, Social Welfare Surcharge, IGST, GST Compensation Cess, if any etc. Details of Built-in CIF Import content (Imported in the name of Contractor) shall be submitted in the respective SP Form.

i. Barmer Refinery project is eligible for concessional rate of Basic Customs duty considering Project Import Rate i.e. 5% under CTH 98.01 & Project Import Regulations, 1986.

j. Owner will be providing Essentiality Certificate from Sponsoring Authority to the Contractor for registering the contracts with Customs authorities under Project Import Regulations. The Owner responsibility shall be limited to providing Essentiality certificate from Sponsoring Authority only. All other procedures/formalities shall be done by Contractor on their Own. In order to issue Essentiality Certificate by Owner to contractor, the contractor shall furnish in advance all necessary information/documentation / contract / purchase order including documentation / contract / purchase order entered into with the sub – contractors by the contractor, if any required for issuance of Essentiality Certificate and accordingly the benefit of the project rate of custom duty shall also be available to the sub -contractor of the contractor, provided the trail of all the contracts / purchase orders amongst sub – contractor, contractor and project owner is submitted with the sponsoring authority.

k. The Contractor shall be responsible for, and shall exercise due diligence in properly classifying the Goods & Material, undertaking the payment of customs duties, social welfare surcharge, IGST and/or otherwise complying with all Applicable Laws with respect to any import of the Goods & Materials. In case Owner / EIL is exposed to any penal action (interest and/ or penalties) by the customs Authorities for incorrect declaration and/ or valuation of the Goods or Materials by the Contractor, or otherwise on account of any breach of Applicable Laws in the course of the import of the Goods and Materials by Contractor, the Contractor shall indemnify and hold harmless, HRRL/EIL for any and all costs, expenses or losses suffered or incurred by HRRL/EIL in this regard.

l. Based on the Essentiality Certificate provided by Owner, Contractor shall be solely and exclusively liable and responsible to assess on their own whether they can avail benefit of Project Rate of Import on materials/equipment(s) consigned to Contractor/their Sub-contractor.

m. In case of wrong assessment of Customs Duties by contractor, any additional liability towards taxes and duties shall be to Contractor's account. HRRL assumes no liability towards applicability of Project Rate of Import Duty on materials/equipment(s) consigned to Contractor/Sub-Contractor.

n. As the above statutory provisions are frequently reviewed by Government of India (GOI), the contractor is advised to check the latest position in their own interest and HRRL will not bear any responsibilities for any incorrect assessment of statutory levies by the contractor.

o. If for any reason, other than a Change Order, the total CIF Price of imported materials mentioned in respective SP FORM of the Price Schedule are exceeded or any penalty or other charges or higher rate of duty than applicable to relative imports is levied on the Contractor with respect

thereto, the Customs Duties/penalties and other charges or levies, if any, to the extent of the excess levied, shall be to the contractor's account and shall be borne and paid wholly by the contractor.

p. General points:

i. The bidder must ascertain and confirm along with supporting documents in the bid, if any custom duty exemption/waiver is applicable to the products being supplied by him under any CEPA/FTA/multi-lateral/bi-lateral trade agreements between India and bidder's country.

ii. The bidder shall be liable to provide all documentation to ensure availment of the exemption/waiver.

In case the bidder defaults on this due to any reason, whatsoever, he shall be liable to bear the incremental custom duty applicable if any.

iii. Any custom duty applicability on account of any change in the CEPA/FTA/multi-lateral/bi-lateral trade agreement shall be to bidder's account.

iv. Documentation to be furnished for availing the exemption/waiver of custom duty shall be specifically listed in the letter of credit also as a prerequisite for release of payment against shipping documents and this documentation shall necessarily form a part of shipping documents.

3. INCOME TAX

a. Foreign Contractors

Quoted Prices of foreign contractors shall be gross of income tax i.e., inclusive of Indian income tax as per Indian income tax act/rules.

Owner shall deduct tax at source under Indian income tax act/rules while making payments against each invoice for the services in India. Certificate for TDS shall be provided to the contractor.

The employees of such foreign contractor, their sub contractor and assignees are also required to comply with various Direct tax laws of India, as applicable.

Withholding tax/tax deductible at source is applicable to all payments to be made to the contractor. Withholding/deduction is required to be made at the rates specified in the Indian Income Tax Act. However, in case of non-resident contractors, lower of the rate of withholding tax as available in the relevant **Double Taxation Avoidance Convention or Agreements (DTAA)** as notified or amended from time to time as compared to the rate applicable as per relevant Finance Act will be applicable subject to certain specified documentary compliances. Therefore, it is incumbent upon the Contractor to decide and declare whether it intends to take benefits of lower rate of Withholding Tax and commit to provide necessary documents. As per extant provisions of Income Tax Act and Rules made there under following documents are mandatory for this purpose :

(a) Tax Residency Certificate (TRC) issued by the competent authority of the country of residence of the Contractor
(b) Form 10F as described in Income Tax Rules, 1962 and
(c) A declaration in specified format in lieu of Permanent Account Number (PAN).

Failing to provide above, the payment to contractor shall be subject to additional TDS as per the provisions of Indian income tax act/rules.

b. Indian Resident Contractors

Quoted Prices of Indian Contractors shall be inclusive of income taxes per Indian income tax act/rules.

Tax shall be deducted at source by owner on all sums due in accordance with the provisions of Indian income tax act/rules as in force at the relevant point of time.

Owner shall issue a tax deduction certificate to the bidder evidencing the tax deducted or withheld and deposited by owner on payments made to the bidder to enable the bidder to claim the credit of Tax deducted by owner.

c. General Points

i. The Contractor shall also be responsible for ensuring compliance with all provisions of the direct tax laws of India including, but not limited to, the filing of appropriate Returns and shall promptly provide all information required by the Owner for discharging any of its responsibilities under such laws in relation to or arising out of the contract. For the lapses, if any, on the part of the contractor and consequential penal action taken by the Income Tax department, the Owner shall not take any responsibility whether financial or otherwise.

ii. The Indian Income Tax Act and rules made there under contains provisions permitting deduction of tax at a lesser rate if the contractor is able to justify to the Income Tax Authorities such lesser rate of deduction. However, a deduction once made has to be deposited by the Owner with the Income Tax Authorities in India and will not be adjustable by the Owner. It is therefore in the interest of the contractor that prior to release of any payment due to the contractor under the Contract that the contractor obtains, from the relevant Income Tax Authorities in India, a certificate specifying the rate of deduction/withholding of Income Tax at source, failing which, payment to the contractor shall be made by the Owner after Withholding/deduction at the highest rate as may be applicable to the non-resident contractors as per Provisions of Income Tax Act, 1961.

iii. In addition, the contractor shall be responsible for payment of all Indian duties, levies, and taxes assessable against the contractor or contractor's employees or Sub-contractor's whether corporate or personal or applicable in respect of property.

C. INVOICING METHODOLOGY W.R.T. TAXATION

Contractor shall bring material at site in their own name and Contractor shall be consignee. Invoice shall be raised by Contractor in the name of Owner.

D. APPLICABILITY OF TAX CREDIT

The percent of GST input credit available to owner is **39.77%.**

E. EVALUATION METHODOLOGY W.R.T. TAXES

Following shall be loaded for evaluation:

GST Loading:

a. Output GST quoted by the Contractor shall be loaded for Price Bid Evaluation wherever Input Tax Credit is not available to Owner for goods and/ or services not eligible for Input Tax Credit as per Section 17(5) of CGST Act.

b. **60.23%** of Output GST quoted by the Contractor shall be loaded for Price Bid Evaluation in all other cases.

c. Cess under GST, if quoted, shall also be loaded for Price Bid Evaluation.

F. TAXATION TERMS FOR INDIAN SOURCED SUPPLIES (Applicable in case of foreign bidder)

Shall be the same as applicable for Indian bidders.

G. TAX IMPLICATION WHERE FABRICATION YARD IS OUTSIDE THE REFINERY PREMISES, WHEREVER APPLICABLE

Since contractors shall bring material in their own name and raise invoice to owner (as per payment milestone achieved) after charging CGST/SGST, location of fabrication yard whether inside or outside refinery will not attract any additional liability.

Where owner issues Free Issue Material (FIM) to contractors, material will be released against delivery challan and such FIM shall be received back in refinery premises as per provision of GST.

H. TAX INDEMNITY

Any errors of interpretation of applicability of taxes and duties by the contractor shall be on contractor's account.

I. STATUTORY VARIATION

No variation on account of taxes and duties, statutory or otherwise, shall be payable to Contractor except for the following:

1. If after the due date of submission of last price bid and upto the contractual delivery period (including extended contractual delivery period for the reasons attributable to Owner or due to Force Majeure condition), any increase/decrease occurs in the applicable rate of GST or introduction of any new taxes/ levies pursuant to this contract, the variation in such GST or such new levy shall be to owner's account and shall be adjusted (increase / decrease) to / from the vendor's invoices based on the documentary evidence.

   Any increase in GST or introduction of any new taxes/ levies pursuant to this contract after the contractual delivery period (including extended contractual delivery period for the reasons attributable to Owner or due to Force Majeure condition) shall be to vendor's account. However, any decrease in the rate of GST shall be passed on to owner.

2. Basic Custom Duty & Social Welfare Surcharge: If after the due date of submission of last price bid and upto the 90% of contractual completion period (including extended contractual completion period for the reasons attributable to Owner or due to Force Majeure condition), any increase/decrease occurs in the applicable rate of Basic Customs Duty & Social Welfare Surcharge on materials imported, the variation in such Basic Customs duty & Social welfare surcharge shall be to owner's account and shall be adjusted (increase/decrease) to/from the Contractor's invoices based on the documentary evidence.

   Any increase in Basic Customs Duty & Social Welfare Surcharge on materials imported after the 90% of the contractual time for completion / extended Time for Completion (due to reasons attributable to Owner or due to Force Majeure) shall be to Contractor's account. However, any decrease in the rate of Basic Customs Duty & Social Welfare Surcharge on materials imported shall be passed on to owner.

   For calculating Statutory Variations ceiling amount as declared by the Bidder in price schedule shall only be considered.

   Any statutory variation shall not be payable on the custom and custom related duties for imported materials/equipments for which import has been carried out on Merit rate of Custom duty.

   Note: Statutory variations on IGST (included in quoted prices) in case of imported materials from outside India in Contractor's name shall be to Contractor account.

ISSUED AS ANNEXURE-8 to CA-1

LAND, POWER, WATER AND OTHER FACILITIES

[ANNEXURE- XXVI TO SPECIAL CONDITIONS OF CONTRACT]

Annexure-XXVI TO SCC

LAND, POWER, WATER AND OTHER FACILITIES

1.1 Land for Construction, fabrication, site office and Warehouse shall be provided FREE OF COST by Owner within HRRL's Project site as per Instruction of Engineer In-Charge based on assessment of quantum of work. Land shall not be provided for Labour colony. The CONTRACTOR shall be responsible to arrange at his own cost and initiation within the scope of work, all facilities necessary for performance of the work including (but not limited to) water, power, transportation, handling and construction equipment, vehicles, vessels etc. If contractor need more land than Engineer In-Charge assessment at or around the job site(s) required for the CONTRACTOR's field office(s), camps, godowns, workshops and residential accommodation for CONTRACTOR's staff, Labour colony, quarry rights, borrow areas and access roads to or around the job site(s) and CONTRACTOR's offices, camps, godowns, workshops, accommodations, and temporary works and facilities whatsoever shall arrange at their cost.

1.2 The OWNER does not warranty or undertake the provisions of any facility aforesaid or otherwise whatsoever to the CONTRACTOR or assistance in obtaining, procuring the same or other assistance whatsoever for or in the performance or testing the work(s) and the CONTRACTOR shall not imply by conduct, expression or assurance or by any other means any promise or obligation on the part of the OWNER contrary to the provisions hereof, and any such promise or obligation understood by the CONTRACTOR shall not be binding upon the OWNER.

1.3 Any assistance which the OWNER renders to the CONTRACTOR, in terms hereof or otherwise relative to the work by provision of any facility, water, power, transportation, tools, vessels, vehicles, construction and/or testing equipment and machinery, provision of land for quarries or borrow areas or for CONTRACTOR's Office, godown(s), workshop(s) or accommodations and/or access road(s) or otherwise howsoever in the performance or testing of the work(s), shall be, without any attendant obligation upon the OWNER or liability on the OWNER for any failure, omission, delay or refusal in providing or continuing to provide the same, and shall not for any cause afford a basis of defence to the CONTRACTOR for any breach by the CONTRACTOR of any of his obligations under the Contract or a ground for extension of time for completion.

1.4 After the completion of the works, certain areas shall be declared as Restricted Areas by the OWNER. If the CONTRACTOR is still in location or occupation of any such Restricted Area, the CONTRACTOR shall vacate the same forthwith on being required to do so by the OWNER, and meanwhile shall at all times comply with and ensure strict compliance with all regulations as the OWNER may from time to time issue with reference to such Restricted Area(s).

1.5 The CONTRACTOR shall, at his own costs and initiative, on completion or prior determination of work or otherwise during execution of the work, if required by the Engineer- in-Charge because of hindrance caused thereby or for any other cause, forthwith remove or re-route the distribution lines, installations and/or works or part(s) thereof, as the case may be required to be removed or re-routed.

1.6 **POWER**

1.6.1 Without prejudice the provisions of **clause No. 1.1 to 1.5 above**, **subject to availability, construction power shall be supplied by OWNER on chargeable basis at single point** near the battery limit through Compact Sub-station (CSS), approx. distance from CSS will be 500 Mtr. All onward power distribution from the locations of issue (i.e.CSS) of power shall be by the CONTRACTOR. However, non-availability of construction power due to delay in commissioning of OWNER's construction power system or due to any other reasons shall not entitle the CONTRACTOR for any claim on OWNER on account of time and cost implications. Contractor shall make his own back-up arrangement for continuous power supply.

1.6.2 The **cost of power supply** shall be recovered by the OWNER every month at the rate of **Rs. 12.5 per KW Hour** (without prejudice to any other mode of recovery available to the OWNER) by deduction from the CONTRACTOR's bills along with any applicable Taxes. The energy meter to be installed by the CONTRACTOR shall be tested and certified by State Electricity Board or any other agency approved by the OWNER. The Construction power as above shall be made available to the CONTRACTOR and no time extension or compensation shall be payable on account of grid disturbance. Therefore, the CONTRACTOR shall within the price of services make alternate arrangement to cope with such eventuality. Additional power, if required, to meet the contractual requirements, shall be arranged by the CONTRACTOR at its own cost. Contractor shall install Capacitor Bank for improving the Power Factor wherever required."

1.6.3 **No construction power shall be provided outside the Battery Limit of the Plantby the OWNER**. CONTRACTOR shall make his own arrangement for construction power at his own cost for fabrication outside the Battery Limit of the Plant.

1.6.4 The CONTRACTOR shall, at his own costs and initiative, on completion or prior determination of work or otherwise during execution of the work, if required by the Engineer-in-Charge because of hindrance caused thereby or for any other cause, forthwith remove or re-route the distribution lines, installations and/or works or part(s) thereof, as the case may be required to be removed or re-routed.

1.6.5 In the event of failure or defect of meter(s), power charges shall be calculated on the consumption determined by the Engineer-in-Charge (whose decision shall be final both as regards the existence of a defect or failure and as regards the power consumed).

1.6.6 All arrangements for the distribution or power from source and the work relative there to shall be made, performed and/or installed in conformity with Indian Electricity Act and other applicable Laws and Regulations governing the supply and transmission, distribution of electricity and shall be subject to prior approval by the Engineer-in-Charge.

1.6.7 The OWNER may at any time without notice and without specifying any cause, suspend or discontinue power supply as aforesaid to the CONTRACTOR, and such suspension or discontinuance shall not entitle the CONTRACTOR to any compensation or damages or constitute a basis for extension of time for completion.

1.6.8 Power supplied by the OWNER to the CONTRACTOR shall be entirely at the risk of the CONTRACTOR as to the continuity and regularity of supply, maintenance of voltage and adequacy of load and frequency without any warranty by or liability of the OWNER in respect thereof and without entitlement

to the CONTRACTOR for any compensation, damages, extension of time or otherwise on ground of grid disturbances, discontinuance, fluctuation of voltage or inadequacy of load or frequency or any other cause whatsoever.

1.7 **WATER**

1.7.1 **Owner shall provide Water for construction purposes** on chargeable basis @ Rs. 26.62 per M3. However water will be available from Nagnachi at a distance of 50 Km (approx.) from HRRL's Refinery gate. Contractor to arrange water from this point. Water will be available at Construction water reservoir within Refinery complex by 01.01.2020. Contractor shall make his own arrangement for adequate supply, transportation through tankers from Nagnachi, storage and distribution of the same to avoid any stoppage of work till 31.12.2019 after that water will be made available from within Refinery at Construction water reservoir. CONTRACTOR shall make their own arrangement for construction water and cost of the same shall be deemed to be inclusive in the Lumpsum Price.

1.7.2 The CONTRACTOR shall, at CONTRACTOR's own cost and initiative provide suitable pumping installations and piping for the transportation of water to and distribution at the CONTRACTOR's place or work.

1.7.3 Such installations, pipes and other equipment shall be laid out/installed by the CONTRACTOR only with the prior approval of the Engineer-in-Charge so as not to interfere with the layout and progress of the other construction work at the site and access to or about the job site.

1.7.4 The CONTRACTOR shall forth with on completion of the work or earlier determination of the Contract or during the execution of the work(s), if so required by the Engineer-in-Charge, on grounds of hindrance or obstruction caused thereby or other cause whatsoever at his/its own cost and initiative remove or re-route, as the case may be, any installation, pipes and/or other equipment put up or erected by the CONTRACTOR for the transportation and/or distribution of water, and fill any trenches, ditches or other excavations done by the CONTRACTOR for the purpose thereof and restore the site to the same condition in which it was prior to the installation.

1.7.5 **Drinking Water for the contract labour, sub-contractors and employees of the CONTRACTOR shall be in the scope of Contractor**. Owner will not provide Drinking Water and water for other use.

1.7.6 Without prejudice the provisions of clause No. 1.1 to 1.5 above, **the Water Required during Pre-Commissioning, Hydro testing may be provided by OWNER** based on the availability of these utilities on chargeable basis. Further Owner does not guarantee the supply of these utilities and this does not relieve CONTRACTOR of his responsibility in making his own arrangement and for the timely completion of the various works as stipulated.

In case water provided by Owner to contactor, the **Charges of Water shall be** recovered from the LSTK Contractor's bills **along with any applicable Taxes.** Permission for bore well drilling inside the premises shall not be granted. Agency to make water arrangements from indicated water source.

1.8 **LAND FOR FABRICATION YARD & WAREHOUSE FOR MATERIALS**

1.8.1 **LAND PROVIDED BY THE OWNER**

Other than the unit area which is available with the successful bidder, an area of 47,600 Sq.M for fabrication/ warehouse & site office shall be provided to CONTRACTOR by the OWNER.

1.8.2 **LAND ARRANGED BY THE CONTRACTOR**

i. **The additional land as required by CONTRACTOR** shall have to be arranged by the CONTRACTOR within the radius of 20 KM from refinery Site. The land shall be leased/subleased by the CONTRACTOR in their name. Any applicable Taxes shall be borne by the CONTRACTOR and shall be directly paid to concerned authorities. Any claim to OWNER by concerned authorities shall be recovered from the LSTK Contractor's bills. All applicable taxes shall be included in the quoted lumpsum price by the CONTRACTOR.

ii. The land so arranged by the CONTRACTOR to meet their additional requirement needs any development shall be carried out by the Contractor without any Cost to Owner, Contractor shall be responsible for arranging water, power, and security of this land and payment of bills of these utilities.

iii. Material received in the subject area shall be deemed to be received at Project site for availing payment as per Payment Terms Annexure X in clause 3.2.1(ii) & 3.2.1(iii).

iv. Heavy individual Equipment, a list of which shall have been discussed and agreed with the Engineer-in-Charge, may however be delivered at the site of Erection subject to the CONTRACTOR providing necessary advance intimation to the Engineer-in-Charge

v. The CONTRACTOR shall be providing Bank Guarantee against invoices raised by the CONTRACTOR for the services and material receipt outside the refinery premises. Detailed procedure for the same shall be provided to the successful bidder on award of contract.

vi. Contractor shall be responsible for maintaining the terms and condition of agreement of lease during usages of this land and shall be responsible for payment of all utilities including power, water and taxes for usages of land if applicable. In case of any dispute arises during the leased period, the same shall be settled by the CONTRACTOR of their own. The CONTRACTORshall submit proof of payment of taxes, water charges, electricity charges, lease rentals to the land owner, on a periodic basis, at least every 6 months.

vii. CONTRACTOR after leaving the land and handing over the land back to landowner as per the terms of agreement shall be required to submit all clearance certificate as issued by the Land Owner/Municipal authority/ Electricity supplier/Water supplier. Any dues if reported by the Landowner /Municipal authority/ Electricity supplier/Water supplier/tax authorities shall be deducted by CLIENT from the final bill.

And the final payment against this contract shall be released only after obtaining no dues/ no claims from the land owner, and other statutory authorities.

viii. Leased agreement before being signed off with the land owner shall be required to be reviewed by OWNER and shall require concurrence of OWNER.

ix. The CONTRACTOR shall indemnify OWNER and their Consultants for any dispute, claim from any statutory authority or others.

x. The cost of development of such land making suitable for the intended use shall be deemed inclusive in the Lumpsum Price.

xi. No debris shall be permitted to be disposed inside the Refinery premises, all the debris including piling muck shall be disposed off safely meeting statutory requirements outside the Refinery premises by arranging land is in the scope of EPCC contractor.

1.8.3 Notwithstanding anything herein provided, the provisions of clause hereof and related Clauses applicable consequent upon termination of contract, shall apply to any breach by the CONTRACTOR of his obligations, within the provisions of **Clauses 1.4, 1.5, 1.7.4** hereof as to a breach of **clause 40.5 of SCC**.

1.8.4 **LAND FOR SITE OFFICE AND RESIDENTIAL ACCOMMODATION**

i. No land shall be provided by Owner for Site office and Residential accommodation. The CONTRACTOR shall at its own cost and initiative arrange land for residential accommodation for its staff and workers and the price of services shall be deemed inclusive of the same.

ii. Office set-up for 3-4 representatives of PMC/OWNER shall be provided by CONTRACTOR at his office during the Design Engineering & Procurement phase of the contract or as and when required.

iii. HSE for Labour considering Labour colony including sanitation, drinking water, Lighting, Roads, dispensary, canteen, Power supply, cleaning, Toiletsetc. shall be in CONTRACTOR'S Scope, and the CONTRACTOR shall adhere to all safety norms/ all statutory requirements as per the Government / Statutory guidelines and the provisions of the Bidding Documents

1.9 **ACCESS TO SITE**

1.9.1 The CONTRACTOR shall at his own cost and initiative arrange for and provide any access to the work area and stringing or other yards for labour, equipment and material as maybe necessary for any cause in addition to the ingress and egress available through public highways. Any arrangements in respect thereof as may be entered into by the CONTRACTOR with any person interested in the land through which access is sought, shall be in writing and a copy of the writing (certified by or on behalf of the CONTRACTOR to be true copy thereof) shall forthwith be lodged with the OWNER. Such a writing shall specifically stipulate that the OWNER shall not be responsible for any claims under the Contractor for any damage, loss or injury to the land or any material, item or thing there on or in, and the CONTRACTOR shall keep the OWNER/Consultant indemnified from and against any claim, action or proceedings in respect thereof.

1.9.2 The CONTRACTOR shall at his own cost and initiative arrange for and obtain all necessary permissions, permits, E-way bills, if applicable, consents, and licenses as may be necessary to transport the materials, tools, equipment, machinery and labour along or across any highway, roadway, or other way, or railway, tramway, bridge, dyke, dam or embankment, or lake, pond, canal, river, state terminal, or other line, border or barrier.

ISSUED AS ANNEXURE-9 TO CA-1

PRICE REDUCTION FOR DELAY IN ACHIEVING INTERMEDIATE MAJOR MILESTONE

[ANNEXURE- XXVIII TO SPECIAL CONDITIONS OF CONTRACT]

PRICE REDUCTION FOR DELAY IN ACHIEVING INTERMEDIATE MAJOR MILESTONE FOR EPCC-01

List of intermediate major milestone(s) , its completion schedule and PRS is as under:

Sl. No	DESCRIPTION / INTERMEDIATE MILESTONE	Completion Period in months from the date of issue of LOA	Max. PRS in % (percent of total lumpsum price as per SOP format, SP-0)
1	Major Tagged(critical) Equipment ordering	4	0.3
2	60% Model review	8	0.3
3	Energization of Sub-station	24	0.3
4	Completion of Heater Package (Supply & Erection)	26	0.3
	Total		**1.2**

Notes:-

1. **In the event of delay in achieving the above intermediate milestones, Price adjustment for delay in achieving each intermediate major milestones shall be a sum equivalent to 0.3% of the Total Lumpsum Price for every week of delay or part thereof, limited to a maximum of 1.2% of the Total Lumpsum Price in respect of any or all the intermediate major milestones put together. However, the total adjustment on account of delay in achieving the intermediate major milestones as mentioned above and delay in Mechanical completion of work beyond the Time schedule as mentioned in Annexure-I to SCC shall be limited to 5% of Total Lumpsum Price only.**

2. **Further in case CONTRACTOR defaults in completion of intermediate major milestones as mentioned above but completes the Mechanical Completion within the Time Schedule as per Annexure – I to SCC, the amount deducted against Price adjustment for delay in achieving intermediate major milestones shall be paid to the CONTRACTOR in the final bill.**

ISSUED AS ANNEXURE-10 to CA-1

SCHEDULE OF PRICE (SOP) Rev.1

SCHEDULE OF PRICES

(SOP)

(Rev. 1)

INDEX TO SCHEDULE OF PRICES

Sr. No.	Description	Form No.
1.	PREAMBLE	7 Sheets
2.	LUMPSUM PRICE	SP-0
2.1	Break up of LUMPSUM PRICE of SP-0(for Consortium Bidder only)	SP-0A
	A. Schedule of Price for Design and Detailed Engineering.	SP-1
	B. Schedule of Price for Supply Portion.	SP-2
	C. Schedule of Price for Construction / Installation Portion	SP-3
2.2	Further Breakup of Prices of SP-1, SP-2 and SP-3	
	A. Breakup Price for Design and Detailed Engineering	SP-4
	B. Breakup of price for Supply Portion.	SP-5
	C. Breakup of price for Construction / Installation Portion	SP-6
3.	2 Year O & M spares	SP-7
4.	Details of Goods And Service Tax (GST)	SP-8A and SP-8B
5.	Details of Custom Duty& Custom related duties	SP-9
6.	Guaranteed values	SP-10
7.	Comprehensive Post Warrantee Annual Maintenance Contract	SP-11(i to xi)
8.	Pre-filled Heavy lift crane retention charge	SP-12

PREAMBLE TO SCHEDULE OF PRICES

1. Bidder's quoted prices shall be strictly as per various FORMS included under Schedule of Prices. Bidder shall quote LUMPSUM PRICE for entire scope of work as per provisions of the Bidding Document in FORM SP-'0'. This LUMPSUM PRICE may also be referred to as Lumpsum Price or Contract Price. Bidder shall also quote break up of LUMPSUM PRICE separately for Design and Detailed Engineering (FORM SP-1), Supply (FORM SP-2) and Construction/Installation (FORM SP-3). Bidder shall furnish further break up of lumpsum prices as per FORM SP-0A, SP-4, SP-5 and SP-6.

   These Breakup of Prices (i.e. FORM SP-1, SP-2, SP-3 and further break-up in FORMs SP-4, SP-5 and SP-6) are only meant for the purpose of Milestone Payment and finalization of Billing Break-up during the execution of the Contract.

2. Bidder to note that breakup of lump sum price is for reference only and total price payable under the Contract shall be restricted to the Lump sum Price / Contract Price indicated in Schedule of Price FORM SP-0. The Price evaluation shall be based on the Lump sum Price quoted in FORM SP-0,in line with provisions of Bidding Document.

   The above Lumpsum Price (FORM SP-0) shall be considering entire Contract as "Works Contract Service".

3. The quoted price shall be deemed to be inclusive of all the taxes & duties except 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). It is clarified that prices, taxes, duties including GST on any transaction between Contractor and their sub-contractor/ sub-supplier shall be included in the Lumpsum price quoted by the Contractor.

4. The quoted price shall also include the insurance, all applicable taxes, Duties, Cesses, Royalty and Levies as per Bidding Documents.

5. The price quoted shall be lumpsum price for the entire scope of work, whether specifically mentioned or not, to be executed on Lumpsum turnkey (LSTK) basis. Unless the basic parameter changes or additional/ extra requirements (scope of work and/or supply and/or services) are made, total payments to be made to the Contractor shall be limited to lumpsum price indicated/finally accepted as per **FORM SP-0 only.**

6. Obligation of the Contractor is not limited to the quantities that the Contractor may either indicate in the Breakup of Lumpsum Prices along with his bid or in further detailed breakup of lumpsum prices furnished after award of Work during billing breakup finalization. Contractor shall carry out entire scope of work/supplies/Services as detailed in various sections/volumes of the Bidding Document within the quoted Lumpsum Price.

   Break up of LUMPSUM PRICE is required to be submitted in FORM SP -1, SP-2, SP-3, SP-4, SP-5 and SP-6 which shall be used for milestones payment purpose only. Further Break-up of these forms as required shall be submitted and got approved from Engineer-in-charge/Owner in the billing schedule after award of Contract. Billing schedule shall be allowed to revise two times only, one after

achieving 50% overall Project progress and second time after achieving 90% Overall progress.

7. Lumpsum price shall be deemed to be inclusive of the cost of any other supplies/work(s)/Services not specifically mentioned in the Bidding Document but are essentially required for the efficient, trouble free operation of the complete package, irrespective of whether the above unspecified supplies/work(s)/services are specifically mentioned in the bidder's bid or not.

8. The Bidder shall carefully examine the various clauses of Bidding document inclusive of Scope of Enquiry, General Terms and Conditions for Works Contract, Special Conditions of Contract, Tender Specifications, Technical and Commercial Amendment(if any) etc. The bidder shall include in his prices any sum he may consider necessary to cover the fulfilment of the various clauses contained therein. The items of work described and the Lumpsum Price stated in the Schedule of Price shall be inclusive of everything necessary to complete the said items of work within the contemplation of the Contract.

9. General directions and descriptions of work and materials given in the specifications are not necessarily repeated in the Schedule of Price.

10. Bidder to note that breakup of Lumpsum Price is for interim payment purposes only and total price payable under the Contract shall be restricted to the Lumpsum Price/Contract Price mentioned in FORM SP-0.

11. The Price for Design and Detailed Engineering quoted in FORM SP-1 shall not exceed 9%of the Lumpsum Price of FORM SP-0.

12. The Price of Supply quoted in FORM SP-2 shall not exceed 57% (Fifty Seven Percent) of the Lumpsum Price of FORM SP-0.

13. In case the prices are beyond the limits mentioned under Sl. Nos. 11, 12, then such additional amount shall be raised by Contractor in the final bill and shall be paid to the Contractor in the final bill/invoice only. Billing schedule shall be prepared as per above clause no.11 & 12 only.

14. In case of any contradiction between Lumpsum Price mentioned in FORM SP-0 and subsequent Break-up of price mentioned in FORMs SP-1, SP-2, SP-3, SP-4, SP-5, SP-6, the Prices indicated in FORM SP-0 shall be final & binding and shall be considered as "Lumpsum Price" for complete Scope of Work and break-up of Prices shall be reworked to match with Price as per FORM SP-0.

15. In case of contradiction between Break up of Prices as per FORM SP-1, SP-2 and SP-3 and further Breakup of prices as per FORM SP-4, SP-5 and SP-6, following order of precedence shall apply :

    SP-1, SP-2, SP-3.
    SP-4, SP-5, SP-6.

16. Following Forms of Schedule of Price are also enclosed.

i) FORM SP-7, indicating Recommended spares for 2 years Operation and Maintenance (O&M spares). Prices as per FORM SP-7 shall be submitted within 03 Months of award of work as per provision of SCC clause 34.8.3 (b).

ii) FORM SP-8A, indicating the details of Goods and Service Tax (GST) in respect of Lumpsum Price quoted under FORM SP-0.

iii) FORM SP-8B, indicating the details of Goods and Service Tax (GST) in respect of PWCAMC prices quoted under FORM SP-11.

iv) FORM SP-9 indicating details of Custom and Custom related duties for the Built-in import content.

v) FORM SP-10 where bidder has to indicate Guaranteed Values in SOP format. Refer Loading & Guarantees chapter attached as Annexure-II to SCC of the Bidding Document.

vi) FORM SP-11 i) to xi) for Prices for Post Warrantee Comprehensive Annual Maintenance Contract (PWCAMC) Services.

vii) FORM SP-12 for Prefilled Heavy Lift Crane Retention(addition/deletion) Charge.

17. **Currency of Bid**

Bidders are allowed to quote in currency(ies) as under:

i. INR and/or

ii. Any one Foreign currency out of USD and EURO

Bidder to carefully mention the applicable foreign currency in the specified columns.

18. It shall be the sole responsibility of the CONTRACTOR to duly observe and perform and fulfil all obligations of all laws, rules, regulations, orders and formalities during the entire period/currency of the Contract, applicable to Goods and Service Tax (GST), Customs Duty, etc. on the import, manufacture, sale and/or supply of any material(s)/equipment to the OWNER and performance of the works contract service under the Contract. The CONTRACTOR shall keep the OWNER and its Project Management Consultant (PMC) indemnified from and against any and all claims, demands, prosecutions, actions, proceedings, penalties, damages, demurrages and/or other levies whatsoever made or levied by any Court, Tribunal or the Customs or other Authorities with respect to any alleged breach, evasion or infraction of such duties, taxes, charges or levies or any breach or infraction of any applicable laws, rules, regulations, orders or formalities concerning the same and from the consequence thereof.

19. The Lumpsum Price of Works Contract Service shall be deemed to cover various factors including but not limited to cost of materials/equipment/Services, overheads, bidding cost, financing costs, profits, mobilization & demobilization cost, etc., as applicable. Unless the scope expressly excludes certain provisions from the CONTRACTOR's scope in the Bidding document/Contract, no additional payment on any such head expressly not mentioned herein in the Bidding Document/Contract shall be entertained on a later date.

20. Bidder shall submit their Priced Bid duly filled in with prices, stamped & signed by Bidder on each page and scanned & uploaded in the respective "PRICE BID" folder only on the e-Procurement Portal as mentioned in the ITB/IFB in the following manner:

    i) Lumpsum Price as per FORM SP-0.
    ii) Breakup of Prices as per FORM SP-1,SP-2 &SP-3and further Break-Up of Prices as per FORM SP-4,SP-5 & SP-6.
    iii) Details of Goods and Service Tax (GST) in FORM SP-8A& SP-8B and Details of Custom Duty as per FORM SP-9.
    iv) Guaranteed Values to be submitted by bidder in FORM SP-10.
    v) Duly filled in Prices for Post Warrantee Comprehensive Annual Maintenance Contract Services FORM SP-11(i) TO SP-11(xi).
    vi) Duly stamped and signed FORM SP-12 towards Pre-filled Heavy Lift Crane(1250 Ton) retention charges for Addition/Deletion

21. Lump sum price shall be exclusive of Comprehensive Insurance (Marine cum transit cum storage and erection) till handing over of the package, as per provision of the Bidding Document. However, all other insurances to be taken by the Contractor, required, if any, as per provision of the Bidding Document shall be included in the quoted Lumpsum price.

22. BREAK-UP OF DESIGN AND DETAILED ENGINEERING PRICE (SP-1) shall include, Design and Detailed engineering and Training, as per requirement of Technical Part of the Bidding Document for complete work in accordance with the various provisions of the Bidding Document.

23. BREAK-UP OF SUPPLY PRICE (SP-2) shall include Sale and Supply of all Materials (except CIVIL AND STRUCTURAL MATERIALS AND OTHER MATERIALS FOR CONSTRUCTION AS SPECIFIED IN FORM SP-3) required for incorporation in the permanent Works as determined by Bidder, within the scope of work, to be necessary to establish, commission and operate the Plant/Unit, delivered in respect of imported materials/equipment and delivered for Indigenous materials/equipment, at the price of materials/equipment, as specified in the Schedule of Prices. SUPPLY PRICE shall include price of all Materials/equipment required for completion of the Works in all respects and also shall include all associated activities. The guidelines for covering the materials/equipment and associated activities under Supply Price is specified herein below:

    a. SUPPLY PRICE (SP-2) shall include supply and transportation up to Project Site/fabrication yard of all materials as mentioned under SP-2, and SP-5.

    b. SUPPLY PRICE(SP-2) shall include supply of any other Materials, not mentioned under SP-2 and SP-5, but required as per provisions of the Bidding or Contract Documents, and as per the guidelines mentioned under this clause 23.0

    c. SUPPLY PRICE (SP-2) shall include the price of mandatory spare parts but exclude the price of 2 years recommended spare parts.

    d. SUPPLY PRICE(SP-2) shall include the price of spare parts for pre-commissioning, commissioning and the price for such spares shall be included in the individual equipment.

e. SUPPLY PRICE(SP-2) shall include price for special tools and tackles, if any.

f. SUPPLY PRICE (SP-2) shall include first fill of lubricant, catalyst, chemicals etc.

g. SUPPLY PRICE(SP-2) shall include prices for Built-In Import content.

h. SUPPLY PRICE(SP-2) shall include the cost of all inspections including Third Party Inspection.

i. SUPPLY PRICE(SP-2) shall also include any incidental or auxiliary supplies which are not specified in the Bidding Document specifically but which are required for completion of Works in all respects which could be reasonably implied from the contents of the Bidding Document.

j. SUPPLY PRICE(SP-2) Price shall include all materials which are in the form of finished goods. Construction materials such as civil, structural shall not be included under SP-2 and shall be included under the Price of Construction.

24. BREAK-UP OF CONSTRUCTION PRICE (SP-3)

a. SP-3Price shall include supply of all construction materials as required for completion of the Work in all respects. Construction Materials, in general, shall include cement, Iron/Steel, reinforcement bar, sand, M-sand, aggregates, stones, bricks, earth and clay, woods and boards of all kinds, sanitary pipes and fittings, sewage pipes and fittings, drainage pipes and associated fixtures and fittings, cisterns, toilets, toilet seats and other sanitary fittings of any kind whatsoever, water proofing compounds, chemicals, paints, varnishes, white-washes, distempers, plaster of paris and other finishing materials whatsoever, barricading materials of all kinds and welding and other electrodes, lead, alloys& other material, compounds and consumables whatsoever involved for and / or incorporated in the permanent Works.

b. SP- 3 Price shall include prices of all type of construction services required for completing the Works in all respects including construction, testing, pre-commissioning, commissioning and handing over to Owner. This shall include all type of Services required for completing the works in all respects as per the scope of work specified in the Bidding Document. The major services are specified here in below, without being limited to :

i. SP-3 Price shall include - Supply, procurement, mobilization and deployment of all Skilled/ Unskilled Manpower/ labour, construction plant/equipment/machinery necessary for lifting, loading, handling, removing, transporting, unloading or securing the materials.

ii. SP-3 Price shall include - The cost of mobilization including but not limited to mobilization of vehicles, movements, machinery, equipment, gear, tools, tackles, Heavy lift cranes of different capacities for erection of FIMs supplied by Owner and Contractor's own scope of equipments& structural items, and other items and goods and personnel necessary for or to perform the works contemplated under the Contract.

iii. SP-3 Price shall include - The cost of all construction plants and equipment, vehicles, movements, supply of water and power, construction of temporary roads and access, temporary works, pumps, wiring, pipes, scaffolding, piling, shuttering and other materials, supervision, labour, fuel, stores, geo technical investigation

iv. SP-3 Price shall include - All supervision charges, establishment charges, overheads, contingencies, site organization, charges etc.

v. SP-3 Price shall include - The cost of all indemnities under the Contract, and insurance premium for the "Insurance" not covered under Owner's Insurance policy but are required as per provisions of the Bidding Document.

vi. SP-3 Price shall include - The cost of all rents, royalties, licenses, permits, permission and any other fee, duty, penalty, levy payable on the excavation, removal of transportation of any material or acquisition or use of any right of way or other right, licenses, permit, privilege, permission or uses required for the performance of work. This provision shall apply for the construction materials.

vii. SP-3 Price shall include - Assembly of sub-assemblies, installation, alignment, welding, and completion up to Erection of all the disciplines – civil and structural, mechanical, pressure vessels, rotary equipment, package equipment, HMTD equipment, piping, electrical, instrumentation, insulation, fire proofing, refractory, painting, etc. as required according to the specifications and drawings.

viii. SP-3 Price shall include – All Testing works including Hydraulic /pneumatic testing at Site.

ix. SP-3 Price shall include - Pre-commissioning of the Complete Unit

x. SP-3Price shall include - Commissioning of the Complete Unit

xi. SP-3 Price shall include - Performance Guarantee runs of the plant

xii. SP-3 Price shall include - The incidental cost arising out of Punch list/ check list issued by commissioning team of Licensor or Owner or operations group of Owner during pre-commissioning / commissioning for smooth and trouble free operation of the system/ units.

xiii. SP-3 Price shall include the cost of transportation from the factory or ware house or other places of delivery in respect of construction materials and to transport these to the Contractor's stockpiles, godowns or other places of storage approved by the Owner, and to transport the same from the said godowns or places of storage to the work site (including for SP-2 Material) for incorporation in the permanent work.

xiv. SP-3 shall also include any incidental or auxiliary works which are not specified above or in the specifications or in the Conditions of Contract or in the Bidding Document specifically but which are required for completion of Works in all respects and which could be reasonably inferred from the contents of the Contract Document.

25. The unpriced commercial bid shall contain the unpriced copy of price bid with the word "QUOTED" mentioned in the Price Column. Also, the unpriced copy must indicate the GST percentage(%) along with correct SAC codes in FORM-SP8A and FORM-SP 8B of this Schedule of Prices (SOP). Bidder to ensure, filling correct applicable SAC codes as the quoted Price shall be **FIRM** and binding for the capping of payment. In case of any ambiguity indicated in SAC code, then the Owner reserves the right to evaluate the offers with applicable taxes under the relevant SAC code of particular services.

Spares for start-up/commissioning and mandatory spares and any other Tools and Tackles as required are in CONTRACTOR's scope and are deemed to be included in their quoted Lumpsum Price, irrespective of whether such spares/items are categorically mentioned or not in the bidder's bid. No claim on this issue shall be entertained at a later date after award of work and at any stage during the faithful execution of the contract.

26. The Prices for Post Warranty Comprehensive Annual Maintenance Contract (PWCAMC) quoted in FORM SP-11 shall not be included in the Lumpsum Price quoted in FORM SP-0.

27. Prices of PWCAMC shall be inclusive of all applicable taxes and duties except GST as quoted in FORM-SP-8B, which shall be paid extra against submission of documentary evidence.

28. The prices for PWCAMC shall remain valid upto the defect liability period. In case of award, the price for PWCAMC shall remain firm till the completion of scope of PWCAMC.

29. **The Prices for PWCAMC shall be considered for evaluation**. OWNER reserves the right to place the order for PWCAMC before completion of defect liability period.

30. The OWNER will place separate Purchase Order/ Contract for PWCAMC on the CONTRACTOR.

FORM-SP-0

LUMPSUM PRICE

S. No.	DESCRIPTION	UNIT	FOREIGN CURRENCY COMPONENT PRICE IN ……. (Indicate currency USD or Euro as applicable)		INDIAN CURRENCY COMPONENT PRICE IN INDIAN RUPEES (INR)	
			IN FIG.	IN WORDS	IN FIG.	IN WORDS
1	Execution of complete scope of work on Lump sum turn Key basis within Time schedule adhering to Quality and Safety guidelines for the complete EPCC package comprising of Crude & Vacuum Distillation Unit (CDU/ VDU) with HWOG, Sat. LPG Treating Unit, Sat. Fuel Gas Treating Unit with complete accessories and auxiliaries for Rajasthan Refinery Project as per the scope of the bidding documents which includes Project management, Residual Process Design, updation of FEED Package, Detailed Design and Engineering , Third party inspection, procurement, supply, transportation, port handling, fabrication, construction, erection, obtaining statutory approvals, installation, Inspection, Testing, supply of consumables, Pre commissioning, Commissioning start up, Initial operation and performance testing, including supply of commissioning and mandatory spares, chemicals, Tools and tackles etc, Handing over to owner, post commissioning assistance services for operation of the unit for 6 months after commissioning for the complete plant. The quoted price shall also include the insurance, all applicable taxes, Duties, Royalty and Levies as per bidding documents. Bidder to consider any other material/item also required for completion of the plant works but not specifically identified and covered above for completion of EPCC package works.					
	Lumpsum Price [SP-0]	L.S.				

Note: In case of any discrepancy between Prices quoted “In Fig.” and “In Words”, the Prices quoted “In Words” shall be considered for evaluation and award.

FORM-SP-0A

BREAKUP OF LUMPSUM PRICE BETWEEN LEADER AND OTHER MEMBER FOR CONSORTIUM BID
(FOR THE PURPOSE OF STAKEHOLDING REQUIREMENT BETWEEN CONSORTIUM MEMBERS)

PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
(A) FOREIGN CURRENCY COMPONENT PRICE IN ……. (Indicate currency USD or Euro as applicable)	**(B) INDIAN CURRENCY COMPONENT PRICE IN INDIAN RUPEES (INR)**	**(C) FOREIGN CURRENCY COMPONENT PRICE IN ……. (Indicate currency USD or Euro as applicable)**	**(D) INDIAN CURRENCY COMPONENT PRICE IN INDIAN RUPEES (INR)**
In Fig. ……	**In Fig. ……**	**In Fig. ……**	**In Fig. ……**
In Words …….. **……..**	**In Words ……..** **……..**	**In Words ……..** **……..**	**In Words ……..** **……..**

a) In case of consortium bids, Leader of consortium shall submit in the unpriced part, the certificate from any one out of their CEO or their CFO or their Company Secretary or any of their Functional Director in their Board of Members, certifying that each member of the consortium holds at least 25% stake in the consortium and the prices are quoted in the price bid accordingly. The reference exchange rate for calculation of stakeholding shall be the SBI Bill selling rate of the relevant Foreign Currency as on the first day of the month in which the bid due date / extended bid due date falls.

b) In case separate payments to consortium members has been opted by the Bidder, then providing the break-up of price between Leader and the other Member is mandatory, else the payment shall be made to the Leader of the consortium only.

c) Wherever, Bidder has provided break-up of Price between Leader and the other Member of the consortium, after opening of prices, for the purpose of ascertaining the stake of each consortium member, the stakeholding of leader and the other member shall be arrived by considering the reference exchange rate as the SBI Bill selling rate of the relevant Foreign Currency as on the first day of the month in which the bid due date / extended bid due date falls.

In accordance with the above calculation methodology, Bidder to quote above “BREAKUP OF LUMPSUM PRICE BETWEEN LEADER AND OTHER MEMBER FOR CONSORTIUM BID” such that the stake of each consortium member corresponds to the respective percentage of stake specified by the Bidder in the MoU as submitted in the Un-priced part.

In case, after opening of Price Bid it is noticed that the stake breakup worked out as above, does not comply with the break-up of stakeholding declared in the MoU submitted by Bidder, HRRL shall adjust the price stake between Leader and Member prior to award of work and as deemed appropriate by them, so that the same are in accordance with the percentage stake in MoU.

d) In case, Bidder has opted for full payment to Leader of consortium only and have not indicated break-up of price between Leader & the other Member of the consortium and the Bidder is awarded the Contract, the Leader of the consortium along with the final bill, shall submit another certificate from a practicing Chartered Accountant (not being an employee / Director and not having any interest in the any of the consortium members), certifying that the contract has been executed by each member of the consortium as per the percentage break-up of stakeholding specified in the MoU/Definite Agreement. The final bill shall be processed only upon receipt of this certificate.

e) On no account revision/change in the Lumpsum Price shall be allowed.

f) In case separate payment to consortium member is opted by the bidder, it shall be upto the consortium members claiming the separate payments to obtain such sanctions, consent and/or permits required from Reserve Bank of India or other authorities concerned to authorize separate payments to and/or separate accounts of each consortium member, failing of which all payments will be made only to the Leader of the consortium disregarding of any agreed distribution.

FORM SP-1

BREAK UP OF LUMPSUM PRICE

Schedule of Lump-sum Price for Design and Detailed Engineering

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
1.	RESIDUAL PROCESS, THERMAL, HYDRAULIC, MECHANICAL AND DETAILED ENGINEERING for EPCC-01 Package Complete Residual Process, Thermal, Hydraulic, mechanical design - Engineering, detailed engineering, preparation of Datasheets, Smart plant P&IDs, PFDs, specifications for procurement, GAD, & Layouts, Smart 3D Model, engineering fabrication drawings, Procurement& Construction schemes, Control Logics, Cause & Effect diagrams, Electrical System studies, Statutory approval from various Statutory state & central Government bodies, approval of drawings & documents from OWNER/EIL, submission of Final Technical documents, AS BUILTS Documents and 3D Model, Pre-commissioning, Commissioning and Operating manuals for all units including packages as per Bidding Document requirements	L.S.				

FORM SP-2

BREAK UP OF LUMPSUM PRICE

Schedule of Lump-sum Price for Supply

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Procurement, supply, Third Party Inspection, Transportation, Port handling, Shop fabrication, assembly, Testing of all items, Equipment's, Components, Materials, bought out items, Procurement of raw materials and sub-ordered equipment, shop fabrication/assembly, inspection, Charges for Third party inspection agency(TPIA), testing, supply of all commissioning and mandatory spares, consumables, lubricants, first-fill chemicals, special tools and tackles as required for work as per Bidding Document requirements for EPCC-01 Package	L.S.				

FORM SP-3

BREAK UP OF LUMPSUM PRICE

Schedule of Lump-sum Price for Construction/Installation

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Construction, installation, Hook up & tie-ins, pre-commissioning, etc. and completion of work in all respects for LSTK Package including Transportation and site handling of material/equipments, supply of consumables, tools and tackles, field engineering services, Receipt, storage, conservation, preservation of FIM and contractor supplied items. Fabrication, construction, assembly, erection at site for all piping, civil, structural, architectural, mechanical, electrical and instrumentation works within battery limit, refractory, insulation, coating, painting, testing, etc. providing all temporary works/structures and equipment for completion, obtaining statutory approvals, final hook-up with owner facilities, pre-commissioning, commissioning, performance testing, guarantee runs, completing all the work in all respects to make system smooth, operable and handing over as per Bidding Document requirements and instructions of the Engineer In Charge, including assistance services during plant Operation for a period of 6 Months from the date of Commissioning for the compete plant as per the provisions of the bidding document. Heavy lift crane (1250 Ton) & Tailing crane charges including its transportation, assembly, testing, mobilisation, demobilisation for the period of 2.5 months for erection of Crude & Vacuum column.	L.S.				

FORM SP-4

FURTHER BREAK-UP OF PRICEFOR DESIGN & DETAILED ENGINEERING

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Complete Residual Process / Thermal / Hydraulic /mechanical design - Engineering , detailed engineering, preparation of Datasheets, Smart plant P&IDs, PFDs, specifications for procurement, GAD & Layouts, engineering & fabrication drawings / schemes, Control logics, review / approval of drawings & documents from OWNER/EIL, supply of documents / manuals, at all stages as per Bidding Document requirements, Smart 3-D modelling, AS BUILT and final documentation.					
a	Process , Thermal, Hydraulic, Mechanical, Electrical, Instrumentation, Civil, Structural & Fire & Safety Engineering	L.S.				
b	Detailed Engineering	L.S.				
c	3D model(30%, 60%, 90% & 100%)	L.S.				
d	Final documentation & AS BUILT submission including Smart plant P&IDs	L.S.				
	TOTAL OF ABOVE (a+b+c+d)	L.S.				

FORM SP-5

FURTHER BREAK-UP OF PRICE FOR SUPPLIES

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Procurement, supply, Third Party Inspection, Transportation, Port handling, Shop fabrication, assembly, Testing of all items, Equipment's, Components, Materials, bought out items, Procurement of raw materials and sub-ordered equipment, shop fabrication/assembly, inspection, Charges for Third party inspection agency(TPIA), testing, supply of all commissioning and mandatory spares, consumables, lubricants, first-fill chemicals, special tools and tackles as required for work as per Bidding Document requirements for EPCC-01 Package. (Inland transportation for all items shall be Quoted under separate Item S. No. xiii)					
i	Columns & Internals excluding free issue items	L.S.				
ii	Heat Exchangers & Air Coolers	L.S.				
iii	Vessel, drums, any other static equipment	L.S.				
iv	Pumps & Compressors	L.S.				
v	Desalter Package	L.S.				
vi	Fired Heaters	L.S.				
vii	All auxiliaries (Vacuum Ejectors, Filters, Firefighting equipment, Oil Mist System, miscellaneous and other equipments, etc.)	L.S.				
viii	Piping Material	L.S.				

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
ix	Electrical Material	L.S.				
x	Instrumentation Material	L.S.				
xi	Mandatory Spares	L.S.				
xii	Commissioning Spares	L.S.				
xiii	Inland transportation of all items	L.S.				
xiv	Any other material/item also required for completion of the plant works but not specifically identified and covered above for completion of EPCC package works.	L.S.				
	TOTAL OF ABOVE	L.S.				

NOTES:

(i) The minor materials for Mechanical Equipment, Electrical, Instrumentation which are required in connection with site installation activities are included under construction –FORM SP-6 in relevant items.

(ii) Prices are inclusive of Third Party Inspection (TPI) charges and Ocean Freight charges and Air freight charges (If any).

FORM SP-6

FURTHER BREAK-UP OF PRICE FOR CONSTRUCTION / INSTALLATION

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Construction, installation, Hook up & tie-ins, pre-commissioning, etc. and completion of work in all respects for LSTK Package including Transportation and site handling of material/equipments, supply of consumables, tools and tackles, field engineering services, Receipt, storage, conservation, preservation of FIM and contractor supplied items. Fabrication, construction, assembly, erection at site for all piping, civil, structural, architectural, mechanical, electrical and instrumentation works within battery limit, refractory, insulation, coating, painting, testing, etc. providing all temporary works/structures and equipment for completion, obtaining statutory approvals, final hook-up with owner facilities, pre-commissioning, commissioning , performance testing, guarantee runs, completing all the work in all respects to make system smooth, operable and handing over as per Bidding Document requirements and instructions of the Engineer In Charge, including assistance services during plant Operation for a period of 6 Months from the date of Commissioning for the compete plant as per the provisions of the bidding document. Heavy lift crane (1250 Ton) & Tailing crane charges including its transportation, assembly, testing, mobilisation, demobilisation for the period of 2.5 months for erection of Crude & Vacuum column.					
i	Civil & Structural Works inclusive of supply materials	L.S.				
ii	Mechanical & Piping Works for all equipments inclusive of supply of Associated Materials	L.S.				
iii	Electrical & Instrumentation Works inclusive of Supply of Associated material.	L.S.				
iv	Insulation & Painting inclusive of Supply of Materials	L.S.				

S. No.	DESCRIPTION	UNIT	SOLE BIDDER OR PRIME MEMBER (LEADER) OF CONSORTIUM		CONSORTIUM MEMBER (OTHER THAN LEADER)	
			FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)	FOREIGN CURRENCY COMPONENT (IN USD/EURO)	INDIAN CURRENCY COMPONENT (IN INR)
v	Testing & Commissioning (Including Pre-Commissioning)	L.S.				
vi	PGTR	L.S.				
vii	Loading of Chemicals and Catalyst	L.S.				
viii	Assistance services during plant Operation for a period of 6 Months after Commissioning of unit (for details refer Note no.3, 4 & 5 below)	L.S.				
ix	Transportation of materials covered under FORM SP-3	L.S.				
x	Any other material/item also required for completion of the plant works but not specifically identified and covered above for completion of EPCC package works.	L.S.				
	TOTAL of ABOVE	L.S.				

NOTES:

1. The breakup of prices given above are exclusive of supply of materials covered in SP-5 but are inclusive of materials for Civil, Structural, General Civil, Architectural, Painting, Insulation, Acid/Alkali proofing, consumables, etc.
2. Total price as per FORM SP-6 shall be inclusive of Construction/Erection, testing and commissioning of the materials supplied by Owner (if any, as specified in job specification) including transportation of materials from Owner's storage point within the Refinery Complex to the Contractor's ware house/work site.
3. Bidder is required to indicate Break-up of Prices for “Assistance services during plant Operation for a period of 6 Months after commissioning” against Sl. No. 1 (viii) above.
4. The requirement of manpower for assistance services during plant operation shall be for “4 persons for six months of continuous plant operation (1 person/ shift for round the clock operation in three shifts 8 hour each with 1 person for cover up” as specified in Technical Section of Bidding Document.
5. The above quoted price against Sl. No. 1 (viii) shall be prorated in case of addition / deletion of manpower for assistance during Operation for arriving Rate/per man day for 8 hour shift. The Price quoted in No. 1 (viii) above shall be divided by factor of 720 (4 persons per day for 6 months i.e. 180 Man Days). Number of persons shall be increased/decreased based on HRRL requirements.

FORM SP-7

PRICE SCHEDULE OF RECOMMENDED SPARES FOR TWO YEARS OPERATION AND MAINTENANCE

SL. NO.	DESCRIPTION OF RECOMMENDED SPARES	UNIT	QTY.	RATE			AMOUNT
				CURRENCY	IN FIGURES	IN WORDS	
1.	2.	3.	4.	5A.	5B.	5C.	6.
i		No.					
ii		No.					
iii		No.					
iv		No.					
v		No.					

NOTE:

1. Prices as per FORM SP-7 shall be submitted within 3 months of award of work as per provisions of SCC Cl. No. 34.8.3 (b).
2. These two years Operation and Maintenance (O&M) spares shall not be considered for evaluation.
3. Prices of two years Operation and Maintenance (O&M) spares shall be kept valid for a period of 12 Months after Contractual Commissioning Owner reserves the right to place the Order for such O & M Spares at its discretion.

FORM SP-8A

DETAILS OF GOODS AND SERVICE TAX (GST) ON LUMPSUM PRICE QUOTED AT SP-0 CONSIDERING CONTRACT AS WORKS CONTRACT SERVICE

SL. NO.	DESCRIPTION	Total Celling Amount on which GST is applicable	Total Ceiling Amount out of (A), where ITC not available to the OWNER (Refer Note-1 below)	Percentage (%) Rate of GST Applicable on (A)	GST compensation cess (Refer Note-4 below)	SAC CODE as per GST act
		(A)	(B)	(C)	(D)	(E)
1	CGST and SGST on Indian Currency component (INR)	As quoted in FORM-SP-0 in INR				
2	CGST and SGST on Foreign Currency component (USD/EURO)	As quoted in FORM-SP-0 in USD/EURO				

Notes :

1. Under column (B), Bidder to furnish the ceiling amount out of the Lump-sum Price quoted in FORM SP-0, on which GST is applicable but the input tax credit (ITC) of GST is not available to the owner for goods/ services mentioned in section 17 (5) of CGST Act.
2. Amount of Non – creditable GST shall be calculated as column (B) X column (C). For loading,100 % of Non-Creditable GST as calculated shall be considered.
3. Creditable GST shall be calculated as {column (A)- column (B)} X column (C). For loading, 60.23 % of Creditable GST as calculated shall be considered.
4. Bidder to ascertain the applicability of Cess on GST as per GST Act/rules. For loading, 100 % of Cess under GST as per column (D) shall be considered.
5. The GST shall be payable to the Contractor only upon submission of GST invoice in accordance with GST Act, subject to the ceiling mentioned in FORM- 8A. Bidder while submitting the Invoice shall clearly give the break-up of Creditable / Non-creditable GST, so that OWNER can avail Input credit as per GST Act/Rules.
6. For evaluation purposes, the foreign currency shall be converted to equivalent Indian Rupees by converting the Foreign Currency into Indian Rupees at the Bill selling rate of State Bank of India, New Delhi prevailing on the day of opening of the price bid. In case the rate is not available as on the day of priced bid opening, the latest available rate prior to the day of priced bid opening, shall be considered.
7. GST shall be paid in Indian rupees only as per the provisions of GST Act/Rules.

FORM SP-8B

DETAILS OF GOODS AND SERVICE TAX (GST) ON PWCAMC QUOTED AT SP-11

SL. NO.	DESCRIPTION	Total Celling Amount on which GST is applicable	Total Ceiling Amount out of (A), where ITC not available to the OWNER (Refer Note-1 below)	Percentage (%) Rate of GST Applicable on (A)	GST compensation cess (Refer Note-4 below)	SAC CODE as per GST act
		(A)	(B)	(C)	(D)	(E)
1	CGST and SGST on Indian Currency component (INR)	As quoted in FORM-SP-11 in INR				
2	CGST and SGST on Foreign Currency component (USD/EURO)	As quoted in FORM-SP-11 in USD/EURO				

Notes :

1. Under column (B), Bidder to furnish the ceiling amount out of the total Price quoted in FORM SP-11, on which GST is applicable but the input tax credit (ITC) of GST is not available to the owner for goods/ services mentioned in section 17 (5) of CGST Act.
2. Amount of Non – creditable GST shall be calculated as column (B) X column (C). For loading, 100 % of Non-Creditable GST as calculated shall be considered.
3. Creditable GST shall be calculated as {column (A) - column (B)} X column (C). For loading, 60.23 % of Creditable GST as calculated shall be considered.
4. Bidder to ascertain the applicability of Cess on GST as per GST Act/rules. For loading, 100 % of Cess under GST as per column (D) shall be considered.
5. The GST shall be payable to the Contractor only upon submission of GST invoice in accordance with GST Act, subject to the ceiling mentioned in FORM- 8B. Bidder while submitting the Invoice shall clearly give the break-up of Creditable / Non-creditable GST, so that OWNER can avail Input credit as per GST Act/Rules.
6. For evaluation purposes, the foreign currency shall be converted to equivalent Indian Rupees by converting the Foreign Currency into Indian Rupees at the Bill selling rate of State Bank of India, New Delhi prevailing on the day of opening of the price bid. In case the rate is not available as on the day of priced bid opening, the latest available rate prior to the day of priced bid opening, shall be considered.
7. GST shall be paid in Indian rupees only as per the provisions of GST Act/Rules.

FORM SP-9

DETAILS OF CUSTOMS DUTY AND CUSTOMS RELATED DUTIES

Description	CFR VALUE INCLUDED IN LUMPSUM PRICE	CIF VALUE INCLUDED IN LUMPSUM PRICE	Basic Customs Duty based on Import included in the Lumpsum Price	Other Customs Related duties included in Lumpsum Price (Other than IGST, Social Welfare Surcharge and GST Compensation Cess)	IGST (included in Lumpsum Price)	Social Welfare Surcharge (included in Lump Sum Price)	GST Compensation Cess, if applicable (included in Lump Sum Price)	Customs Tariff Considered (Bidder to indicate)
	Amount	Amount	Amount	Amount	Amount	Amount	Amount	
	IN INR/Equiv. INR	IN INR/Equiv. INR	IN INR	IN INR	IN INR	IN INR	IN INR	
1	2	3	4	5	6	7	8	9
FOR BUILT IN IMPORT CONTENT INCLUDED IN SP-0 Price								

NOTES:

1. Under the column 2 CFR values of imports shall be indicated. The CIF value under column 3 shall be based on CFR value indicated in Column 2 plus marine insurance charges. Marine Insurance charges shall be considered @ 0.15% of the CFR value quoted by the Bidder.

2. The Customs Duty and other custom related duties as indicated above shall be included in the quoted price as per the provisions of the Bidding Document.

3. In column 6 of the above SP FORM, Bidder to indicate Total IGST Amount (Creditable/Non-creditable to contractor) on Built-in import content. The Lumpsum price quoted shall be inclusive of the impact if any, towards the credit/non-credit applicable to the bidder for the IGST on built-in import content. No IGST and /or any variation thereof on such built-in import content shall be separately payable by the OWNER.

FORM SP-10

GURANTEED VALUES

S.No.	Item	Unit	Bidders Guarantee Figure	Remarks
1(a)	Total Power Consumption for the identified Rotating equipments	KWH/Hr		For identified equipment with respect to relevant Sr.No., refer Annexure-II of SCC
1(b)	Total Power Consumption for the Desalter package	KWH/Hr		
1(c)	Total Power Consumption for the Ejector package	KWH/Hr		
2(a)	Total MP Steam Consumption for the Ejector Package	TPH		
2(b)	Total MP Steam consumption for the Atomizing Steam for Crude & Vacuum heaters	TPH		
3	Total Fuel Consumption for the Crude and Vacuum Heaters	Kg/Hr		
4(a)	Total Cooling water Consumption for Ejector	M3/Hr		
4(b)	Total Cooling water consumption for Sat. Fuel Gas Treating unit.	M3/Hr		
4(c)	Total Cooling water consumption for CDU/VDU & Sat. LPGTU excluding Ejector package.	M3/Hr		

Notes:

I. Refer Loading Criteria mentioned else wherein Annexure-II of SCC
II. The guarantee values as above should be quoted in Priced Bid. Guaranteed values should not be quoted/ mentioned in the Un-priced Bid.
III. All the guarantees as quoted by bidder in this format shall be used for loading purposes at the time of evaluation of the bid and also shall be guarantee points for demonstrating the same during PGTR.
IV. Reduction of price shall be applicable if bidder fails to meet the Guarantees as quoted herein.
V. For Cooling water consumption: For Loading total of 4(a), 4(b) & 4(c) shall be considered while for Guarantee 4(a), 4(b) & 4(c) calculated separately.

FORM SP-11(i)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR LIFTS

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of LIFTS comprising of deployment of minimum one Supervisor including supply of all spare parts (Mechanical, electrical and instrumentation) and lubricants as requiredand deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of defect liability		
	b) Second year after expiry of defect liability		
	c) Third year after expiry of defect liability		
	TOTAL PRICES (a + b + c)		

FORM SP-11(ii)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR ANALYSERS

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of Analysers after 2 years extended warrantee of all types comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of extended warranty period		
	b) Second year after expiry of extended warranty period		
	c) Third year after expiry of extended warranty period		
	TOTAL PRICES (a + b + c)		

Note: 1. EPCC-01 Contractor to provide 2 years extended warrantee of all Analysers after completion of Defect liability period, Comprehensive post warrantee Annual maintenance(CPWAMC) contract period shall start after completion of 2 years extended warrantee period,

FORM SP-11(iii)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR VFDs

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of VFD after 2 years extended warrantee of all types comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of extended warranty period		
	b) Second year after expiry of extended warranty period		
	c) Third year after expiry of extended warranty period		
	d) Fourth year after expiry of extended warranty period		
	e) Fifth year after expiry of extended warranty period		
	TOTAL PRICES (a + b + c + d + e)		

Note:1. EPCC-01 Contractor to provide 2 years extended warrantee of all VFD after completion of Defect liability period. Comprehensive post warrantee Annual Maintenance Contract (CPWAMC)period shall start after completion of 2 years extended warrantee period,

FORM SP-11(iv)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR PLCs

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of PLC after 2 years extended warrantee of all types comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of extended warranty period		
	b) Second year after expiry of extended warranty period		
	c) Third year after expiry of extended warranty period		
	TOTAL PRICES (a + b + c)		

Note:1. EPCC-01 Contractor to provide 2 years extended warrantee of all PLCs after completion of Defect liability period. Comprehensive post warrantee Annual Maintenance Contract(CPWAMC) period shall start after completion of 2 years extended warrantee period.

FORM SP-11(v)

PRICES FOR POST WARRANTEE COMPREHENSIVEANNUAL MAINTENANCE CONTRACT SERVICES FOR SOFT STARTERS

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of SOFT STARTERS comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of defect liability		
	b) Second year after expiry of defect liability		
	c) Third year after expiry of defect liability		
	d) Fourth year after expiry of defect liability		
	e) Fifth year after expiry of defect liability		
	TOTAL PRICES (a + b + c + d + e)		

FORM SP-11(vi)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR SUBSTATION AUTOMATION SYSTEM(SAS)

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of complete SUBSTATION AUTOMATION SYSTEM (SAS) comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of defect liability		
	b) Second year after expiry of defect liability		
	c) Third year after expiry of defect liability		
	d) Fourth year after expiry of defect liability		
	e) Fifth year after expiry of defect liability		
	TOTAL PRICES (a + b + c + d + e)		

FORM SP-11(vii)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR UPS

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of UPS of all types comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of defect liability		
	b) Second year after expiry of defect liability		
	c) Third year after expiry of defect liability		
	d) Fourth year after expiry of defect liability		
	e) Fifth year after expiry of defect liability		
	TOTAL PRICES (a + b + c + d + e)		

FORM SP-11(viii)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR DC SYSTEM

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of DC System of all types comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of defect liability		
	b) Second year after expiry of defect liability		
	c) Third year after expiry of defect liability		
	d) Fourth year after expiry of defect liability		
	e) Fifth year after expiry of defect liability		
	TOTAL PRICES (a + b + c + d + e)		

FORM SP-11(ix)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR THYRISTOR CONTROL PANEL FOR HEATER

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of Thyristor control panel for heater of all types comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of defect liability		
	b) Second year after expiry of defect liability		
	c) Third year after expiry of defect liability		
	d) Fourth year after expiry of defect liability		
	e) Fifth year after expiry of defect liability		
	TOTAL PRICES (a + b + c + d + e)		

FORM SP-11(x)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR CATHODIC PROTECTION SYSTEM

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of CATHODIC PROTECTION SYSTEM comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of extended warranty period		
	b) Second year after expiry of extended warranty period		
	c) Third year after expiry of extended warranty period		
	TOTAL PRICES (a + b + c)		

Note:1. EPCC-01 Contractor to provide CPWAMC for CATHODIC PROTECTION SYSTEMs after completion of Defect liability period.

FORM SP-11(xi)

PRICES FOR POST WARRANTEE COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT SERVICES FOR MACHINE MONITORING SYSTEM

SR.NO.	DESCRIPTION	PRICE	
		FOREIGN CURRENCY COMPONENT (IN CURRENCY AS INDICATED IN FORM-SP-0)	INDIAN CURRENCY COMPONENT (IN INR)
1.	Comprehensive post warrantee Annual charges for maintenance of MACHINE MONITORING SYSTEM comprising of deployment of minimum one Supervisor including supply of spare parts and deployment of extra personnel required for repair or replacement of the above systems for the following periods:		
	a) First year after expiry of extended warranty period		
	b) Second year after expiry of extended warranty period		
	c) Third year after expiry of extended warranty period		
	TOTAL PRICES (a + b + c)		

Note:1. EPCC-01 Contractor to provide CPWAMC for MACHINE MONITORING SYSTEMs after completion of Defect liability period.

FORM SP-12

PREFILLED HEAVY LIFT CRANE RETENTION CHARGE

S.No.	ITEM	PRICE (INR) PER DAY		In case of Consortium bid, Bidder to indicate name of consortium member who will be responsible for Heavy Lift Crane arrangement
		IN FIGS.	IN WORDS	
1	Heavy Lift Crane(1250 Ton) retention charges after 2.5 months. However, same rate shall be applicable for recovery of the unutilized period of work completed before 2.5 Months.	INR 8,00,000 / Day	INDIAN RUPEES EIGHT HUNDRED THOUSAND PER DAY	.....

Notes:

I. Additional retention charges on per day basis shall be payable only for Erection & in-situ welding of Crude and Vacuum columns.

II. Crane Retention Charges given above is in Per Day basis.

III. Mobilization and demobilization already covered in main scope of work, hence no additional mobilization & demobilization charges shall be given.

IV. Additional Retention of Heavy lift crane need approval and certification of retention days from Engineer In-charge for settlement of payment.

V. In case EPCC bidder complete erection job before 75 days(2.5 months) than for balance days (unutilized period of the completion of both column erection work as per scope) necessary recoveries shall be made as per above rates.

VI. Bidder to submit signed & stamped copy along with un-priced and priced bid submission.