GOVERNMENT OF HARYANA

_____DEPARTMENT

COMMON BIDDING DOCUMENT

Name of Work:

Cost of Work:

Last Updated 31.08.2022

TABLE OF CONTENTS

e-Tender Notice

PRESS NOTICE

HARYANA PW(B&R) DEPARTMENT
Notice Inviting Tender
No. /_____Deptt/HRY. Dated _____

The [Governor of Haryana] invites bids from the contractors who have created login ID on the portal ***http://works.haryana.gov.in*** through online bids on the website: ***etenders.hry.gov.in*** for the work detailed in the table.

Name of Work:	
Time Limit	_____months (_____Months)
Tenders to be received till:	_____hours on dated _____

1. Pre bid meeting (if applicable) will be held on ---------- at 11.30 Hrs. in the office of …….. Engineer, …….. City……..
2. Bidder shall pay Rs. 1180/- as E-Service fee through Net Banking in favour of "Society for IT initiative fund for e-Governance" payable at Chandigarh.
3. For further details and e-tendering schedule please visit website **Error! Hyperlink reference not valid.**http://etenders.hry.nic.in

For and on behalf of Governor of Haryana

_____
_____Department
_____Circle
Phone No._____

Email_____

DETAIL NOTICE INVITING TENDER

The [Governor of Haryana] invites the bids from the contractors who have created login ID on the portal ***http://works.haryana.gov.in*** through online bids on the website: **etenders.hry.gov.in** for the work detailed in the table below.

Sr. No.	Name of work	Cost of work (in Rs)	Earnest money (For unregistered bidders only) (in Rs.)	Cost of bid document (in Rs.)	Time limit	Date and time for bid Submission.
1	2	3	4	5	6	
1.			_____lacs for Contractors & _____lacs for Societies	_____ /-	_Months	Upto _____hrs.

Bidders registered on the portal ***http://works.haryana.gov.in*** are not required to deposit any earnest money and are required to submit earnest money declaration Form as provided in Section 7 of the bidding document.

2. Interested bidders are encouraged to get themselves registered as contractor on the portal ***http://works.haryana.gov.in.***
3. Cost of Bid Form: Rs. _____/- (*non-refundable*) (to be submitted online).
4. Availability of Bid document and mode of submission:

a.	Tender document is available online on http://etenders.hry.nic.in
b.	i. **Earnest Money:** for un-registered bidders – Online. ii. **Earnest Money Declaration Form:** Bidders registered by Haryana Government – the bidder shall upload an earnest money declaration form as per format given in Section – 7 in the bidding document online.
c.	Tender document fee to be paid – Online
d.	Submission of Technical Bid – Online
e.	Submission of Price Bid – Online

5. In the first instance, Earnest money /Earnest money Declaration Form (as provided in Section 7) shall be opened online and checked for correctness along with tender document fee. If the earnest money declaration form / earnest money are found in order, Technical Bid shall be opened (Online) in the presence of such contractors who choose to be present. The Financial offer shall be opened (Online) only, if the bidders meet the qualification criteria as per the bid document. The date of opening of Financial Bid shall be intimated separately.

Exemption of tender document fees of the Contractors / Agencies:

i. "Single tender shall normally not be considered unless there are special circumstances to do so. In such eventuality, decision to accept the single tender shall be as prescribed in the rules. If special circumstances are not present, tenders shall be re-called. If re-tendering again results in a single Tender, its acceptance may be considered with proper justification and reasons". Where on first call of tender, number of bidders participate in the tender but on Technical evaluation only one participating bidder qualifies, the tender shall be re-invited treating it as single tender.

ii. Those bidders shall not be required to pay tender document fees, who choose to submit bids again on tender being re-called on account of single tender being received or single bidder qualifies on first call.

6. Bidders shall have to pay the e-Service Fees of Rs. 1180/- in favour of 'Society for IT initiative fund for e-Governance through Debit Cards & Internet Banking Accounts are required to be paid online directly through Internet Baking Accounts.

7. Last Date/ Time for receipt of bids through e-tendering:

_____(dd/mm/yyyy) up-to _____Hrs. (time)

8. The site for the work is available.

9. Only online submission of bids is permitted, therefore; bids must be submitted online on website http://etenders.hry.nic.in. The technical qualification part of the bids will be opened online at _____Office, _____on _____at _____ hrs. by the authorized officers. If the office happens to be closed on the date of opening of the bids as specified, the bids will be opened online on the next working day at the same time.

10. The bid for the work shall remain open for acceptance during the bid validity period to be reckoned from the last date of 'Submission of Online Bids. Bids as submitted online shall be valid for 120 days from the date of bid closing i.e. from last date of submission of online bids. In case the last day to accept the tender happens to be holiday, validity to accept tender will be the next working day.

11. Bidders may bid for any one or more of the works mentioned in the Table above.

12. To qualify for a package of contracts made up of this and other contracts for which bids are invited in the same NIT, the bidder must demonstrate having experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual contracts.

13. Other details can be seen in the bidding documents. The Employer shall not be held liable for any delays due to system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, the Employer shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to the tender.

14. Conditional tenders will not be entertained and are liable to be rejected.

15. In case the day of opening of tenders happens to be holiday, the tenders will be opened on the next working day. The time, mode and place of receipt of tenders and other conditions will remain unchanged.

16. The invitation of this tender can be cancelled without assigning any reason.

17. The societies shall produce an attested copy of the resolution of the Co-operative department for the issuance of tenders.

18. The tender without Earnest money Earnest money Declaration form and tender document fee will not be opened.

19. The jurisdiction of court will be as defined as in Appendix to ITB.

20. The tender of the bidder who does not satisfy the qualification criteria in the bid documents are liable to be rejected and financial bids will not be opened.

21. The Pre-bid meeting will be held as per the details in Appendix to ITB.

22. The bidders may note that the works are to be carried out strictly as per the applicable laws, permits, rules and regulations. Any damages / penalties imposed by any statutory authority, like NGT etc, on account of noncompliance of any applicable laws, permits, rules and regulations shall have to be borne by the contractor.

23. The undersigned reserves the right to reject any or all of the bids without assigning any reason.

For & on behalf of [Governor of Haryana].

_____Department_____Circle
Phone No._____
Email_____

KEY DATES

1.	**Date of Issue of Notice Inviting Bid**	**:**	Date _____
2.	**Period of availability of Bidding Documents on website http://etenders.hry.nic.in**	**:**	**From** Date ____Month___Year ____ **To** Date ____Month___Year ____
3.	**Time, Date of Pre-bid Meeting**	**:**	Date ____at ___hrs
4.	**Deadline for Receiving Bids online**	**:**	Date ____at ___hrs
5.	**Opening of Bids** **(Tender Document fee & Earnest Money Declaration Form)**	**:**	Date ____at ___hrs
6.	**Time and Date for opening of Part-I of the Bid (Technical Qualification Part)**	**:**	Date ____at ___hrs
7.	**Time and Date of opening of Part-II of the Bid (Financial Part) of the Bidders who Qualify in Part I of the Bid.**	**:**	To be intimated.
8.	**Last Date of Bid Validity**	**:**	Date ____
9.	**Officer inviting Bids**		_____Engineer _____Department _____City

Section 1: Instructions to Bidders

Table of Clauses

A. General

1. Scope of Bid

1.1 The Employer (Appendix to ITB) on behalf of 'Authority' (defined in Appendix to ITB) invites bids for the construction of Works as described in these documents and referred to as "the Works". The name of the works is provided in the Appendix to ITB. The bidders may submit bids for any or all of the works detailed in the table given in the Notice Inviting Tender. Bid for each work should be submitted separately. The bidders should refer Section 4-A for the detailed scope of work and Section 4-B for Technical Specifications for the work.

1.2 The successful Bidder will be expected to complete the Works by the Intended Completion Date specified in the **Contract data**.

1.3 Throughout these documents, the terms "bid" and "tender" and their derivatives (bidder/tenderer, bid/tender, bidding/tendering etc.) are synonymous.

1.4 The jurisdiction of court will be as defined as in Appendix to ITB

2. Source of Funds

2.1 The expenditure on this project will be met from the budget provided by the Govt. of Haryana.

3. Eligible Bidders

3.1 The Invitation for Bids is open to all registered bidders on the portal *http://works.haryana.gov.in* and eligible bidders meeting the eligibility criteria as defined in ITB.

3.2 The bidders in Joint Ventures are allowed as per the Appendix to ITB.

3.3 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices by the Central Government, the State Government or any public undertaking, autonomous body, authority by whatever name called under the Central or the State Government.

4. Qualification of the Bidder

A) For works put to tender upto Rs. 25.00 Lacs, a valid Registration/ contractor's id on Haryana Engineering Works Portal. (No technical evaluation shall be carried out for this category). The intending bidders who are not registered are required to submit the following documents in place of Registration:

Interested bidders who are not registered should upload the following documents at the time of bidding:

a. Mandatory Documents

i. Proof of Constitution - Partnership deed (in case of the partnership firm registration); or Certificate of Incorporation (in case of Private limited company, public limited company, Public sector undertaking, Limited Liability Partnership, registration); or Any proof substantiating constitution (in the case of society, trust, AOP, Government department, local authority, statutory body registration.)
ii. PAN Card
iii. GST Certificate
iv. Undertaking of Non-Blacklisting – (Certificate that contractor has not been blacklisted previously)
v. Proof of immovable properties/self-certification that doesn't have any property
vi. Cancelled Cheque / Proof of bank account
vii. Proof of Address
viii. Similar works experience for the category of registration
ix. The applicant himself or his employee (at least one) should be a Diploma Holder Engineer (Civil/Electrical/Agri./Hort.) as applicable. Accordingly, self-declaration certificate of applicant and his employee along with copy of Diploma certificate is to be submitted.
x. In case of registration for electrical works the applicant or the employee of the applicant should submit valid Wireman License from Chief Electrical Inspector, Haryana

b. Optional Documents

i. TAN Number Document
ii. MSME Registration Certificate (If Applicable)
iii. Form 26AS for last three years (Provided by Income Tax Department)
iv. LLCs (Limited Liability Company) to upload last audited balance sheet
v. Change of constitution of agency
vi. Litigation History (If any)
vii. List of Abandoned works (if any)
viii. Any Other relevant documents

In case during examination it is found that any bidder for this category of works has not submitted above mandatory documents or has submitted false documents his bid shall be rejected.

B) For works put to tender from Rs. 25.01 Lacs to Rs. 64.00 Lacs, a valid registration and contractor's id on Haryana Engineering Works Portal with proof of ownership/ lease of specified machinery/ manpower as listed in Clause 39 of this document.

(Technical Evaluation shall be carried out as per the requirement specified in Clause 39 of this document and financial bid of only responsive qualifying bidders shall be opened)

C) For works put to tender from Rs. 64.01 Lacs onwards, following qualification criteria is required to be fulfilled:-

4.1 All bidders shall provide the Qualification Information as specified in Section-2 of this document, Forms of Bid and the undertaking(s) as specified in Section 7. The undertaking should be of a date after the first invitation of this tender. Initially the scanned copy of undertaking(s) shall have to be submitted in technical bid and before signing the agreement, the original undertaking(s) should be submitted by the bidders to the concerned Executive Engineer. The undertaking(s) in original shall make integral part of the agreement.

4.2 **All bidders participating in tenders costing more than Rs. 25.00 lacs shall include the following information and documents with their bids in Section 2, Qualification Information unless otherwise stated in the Appendix to ITB:**

(a) Copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder;

(b) Total annual financial turnover of each of the last three years duly certified by Chartered Accountant;

(c) (i) Experience in works of a similar nature and size for each of the last seven years with certificates from the concerned officer not below the rank of Executive Engineer or equivalent;

(ii) and details of works in progress or contractually committed with detail of clients who may be contacted for further information on those contracts;

(d) The undertakings as per the format and language given in Section 7 of the document. The undertakings should be of a date after the invitation of this tender. The bids accompanying with the language deviated from the language of the draft provided in Section 2 shall be treated as non – responsive.

4.3 All care should be taken by the bidder to submit correct information and documents in first place. No cognizance of the documents submitted subsequently by the bidder on his own regarding his technical bid shall be taken. However, clarification can be sought upto the extent of clearing any doubt on the documents already submitted online.

4.4 Joint Ventures are permitted to bid for the work as defined in the Appendix to ITB. Bids submitted by a Joint Venture (JV) shall comply with the following requirements:

a. There shall be a Joint Venture Agreement (as per the format given in Section-7) specific for these contract packages between the constituent firms, indicating clearly, amongst other things, the proposed distribution of responsibilities both financial as well as technical for execution of the work amongst them. For the purpose of this clause, the most experienced lead

partner will be the one defined. A copy of the Joint Venture agreement shall be submitted before any award of work could be finalized.

b. The bid, and in the case of the successful bidder, the Form of Agreement, etc., shall be signed and / or executed in such a manner as may be required for making it legally binding on all partners (including operative parts of the ensuing Contract in respect of Agreement of Arbitration, etc.). On award of work, the Form of Agreement and Contract Documents shall be signed by all partners of the Joint Venture to conclude Contract Agreement.

c. Lead partner shall be nominated as being partner-in-charge; and this authorization shall be evidenced by submitting a power of attorney signed by the legally authorized signatories of all the partners.

d. The partner-in-charge shall be authorized to incur liabilities and to receive instructions for and on behalf of the partners of the Joint Venture, whether jointly or severally, and entire execution of the Contract (including payment) shall be carried out exclusively through the partner-in-charge. A copy of the said authorization shall be furnished in this Bid.

e. All partners of the Joint Venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under sub clause I above as well as in the Form of Tender and the Form of Agreement (in case of a successful bidder).

f. In the event of default by any partner, in the execution of his part of Contract, the Employer shall be so notified within 30 days by the partner-in-charge, or in the case of the partner-in-charge being the defaulter, by the partner nominated as partner-in-charge of the remaining Joint Venture. The partner-in-charge shall, within 60 days of the said notice, assign the work of the defaulting partner to any other equally competent party acceptable to the Employer to ensure the execution of that part of the Contract, as envisaged at the time of bid. Failure to comply with the above provisions will make the Contractor liable for action by the Employer under the Conditions of Contract. If the Most Experienced i.e. Lead Partner defined as such in the Communication approving the qualification defaults, it shall be construed as default of the Contractor and Employer will take action under the Conditions of Contract.

g. Notwithstanding the permission to assigning the responsibilities of the defaulting partner to any other equally competent party acceptable to the Employer as mentioned in sub clause (f) above, all the partners of the Joint Venture will retain the full and undivided responsibility for the performance of their obligations under the Contract and/ or for satisfactory completion of the Works.

h. The bid submitted shall include all the relevant information as required under the provisions of Sub-Clause 4.5 D of ITB and furnished separately for each partner.

4.5 Qualification Criteria [applicable as per cost of work put to tender]

4.5A To qualify for award of the contract, each bidder in its name should have :-

i) Minimum average annual financial turnover (as certified by the Chartered Accountant) during the last three years, ending 31st March of the previous financial year, should not be less than 30% of the value of work. The turn over shall be updated to price level of the last financial year at the rate of 8% per year compounded yearly.

ii) Experience of having successfully completed or substantially completed similar works (i.e. road/bridge/building works/airport runway/PHED/ IWRD works as applicable for that type of tender) during the last seven years ending last day of month previous to the one in which bids are invited should be either of the following:-

(a) Three similar works each costing not less than 40% of the value of work.

Or

(b) Two similar works each costing not less than 50% of the value of work.

Or

(c) One similar work costing not less than 80% of the value of work.

The amount of works shall be updated to price level of the last financial year at the rate of 8% per year compounded yearly.

Note 1:- The works may have been executed by the applicant as Prime contractor or as a member of Joint Venture or sub-contractor. As sub-contractor, he should have acquired the experience of execution of all major items of works under the proposed contract. In case a project has been executed by a Joint Venture, the turnover or experience shall be evaluated in proportion to their participation of the Joint Venture. In case of experience as a sub-contractor, the certificate from the Principal Employer shall have to be furnished.

Note 2:- Substantially completed works means those works which are at least 95% completed as on the date of submission (i.e. gross value of work done upto the last date of submission is 95% or more of the original contract price or enhanced contract price as the case may be) and continuing satisfactorily.

Note 3:- Similar works means road work for road tender, building work for building tender, bridge work for bridge tender and so on.

For these, a certificate from the employer shall be submitted along with qualification information clearly mentioning the name of work, Contract Value, billing amount. Date of commencement of works, satisfactory performance of the Contractor and any other relevant information.

4.5 B Each bidder must produce:

(i) An affidavit in the prescribed format given in this document in Section 7. The affidavit should be of a date later then the date of calling of tender; and

(ii) Such other certificates as defined in the Appendix to ITB. Failure to produce the certificates shall make the bid non-responsive.

4.5 C To qualify for a package of contracts made up of this and other contracts for which bids are invited in the Notice Inviting Tender, the bidder must demonstrate having experience and resources sufficient to meet the aggregate of the qualifying criteria for the individual contracts.

4.5 D If bidder is a Joint Venture, the partners would be limited to three (including lead partner). Joint Venture firm shall be jointly and severally responsible for completion of the project. Joint Venture must fulfill the following minimum qualification requirement.

i. The lead partner shall meet not less than 50% of qualification criteria given in sub-clause 4.5 A (i) & (ii) of ITB above.

ii. Each of the remaining partners shall meet not less than 25% of all the criteria given in sub-clause 4.5 A (i) & (ii) of ITB above.

iii. The Joint Venture must also collectively satisfy the subject of the criteria of Clause 4.5 B and 4.5 C of ITB for this purpose the relevant figures for each of the partners shall be added together to arrive at the Joint Venture total capacity which shall be 100% or more.

iv. In the event that the Employer has caused to disqualify under Clause 4.7 of ITB below all of the Joint Venture partners will be disqualified.

v. Joint Venture Applicants shall provide a certified copy of the Joint Venture Agreement in demonstration of the partners undertaking joint and several liabilities for the performance of any contract entered into before award of work.

vi. The available bid capacity of the JV as required under Clause 4.6 of ITB below will be applied for each partner to the extent of his proposed participation in the execution of the work. The total bid capacity available shall be more than estimated contract value.

vii. The Sub-Contractors' experience and resources shall not be taken into account in determining the bidder's compliance with the qualifying criteria.

4.5. E Any other requirement as specified elsewhere in the ITB.

4.6 Bidders who meet the minimum qualification criteria will be qualified only if their available bid capacity for construction work is equal to or more than the total bid value. The available bid capacity will be calculated as under:

Assessed Available Bid Capacity = (A*N*2- B)

Where

A = Maximum value of financial turnover (as certified by the Charted Accountant) in any one year during the last three years (updated to price level of the last financial year at the rate of 8% per year compounded yearly).

N = Number of years prescribed for completion of the works for which bids are invited (period up to 6 months to be taken as ½ and more than 6 months

as 1 in a year).

B = Value, at the current price level (compounded yearly @8% per year), of existing commitments and on-going works to be completed during the period of completion of the works for which bids are invited.

4.7 Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

- made misleading or false representations in the forms, statements, affidavits and attachments submitted in proof of the qualification requirements; and/or
- record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc: and/or.
- participated in the previous bidding for the same work and had quoted unreasonably high bid prices and could not furnish rational justification to the employer.

5. One Bid per Bidder

5.1 Each Bidder shall submit only one Bid for one work. A Bidder who submits more than one Bid for one work will cause the proposals with the Bidder's participation to be disqualified.

6. Cost of Bidding

6.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will, in no case, be responsible or liable for those costs.

7. Site Visit

7.1 The Bidder, at the Bidder's own responsibility and risk is encouraged to visit and examine the Site of Works and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense. The Bidder acknowledges that prior to the submission of the bid, the Bidder / Contractor has, after a complete and careful examination, made an independent evaluation of the Scope of the Project, Specifications and Standards of design, construction and maintenance, Site, local conditions, physical qualities of ground, subsoil and geology, suitability and availability of access routes to the Site and all information provided by the Employer or obtained, procured or gathered otherwise, and has determined to its satisfaction the accuracy or otherwise thereof and the nature and extent of difficulties, risks and hazards as are likely to arise or may be faced by it in the course of performance of its obligations hereunder. The Employer makes no representation whatsoever, express, implicit or otherwise, regarding the accuracy, adequacy, correctness, reliability and/or completeness of any assessment assumptions, statement or information provided by it and the Bidder confirms that it shall have no claim whatsoever against the Employer in this regard.

B.BIDDING DOCUMENTS

8. Content of Bidding Documents

8.1 The set of bidding documents comprises the documents listed below and addenda issued in accordance with Clause 10 of ITB.

1. Detail Notice Inviting Tender
2. Instructions to Bidders including Appendix to bid
3. Qualification Information and other forms.
4. Conditions of Contract (Part I General Conditions of Contract, and Contract Data; Part II Special Conditions of Contract)
5. Technical Specifications
6. Drawings
7. Bill of Quantities
8. Form of Acceptance, Form of Agreement, Issue of Notice to Proceed with the Work,
9. Forms of Securities and Form of Unconditional Bank Guarantee.

8.2 The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms, terms and specifications, bill of quantities, forms and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. Pursuant to Clause 26 hereof, bids, which are not substantially responsive to the requirements of the Bid Documents, shall be rejected.

9. Clarification of Bidding Documents and Pre-bid Meeting

9.1 A prospective bidder requiring any clarification of the bidding documents may notify the Employer in writing or through email at the Employer's address indicated in the invitation to bid. The Employer will respond to any request for clarification which he receives earlier than 10 days prior to the deadline for submission of bids. Copies of the Employer's response will be put on website including a description of the enquiry but without identifying its source.

9.2 If a pre-bid meeting is to be held, the bidder or his authorized representative is invited to attend it. Its date, time and address are given in the Appendix to ITB.

9.3 The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

9.4 Minutes of the meeting, including the text of the questions raised (without identifying the source of the enquiry) and the responses given will be uploaded for information of the public or other bidders. Any modifications of the bidding documents listed in Clause 8.1 of ITB, which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the

issue of an Addendum pursuant to Clause 10 of ITB and not through the minutes of the pre-bid meeting.

9.5 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

10. Amendment of Bidding Documents

10.1 Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing corrigendum.

10.2 Any addendum/corrigendum thus issued shall be part of the bidding documents and put on website only and shall be deemed to have been communicated to all the bidders. The Employer will assume no responsibility in this regard.

10.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer shall extend, as necessary, the deadline for submission of bids, in accordance with Clause 20.2 of ITB.

11 PREPARATION OF BIDS

11.1 Language of Bid

All documents relating to the Bid shall be in **English** language.

12. Documents Comprising the Bid

The Bid submitted by the Bidder shall be in two separate parts:

Part I Technical bid. This shall be named Technical Qualification Part of Bid and shall comprise of:

i) The cost of the bidding documents.

ii) The Earnest money in any of the forms as specified in clause 16 of ITB or Earnest Money declaration form specified in Section-7 as applicable.

iii) Authorized address and contact details of the Bidder having the following information:

a. Address of communication:
Telephone No.(s):
Office:
Mobile No.:

b. Facsimile (FAX) No.:

c. Electronic Mail Identification (E-mail ID):

iv) **Qualification information, supporting documents as specified in ITB**.

v) Any other information/documents required to be completed and submitted by bidders, as specified in the Appendix to ITB, and

vi) Scanned copy of the affidavit (**on the format given in Section 7 of bid document**).

Part II. Financial **Bid:-**It shall be named Financial Bid and shall comprise of:

Priced bill of quantities for items specified in Section 6;

The following documents, which are not submitted with the bid, will be deemed to be part of the bid.

Section	Particulars
1	Detail Notice Inviting Tender
2	Instructions to Bidders
3.	Conditions of Contract
4.	Contract Data
5.	Technical Specifications
6.	Drawings

13. Bid Prices

13.1 The Contract shall be for the whole Works, as described in Clause 1.1 of ITB, based on the priced Bill of Quantities submitted by the Bidder.

13.2 For item rate tenders, the bidder shall fill in item rate at its appropriate place in figures. Items for which no rate or price is entered by the bidder will not be paid for by the employer. Such item, where the bidder does not quote the price or leaves it blank, will be treated as item to be executed free of cost item from the contractor.

13.3 For percentage rate tender, the bidder shall make its due diligence and quote a single percentage above or below HSR items including any premium if applicable and individual rate for NS items which are in the BOQ but not in HSR. NS *Items in the BOQ, for which no rate or price is entered by the bidder will not be paid for by the Employer and considered as nil rate items.*

13.4 All duties, taxes, royalties, compensation, cost and other levies payable by the Contractor under the Contract or to execute item(s) of work or for any other cause, shall be included in the rates, prices, and total Bid price submitted by the Bidder online.

13.5 The rates and prices quoted by the bidder are subject to adjustment during the performance of the Contract in accordance with the provision of Clause 42 A of the Conditions of Contract.

14. Currencies of Bid

14.1 The unit rates and the prices shall be quoted by the bidder entirely in Indian Rupees.

15. Bid Validity

15.1 Online Bids shall remain valid for a period of not less than 120 days after the deadline date for bid submission specified in ITB. A bid valid for a shorter period shall be rejected by the Employer as non-responsive.

15.2 In exceptional circumstances, prior to expiry of the original time limit, the Employer may request the bidders to extend the period of validity for a specified additional period. The request to the bidders' shall be made in writing or by email. A bidder may refuse the request without forfeiting his Earnest money. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his Earnest money for a period of the extension, and in compliance with Clause 16 of ITB in all respects.

16. Earnest money and Earnest money declaration Form

16.1. The Bidder who does not have contractor id on HEWP can not participate in tendering process. Bidders who have contractor ID but have not registered on HEWP can participate in tendering process by paying the earnest money through online payment on the portal. Bidders who have contractor Id and are registered on HEWP and also have deposited one time deposit are eligible for participation in the tender by annexing bid specific Earnest Money Declaration Form generated from HEWP.

16.2. The bidder who is registered as contractor with Haryana Government and is availing the exemption available for earnest money, shall upload bid specific Earnest Money Declaration form duly downloaded from HEWP.

16.3 Any bid from the registered bidders not accompanied by an acceptable Earnest Money Declaration form (in case exemption is availed) as above or not secured as indicated in Sub-Clauses 16.1 above shall be rejected by the Employer as non-responsive.

16.4. The successful bidder shall be de-registered with forfeiture of his/its one time deposit of EMD exemption amount on HEWP and further barred from participation in future bidding for a period of 2 years, in case of failure to submit the Performance Bank Guarantee as per Clause 34 of this document.

17. Alternative Proposals by Bidders

17.1 Bidders shall submit offers that comply with the requirements of the

bidding documents, including the Bill of Quantities and the basic technical design as indicated in the drawings and specifications. Conditional offer or alternative proposals will be rejected as non-responsive.

18. Format and Signing of Bid

Deleted

D. ONLINE SUBMISSION OF BIDS

Bidding through E-Tendering System

19. Instructions to bidder on Electronic Tendering System

These conditions will over-rule the conditions stated in the tender documents, wherever relevant and applicable.

19.1 Registration of bidders on e-Procurement Portal:-

All the bidders intending to participate in the tenders processed online are required to get registered on the centralized e – Procurement Portal i.e.https://etenders.hry.nic.in. Please visit the website for more details.

19.2 Obtaining a Digital Certificate:

19. 2.1 The Bids submitted online should be encrypted and signed electronically with a Digital Certificate to establish the identity of the bidder bidding online. These Digital Certificates are issued by an Approved Certifying Authority, by the Controller of Certifying Authorities, Government of India.

19.2.2 A Digital Certificate is issued upon receipt of mandatory identity (i.e. Applicant's PAN Card) and Address proofs and verification form duly attested by the Bank Manager / Post Master / Gazetted Officer. Only upon the receipt of the required documents, a digital certificate can be issued. For more details please visit the website – https://etenders.hry.nic.in.

19.2.3 The bidders may obtain Class-II or III digital signature certificate from any Certifying Authority or Sub-certifying Authority authorized by the Controller of Certifying Authorities or may obtain information and application format and documents required for the issue of digital certificate from the authority.

19.2.4 The bidder must ensure that he/she comply by the online available important guidelines at the portal https://etenders.hry.nic.in for Digital Signature Certificate (DSC) including the e-Token carrying DSCs.

19.2.5 Bid for a particular tender must be submitted online using the digital certificate (Encryption & Signing), which is used to encrypt and sign the data during the stage of bid preparation. In case, during the process of a particular tender, the user loses his digital certificate (due to virus attack, hardware problem, operating system or any other problem) he will not be able to submit the bid online.

Hence, the users are advised to keep a backup of the certificate and also keep the copies at safe place under proper security (for its use in case of emergencies).

19.2.6 In case of online tendering, if the digital certificate issued to the authorized user of a firm is used for signing and submitting a bid, it will be considered equivalent to a no-objection certificate/power of attorney /lawful authorization to that User. The firm has to authorize a specific individual through an authorization certificate signed by all partners to use the digital certificate as per Indian Information Technology Act 2000. Unless the certificates are revoked, it will be assumed to represent adequate authority of the user to bid on behalf of the firm in the department tenders as per Information Technology Act 2000. The digital signature of this authorized user will be binding on the firm.

19.2.7 In case of any change in the authorization, it shall be the responsibility of management / partners of the firm to inform the certifying authority about the change and to obtain the digital signatures of the new person / user on behalf of the firm / company. The procedure for application of a digital certificate however will remain the same for the new user.

19.2.8 The same procedure holds true for the authorized users in a private/Public limited company. In this case, the authorization certificate will have to be signed by the directors of the company.

19.3 Pre-requisites for online bidding:

In order to bid online on the portal http://etenders.hry.nic.in, the user machine must be updated with the latest Java & DC setup. The link for downloading latest java applet & DC setup are available on the Home page of the e-tendering Portal.

19.4 Online Viewing of Detailed Notice Inviting Tenders:

The bidders can view the detailed N.I.T and the time schedule (Key Dates) for all the tenders floated through the single portal e-Tender system on the Home Page at http://etenders.hry.nic.in

19.5 Download of Tender Documents:

The tender documents can be downloaded free of cost from the e-Tender portal http://etenders.hry.nic.in

19.6 Key Dates:

The bidders are strictly advised to follow dates and times as indicated in the online Notice Inviting Tenders. The date and time shall be binding on all bidders. All online activities are time tracked and the system enforces time locks that ensure that no activity or transaction can take place outside the start and end dates and the time of the stage as defined in the online Notice Inviting Tenders.

19.7 Online Payment of eService fee & Bid Preparation & Submission (PQQ/ Technical & Commercial/Price Bid):

Online Payment e-Service fee:

The online payment for eService fee can be done using the secure electronic payment gateway by bidders/ Vendors online directly through Debit Cards & Internet Banking Accounts. The secure electronic payments gateway is an online interface between contractors and Debit card / online payment authorization networks.

ii) PREPARATION & SUBMISSION Of online APPLICATIONS/BIDS:

Detailed Tender documents may be downloaded from e-Tenders website (http://etenders.hry.nic.in) and tender mandatorily be submitted online.
Scan copy of Documents to be submitted/uploaded for Prequalification or Technical bid under online. The required documents (refer to DNIT) shall be prepared and scanned in different file formats (in PDF /JPEG/MS WORD format such that file size is not exceed more than 10 MB) and uploaded during the on-line submission of Technical Bid.
FINANCIAL or Price Bid PROPOSAL shall be submitted mandatorily online in the Excel Format.

19.8 ASSISTANCE TO THE BIDDERS:-

In case of any query regarding process of e-tenders and for undertaking training purpose, the intended bidder can also avail the following and can contact service provider as per below:

Office Timings of Help-desk support for Single e-Tender Portal of Government of Haryana – Technical Support Assistance will be available over telephone Monday to Friday (09:00 am. To 5:00 pm) 0172-2700275 also contact to help desk team of Delhi (24 x 7) as given below
0120-4001002
0120-4200462
0120-4001005
0120-6277787
All queries would require to be registered at our official email support as under (only those queries which are sent through email along with appropriate screen shots or error description will be considered as registered with the Help-desk)

(a) Technical:– Support e proc (at) nic (dot) in

(b) Policy Related:-cppp-doc(at) nic (dot) in

Important Note:-

(a) Any intending bidder can contact the helpdesk on or before prior to 4 hours of the scheduled closing date &time of respective e-Auction/Tender event.

(b) For queries pertaining to e-Payment, please contact the help desk at least 2 business days prior to the closing date & time of e-Auction/Tender event.

I Help-desk support will remain closed during lunch break i.e.from 1:30

Pmupto2:15 PM on each working day.

Schedule for Training

Haryana e-Tender Help Desk Office will remain closed on Saturday, Sunday and National Holidays.

NOTE:-Bidders participating in online tenders shall check the validity of his/her Digital Signature Certificate before participating in the online Tenders at the portal http://etenders.hry.nic.in.
For help manual please refer to the 'Home Page' of the e-Tender website at https://etenders.hry.nic.in and click on the available link 'How to ...? to download the file.

20. Deadline for Submission of Bids

20.1 Complete Bids in two parts as per clause 19 above must be submitted by the Bidder online not later than the date and time indicated in the Appendix to ITB.

20.2 The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10.3 of ITB. In such case all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

21. Late Bids

21.1 Any Bid received by the Employer after the deadline prescribed in Clause 20 will be returned unopened to the bidder.

22. Withdrawal or Modifications

22.1 No bid shall be modified or withdrawn after the deadline of submission of bids.

22.2 Withdrawal or modification of a bid between the deadline for submission of bids and the expiration of the original period of bid validity specified in clause 15.1 above or as extended pursuant to Clause 15.2 may result in the forfeiture of the Earnest money pursuant to Clause 16 or invite action as per Earnest Money declaration undertaking.

E. Bid Opening and Evaluation

Bid Opening

23.1 The Employer inviting the bids or its authorized representative will open the bids online in the presence of the bidders or their representatives who choose to attend at time, date and the place specified in Appendix to ITB.

23.2 In the event of the specified date for the Opening of bids being declared a holiday for the Employer, the Bids will be opened at the appointed time and location on the next working day.

23.3 The file containing the Part-I of the bid will be opened first.

23.4 The amount, form and validity of the cost of bidding document and earnest money furnished with each bid will be announced. If the cost of bidding document and earnest money furnished does not conform to the amount and validity period as specified in the Invitation for Bid, and has not been furnished in the form specified in Clause 16, the remaining technical bid will not be opened and will be disqualified for opening of financial bid. Similarly for registered bidders, bid not accompanied by the Earnest Money declaration form, shall be rejected and technical bid not be opened.

23.5 The Employer will also prepare minutes of the Bid opening, including the information disclosed in accordance with Clause 23.4 of ITB.

23.6

(i) Subject to confirmation of the earnest money, the bids accompanied with valid earnest money/earnest money declaration form will be taken up for evaluation with respect to the Qualification Information and other information furnished in Part I of the bid pursuant to Clause 12.1.

(ii) The technical bid will be evaluated on the basis of the documents submitted online by the bidder and no modification of his technical bid will be sought from the bidder. No cognizance of the documents submitted subsequently by the bidder on his own regarding his technical bid shall be taken. However, clarification can be sought upto the extent of clearing any doubt the documents already submitted online.

(iii) The bidders will respond in not more than 7 days of issue of the clarification letter, which will also indicate the date, time and venue of opening of the Financial Bid.

(iv) Immediately, on receipt of these clarifications the Evaluation Committee will finalize the list of responsive bidders whose financial bids are eligible for consideration.

23.7 The Employer shall hoist the result of technical evaluation of bids alongwith the reasons for rejection of Part-I of the bid (Technical bid) on the website. Thereafter, the employer shall wait for 7 days before opening the financial bid of the qualified bidders so as to give the disqualified bidders and opportunity to

avail, if they so desire, any remedy available under the Law.

23.8 Part II (Financial Bid) of bids of only those bidders will be opened online, who have qualified in Part I of the bid. The bidders' names, the Bid prices, the total amount of each bid, and such other details as the Employer may consider appropriate will be notified by the Employer at the time of bid opening.

23.9 The Employer shall prepare the minutes of the online opening of Part-II of the Bids.

24 Process to be Confidential

Information relating to the examination, clarification, evaluation, and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any attempt by a Bidder to influence the Employer's processing of bids or award decisions may result in the rejection of his Bid.

25 Clarification of Bids and Contacting the Employer

25.1 No Bidder shall contact the Employer on any matter relating to its bid from the time of the bid opening to the time the contract is awarded **except as specified in clause 25.3 here under.** If the bidder wishes to bring additional information to the notice of the Employer, it should do so in writing.

25.2 Any attempt by the bidder to influence the Employer's bid evaluation, bid comparison or contract award decision may result in the rejection of his bid.

25.3 To assist in the examination, evaluation, and comparison of Bids, the Employer may, at his discretion, ask any Bidder for clarification of his Bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by email, but no change in the price or substance of the Bid shall be sought, offered, or permitted.

26. Examination of Bids and Determination of Responsiveness

26.1 During the detailed evaluation of "Part-I of Bids", the Employer will determine whether each Bid

(a) meets the eligibility criteria defined in Clauses 3 and 4;
(b) has been properly signed;
(c) is accompanied by the required securities; and
(d) is substantially responsive to the requirements of the bidding documents.

During the detailed evaluation of the "Part-II of Bids", the responsiveness of the bids will be further determined with respect to the remaining bid conditions, i.e., priced bill of quantities.

26.2 A substantially responsive "Financial Bid" is one which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one

(a) which affects in any substantial way the scope, quality, or performance of the Works;

(b) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the Bidder's obligations under the Contract;

or

whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

26.3 If a Bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation.

27. Correction of Errors.

27.1. "Financial Bids" determined to be substantially responsive will be checked by the 'Employer' for any errors. Errors will be corrected by the Employer as follows:

Where there is a discrepancy between the unit of any item mentioned in BOQ, from that in HSR, the unit mentioned in HSR shall prevail and the total resulting from multiplying the quoted rate by the quantity, shall be taken in to account.

27.2. The amount stated in the "Financial Bid" will be corrected by the Employer in accordance with the above procedure and the bid amount adjusted in the following manner.

(a) If the Bid price increases as a result of these corrections, the amount as stated in the bid will be the 'bid price' and the increase will be treated as rebate;

(b) If the bid price decreases as a result of the corrections, the decreased amount will be treated as the 'bid price'.

28. Adjusted in bid price pursuant to clause 27 above, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount the Bid will be rejected, and action as per provisions of Earnest Money Declaration Form shall be initiated or Earnest Money shall be forfeited as applicable**.**

29. Evaluation and Comparison of Bids

29.1 The Employer will evaluate and compare only the bids determined to be substantially responsive in accordance with Clause 26 of ITB.

29.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price as follows:

(a) adjustments to reflect discounts or other price offered in Financial bid submitted online.

29.3 If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer's estimate of the cost of work to be performed under the contract, the

Employer may require the Bidder to produce detailed price analysis for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices. After evaluation of the price analysis, the Employer may require that the amount of the Performance Security set forth in **Clause 34** of ITB be increased at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract. The amount of the increased Performance Security shall be decided at the sole discretion of the Employer, which shall be final, binding and conclusive on the bidder. The amount of additional performance security shall be equal to an amount arrived at as below: -

(i) If the Bid price offered by the contractor is negatively unbalanced upto the 10% of the estimated project cost (as per analytical rates / N.S. rates).
In such cases no additional performance security shall be taken from the successful bidder;

(ii) If the bid price offered by the contractor is negatively unbalanced below 10% and upto 20% of the estimated project cost (as per analytical rates / N.S. Rates): -

In such case, Additional performance security shall be calculated @ 20% of the {(% below quoted by the contractor – 10%) of the estimated cost of the project};

(iii) If the bid price offered by the contractor is further negatively unbalanced below 20% of the estimated project cost (as per analytical rates / N.S. Rates): -

In such case, the Additional performance security shall be calculated @ 30% of the {(% below quoted by the contractor – 10%) of the estimated cost of the project};

(iv) 20% of the total unbalanced amount of all the seriously unbalanced items (i.e. unbalanced by more than 40% of the estimated amount of that particular item/items).

Out of (i), (ii), (iii) and (iv) above Whichever is higher is to be deposited by the successful bidder.

29.4 Validity of above Additional performance Security shall be valid until a date 28 days from the date of issue of the certificate of completion.

29.5 The Employer reserves the right to accept or reject any variation or deviation. Variations and deviations and other factors, which are in excess of the requirements of the Bidding documents or otherwise result in unsolicited benefits for the Employer, shall not be taken into account in Bid evaluation.

29.6 The estimated effect of the price adjustment conditions under Clause 47 of the

Conditions of Contract, during the period of implementation of the Contract, will not be taken into account in Bid evaluation.

30. The agency/Bidder to whom the work is allotted shall be paid lowest of the following in the running/final bills.

I. Amount calculated with the accepted rates of lowest agency.

II. Amount worked out with the accepted percentage above/below HSR+CP/analytical rates/ NS item rates, worked out in financial statement. Financial statement will be made a part of agreement.

F. AWARD OF CONTRACT

31. Award Criteria

31.1 Subject to Clause 32 of ITB, the Employer will award the Contract to the Bidder whose Bid has been determined:

(i) To be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid price and

(ii) To be within the available bid capacity adjusted to account for his bid price which is evaluated the lowest in any of the packages opened earlier than the one under consideration. In no case, the contract shall be awarded to any bidder whose available bid capacity is less than the evaluated bid.

32. Employer's Right to Accept any Bid and to Reject any or all Bids

32.1 Notwithstanding Clause 31 above, the Employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.

33. Notification of Award and Signing of Agreement

33.1 The bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period by email confirmed by registered letter. This letter (hereinafter and in the Part I *General Conditions of Contract* called the "Letter of Acceptance") will state the sum that the Employer will pay to the Contractor in consideration of the execution, completion and maintenance of the works, by the Contractor during defect liability period as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

33.2 The notification of award will constitute the formation of the Contract, subject only to the furnishing of a Performance Security in accordance with the provisions of Clause 34.

33.3 The Agreement will incorporate all agreements between the Employer and the successful Bidder. It will be signed by the Employer and the successful Bidder after the Performance Bank Security is furnished.

33.4 Upon the furnishing by the successful Bidder of the Performance Security, the Employer will promptly notify the other Bidders that their Bids have been unsuccessful.

33.5 Upon the furnishing by the successful Bidder of the Performance Security, the Employer shall issue the letter to proceed with the work.

33.6 If the lowest tenderer (L-1) backs out, his earnest money shall be forfeited or action as per conditions of Bid Security Declaration Form shall be initiated. The agency will be de-barred for giving tenders for two year and the second lowest tenderer (L-2), third lowest tenderer (L-3) in order of sequence, may be called

upon to bring his offer to the same level as the originally first lowest tenderer. In the event of their refusal to do so, tenders shall be recalled. In case of great urgency, authority competent to accept the tender may authorize call of limited or short notice tenders.

34. Performance Security

34.1.a) Within 15 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance Security in any of the forms given below for an amount equivalent to 5% of the Contract price plus additional security for unbalanced Bids in accordance with Clause 29.3 of ITB and Conditions of Contract:

A Bank Guarantee in the form given in Section 7/FDR in the name of Executive Engineer concerned. Performance bank guarantee shall be valid until a date 45 days after the expiry of Defect Liability-cum-Maintenance Period.

34.1.b) As per Haryana Govt. Co-operation Department Notification No. 8366-C-7-2016/13818 dated 08.12.2016, the performance security for Co-operative Labour and Construction Societies shall be half of the performance security applicable to contractors for works upto any value. In case of the Cooperative Labour and Construction Societies consisting of all women members or all SC members the performance security will be 25% of the performance security applicable to contractor.

34.2 If the performance security is provided by the successful Bidder in the form of a Bank Guarantee / FDR, it shall be issued either (a) at the Bidder's option, by a Nationalized / Scheduled Indian Bank or (b) by a foreign bank located in India and acceptable to the Employer**.**

34.3 Failure of the successful Bidder to comply with the requirements of Sub-Clause 34 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Earnest money/action due as per Earnest Money declaration. The bidder shall also be debarred for period of 2 year from participation in tenders in any of the Departments/ Boards/ Corporations etc. of Haryana Government. If the work of is an urgent nature and cannot brook delay involved in re-tendering, the remaining tenderers shall be offered the lowest approved rates. If more than one tenderer turns up, then preferences shall be given to the tenderer graded according to the rates quoted in the first instance.

34.4 Whenever the work value is enhanced on account of variation in quantities / change of scope of work during the execution, beyond 10% above the original agreement amount, the contractor shall be required to submit the additional Performance Security in the form of Bank Guarantee @ 5% of the enhanced value of contract with the same validity as applicable to the original Performance Security and a supplementary agreement for the revised work value shall be signed with the department which shall also define the mile stones as well as revised intended completion date. The contractor shall deliver additional Performance Security within 21 days of receipt of request in this regard from the employer.

Illustration:

Original Amount of agreement	Enhancement	Amount after enhancement	Additional Performance
Rs 1,00,000.00	Rs 10,000.00	1,10,000.00	Nil
Rs 1,00,000.00	Rs 15,000.00	1,15,000.00	5% of Rs 15,000.00

34.5 Failure of the contractor to submit a valid additional Performance Bank Guarantee @ 5% of the enhanced value of contract as above shall invite similar penalties as prescribed for non-submission of original Performance Security. The time control on the revised work shall also be monitored and implemented on pro-rata basis as per the clauses applicable to the original work.

35. Advances

The Employer will provide Advances as stipulated in the conditions of contract, subject to maximum amount, as stated in the Contract Data.

36. Corrupt or Fraudulent Practices

36.1 The 'Employer' will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question and will declare the firm ineligible, either indefinitely or for a stated period of time; to be awarded a contract by Haryana Government in any of Departments/ Boards/ Corporations etc.

36.2 The successful bidder shall be required to sign an **Integrity Pact** as provided in Section 7.

36.3 The Employer requires the Bidders/Contractors to strictly observe the laws against fraud and corruption in force in India, namely, Prevention of Corruption Act, 1988.

37. Debarring

If a registered but unverified bidder submits Financial Bid online but he/it fails to submit the Earnest Money instruments in physical form by 5:00 pm with the Executive Engineer on the last date of submission of this tender, he / it shall be blacklisted for participation in the bidding in all future tenders floated by any of Department/ Boards/ Corporations etc. of Government of Haryana, for a period of 2 years.

38. Completion of work

The agency to whom the work is allotted shall complete the entire work as per drawings irrespective of quantities in the DNIT. The agency is bound to consult the drawings before tendering and tender the work accordingly. However, Clause 37 of GCC shall be applicable on the varied quantities.

Note :- After Clause 38 of ITB, any of the tendering Departments may include one or more clauses in the ITB as per specific requirement of the department/work.

39. Instructions/ Special Qualification Requirements for Road Works

Note: - Here tendering Departments should specify following requirements as may be necessary for execution of the work :-

1. Equipment, Plant & Machinery.
2. Laboratory Equipment"

Appendix to ITB

Instructions to Bidder Clause Reference

Sr. No.	Description	Value to be printed on system generated CBD	Clause No.
1.	Authority	**Governor of Haryana / Managing Director / Chief Administrator or Employer**	[Cl.1.1] or Press Notice/ DNIT
2.	The Employer is Designation: Address:	**Superintending Engineer/Deputy General Manager (IA)**	[Cl.1.1] or Press Notice/DNIT
3.	Name of authorized Representative	_____	[Cl.1.1]
4.	The Engineer is Designation: Address:	_____	[Cl.1.1]
5.	The Intended Completion Date for the whole of the Works is ___ months after start of work.	**DD/MM/YYYY**	[Cl.1.1, 17&27]
6.	The Works is *(Name of the work)*	_____	[Cl.1.1]
7.	The jurisdiction of court is	_____	[Cl.1.1]
8.	The average annual financial turn over amount is	**Rs. _____lacs (Rs. _____only)**	[Cl.(4.5 A) (i)]
9.	Value of work is as under :-	(i) **Three works :- Rs…… Lacs** (ii) **Two works :- Rs…… Lacs** (iii) **Single Work:- Rs…… Lacs**	[Cl.(4.5 A) (ii)]
10.	Joint Ventures	**Allowed/Not Allowed**	[Cl.3.1 & 4.4]
11.	The contact person is:	**Executive Engineer, _____, / Asstt. General Manager, _____, Address : Telephone No.**	[Cl.7.1]
12.	Place, Time and Date for pre-bid meeting are	**Place :- Time :- Date :-**	[Cl.9.2]

_____,
_____Department.

_____Circle

Section-2

Qualification Information

Notes on Form of Qualification Information

The information to be filled in by bidders in the following pages will be used for purposes of post-qualification as provided for in Clause 4 of the Instructions to Bidders. This information will not be incorporated in the Contract. Attach additional pages as necessary.

1.	**Individual Bidders**	
1.1	Constitution or legal status of Bidder Place of registration: Principal place of business: Power of attorney of signatory of Bid (if required)	*[attach copy]* _____ _____ *[attach]*
1.2	Total annual financial turnover of each of the last three year duly certified by Chartered Accountant	(Rs. In lacs) Year _____ Year _____ Year _____

1.3.1 Work performed as prime Contractor (in the same name and style) on construction works of a similar nature and volume over the last Five years. Attach certificate from the Engineer-in-charge.

Project Name	Name of Employer	Description of work	Value of contract	Contract No.	Date of Issue of Work Order	Stipulated date of completion	Actual Date of Completion	Remarks explaining reasons for delay, if any

1.3.2 Work performed as Sub-Contractor (in the same name and style) on construction works of a similar nature and volume over the last Seven years. Attach certificate from Principal Employer (Main Client). Attach legal document of agreement / subcontract, Form 26 AS of the sub-contractor.

Project Name	Name of Employer	Description of work	Value of contract	Contract No.	Date of Issue of Work	Stipulated date of completion	Actual Date of Completion	Remarks explaining reasons for delay, if any

					Order			

1.3.3 Information on Bid Capacity (works for which bids have been submitted and works which are ongoing and yet to be completed) as on the date of this bid.

Existing commitments and on-going construction works:

Description of Work	Place & State	Contract No & Date	Name & Address Of Employer	Value of Contract (Rs. In lacs)	Stipulated period of completion	Value of works remaining to be completed (Rs. Lacs) *	Anticipated Date of completion
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1.3.3 (A) Works for which bids already submitted:

Description of works	Place & State	Name & Address of Employer	Estimated value of works (Rs. In lacs)	Stipulated period of completion	Date when decision is expected	Remarks, if any
1	2	3	4	5	6	7

Note:- Here, any of the departments may specify the quantities of the work executed by the bidder.

Section 3

Conditions of Contract

Table of Contents

Section 3

Part I General Conditions of Contract

A. General

1. Definitions

Terms which are defined in the Contract Data are not also defined in the Conditions of Contract but keep their defined meanings. Capital initials are used to identify defined terms.

Bill of Quantities means the priced and completed Bill of Quantities forming part of the Bid.

Compensation Events are those defined in Clause 40 hereunder.

The Completion Date is the date of completion of the Works as certified by the Engineer, in accordance with Clause 48.1.

The Contract is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in Clause 2.3.

The Contract Data defines the documents and other information which comprise the Contract.

The Contractor is a person or corporate body whose Bid to carry out the Works, including routine maintenance, has been accepted by the Employer.

The Contractor's Bid is the completed bidding document submitted by the Contractor to the Employer.

The Contract Price is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

Days are calendar days; months are calendar months.

A Defect is any part of the Works not completed in accordance with the Contract or distressed development in the work irrespective of any causes.

The Defect Liability-cum-Maintenance Period is the period named in the contract Data and calculated from the Completion Date.

The 'Defect Liability-cum-Maintenance Period' is without any payment for maintenance activities.

The Defect Liability-cum-Maintenance Period Certificate is the certificate issued by Engineer, after the Defect Liability-cum-Maintenance Period has ended and upon correction of Defects by the Contractor.

The Maintenance means the activities required to be carried out for routine maintenance of road relating to works covered in scope of work as per the agreement or enhanced agreement.

Drawings include calculations and other information provided or approved by the Engineer for the execution of the Contract.

The Employer is the party as defined in the Contract Data, who employs the Contractor to carry out the Works, including routine maintenance. The Employer may delegate any or all functions to a person or body nominated by him for specified functions.

The Engineer is the person named in the Contract Data (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Engineer) who is responsible for supervising the execution of the Works and administering the Contract.

Equipment is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

The Initial Contract Price is the Contract Price listed in the Employer's Letter of Acceptance.

The Revised Contract Price is the Contract Price agreed after signing of a supplementary agreement with the Employer.

The Intended Completion Date is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is specified in the Contract Data. The Intended Completion Date may be revised only by the Engineer by issuing an extension of time.

Materials are all supplies, including consumables, used by the Contractor for incorporation in the Works.

Plant is any integral part of the Works that shall have a mechanical, electrical, electronic, chemical, or biological function.

The **Site** is the area defined as such in the Contract Data.

Site Investigation Reports are those that were included in the bidding documents and are reports about the surface and subsurface conditions at the Site.

Specification means the Specification of the Work included in the Contract and any modification or addition made or approved by the Engineer. Specifications for Road and Bridge Works (Latest Edition as on date of Tender) published by Ministry of Road Transport & Highways shall be applicable or any or all other specifications/IS Codes applicable to a work.

The **Start Date** is given in the Contract Data. It is date when the Contractor shall commence execution of the works. **It does not necessarily coincide with any of the Site Possession Dates.**

A **Sub-Contractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the construction work in the Contract, which includes work on the Site.

Temporary Works are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.

A **Variation** is an instruction given by the Engineer, which varies the Works.

The Works as defined in the Contract Data, are what the Contract requires the Contractor to construct, install, maintain, and hand over to the Employer.

Substantial completion means those works which are at least 95% completed as on the date of submission (i.e. gross value of work done upto the last date of submission is 95% or more of the original contract price) and continuing satisfactorily.

2. Interpretation

2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Engineer will provide instructions clarifying queries about these Conditions of Contract.

2.2 If sectional completion is specified in the Contract Data, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

2.3 The documents forming the Contract are to be taken as mutually explanatory, and unless otherwise expressly provided elsewhere in the Contract, the priority of the documents, in the event of any ambiguity between them, shall be interpreted in the following order of priority:

(1) Agreement / Revised Agreement / Supplementary Agreement,
(2) Notice to Proceed with the Work,
(3) Letter of Acceptance,
(4) Contractor's Bid,
(5) Contract Data,
(6) Special Conditions of Contract Part II,
(7) General Conditions of Contract Part I,
(8) Specifications,
(9) Drawings,
(10) Bill of Quantities, and
(11) Any undertaking given subsequent to submission of bid.
(12) Any other document listed in the Contract Data.

3. Language and Law

3.1 The language of the Contract shall be English. The law governing the Contract

are the Acts/Rules/Guidelines etc. notified by Government of India and Government of Haryana.

3.2 The works are to be carried out strictly as per the applicable laws, permits, rules and regulations. Any damages / penalties imposed by any statutory authority, like NGT etc, on account of noncompliance of any applicable laws, permits, rules and regulations shall have to be borne by the contractor.

4. Engineer's Decisions

4.1 Except where otherwise specifically stated, the Engineer will decide contractual matters between the Employer and the Contractor in the role representing the Employer. However, if the Engineer is required under the rules and regulations and orders of the Employer to obtain approval of some other authorities for specific actions, he will so obtain the approval.

4.2 Except as expressly stated in the Contract, the Engineer shall not have any authority to relieve the Contractor of any of his obligations under the Contract.

5. Delegation

5.1 The Engineer, with the approval of the Employer, may delegate any of his duties and responsibilities to other person, after notifying the Contractor, and may cancel any delegation after notifying the Contractor.

6. Communications

6.1 All certificates, notices or instructions to be given to the Contractor by the Employer/Engineer shall be sent on the address or contact details given by the Contractor. The address and contact details for communication with the Employer/ Engineer shall be as per the details given in Contract Data to GCC. Communications between parties that are referred to in the conditions shall be in writing. The Notice sent by facsimile (fax) or other electronic means shall be effective on confirmation of the transmission. The Notice sent by Registered post or Speed post shall be effective on delivery or at the expiry of the normal delivery period as undertaken by the postal service.

7. Subcontracting

7.1 (a) The Contractor may subcontract part of the work with the approval of the Employer in writing, up to percent defined in contract data of the contract price, but will not assign the Contract. It is expressly agreed that the Contractor shall, at all times, be responsible and liable for all his obligations under this Agreement notwithstanding anything contained in the agreements with his Sub-contractors or any other agreement that may be entered into by the Contractor and no default under any such agreement shall exempt the Contractor from his obligations or liability hereunder.

7.1 (b) However, any specialized work can be Sublet to a Sub Contractor possessing required valid Experience and certificate required if any after approval from the Employer.

7.2 The Contractor shall not be required to obtain any consent from the Employer for:

(a) the sub-contracting of any part of the Works for which the Sub-Contractor is named in the Contract;

(b) the provision for labour, or labour component.

(c) the purchase of Materials which are in accordance with the standards specified in the Contract.

7.3. The Engineer should satisfy himself before recommending to the Employer whether the Sub-Contractor so proposed for the Works possesses the experience, qualifications and equipment necessary for the job proposed to be entrusted to him in proportion to the quantum of Works to be sub-contracted.

7.4 While sub-contracting part of construction work as per provisions of Clause 7.1 and 7.3 above, the Contractor shall enter into formal sub-contract with sub-contractor making provisions for such requirements as may be specified by the Engineer including a condition that to the extent of inconsistency, provision of the Contract shall prevail over the provisions of the sub-contract. A copy of document of formal sub-contract shall be furnished to the Employer within a period of 30 days from the date of such sub-contract. In all such cases, on completion of the Contract, the Engineer, unless for reasons recorded in writing decides otherwise shall issue a Certificate of Experience to the contractor and in such certificate, the experience of the sub-contractors shall also be mentioned. The Copy of such certificate would also be endorsed to the sub-contractor.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with Other Contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as referred to in the Contract Data. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

8.2 The Contractor should take up the works in convenient reaches as decided by the Engineer to ensure there is least hindrance to the smooth flow of traffic including movement of vehicles and equipment of Other Contractors till the completion of the Works.

9. Personnel

9.1 The Contractor shall ensure that the personnel engaged by it in the performance of its obligations under this Contract are at all times appropriately qualified, skilled and experienced in their respective functions.

9.2 The Contractor shall employ for the construction work and operation of lab, the technical personnel named in the Contract Data or other technical persons

approved by the Engineer. Before signing the agreement the contractor will submit the bio data of the technical personnel, as given in contract data, he proposes to employ on this work to the Engineer and will get the bio data approved from the Engineer. The Engineer will approve any proposed replacement of technical personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel stated in the Contract Data.

9.3 If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the Works in the Contract. The Contractor shall then appoint (or cause to be appointed) a replacement.

9.4 The Contractor shall not employ any retired Gazetted officer who has worked in the Engineering Department of the State Government and has either not completed two years after the date of retirement or has not obtained State Government's permission for employment with the Contractor.

9.5 The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative, who in the opinion of the Engineer:

(a) persists in any misconduct,
(b) is incompetent or negligent in the performance of his duties,
(c) fails to conform with any provisions of the Contract, or
(d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment.

10. Employer's and Contractor's Risks

10.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

11. Employer's Risks

11.1 The Employer is responsible for the excepted risks which are (a) in so far as they directly affect the execution of the Works in the Employer's country, the risks of war, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot commotion or disorder (unless restricted to the Contractor's employees) and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive.

12. Contractor's Risks

12.1 All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract

other than the excepted risks, referred to in clause 11.1, are the responsibility of the Contractor.

13. Insurance

13.1 The Contractor at his cost shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the date of completion, in the amounts and deductibles stated in the Contract Data for the following events which are due to the Contractor's risks:

(a) loss of or damage to the Works and material, plant and machinery to be incorporated in the work.
(b) Personal injury or death.
(c) Loss of damage to property of third party other than the Contractor and the Employer (except works, plant, material and equipments) in connection with the Contract.

13.2 Insurance policies and certificates for insurance shall be delivered by the Contractor to the Engineer for the Engineer's approval before the Start Date. All such insurance shall provide for compensation to be payable in Indian Rupees to rectify the loss or damage incurred.

13.3 (a) The Contractor at his cost shall also provide, in the joint names of the Employer and the Contractor, insurance cover from the date of completion to the end of **Defect Liability-cum-Maintenance Period**, in the amounts and deductibles stated in the Contract Data for personal injury or death which are due to the Contractor's risks:

13.3 (b) Insurance policies and certificates for insurance shall be delivered by the Contractor to the Engineer for approval before the completion date/start date. All such insurance shall provide for compensation to be payable in Indian Rupees.

13.4 Alterations to the terms of insurance shall not be made without the approval of the Employer.

13.5 Both parties shall comply with any conditions of the insurance policies.

14. Site Investigation Reports

14.1 The Contractor, in preparing the Bid, may, at his own risk, rely on any Site Investigation Reports if referred to in the Contract Data, supplemented by any other information available to him, before submitting the bid.

14.2 The Contractor shall be required to make adequate dewatering arrangements to make the area dry for construction work. No separate payment shall be made to the Contractor for dewatering. The percentage premium (above or below) for HSR items and individual rates for NS items shall include the cost of dewatering unless specific provisions are made in the BOQ for payment of dewatering. This includes sub soil/surface dewatering also, if needed to execute the work properly.

15. Queries about the Contract Data

15.1 The Engineer will clarify queries on the Contract Data.

16. Contractor to Construct the Works

16.1 The Contractor shall construct, and install and maintain the Works in accordance with the Specifications and Drawings.

17. The Works to Be Completed by the Intended Completion Date

17.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Programme submitted by the Contractor, as updated with the approval of the Engineer, and complete them by the Intended Completion Date.

18. Approval by the Engineer

18.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer, who is to approve them.

18.2 The Contractor shall be responsible for design and safety of Temporary Works.

18.3 The Engineer's approval shall not alter the Contractor's responsibility for design and safety of the Temporary Works.

18.4 The Contractor shall obtain approval of third parties to the design and safety of the Temporary Works, where required.

18.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Engineer before their use.

19. Safety

19.1 The Contractor shall be responsible for the safety of all activities on the Site.

19.2 The Contractor shall be responsible for safety of all persons, employed by him on Works, directly or through petty contractors or Sub-Contractors, and shall report accidents to any of them, however, and wherever occurring on Works, to the Engineer or the Engineer's Representative and shall make every arrangement to render all possible assistance and to provide prompt and proper medical attention. The compensation for affected Workers or their relatives shall be paid by the Contractor in such cases expeditiously in accordance with the Workmen's Compensation Act and other labour Laws and regulations.

20. Discoveries

20.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor

shall notify the Engineer of such discoveries and carry out the Engineer's instructions for dealing with them.

21. Possession of the Site

21.1 The Employer shall handover complete or part possession of the site to the Contractor seven days in advance of construction programme. At the start of the work, the Employer shall handover the possession of at least 80% of the site.

22. Access to the Site

22.1 The Contractor shall allow access to the Site and to any place where work in connection with the Contract is being carried out, or is intended to be carried out to the Engineer and any person/persons/agency authorized by:

(a) The Engineer

(b) The Employer

(c) State Government of Haryana.

22.2 Royalties

Except where otherwise stated, the contractor shall pay all tonnage and other royalties, rent and other payments of compensation, if any, for getting stone, sand, gravel, clay or other materials required for the works or excavation of earth on the site of work.

The contractor has to give proof for making payment of royalty to any state Government for procuring stone soling, stone metal, bajri and earth etc. If these are arranged from quarries situated in Haryana but not auctioned by Industries Department, Government of Haryana, the Engineer shall be at liberty to make recovery of royalties after due notice to the contractor. The decision of Employer in this regard shall be final.

23. Instructions

23.1 The Contractor shall carry out all instructions of the Engineer, which comply with the applicable laws where the Site is located.

24. Dispute Redressal system

24.1 If any dispute or difference of any kind what-so-ever shall arise in connection with or arising out of this contract or the execution of work or Defect Liability-cum-Maintenance period of the works there under, whether before its commencement or during the progress of works or after the termination, abandonment or breach of the contract, it shall, in the first instance, be referred for settlement to the competent authority, described alongwith their powers in the contract data above the rank of the Engineer. The competent authority shall, within a period of forty five days after being requested in writing by the contractor to do so, convey his decision to the contractor. Such

decision in respect of every matter so referred shall, subject to review as hereinafter provided, be final and binding upon the contractor. In case the work is already in progress, the contractor shall proceed with the execution of the works, including maintenance thereof pending receipt of the decision of the authority as aforesaid, with all due diligence.

24.2 Either of the parties is barred from making reference to the competent authority after 120 days from completion of work i.e. the claims will be time barred if the reference to the competent authority is not made within 120 days from the completion of work.

24.3 Either Party will have the right to apply for arbitration as provided here in after if he/it is not satisfied with decision of the competent authority.

25. Arbitration

(a) Where any of the party is not satisfied with the order passed by the competent authority can apply for appointment of Arbitrator. In case the party invoking arbitrator is contractor he shall deposit a sum as security deposit, proportionate to the claim amount, determined as per the values given in 'Contract Data' with 'Engineer'. On termination of the arbitration proceedings, this fee shall be adjusted against the cost, if any, awarded by the arbitrator against the claimant party and the balance remaining after such adjustment, and in the absence of such cost being awarded, the whole of the sum bill will be refunded within one month of the date of award.

(b) For agreement amounts upto Rs. 10.00 Crore (after adjusting the contract price any increase/decrease due to variations etc.) the matter will be referred to a single Arbitrator to be appointed by the Engineer-in-Chief from the panel of arbitrators approved by the Government.

(c) For agreement amounts more than Rs. 10.00 Crore (after adjusting the contract price any increase/decrease due to variations etc.) the matter will be referred to an Arbitral Tribunal consisting of 3 arbitrators, one each to be appointed by the Employer after taking approval from Engineer-in-Chief and the contractor and the third arbitrator to be chosen by the two arbitrators so appointed by both the parties to act as Presiding Arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the Administrative Secretary, of the department to which the work belongs (Principal Secretary/ Additional Chief Secretary) as the case may.

(d) If one of the parties fails to appoint its arbitrator in pursuance of sub-clause (c) above within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the Administrative Secretary, of the department to which the work belongs shall appoint the arbitrator. A certified copy of the order of the Administrative Secretary, of the department to which the work belongs, making such an appointment shall be furnished to each of the parties.

e. The decision of the majority of arbitrators shall prevail both parties.

f. Arbitration proceedings shall be held in India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.

g. The cost and expenses of Arbitration proceedings will be paid as provided hereinafter. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself. The fee and expenses of presiding Arbitrator shall be borne by both the parties equally.

h. Performance under the contract shall continue during the arbitration proceedings and payments due to the contractor by the employer shall not be withheld, unless they are the subject matter of the arbitration proceedings.

i) The fee and other charges payable to an arbitrator shall be as per of "THE ARBITRATION AND CONCILIATION (AMENDMENT) ACT., 2016.

B.Time Control

26. Programme

26.1 Within the time stated in the Contract Data, the Contractor shall submit to the Engineer for approval a Programme showing the general methods, arrangements, order, and timing for all the activities in the Works, for the construction of works.

26.2 The Contractor shall submit the list of equipment and machinery being brought to site, the list of key personnel being deployed, the list of machinery/ equipment being placed in field laboratory and the location of field laboratory along with the Programme. The Engineer shall cause these details to be verified at each appropriate stage of the programme.

26.3 An update of the Programme shall be a programme showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining Works, including any changes to the sequence of the activities.

26.4 The Contractor shall submit to the Engineer for approval an updated Programme at intervals no longer than the period stated in the Contract Data. If the Contractor does not submit an updated Programme within this period, the Engineer may withhold the amount stated in the Contract Data from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Programme has been submitted.

26.5 The Engineer's approval of the Programme shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Engineer again at any time. A revised Programme shall show the effect of Variations and Compensation Events.

27 Extension of the Intended Completion Date

27.1 The Engineer shall extend the Intend Completion Date, with approval from authority competent to grant time extension as mentioned in clause 16.16.6 of PWD code through Employer, if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work and which would cause the Contractor to incur additional cost.

The Clause 16.16.6 is reproduced as under:-
"16.16.6 The authority competent to technically sanction the estimate shall have the power to grant EOT. However, to check disproportionate EOTs and to ensure uniformity in approach, the Engineer-in-Chief shall issue instructions in this regard from time to time."

27.2 The Engineer with the approval of the authority competent to grant time

extension as per PWD Code Clause 16.16.6 through employer shall decide whether and by how much to extend the Intended Completion date within 56 days of the Contractor asking the Engineer for a decision upon the effect of a compensation event or variation and submitting full supporting information. If the Contractor has failed to give early warning to delay or has failed to cooperate in dealing with a delay, the delay by the failure shall not be considered in accessing the new Intended Completion Date.

27.3 The Engineer shall within 14 days of receiving full justification from the contractor for extension of Intended Completion Date refer to the employer. The employer shall refer the case to the authority competent to grant time extension as per Clause 16.16.6 of PWD Code within further 14 days for his decision. It the authority competent to grant time extension fails to give his acceptance within next 28 days, the engineer shall not grant the time extension and the Contractor may refer the matter to the Dispute Redressal System under clause 24.1. In case the employer happens to be the authority competent to grant time extension, he would convey his decision to the Engineer within 42 days.

28. Delays Ordered by the Engineer

28.1 The Engineer may instruct the Contractor to delay the start or progress of any activity within the Works. Delay/delays totaling more than 30 days will require prior written approval of the Employer.

29. Management Meetings

29.1 The Engineer may require the Contractor to attend a management meeting. The business of a management meeting shall be to review the plans for the Works.

29.2 The Engineer shall record the business of management meetings and provide copies of the record to those attending the meeting. The responsibility of the parties for actions to be taken shall be decided by the Engineer either at the management meeting or after the management meeting and stated in writing to all those who attended the meeting.

C.Quality Control

30. Identifying Defects

30.1 The Engineer shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Engineer may instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer considers may have a Defect.

31. Tests

31.1 For carrying out mandatory tests as prescribed in the specifications, the Contractor shall establish field laboratory at the location decided by Engineer with in the time period defined in Contract Data. The field laboratory will have minimum equipments as specified in the Contract Data. The Contractor shall be solely responsible for :

(a) Carrying out the mandatory tests prescribed in the relevant Specifications, and

(b) For the correctness of the test results, whether preformed in his laboratory or elsewhere.

If the Engineer instructs the Contractor to carry out a test not specified in the Specifications to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples.

32 Correction of Defects noticed during the Defects Liability-cum-Maintenance Period. **Period as defined in Contract Data**.

32.1 The Engineer shall give notice to the Contractor of any Defects before the end of the Defect Liability-cum-Maintenance Period, which begins from the Completion Date. The Defect Liability-cum-Maintenance Period shall be extended for as long as the Defects remain to be corrected.

32.2 Every time notice of Defect/Defects is given, the Contractor shall correct the notified Defect/Defects within the duration of time specified by the Engineer's notice.

32.3 To fulfill the objectives laid down above, the Contractor shall undertake detailed inspection of the roads at least once in a month. The Engineer can increase this frequency in case of emergency. The Contractor shall forward to the Engineer, the record of inspection and rectification each month. The Contractor shall pay particular attention on those road sections which are likely to be damaged or inundated during rainy season.

32.4 The Engineer may issue notice to the Contractor to carry out maintenance of defects, if any, noticed in his inspection, or brought to his notice. The Contractor shall remove the defects within the period specified in the notice and submit to

the Engineer a compliance report.

33 Uncorrected Defects

33.1. If the Contractor has not corrected a Defect within the time specified in the 'Engineer's notice, the 'Engineer' will assess the cost of having the Defect corrected, and the Contractor will pay double of this amount.

33.2 If the contractor fails to pay the amount as intimated by the 'Engineer' to the contractor as per clause 36.1 the same shall be recovered from the running bill or the security amount and it if is more than the security amount then the same shall be recovered from the performance security.

D. Cost Control

34. Bill of Quantities

34.1 The Bill of Quantities shall contain items for the construction, installation, testing, and commissioning works to be done by the Contractor.

35 The Bill of Quantities is used to calculate the Contract Price. The Contractor is paid for the quantity of the work done at the rates in the Bill of Quantities for each item.

36. Variations

36.1 The Engineer shall, having regard to the scope of the Works and the sanctioned estimated cost, have power to order, in writing, Variations within the scope of the Works, he considers necessary during the progress of the Works. Such Variations shall form part of the Contract and the Contractor shall carry them out and include them in updated Programmes produced by the Contractor. Oral orders of the Engineer for Variations, unless followed by written confirmation, shall not be taken into account.

37. Payments for Variations

37.1. If the final quantity of the work done exceeds from the quantity in the Bill of Quantities for the particular item by more than 25 per cent provided the change exceeds 1% of initial Contract Price, the 'Engineer' with the approval of the Competent Authority and shall adjust the rate to allow for the change, duly considering:

(a) justification for rate adjustment as furnished by the Contractor,
(b) economies resulting from increase in quantities by way of reduced plant, equipment and overhead costs.
(c) Entitlement of the Contractor to compensation events where such events are caused by any additional work.

37.2. If requested by the 'Engineer' / Employer, the Contractor shall provide the 'Engineer' / Employer with a detailed cost breakdown of any rate in the Bill of Quantities.

38. Cash Flow Forecasts

38.1 When the Programme is updated, the Contractor shall provide the Engineer with an updated cash flow forecast.

39. Payment Certificates

39.1. The Contractor shall submit to the 'Engineer' monthly statements of the estimated value of the work completed less the cumulative amount certified previously by 1st week of the month. In case contractor does not submit his bill by 1st week of the month, 'Engineer' shall get the monthly statement of the

estimated value of work completed less cumulative amount prepared by the end of third week of the month. This procedure will be followed even if no work is carried out at the site of work.

39.2. Deleted

39.3 *Deleted*

39.4 *Deleted*

40. Payments

40.1 Payments shall be adjusted for deductions for advance payments, security deposit/ retention, other recoveries in terms of the contract and taxes at source, as applicable under the law.

41. The Employer may appoint another authority, as specified in the Contract Data (or any other competent person appointed by the Employer and notified to the Contractor) to make payment certified by the Engineer.

42. Items of the Works for which no rate or price has been entered in the Bill of Quantities, will not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

43. The agency / bidder to whom the work is allotted shall be paid lowest of the following in the running / final bills**:-**

1. Amount calculated with the accepted rates of lowest agency.
2. Amount worked out with the accepted percentage above /below HSR+CP/analytical rates/NS item rates, worked out in financial statement. Financial statement will be made a part of agreement.

44. Compensation Events

44.1 The following are Compensation Events unless they are caused by the Contractor:

a. The Employer does not give access to 80% of the area of project Site by the Site Possession Date stated in the Contract Data.
b. The Employer modifies the schedule of other contractors in a way which affects the work of the contractor under the contract.
c. The Engineer orders a delay or does not issue drawings, specifications or instructions required for execution of works on time.
d. The Engineer instructs the Contractor to uncover or to carry out additional tests upon work which is then found to have no Defects.
e. The Engineer does not approve of a subcontract to be let, within 30 days.
f. Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of Letter of Acceptance from the information issued to Bidders (including the Site Investigation Reports),

from information available publicly and from a visual inspection of the site.

g. The Engineer gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.
h. Other contractors, public authorities, utilities or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
i. The advance payment is delayed, beyond 28 days after receipt of application and bank guarantee.
j. The effect on the Contractor of any of the Employer's Risks.
k. The Engineer unreasonably delays issuing a Certificate of Completion.
l. Other Compensation Events listed in the Contract Data or mentioned in the Contract**.**

44.2 In case of works of Irrigation Water Resources Department, no compensation would be payable due to non-availability of closure of a canal. If the closure is not made available within the Intended Completion Date, the Contractor will have the option to complete the works, with the permission of Competent Authority, in the extended period.

44.3 If a Compensation Event would prevent the Works being completed before the Intended Completion Date, the Intended Completion Date shall be extended. The Engineer shall recommend to the Employer whether and by how much the Intended Completion Date shall be extended. Final approval shall rest with the Employer.

45. Tax

The Price Bid by the Contractor shall include all custom duties, import duties, levies, business taxes, income, toll and other taxes, duties, service tax, SGST, CGST etc. of local bodies and authorities as applicable that may be levied in accordance to the laws and regulations in being as on the closing date for submission of Bid in the country of Employer on the Contractor's Equipment, Plant, materials and supplies (permanent, temporary and consumables) acquired for the purpose of Contract and on the services performed under the Contract. Nothing in this Contract shall relieve the Contractor from the responsibility to pay that may be levied in the Employer's country on profits made by him in respect of the Contract.

45.1 Subsequent Legislation

If, after the closing date for submission of Bid there occur changes to any National or State Statue, Ordinance, Decree or other Law or any regulation or bye-law of any local or other duly constituted authority, or the introduction of any such State Statue, Ordinance, Decree, Law, regulation or bye-law which causes additional or reduced cost to the Contractor in the execution of the Contract, such additional or reduced cost shall, after due consultation with the Employer and the Contractor, be determined by the Construction Manager and shall be added to or deducted from the Contract Price and the Construction

Manager shall notify the Contractor accordingly, after taking approval from the Competent Authority, with a copy to the Employer.

45.2 Other Changes in Cost

To the extent that full compensation for any rise or fall in costs to the Contractor is not covered by the provisions of this or other 'Clauses in the Contract, the unit rates and prices included in the Contract shall be deemed to include amounts to cover the contingency of such other rise or fall of costs.

46 Currencies

46.1 All payments will be made in Indian Rupees.

47. Price Adjustment

47.1 Contract price shall be adjusted for increase or decrease in rates with the principles and procedures and as per formula given in the contact data. The rate of cement/steel issued under the authority of Engineer-in-Chief concerned on the date of receipt of tender shall be considered as base rate.

47.2 To the extent that full compensation for any rise or fall in costs to the contractor is not covered by the provision of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.

47.3 The contractor shall submit original bill/ voucher while claiming the payment for the work done. The bill/ voucher should pertain to the period of original contractual time limit and should correspond with the progress of work. No extra payment due to increase in rate of cement/steel/bitumen will be paid if the original bill/ vouchers are not submitted by the agency. No increase in prices of the cement/steel/bitumen shall be reimbursed to the contractor beyond the original time period allowed for construction as per contract agreement irrespective of extension of time limit granted to the agency for any reason, whatsoever.

48. Retention Money

The Employer shall retain is sum of 6% (six percent) from each payment due to the contractor subject to maximum of 5% of the final contract price until Completion of the whole of the Works.

On completion of the whole of the Works half the total amount retained is repaid to the Contractor and half when the Defect Liability-cum-Maintenance Period has passed and the Engineer has certified that all Defects notified by the Engineer to the Contractor before the end of this period have been corrected.
On completion of the whole works, the contractor may substitute retention money with an "on demand" Bank guarantee/FDR.

49. Liquidated Damages

49.1 In the event of failure on part of the Contractor to achieve timely completion of

the project, including any extension of time granted under Clause 27, he shall, without prejudice to any other right or remedy available under the law to the Employer on account of such breach, pay as agreed liquidated damages to the Employer and not by way of penalty in a sum calculated at the rate per day or part thereof as stated in the Contract Data. For the period that the Completion Date is later than the Intended Completion Date, liquidated damages at the same rate shall be withheld if the Contractors fails to achieve the milestones prescribed in the Contract Data. However, in case the Contractor achieved the next milestone, the amount of the liquidated damages already withheld shall be restored to the Contractor by adjustment in the payment certificate. Both the Parties expressly agree that the total amount of liquidated damages shall not exceed 10% (ten percent) of the value of the balance work (amount of uncompleted work) on the date on which liquidated damages have become due. The liquidated damages payable by the Contractor are mutually agreed genuine pre-estimated loss and without any proof of actual damage likely to be suffered and incurred by the Employer; and the Employer is entitled to receive the same and are not by way of penalty.

The Employer may, without pre-judice to any other method of recovery, deduct the amount of such damages from any sum due, or to become due to the Contractor or from Performance Security including Additional Performance Security or any other dues from Government or semi-Government bodies within the state.

The payment or deduction of such damages shall not relieve the Contractor from his obligations to complete the Works, or from any other of his duties, obligations or responsibilities under the Contract.

The Contractor shall use and continue to use his best endeavor to avoid or reduce further delay to the Works, or any relevant Stages.

49.2 The Employer, with the approval of the competent authority, based on the justified reasons, can extend the intended completion date. The liquidated damages can be deferred/reduced/waived (whole or part) by the SE concerned for contract(s) upto Rs.1.00 cr., CE from Rs.1.00 cr. to Rs.10.0. cr. and E-In-C for contract(s) above Rs.10.00 cr. This will be done on the written request of the contractor and written recommendations of EE/SE as the case may be. If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any such payment of liquidated damages by the Contractor by adjusting the next payment certificate.

49.3 It is agreed by the Contractor that the decision of the Employer as to the liquidated damages payable by the Contractor under this Clause shall be final and binding.

50. Advance Payment

50.1. The Employer shall make advance payment to the Contractor of the amounts stated in the Contract Data by the date stated in the Contract Data, against provision by the Contractor of an Unconditional Bank Guarantee in a form as per Section-7 and by a bank acceptable to the Employer in amounts and currencies equal to the advance payment. The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee

shall be progressively reduced by the amounts repaid by the Contractor. Interest will be charged on the advance payment as specified in the contract data.

50.2. The Contractor is to use the advance payment only to pay for Equipment, Plant and Mobilization expenses required specifically for execution of the Works. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the 'Engineer'.

50.3. The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor. Following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment is assessing valuations of work done, Variations, price adjustments, Compensation Events, or Liquidated Damages.

50.4. Secured Advance

The 'Engineer' shall make advance payment in respect of materials intended for but not yet incorporated in the Works in accordance with conditions stipulated in the Contract Data.

51 Securities

51.1 The Performance Security equal to 5% (five percent) and additional security for unbalanced bids shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form by a bank or surety acceptable to the Employer, and denominated in Indian Rupees. The Performance Security shall be valid until a date 45 days from the date of expiry of Defect Liability-cum-Maintenance Period and the additional security for unbalanced bids shall be valid until a date 28 days from the date of issue of the certificate of completion.

51.2 Whenever the work value is enhanced on account of variation in quantities / change of scope of work during the execution, beyond 10% above the original agreement amount, the contractor shall be required to submit the additional Performance Security in the form of Bank Guarantee @ 5% of the enhanced value of contract with the same validity as applicable to the original Performance Security and a supplementary agreement for the revised work value shall be signed with the department which shall also define the mile stones as well as revised intended completion date. The contractor shall deliver additional Performance Security within 21 days of receipt of request in this regard from the employer.

Illustration:

Original Amount of agreement	Enhancement	Amount after enhancement	Additional Performance
Rs 1,00,000.00	Rs 10,000.00	1,10,000.00	Nil
Rs 1,00,000.00	Rs 15,000.00	1,15,000.00	5% of Rs 15,000.00

52. Cost of Repairs

52.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the **Defect Liability-cum-Maintenance Period** shall be remedied by the Contractor at his cost if the loss or damage arises from the Contractor's acts or omissions.

E. Finishing the Contract

53. Completion of Construction and Maintenance

53.1 The Contractor shall request the Engineer to issue a Certificate of Completion of the works and the Engineer will do so upon deciding that the Work is completed, within 21 days of the receipt of request or within a reasonable period as per nature of the work.

54. Taking Over

54.1 The Employer shall take over the Works within seven days of the Engineer's issuing a certificate of Completion of Works. The Contractor shall continue to remain responsible for its **Defect Liability-cum-Maintenance period during the Defect Liability-cum-Maintenance Period.**

54.2 The Employer shall take over the maintained work within seven days of the Engineer issuing a certificate of clearance of **Defect Liability-cum-Maintenance Period.**

55. Substantial completion

55.1 The Engineer shall issue a substantial completion certificate if so requested by the contractor if the work is atleast 95% complete and the work has been executed to such an extent that it can be gainfully utilized by the Employer and remaining work is minor in nature not affecting gainful use of the work.

56. Defect Liability-cum-Maintenance period

56.1 The Defect Liability-cum-Maintenance period shall be as defined in the Contract Data and Special Condition of Contract.

57. Final Account

57.1. The Contractor shall supply to the 'Engineer' a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The 'Engineer' shall issue a Defect Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, 'Engineer' shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Engineer shall decide on the amount payable to the Contractor and issue a payment certificate, within 56 days of receiving the Contractor's revised account.

57.2 The contractor will submit the final bill of construction within 21 days of issue of Completion Certificate. The Engineer will process and pass the final bill within 21 days of the submission of final bill by the contractor.

58. As built drawings and Operating & Maintenance Manuals

58.1 The Contractor shall submit "as built" drawings for the work by the dates given in the contract data. If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the Contract Data.

58.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the Contract Data, or they do not receive the Engineer's approval, the Engineer shall withhold the amount stated in the Contract Data from payments due to the Contractor.

59. Termination

59.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

59.2 Fundamental breaches of the Contract shall include, but shall not be limited to, the following:

(a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Programme and the stoppage has not been authorized by the Engineer;

(b) the 'Engineer' instructs the Contractor to delay the progress of the Works and the instruction is not withdrawn within 56 days the Contractor is declared as bankrupt or goes into liquidation other than for approved reconstruction or amalgamation;

(c) the Engineer gives Notice that failure to correct a particular Defect whether pertaining to construction work or pertaining to **Defect Liability-cum-Maintenance Period** is a fundamental breach of the Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer;

(d) the Contractor does not maintain a Security, which is required;

(e) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in clause 44.1;

(f) the Contractor fails to provide insurance cover as required under clause 13;

(g) if the Contractor, in the judgment of the Employer, has engaged in the corrupt, fraudulent or coercive practice in competing for or in executing the Contract. For the purpose of this clause, "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract execution. "Fraudulent Practice" means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage

to justified interest of others and/or to influence the procurement process to the detriment of the Government interests. And, this includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid process at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition. "Coercive practice" means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process.

(h) if the Contractor, in the judgment of the Employer, has engaged in the corrupt, fraudulent practice to extract undue payments from the department while executing the Contract. For the purpose of this clause, "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract execution. "Fraudulent Practice" means a willful misrepresentation or omission of facts or submission of fake / forged documents / claims / bills in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage detriment of the Government interests.

(i) any other fundamental breaches as specified in the Contract Data.

59.3 When either party to the Contract gives notice of a breach of contract to the 'Engineer' for a cause other than those listed under Sub Clause 59.2 above, the 'Engineer' shall decide whether the breach is fundamental or not.

59.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.

59.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.

60. Payment upon Termination

60.1 (i) If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done, less liquidated damages, less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as indicated in the Contract Data. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be recovered from the Retention Money and Performance Security. If any amount is still left un-recovered it will be a debt payable to the Employer from any other due payments to the contractor for any other works executed by him in the State of Haryana, any other state Govt. works, Central Govt. works including state public sector works executed by the Contractor.

60.1 (ii) If the Contract is terminated because of a fundamental breach of contract by the Contractor due to non-compliance of the requirements of clause 32 of GCC regarding Defect Liability-cum-Maintenance Period, the Engineer will

assess the cost of having the defect corrected. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be recovered from the Security Deposit and Performance Security. If any amount is still left un-recovered, it will be recovered from any dues payable to the Contractor from any other State Government works including State Public Sector works executed by the Contractor. If any amount still remains unrecovered, it shall be recovered as arrears of land revenue.

60.2 If the Contract is terminated at the Employer's convenience or because of a fundamental breach of Contract by the Employer, the 'Engineer' shall issue a certificate for the value of the work done, the cost of balance material brought by the contractor and available at site, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works and the Contractor's costs of protecting and securing the Works and less advance payments received up to the date of the certificate, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law

61. Property

61.1 All materials on the Site, Plant, Equipment, Temporary Works and Works are deemed to be the property of the Employer, if the Contract is terminated because of a Contractor's default to make recoveries.

62. Release from Performance

62.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of the Employer or the Contractor, the Engineer shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.

62.2 If a Contractor dies during the currency of the Contract or becomes permanently incapacitated, and his/her legal heirs are not willing to complete the Contract, the Contract shall be closed without levying any damages/compensation as provided for in clauses 44 and 60 of GCC.
However, if the nominee expresses his/her intention to complete the balance work and the competent authority is satisfied about the competence of the nominee, then the competent authority shall enter into a fresh agreement for the remaining work strictly on the same terms and conditions, under which the Contract was initially awarded.

Part-II Special Conditions of Contract

LABOUR:

1.1 Every Contractor shall:-

(i) In relation to an establishment to which this Act applies on its commencement, within a period of 60 days from such commencement, and

(ii) In relation to any other establishment to which this Act may be applicable at any time after such commencement, within a period of 60 days from the date on which this Act becomes applicable to such establishment, make an application to the registering officer for the registration of establishment.

Further, the first running bill of the contractor shall be cleared only after the receipt of registration certificate under the Building & Other Construction Workers Welfare (RE&CS) Act, 1996 and registration of all the eligible construction workers as a beneficiary of the Haryana Building & Other Construction Worker Welfare Board.

1.2 The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

1.3 The Contractor shall, if required by the 'Engineer's, deliver to the 'Engineer' a return in detail, in such form and at such intervals as the 'Engineer' may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the 'Engineer' may require.

2.0 COMPLIANCE WITH LABOUR REGULATIONS:

During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all existing labour enactments and rules made thereunder, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to construction industry are given below. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules make thereunder, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications /bye laws /Acts /Rules /regulations including amendments, if any, on the part of the Contractor, the 'Engineer's /Employer

shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/'Engineer' shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

2.1. Registration of Establishment: -

(1) Every employer shall –
   (a) in relation to an establishment to which this Act apples on its commencement, within a period of sixty days from such commencement; and
   (b) in relation to any other establishment to which this Act may be applicable at any time after such commencement, within a period of sixty days from the date on which this Act becomes applicable to such establishment, make an application to the registering officer for the registration of such establishment;
   Provided that the registering officer may entertain any such application after the expiry of the periods aforesaid, if he is satisfied that the applicant was prevented by sufficient cause from making the application within such period.

(2) Every application under sub-section (1) shall be in such form and shall contain such particulars and shall be accompanied by such fees as may be prescribed.

(3) After the receipt of an application under sub-section (1), the registering officer shall register the establishment and issue a certificate of registration to the employer thereof in such form and within such time and subject to such conditions as may be prescribed.

(4) Where, after the registration of an establishment under this section, any change-occurs in the ownership or management or other prescribed particulars intimated by the employer to the registering officer within thirty days of such change in such form as may be prescribed".

In case of work executed through the contractor, it is the responsibility of the contractor to get the works registered as employers as per section 2(i) of the BOCW Act. In case of works executed directly through the department, the department is liable to get the works registered.

a) Every Contractor shall :-

(i) In relation to an establishment to which this Act applies on its commencement, within a period of 60 days from such commencements; and

(ii) In relation to any other establishment to which this Act may be applicable at any time after such commencement, within a period of 60 days from the date

on which this Act becomes applicable to such establishment, make an application to the registering officer for the registration of establishment.

It is mandatory to strictly compliance of BOCW Act and registration of all eligible construction labour. Otherwise it will attract criminal proceedings against the contractual agency and employer for non-compliance of Building & Other Construction Workers Welfare (RE&CS) Act, 1996 and registration of all the eligible construction workers as a beneficiary of the Haryana Building & Other Construction Worker Board.

2.2 SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK.

a) Workman Compensation Act 1923:- The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

b) Payment of Gratuity Act 1972:- Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more on death, the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

c) Employee P.F. and Miscellaneous Provision Act 1952:- The Act Provides for monthly contributions by the employer plus workers @10% each. The benefits payable under the Act are:

(i) Pension or family pension on retirement or death, as the case may be.
(ii) Deposit insurance linked with death of the worker during Employment.
(iii) Payment of P.F. accumulation or retirement/death etc.

d) Maternity Benefit Act 1951:- The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

e. Contract Labour (Regulation & Abolition) Act 1970:- The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take licence from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer, if they employ 20 or more contract labour.

f. Minimum Wages Act 1948:- The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of

the Act, if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.

(g) Payment of Wages Act 1936:_ It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

(h) Equal Remuneration Act 1979:- The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.

(i) Deleted

(j) Industrial Disputes Act 1947:- The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(k) Industrial Employment (Standing Orders) Act 1946:- It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.

(l) Trade Unions Act 1926:- The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(m) Child Labour (Prohibition & Regulation) Act 1986:- The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.

(n) Inter-State-Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979:_ The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be

provided certain facilities such as housing, medical aid, traveling expenses from home upto the establishment and back, etc.

(o) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996:- All the establishment who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

(p) Factories Act 1948:- The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

2.3 FAIR WAGE CLAUSES

(a) The Contractor shall pay not less than the fair wage to labourers engaged by him on the work.
EXPLANATION:- Fair Wage' means wage whether for time of piece work notified from time to time for the area and where such wages have not been so notified the wages specified by the Public Works (B&R) Deptt. Haryana for the district in which the work is done.

(b) The Contractor shall not with standing the provisions of any agreement to the contrary, caused to be paid fair wages to labour, indirectly engaged on the work including any labour engaged by his sub-contractors in connection with the said work, as if the labourers had been directly employed by him.

(c) In respect of labour directly or indirectly employed on the works for the performances of the contractor's part on this agreement the contractor shall comply with or cause to be complied with the Haryana PWD

Contractor's Labour's Regulations made by the Government from time to time in regard to payment of wages wage period deductions from wages recovery of wages not paid and deductions unauthorized made maintenance of wage register wage book, wage slip, publication of wages and other terms of employment inspection and submission of periodical returns and all other matters of a lime nature.

(d) The Executive Engineer or Sub Divisional Engineer concerned shall have the rights to deduct, from the moneys due to the Contractor, any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for benefit of the workers, non payment of wages or deductions made from his or their wages, which are not justified by terms of the contract for non observance of the regulations referred to in clause I above.

(e) Vis-à-vis the Haryana Government, the Contractor shall be primarily liable for all payments to be made under and the observance of the regulations aforesaid without prejudice to his right to claim indemnity from his sub Contractors.

(f) The regulations shall be deemed to be a part of this contract and any branch there shall be deemed to be branch of this contract.

2.4 RULES FOR PROTECTION OF HEALTH & SANITARY ARRANGEMENTS

2.4.1 Rules for the Protection of Health and Sanitary Arrangements for Workers Employed by the Haryana Public Works Department or its Contractors

The Contractor shall at his own expense provide or arrange for the provision of foot wear for any labour doing cement mixing work (the Contractor has undertaken to execute under this contract) to the satisfaction of the Engineer – in – charge and on his failure to do so Government shall be entitled to provide the same and recover the cost thereof from Contractor.

The Contractor shall submit by the 4th and 19th of every month to the Executive Engineer a true statement showing in respect of the second half of the proceeding month and the first half of the current month respectively (i) the number of labourers employed by him on the work (ii) their working hours (iii) the wages paid to them (iv) the accident that occurred during the said forthright showing the circumstances under which they happened and the extent of damage and injury caused by them and (v) the number of female workers who have been allowed Maternity benefit according to clause 19-F and the amount paid to them failing which the Contractor shall be liable to pay to Government a sum not exceeding Rs. 50/- for each default or materially incorrect statement. The decision of the Executive Engineer shall be final in deducting from any bill due to the contractor the amount levied as fine.

Maternity benefit for female workers employed by the Contractor, leave and pay during leave shall be regulated as follow: -

1. LEAVE (i) in case of delivery/maternity leave not exceeding 8 weeks (4 weeks up to and including the day of delivery and 4 weeks following that day) (ii) in case of miscarriage : up to 3 weeks from the date of miscarriage.

2. PAY (i) In case of delivery, leave pay during maternity leave will be at the rate of the woman's average daily earning calculated on the total wages earned on the day when full time work was done during a period of 3 months immediately preceding the date of which she gives notice that she excepts to be confined or at the rate of Rs. 12/- per day which ever is greater.

3. In case of miscarriage, Leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of 3 months immediately proceeding the date of such miscarriage.

4. Conditions for the grant of Maternity leave:- No Maternity leave benefit shall be admissible to a woman unless she produces a certificate of confinement and excepted delivery within 4 weeks proceeding the date on she proceeds on leave.

2.4.2 FIRST AID

(a) At every work place, there shall be maintained in readily accessible place first aid appliances including an adequate supply of sterilized dressing and cotton wools. The appliances shall be kept in good order and in large workplaces it shall be placed under the charge of a responsible person who shall be readily available during the working hours.
(b) All large work places where hospital facilities are not available within easy distance of the work, first aid post shall be established and be run by a trained compo under.
(c) Where large work places are remote from regular hospital an indoor ward shall be provided with one bed for every 250 employees.
(d) Where large work places are situated in cities, towns in their suburbs and no beds are considered necessary owing to the proximity of city or town hospitals a suitable transport shall be provided to facilitate removal of urgent cases to these hospitals.
(e) At other work place, the conveyance facilities such as car shall be kept readily available to take injured or persons suddenly taken seriously ill, to the nearest hospital.

2.4.3 SCALES OF ACCOMMODATION IN LATRINES URINALS

These shall be provided within the precinct of every work places, Latrines and Urinals in an accessible place and the accommodation separately for each of them shall not be less than the following scales : -

	No. of Sheds
(a) Where the number of persons does not exceed 50	2
(b) Where the number of persons exceeding 50 but does not exceeds 100	3
(c) For every additional 100	3 per 100

In particulars cases the Executive Engineer shall have the powers to very the scale where necessary.

2.4.3 Latrines and Urinals for women

If women are employed, separate latrines and urinals screamed from these for men and marked in vernacular in conspicuous letters 'FOR WOMEN ONLY' shall be provided on the scale laid in rules, Similarly those for men shall be marked 'FOR MEN ONLY' A poster showing the figures of a man and women shall also be exhibited at the entrance of latrine for each sex. There shall be adequate supply of water close to latrines.

2.4.4 LATRINES AND URINAL

Except in work places provided with flush latrines concerned with a water borne sewerages systems all latrines shall be provided with receptacies order earth system which shall be in working order and kept in strictly sanitary conditions. The receptacles shall be tarried inside and outside at least once a year.

The inside walls shall be constructed of masonry or some suitable heat resisting non absorbent material and shall be cement washed inside and outside at least once a year. The dates of cement shall be noted in register maintained for this purpose and kept available for inspection.

2.4.5 DISPOSAL OF EXCRETA

Unless otherwise aggranged for by the local sanitary authority arrangements for proper disposal and a sanitary of excreta by incineration at the work place shall be made by means of a suitable incineration approved by the Asstt. Director of Public Health or Municipal Medical Officer of Health, as the case may be, in whose jurisdiction the work place is situated. Alternately excreta may be disposed of by putting a layer of night soil at the bottom of pucca tank prepared for the purpose and covering it with 9 inches layers of earth for a fortnight when it will turn into a manure.

2.4.6 CRECHE:

At every work place these shall be provided free of cost two suitable sheds one main and the other for the use of labour. The height of the shelter shall not be less than eleven feet from the floor level to the lowest part of the roof.

2.4.7 PROVISION OR SHELTER DURING REST:

At every work place at which 50 or more women workers are ordinary employed, these two huts for use of children under the age of six years belonging to such women. One hut shall be used for infants "Games and to play" and the other as their bed room. The hut shall not be constructed on a lower standard then the following :-

(i) Thatched roofs.
(ii) Mud floors and walls.
(iii) Plants spread over mud floor and covered with mating.

The huts shall be provided with suitable and sufficient opening for light and ventilations. There shall be adequate provision of sweepers to keep the place clean. There shall be two day attendant. Sanitary, utensils shall be provided to the satisfaction of Health Office of the area concerned. The use of the hut shall be restricted to children, their attendant and mothers of the children.

2.4.8 CANTEEN:

A cooked food canteen sson a moderate scale shall be provided for the benefit of workers where over it is considered expedient.

2.4.9 GENERAL RULES AS TO SCAFFOLDS :

(i) Suitable scaffolds shall be provided for all workmen for all works that cannot be safely done from a ladder or by other means.

(ii) A scaffolds shall not be constructed taken down or substantially altered except.

(iii) Under the supervision of a competent and responsible person, and

(a) As far as possible by competent workers possessing adequate experience in this kind of work.

(b) All scaffolds and appliances connected there with and ladder shall :-

1. be of sound material.

2. be of adequate strength having regard to the load and strains to which they will be subjected and

3. be maintained in proper condition.

4. scaffolds shall not be overloaded and so far as practicable, the load shall be evenly distributed.
5. scaffolds shall be so constructed that no part there of can be displaced in on normal use.
6. Before installing, lifting gear on scaffolds special precautions shall be taken to ensure the strength and stability of the scaffolds.
7. scaffolds shall be periodically inspected by the competent person.
8. before allowing a scaffold to be used by the workman, every care shall be taken to see whether the scaffolds have been erected by his workmen and steps taken to ensure that it complies fully with the requirement of the articles.
9. Working platforms gangways and stairways shall:

(a) be so constructed that no part of the road is covered.

(b) Be so constructed and maintained, having regard to the prevailing condition as to reduce as for as practicable.

(c) Be kept free from any unnecessary obstruction.
(d) In case of working platforms gangways place and stairways at a height exceeding that to be prescribed by a national laws and regulations :-
(i) Every working platform and every gangway shall be closely boarded unless other adequate measures are taken to ensure safety.
(j) Every working platform and every gangway shall have adequate width, and;
Every opening in the floor of a building or in working platforms shall except for the time and to the extent required to allow the access of persons or the transport or shifting of material be provided with suitable means to prevent the fall of persons or materials.

When persons are employed on a roof where there is a danger of failing from a height exceeding that to be prescribed by national laws of regulations suitable precautions shall be a taken to prevent the fall of persons or materials.

Suitable precautions shall be taken to prevent persons being struck by articles which might fall from scaffolds or other working places.

1. Soft means of access shall be provided to all working platforms an other working places.
2. Every place where work is carried on the means approach there to shall be adequately lighted.
3. Every ladder shall be securely fixed of such length as to provide secure hand held and foot at every position at which it is used.
4. Adequate precautions shall be taken to prevent danger from electrical equipment.

5. No material on the site shall be so stacked or placed as to cause danger to any person.

2.4.10 GENERAL RULES AS TO SAFETY EQUIPMENT AND FIRST AID

(1) All necessary personal safety equipment shall be kept and available for use of the persons employed on the site be maintained in condition suitable for immediate use.
(2) The worker shall be required to use the equipment thus provided and the employed shall take adequate steps to ensure proper use of the equipment by these concerned.
(3) Adequate provision shall be made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.

3.0 Environment

a) The contractor shall take all reasonable steps to protect the environment at and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.
b) During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, notifications and by laws of the State or Central Government or local authorities and any other law, bye law, regulations that may be passed for notification that may be issued in this respect in future by the State or Central Government or the local authority.

3.1 Salient features of some of the major laws that are applicable are given below:

(i) The water (Prevention and Control of Pollution) Act 1974: This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alternation of physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.
(ii) The Air (Prevention and Control of Pollution) Act 1981: This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid, or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

iii) The Environment (Protection) Act 1986: This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. '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, micro-organism and property.

iv) The Public Liability Insurance Act 1991: This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

4.0 The Apprentices Act, 1961

4.1 The Contractor shall duly comply with the provisions of the Apprentices Act, 1961 (III of 1961), the rules made there under and the orders that may be issued from time to time under the said Act and the said Rules and on his failure or neglect to do so, he shall be subject to all liabilities and penalties provided by the said Act and said Rules.

5.0 Amendment

The Haryana Government may, from time to time and to amend any of the Labour or Pollution or other regulations, all amendments in any or all Acts shall also be followed.

6.0 Drawings and Photographs of the Works

6.1 The Contractor shall do photography/video photography of the site firstly before the start of the work, secondly mid-way in the execution of different stages of work and lastly after the completion of the work. No separate payment will be made to the Contractor for this.

6.2 The Contractor shall not disclose details of Drawings furnished to him and works on which he is engaged without the prior approval of the Employer in writing. No photograph of the works or any part thereof or plant employed thereon, except those permitted under clause 58.1, shall be taken or permitted by the Contractor to be taken by any of his employees or any employees of his sub-Contractors without the prior approval of the Employer in writing. No photographs/ Video photography shall be published or otherwise circulated without the approval of the Employer in writing.

6.3 The various works shall be done in line to line level and grade. The periodical checking of these by the Engineer or Engineer's representative shall not absolve the Contractor of his responsibility regarding their accuracy. In case of any deviation or discrepancy in line, level or grade at the meeting faces, the Contractor shall make good the discrepancy at his own cost and without any

compensation for the additional work, if any involved. The Engineer shall further have right, if need be, to rectify the discrepancies and recover the cost from the Contractor.

6.4 All materials, before being incorporated in the work, shall be inspected by the Engineer or his representative and, if necessary, tested before use. Any work, on which such materials are used without approval and written permission of the Engineer, is liable to be considered as defective and not acceptable.

6.5 The day to day and periodical tests, to be carried out on materials, mixes and placed concrete, etc., shall be specified by the Engineer from time to time and the Contractor shall allow all the facilities and cooperation towards collections of samples etc. All labour for collecting samples for tests will be supplied by the Contractor free of cost to the Engineer. Where testing facility is not available in the field lab, the Engineer-in-Charge will get the test conducted from some approved laboratory and testing and transportation charges shall be borne by the Contractor in all such cases.

6.6 An authorized representative of the Contractor shall remain present at the time when the samples are taken and shall authenticate the facts, if so required. If the Contractor's representative fails to be present as aforesaid, the samples or cores, etc. as are taken by the Engineer or his representatives shall be considered to be authentic. The Contractor will however be informed of the details of such samples having been taken.

6.7 The materials, mixes and the cores shall be tested day to day and periodically at the laboratory and the results given thereby shall be considered correct and authentic by the Contractor. The Contractor shall be given access to all operations and tests that may be carried out as aforesaid so that he may satisfy himself regarding the procedure and method adopted. It shall then be the Contractor's responsibility to produce the works, materials and finished item to the standards based on the laboratory design and tests.

7.0 The methods of sampling, testing, procedures and standards shall be laid down by the Engineer from time to time.

8.0 The quality and quantity of material shall be the responsibility of the Contractor, irrespective of the test results being good.

9. Arrangement of water and electric power, etc. required by the Contractor for the work shall be made by him at his own cost. Engineer will, however, recommend to the concerned State Electricity Utilities for providing the connection and power to the Contractor, however, the Engineer will bear no responsibility in this respect.

9.1 Contractor shall not be allowed to start the work till Engineer is satisfied with the proper arrangement of good quality water for execution of work including curing for 28 days. For this, the Contractor shall have to construct water storage tanks of sufficient capacity. No extra payment shall be made on this account. Any delay in execution of work due to non-availability of sufficient water will be responsibility of the Contractor. In case water is used from

Government source, the contractor has to pay 0.5% of the cost of the part of such work for which the water is used.

9.2 The Contractor shall not set fire to any standing jungle, trees, 'bush' wood or grass without a written permission from the Engineer.

9.3 When such permission is given and also in all cases when destroying of dug trees, bush wood, grass, etc. by fire the Contractor shall take necessary measures to prevent such fire spreading to or otherwise damaging surrounding property.

9.4 Any damage caused by the spreading of such fire, whether in or beyond limits of the Engineer's property shall be made good by the Contractor within a period specified by the Engineer or in default the amount of the damage shall be recovered by the Engineer from the Contractor's bill as damages or deducted by any other duly authorized officer from any sums that may be due or become due from the Employer to the Contractor under the Contract or otherwise.

9.5 The Contractor shall bear the expenses of defending any action of law proceedings that may be brought by any person by injury sustained owing to neglect of precautions to prevent the spread of fire and shall pay any damage, and cost that may be awarded in consequence.

10. The Engineer may order the Contractor to suspend any work that may be subject to damage by climatic conditions and no claim of the Contractor will be entertained by the Engineer on this account.

11. A site order book shall be kept on the site of the work. As far as possible, all orders, regarding the work are to be entered in this Book. All entries therein shall be signed by the Engineer or his authorized representative and the Contractor or his authorized representative. In important cases, the Engineer will countersign the entries which have been made. The site order book shall not be removed from the work site except with the written permission of the Engineer and the Contractor or his representative shall be bound to take note of all instructions and directions meant for the Contractor as entered in the site order book without having to be called on separately to note them. The authorized representative of the Engineer shall submit periodically copies of the remarks in the site order book to the Engineer for record and to the Contractor for submitting compliance report.

12. The Contractor shall confirm to the regulations, safety precautions, bye-laws or any other statutory rules made by any local authority or by the Government and shall protect and indemnify the Engineer against any claims or liability arising from or based on the violations of any such laws, ordinance, regulations, orders and decrees, etc.

13. The Contractor shall make his own arrangement for supply of all materials including cement and steel. The Contractor shall be responsible for all transportation and storage of the materials at site and shall bear all the related costs. The Engineer shall be entitled, at any time, to inspect or examine all such

materials. The Contractor shall provide reasonable assistance for inspection or examination as may be required.

14. The Contractor shall keep an accurate record for use of materials like cement and steel used in the works in a manner prescribed by the Engineer.
15. Large stock of cement shall not be kept at the work site but only sufficient quantities shall be kept to ensure continuity of the work. The Contractor shall provide and maintain efficient water proof storage sheds for cement on the site of work. It shall be stacked on the platform 30 cm above the floor level and shall be covered with tarpaulin or any other impervious covering material in order to protect the cement bags from moisture. The cement shall be neatly stacked in an orderly manner so as to allow an easy access and count. The arrangement of storage and utilization shall be such as to ensure the utilization of cement in order of its arrival at the stores and the Contractor shall maintain satisfactory records which would at any time show the date of receipt and proposed utilization of cement lying in the stores at site.
16. The Contractor shall also construct and equip at his cost a working office with electricity and water arrangement for his site Engineer.
17. The contractor shall also provide instruments for setting up field laboratory at his own cost to site Engineer. No separate payment shall be made for this.
18. The Engineer shall have the right to deduct from the money due to Contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the condition of Contract for the benefit of the workers vis-à-vis the Haryana Government, the Contractor shall be primarily liable for all payments to be made under and for the observance of the rules, regulations and labour law without prejudice to his right to claim indemnity from his sub-Contractor.
19. **Third Party Inspection –** The Engineer-in-Charge may opt for 3rd party inspection other than department in addition to inspection by department staff, the 3rd party would inspect to ensure execution of work as per specification/ agreement and also quality control i.e. draw of samples, testing and other items etc. The report of the same would be submitted to Engineer-in-Charge by the 3rd party. The agency/ contractor shall be bound by the report of 3rd party inspection and shall take remedial measures for execution of work as per specifications in agreement at their own cost. The cost of 3rd party inspection will be borne by the employer.
20. The Contractor shall confirm to the regulations, safety precautions, bye-laws or any other statutory rules made by any local authority or by the Government and shall protect and indemnify the Engineer against any claims or liability arising from or based on the violations of any such laws, ordinance, regulations, orders and decrees, etc.
21. The Contractor shall make his own arrangement for supply of all materials including cement and steel. The Contractor shall be responsible for all transportation and storage of the materials at site and shall bear all the related costs. The Engineer shall be entitled, at any time, to inspect or examine all such

materials. The Contractor shall provide reasonable assistance for inspection or examination as may be required.

22. The Contractor shall keep an accurate record for use of materials like cement and steel used in the works in a manner prescribed by the Engineer.

23. Large stock of cement shall not be kept at the work site but only sufficient quantities shall be kept to ensure continuity of the work. The Contractor shall provide and maintain efficient water proof storage sheds for cement on the site of work. It shall be stacked on the platform 30 cm above the floor level and shall be covered with tarpaulin or any other impervious covering material in order to protect the cement bags from moisture. The cement shall be neatly stacked in an orderly manner so as to allow an easy access and count. The arrangement of storage and utilization shall be such as to ensure the utilization of cement in order of its arrival at the stores and the Contractor shall maintain satisfactory records which would at any time show the date of receipt and proposed utilization of cement lying in the stores at site.

24. The Engineer may order the Contractor to suspend any work that may be subject to damage by climatic conditions and no claim of the Contractor will be entertained by the Engineer on this account.

25. Cement contents – Actual cement required for the aggregates in concrete to be used shall be determined by laboratory test while designing the concrete mixes. If the cement contents of the design mix of that grade come less than the provision of cement contents provided in the Haryana Scheduled of Rates, (with latest amendments) due to durability conditions, the cement contents as provided in the Haryana Schedule of Rates shall be used and no extra payment on this account shall be made to the contractor. No extra amount over and above the minimum cement content as provided in the Haryana Schedule of Rates shall be paid.

Note: - Each department may specify any other special conditions of contract as per requirement of the work

Contract Data to General Conditions of Contract

Sr. No.	**Description**		**Clause No. GCC**
1.	**The Authority is**		[Cl.1.1]
1.	The Employer is Designation: Address:	…… …… ……	[Cl.1.1]
2.	Name of authorized Representative	……	[Cl.1.1]
3.	The Engineer is Designation: Address:	…… …… ……	[Cl.1.1]
4.	The Intended Completion Date for the whole of the Works is _____months after start of work.	DD/MM/YYYY	[Cl.1.1, 17&27]
5.	The Site is located	Km. _____ to km. _____	[Cl.1.1]
6.	The Start Date shall be **10 days** after the date of issue of the Notice to Proceed with the work	DD/MM/YYYY	[Cl.1.1]
7.	Section completion	……	[Cl 2.2]
8.	The following documents also form part of the Contract :	Undertakings of the bidder if any	[Cl.2.3 (11,12)]
9.	Joint Ventures	[Allowed / not allowed]	[Cl.3.1]
10.	Sub Contracting	Maximum [50%]	[Cl 7.1]
11.	The Schedule (if any) of Other Contractors is attached	……	[Cl. 8.1]
12.	The Technical Personnel for work and operation of lab are:		[Cl. 9.2]

Sr. No.	**Personnel**	**Qualification**	**No. of personals**
1.	Project Manager		-
2.	Site Engineer		-
3.	Plant Engineer		-
4.	Quantity Surveyor		-
5.	Soil & Material Engineer		-
6.			
7.			
8.			

Note:-

In case, the above qualified personnel are not deployed the following deduction shall be made per month from the payment due to the contractor

Project Manager	=	Rs. 1,50,000/- per month
Site Engineer	=	Rs. 75,000/- per month
Plant Manager	=	Rs. 50,000/- per month
Quantity Surveyor	=	Rs. 40,000/- per month
Soil and Material Engineer	=	Rs. 40,000/- per month
_____	=	Rs. _____/- per month
_____	=	Rs. _____/- per month
_____	=	Rs. _____/- per month

The Employer reserves the right to employ any or all the above personal as per requirement given above irrespective of above deductions made from the payments due to the contractor.

<table>
<tr><td>11</td><td>Amount and deductible for insurance are:</td><td></td></tr>
<tr><td>(i)</td><td>Insurance cover for work is equal to the contract price and the amount of deductible is 1% of the contract price</td><td>[Cl. 13.1 (a)]</td></tr>
<tr><td>(ii)</td><td>Minimum insurance cover for injury and death is Rs.10.00 lacs per occurrence with the number of occurrences limited to four. After each occurrence, contractor will pay additional premium necessary to make insurance valid for four occurrences always. The amount of deductible is Rs. 2.00 Lacs of the contract price.</td><td>[Cl. 13.1 (b)]</td></tr>
<tr><td>(iii)</td><td>Minimum insurance cover for damage to the property of the third party is Rs. 20.00 Lacs. The amount of deductible is Rs. 2.00 Lacs of the contract price.</td><td>[Cl. 13.1 (c)]</td></tr>
<tr><td>(iv)</td><td>Insurance cover for work is equal to the contract price and the amount of deductible is 1% of the contract price</td><td>[Cl. 13.3 (a)]</td></tr>
<tr><td>12.</td><td>Site investigation report</td><td>[Cl.14.1]</td></tr>
<tr><td>13.</td><td>Security Deposit for invoking Arbitration
<table>
<tr><td>Sr No.</td><td>Amount of Claim</td><td>Rate of Security Deposit</td></tr>
<tr><td>1.</td><td>For claims below 10,000</td><td>2% of claimed amount</td></tr>
<tr><td>2.</td><td>For claims of Rs. 10,000 and above but below Rs 1,00,000/-</td><td>5% of claimed amount</td></tr>
<tr><td>3.</td><td>For claims of Rs 1,00,000 and above</td><td>7.5% of claimed amount</td></tr>
</table></td><td>[Cl. 25]</td></tr>
<tr><td>14.</td><td>a. The period for submission of the programme for approval of Engineer shall be 15 days from the issue of Letter of Acceptance</td><td>[Cl.26.1]</td></tr>
<tr><td></td><td>b. The updated programme shall be submitted at interval of 60 days.</td><td>[Cl. 26.4]</td></tr>
<tr><td></td><td>c. The amount to be withheld for late submission of an updated programme shall be 2% of the initial / revised contract price or the enhanced contract price as applicable.</td><td>[Cl. 26.4]</td></tr>
</table>

15. The following events shall also be Compensation Events:

[Cl. 44.2 l]

Substantially adverse ground conditions encountered during the course of execution of work not provided for in the bidding document.

(i) Removal of underground utilities detected subsequently
(ii) Significant change in classification of soil requiring additional mobilization by the contractor, e.g. ordinary soil to rock excavation,
(iii) Removal of unsuitable material like marsh, debris dumps, etc not caused by the contractor
(iv) Artesian conditions
(v) Seepage, erosion, landslide
(vi) River training requiring protection of permanent work
(vii) Presence of historical, archeological or religious structures, monuments interfering with the works.
(viii) Restriction of access to ground imposed by civil, judicial, or military authority.

15 a. The formula for price adjustment of prices are: [Cl. 47.1]

(i) Adjustment of price for bitumen:

Price adjustment for increase or decrease in the cost of bitumen shall be paid as follows:

That the rate of bitumen/ emulsion at the refinery on the date of close for financial bidding shall be considered as base rate if during execution of the works, the rate of bitumen/ emulsion increase or decrease at refinery, the difference in cost shall be paid/ recouped from the contractor in the bill, subject to the following conditions :-

(A) The contractor shall submit original bill/ voucher of the refinery while claiming the payment for the work done. The bill/ voucher should pertain to the period of original contractual time limit and should correspond with the progress of work. No extra payment due to increase in rate of bitumen / emulsion will be paid if the original bill/ voucher are not submitted by the agency.

(B) No increase in prices of the bitumen / emulsion shall be reimbursed to the contractor beyond the original time period allowed for construction as per contract agreement irrespective of extension of time limit granted to the agency for any reason, whatsoever. However, decrease in price of bitumen/emulsion shall be recouped from the contractor even beyond the original time period allowed for construction.

(C) After approval of tender, the contractor shall submit the work programme for execution of work and get it approved from the Engineer-in-Charge in the time limit prescribed in the tender document. The increase in rates of bitumen, emulsion shall only be paid if the bitumen work is carried out within the prescribed period as per approved work programme.

(D) Only actual difference of rates of Bitumen will be payable / deductable to the contractor. No overhead charges and contractor profit etc. are to be added / deleted, no tender premium is to be added / deleted."

(E) The contractor can arrange the bitumen from any of the refinery subject to the condition that the quality of bitumen is as per the requirement of contract and specifications. Regarding payment of price variation of bitumen as per the agreement, that the escalation de-escalation will be paid on the basis of lesser cost implication to Department / Government on consideration of the difference in rates as given below subject to financial regularity and other terms and conditions of agreement :-

(a) Prevailing rates of IOC refineries at Panipat at the time of tender and at the time of purchase of bitumen.

(b) Prevailing rates at the source from which the bitumen is purchased by the contractual agency at the time of tender.

It is further clarified that:-

(a) When recovery is due on account of decrease in rates of bitumen, higher of the difference in rates of IOC Panipat and that of private refinery, shall be considered.

(b) When escalation is due to increase in rates of bitumen is due to agency, then lesser of the difference in rates of IOC Panipat and that of private refinery, from whom bitumen was purchased, shall be considered.

(ii) Adjustment for Cement (OPC/PPC) and Steel (MS Long Products) :

Price adjustment for increase or decrease in the cost of Cement (OPC/PPC) and Steel (MS Long Products) shall be paid as follows:

(A) If after submission of the, the price of Cement (OPC/PPC) or Steel (MS Long Products) incorporated in the works (not being a material supplied form the Engineer-in-Charge's Store) increase (s) beyond the price (s) prevailing at the time of the last stipulated date for financial bid closing of tenders (including extensions, if any) for the work, then the amount of the contract shall accordingly be varied and provided further that any such increase shall not be payable if such increase has become operative after the stipulated date of completion of work in question.

(B) If after submission of the, the price of Cement (OPC/PPC) / or Steel (MS Long Products) incorporated in the works (not being a material supplied form the Engineer-in-Charge's Store) is decreased, Govt. shall in respect of these materials incorporated in the works (not being materials supplied from the Engineer-in-Stores) be entitled to deduct from the dues of the contractor such amount as shall be equivalent to the difference between the prices of Cement (OPC/PPC) as prevailed at the time of last stipulated date for receipt of tenders including extensions if any for the work and the prices of these materials on the

coming into force of such base price of Cement (OPC/PPC) and issued under authority of Engineer-in-Chief, Haryana PWD B&R, Chandigarh.

(C) It is further clarified that the decrease in the prices of Cement (OPC/PPC) / or Steel (MS Long Products) and shall be deducted from the dues of the contractor if such decrease has become operative after the stipulated date of completion of work in question and increase shall not be payable if such increase shall not be payable if such increase has become operative after the stipulated date of completion of work in question.

(D) The increase/ decrease in prices shall be determined by the All India Wholesale Prices Indices for Cement (OPC/PPC) / or Steel (MS Long Products)as published by the Economic Advisor to Government of India, Ministry of Commerce and Industry) and base price for Cement (OPC/PPC) / or Steel (MS Long Products)as issued under authority of Engineer-in-Chief, Haryana PWD B&R, Br. Chandigarh as valid on the last stipulated date of receipt of tender, including extension if any and for the period under consideration.

(E) (i) The amount of the contract shall accordingly be adjusted for Cement (OPC/PPC) will be worked out as per the formula given below:-

Adjustment for component of "Cement (OPC/PPC)"

$$Vc = Pc \times Qc \times \frac{CI - C1o}{C1o}$$

Where,

Vc= Variation in Cement (OPC/PPC) cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

Pc= Base price of Cement (OPC/PPC) as issued under authority of Engineer-in-Chief, Haryana PWD B&R, Br. Chandigarh valid at the time of the last stipulated of receipt of tender including extension if any.

Qc= Quantity of Cement (OPC/PPC) used in the works since previous bill.

CI_0= All India wholesale price index for Cement (OPC/PPC) as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce as valid on the last stipulated date of receipt of tenders including extensions if any.

C1= All India wholesale price index for Cement (OPC/PPC) for period consideration as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce

(E) (ii) Adjustment for Steel (MS Long Products)

$$Vs = Ps \times Qs \times \frac{SI - S1o}{S1o}$$

Vs = Variation in cost of Steel (MS Long Products) i.e. increase or decrease in the amount in rupees in the amount in rupees to be paid or recovered.

Ps = Base price of Steel (MS Long Products), as issued under authority of Engineer-in-Chief, Haryana PWD B&R Br., Chandigarh at the time of the last stipulated date of receipt of tender including extensions, if any.

Qs= Quantity of Steel (MS Long Products) paid either by way of secured advance or used in the works since previous bill (Whichever is earlier).

S1o= All India wholesale Price Index for Steel (MS Long Products) for the period under consideration as published by Economic Advisor to Government of India, Ministry of Industry and Commerce as valid on the last stipulated date of receipt of tenders including extensions, if any.

S1= All India Wholesale Price Index for Steel (MS Long Products) for the period under consideration as published by Economic Advisor to Government of India, Ministry of Industry and Commerce.

Base rate of Cement (OPC/PPC) and Steel (MS Long Products)

Cement (OPC/PPC) : Rs. _____/- per MT including taxes..

Steel (MS Long Products): Rs. _____/- per MT including Taxes.

No other increase/decrease in prices is permissible.

(iii) **Adjustment of POL (fuel and lubricant) component**

Price adjustment for increase or decrease in the cost of POL (fuel and lubricant) shall be paid in accordance with the followings formula:

$V_f = 0.85 \times P_f/100 \times R \times (F_l - F_o)/F_o$

V_f =increase or decrease in the cost of work during the month under consideration due to changes in rates for fuel and lubricants.

F_o= The all India wholesale price index for 'Fuel and Power' for the calendar month 28 days preceding the closing date of bids as published by the Office of Economic Advisor, Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion with website www.eaindustry.nic.in

F_1 =The all India average wholesale price index for 'Fuel and Power' for the month under consideration as published by Office of Economic Advisor, Government of India, Ministry of Commerce and Industry, Department of Industrial Policy and Promotion with website as www.eaindustry.nic.in

P_f = 5.

R = Value of work executed during the period.

16. The proportion of payments retained (Retention Money) shall be 6% from each bill subject to a maximum of 5% of final contract price.

[Cl.48]

17. (a) Milestones to be achieved during the contract period

Milestone dates:

[Cl. 49.1]

	Financial works to be completed	**Period from the start date**
	Milestone 1 i.e. 20%	25% of the stipulated time
	Milestone 2 i.e. 50%	50% of the stipulated time
	Milestone 3 i.e. 75%	75% of the stipulated time
	Milestone 4 i.e. 100%	100% of the stipulated time
(b)	Amount of liquidated damages for delay in completion of works	**For whole of work** (1/2000)th of the initial / revised Contract Price, rounded off to the nearest thousand, per day. **For non achievement of milestone,** (1/2000)th of the initial / revised Contract Price, rounded off to the nearest thousand, per day.
(c)	Maximum limit of liquidated damages for completion of work	10 (Ten) per cent of the balance amount of work

18	The amounts of the advance payment are:		[CL:50]
	Nature of Advance	**Amount**	**Conditions to be fulfilled**
I	Mobilization	Maximum 5 % of the contract price	An interest bearing mobilization advance upto the extent of 5% of contract value (or such limit as prescribed) may be given to contractors for works costing more than Rs. 2.00 crores, against unconditional and irrecoverable bank guarantees to be furnished by the contractor equal to the amount of advances paid from time to time. Interest @ Marginal Cost of Funds based Lending (MCLR) of SBI prevalent at the time of tender per annum shall be charged on mobilization advance given to the contractor The recovery of the mobilization advance together with interest shall be done through percentage deductions from interim/running payments, in the manner prescribed in the contract. It shall be desirable to recover the total amount of mobilization advance alongwith interest within 80% of the time stipulated for completion. The mobilization bank guarantee shall be released after the recovery of full mobilization advance, including interest thereon. In case, of slow progress of work, the 'Engineer' comes to a conclusion that the total amount of mobilization advance with interest cannot be recovered by the time 80% of stipulated

			time is over, the bank guarantee(s) furnished by the contractor may be encashed. If the tender document so provides, the contractor will have the option to furnish mobilization bank guarantee in parts and on recovering of ¼ , ½, ¾ and full advance, proportional bank guarantees can be released.
II	Secured advance for non-perishable material brought to site	75% of Invoice value	In case the contractor requires an advance on the non-perishable materials brought to site, 'Engineer' may, on written request from the contractor, sanction the advance upto an amount 75% or as decided by the 'Engineer' of the value (as assessed by themselves) as stated in the Contract Data of such materials, provided such materials are to be consumed with in next three months and that a formal agreement is drawn up with the contractors under which Govt. secures a lien on the materials and is safeguarded against losses due to the contractor postponing the execution of the work or misuse of the material and against the expense entailed for their proper watch and safe custody. If the material is fire prone or can be destroyed fully/partially on storage, it shall be desirable to have it first insured by the contractor. Cases in which a contractor, whose contract is for finished work, requires an advance on the security of materials brought to site. **Any secured advance should be settled / recovered within 3 months of its release.** Note : Such advance will not be given for sand, aggregate, GSB and stone metal etc. The contractor will submit the original bills and e-way bills for the material for which secured advance is being claimed.
III	Machinery Advance	Maximum 5 % of the contract price	For works costing more than Rs.10.00 crores another interest bearing machinery advance to a maximum of 5% of the contract price, depending on merits of the case, can be given against the new key construction equipment brought to the site and to be deployed on the work, if a written request is made by the contractor. The advance shall be paid only upon the contractor furnishing (i) an affidavit that the machinery in question is free of any charge or hypothecation with any bank or financial institution: (ii) unconditional and irrecoverable bank guarantee(s) (iii) satisfactory proof of purchase/payment of the machinery, and (iv) a written undertaking that the equipment so purchased by him is required for use on the work in question, is fully serviceable shall work only on that job and shall not be removed from the site without obtaining written approval of

			the 'Engineer's . The recovery of machinery advance and the Interest @Marginal Cost of Funds based Lending (MCLR) of SBI prevalent at the time of tender per annum shall be charged. against the machinery advance given to the contractor. The recovery of the machinery advance together with interest shall be done through percentage deductions from interim/running payments, in the manner prescribed in the contract. It shall be desirable to recover the total amount of machinery advance along with interest within 80% of the time stipulated for completion. The mobilization bank guarantee shall be released after the recovery of full machinery advance, including interest thereon.
	Note: • The bank guarantee for advances shall be unconditional, requiring the bank to pay the beneficiary the sum specified in the guarantee on the first demand and without demur, and without reference to the party on whose behalf it has been issued, notwithstanding any dispute or disagreement that might have arisen between the employer and the contractor. The form of bank guarantee shall be prescribed by the departments. • It shall be the duty of the 'Engineer' to obtain independent confirmation about the genuineness of the bank guarantees directly from the bank issuing them. Further, he shall keep them in safe custody and hand them over to his successor when a change of charge takes place. Details of bank guarantees shall be entered into a register which shall be reviewed every month to ensure timely action in respect of renewal of any guarantee, if required, before it expires.		
	• The advance payment will be paid to the Contractor no later than 28 days after fulfillment of the above conditions.		
	• Provided that the advance shall be completely repaid prior to the expiry of the original time for completion pursuant to clauses 17.		

19 The period for setting up a field laboratory with the prescribed equipment is **28** days from the date of notice to start work [Cl.31.1]

20. **The Defect Liability-cum-Maintenance Period is _____years from the date of completion.** **[**Cl. 56]

21. The date by which "as-built" drawings (in scale as directed) in 2 sets are required is within 28 days of issue of certificate of completion of whole or section of the work, as the case may be. [Cl.58.2]

22. The amount to be withheld for failing to supply "as-built" drawings by the date required is **Rs. 0.5% of agreement amount**. [Cl.58.2]

23. The following events shall also be fundamental breach of Contract: [Cl.59.2 (i)]

(i) The Contractor has contravened Clause 7.1 or Clause 9 of Part I General Conditions of Contract

24. The percentage to apply to the value of the work not completed representing the Employer's additional cost for completing the Works shall be 20 (Twenty)percent). [Cl.60.1(i)]

Section 4-A

Detailed Scope of Work

Note: - Here tendering Departments may specify Detailed Scope of Work if necessary for clarity of bidders.

Section 4-B

Technical Specifications

Note: - Here tendering Departments may specify Technical Specifications as may be necessary for execution of the work

Technical Specifications for Road Works

Technical Specifications for Road Works

A. The work shall be carried out as per MoRT&H and PWD Specifications and also with latest applicable IRC codes.

B. Maintenance during construction period

The contractor will maintain the existing road from start of contract to the completion of contract by filling potholes duly covered with bituminous material to keep the road in traffic worthy condition. This is incidental to main work and nothing extra shall be payable on this account.

C. Special Conditions for Bituminous work

(a) **"Bitumen and** Bitumen Grade CRMB, wherever to be used in the work, will be purchased from the refineries only."

(b) An undertaking should be taken from the agency during the payment of every bill that:

i) He has actually purchased the bitumen as per list enclosed as annexure (the annexure should be part of undertaking).
ii) He has used this bitumen on this work only.
iii) He has not claimed its cost from any other division/office or anywhere else.
iv) The data submitted by him is totally correct.
v) He owns full responsibility for the quality & quantity of bitumen and submission of data.

(c) For controlling the quantity of mixed material the following procedure be adopted:

(i) The contractor shall provide, install, maintain and operate at his own cost in good working condition a weigh bridge of suitable capacity at site of the hot mix plant under the direction of Engineer or his representative.
(ii) Each truck before loading of the mix shall be weighted on the Weigh Bridge and its weight shall be recorded in the measurement book under the signature of authorized representative of the contractor and of the Engineer.
(iii) The truck shall be again weighed on the weight bridge after loading of the mix and its weight recorded as per prescribed performa.

The details of mixed material be compiled as per following procedure:-

i) A slip should be issued by JE at the plant site as per Annexure-II.
ii) The slip book should be in three colors i.e. Pink, Yellow and White.
iii) White slip shall be retained at plant site, Yellow & Pink shall be sent to work site. Yellow slip shall be returned to plant site JE duly signed by

JE & SDE of site in-charge and Pink slip shall be retained by JE work site.

iv) A register showing these details will be maintained at site.

The above instructions/ procedures are applicable for procurement of bitumen by department as well as through the contractors. These may also be made part of the contract document henceforth.

Annexure-I

Tanker No.	Refinery Indent No.	Date of indent	Date of receipt	Empty weight of Tanker	Loaded weight of Tanker	Weight of bitumen	Photograph of Tanker	Person in whose presence unloaded.

Annexure-II
SLIP

Sr. No._____ Book No._____
1. Vehicle No. _____ Date & time_____
2. Weight of loaded Tipper_____
3. Weight of empty Tipper_____
4. Weight of Mix Material_____

Signature of JE at Hot Mix Plant. **Signature of SDE at site of work.** **Signature of JE at site of**

(d) The agency to whom the work is allotted will have to produce original vouchers for all quantities in lieu of purchase of bitumen, steel, and cement from the original manufacturer or other authorized dealers/distributors to the entire satisfaction of the Engineer for ascertaining the genuineness of material. Attested copy of voucher will have to be submitted along with bills.

(e) The Job mix formula will be got tested from CRRI New Delhi, NIT Kurukshetra, PEC, Chd., TTI, Chandigarh, Shriram Institute, Delhi and testing charges will be borne by the agency. Nothing shall be paid on this account.

(f) When the work under one agreement is being executed, the contractor shall not undertake any other work from same hot mix plant without written permission of the Engineer and shall also make separate arrangement of bitumen for that work.

(g) Before carrying out bituminous work, coating & stripping of bitumen aggregate mix is to be performed in accordance with IS-6241.If coating and stripping of bitumen aggregate mix is less than 95%, anti-stripping agent will be used by the contractor. The anti-stripping agent should conform to the requirement as stipulated in IS 14982:2017. The cost so incurred will be considered as incidental to work and nothing extra shall be payable. The type and brand of anti-stripping agent along with procedure shall be approved by SE in-charge in writing before start of work. A proper record of results be maintained and same shall be submitted along with bills by the contractor.

D. ADDITIONAL CONDITIONS

(i) Before laying any construction layer of GSB, sub grade or base course, earth work on berms, if it is to be done by the agency against this agreement, should be completed in all respect simultaneously. Before taking work of any next layer, earth work on berms should be completed. Payment of any layer will be released only when earth work on berms are completed.

(ii) No compensation for any damages caused to the earthwork by rains, floods or any other natural calamities shall be paid to the contractor. The contractor shall have to make good all such damages at his own cost as per direction of Engineer.

(iii) The final payment of the tenderer will not be paid until and unless he furnishes to the satisfaction of the Engineer, proof that the price of earth used for the work having been fully paid to the owner of the land from which the earth was removed by the contractor from his (owner) land for the work and to indemnify against all the losses, damages, cost of land expenses which the Govt. suffer or incur as a result of such claim.

(iv) In case of embankment with Fly Ash, the contractor shall take special care to keep the surface wet at all times so that the Fly Ash does not get mixed up with the atmosphere thus causing poor visibility besides health hazards. If the contractor does not comply with this provision, the Engineer shall make necessary arrangement after giving appropriate notice to the contractor, for keeping the fly ash surface wet and the contractor shall pay the expenses incurred on demand or otherwise the same shall be recovered by Engineer from bills due to the contractor.

E. GENERAL CONDITIONS

(i) Correction of defects:- The Engineer shall give notice to the contractor of any defects before the end of Defect Liability-cum-Maintenance Period which begins at completion as per definition. The Defect Liability-cum-Maintenance Period shall be extended as long as defects remain to be corrected. Every time notice of a defect is given, the contractor shall correct the notice defect within the length of time specified by the Engineer's notice. If the contractor has not corrected a defect within the time specified in Engineer's notice, the Engineer

will assess the cost of having the defect corrected and the contractor will pay the amount.

(ii) The contractor shall have to provide a fields laboratory fully equipped at work site and hot mix plant for conducting all the relevant tests mentioned in the MORT&H specification subject to the approval of the Engineer or his representative. The record of such tests is to be maintained in proper register duly singed by the contractor or his representatives, which will become the property of the department. The contractor will bear all the running expenses for conducting such tests. All the tests will be carried in the presence of S.D.E.-in-charge and J.E.-in-charge.

(iii) The quality control test will also be done by the department and the material for such test will be supplied by the contractor free of cost. In case the material is not found upto the requirement, the same will be rejected.

(iv) Various quality control operation will be maintained as per Clause No. 901, 902, 903 of MORT&H (Road Wing) specification (5th revision) of latest edition and as per instructions issued by MORT&H from time to time upto date.

(v) Contractor shall provide suitable measuring arrangement and leveling instruments of latest quality as approved by Engineer at the site of work.

(vi) No extra payment on account of quality control measures shall be paid to the contractor.

(vii) The Engineer at his description can get any type and Nos. of tests carried out from any other approved laboratory for his satisfaction for which all the expenses incurred would be borne by the agency. The result so obtained from the laboratory would be acceptable/binding to the agency.

(viii) The contractor shall be required to provide all such materials/ equipment at site to conduct fields tests and to ensure that the quality of material/item shall be according to the prescribed specification and no payment of any kind for such tests shall be made to him. In case the material/item is not found upto mark, the same will be rejected.

(ix) For cement, bitumen, mild steel and similar other material, the essential tests are to be carried out at the manufactures plant or at laboratories other than the site laboratory. The cost of samples, testing and furnishing of test certificates shall be borne by the contractor. He shall also furnish the test certificates to the Engineer.

(x) Contractor has to submit the bills (Running as well as final bill) for payment alongwith quality control test results conducted as per frequency specified in MORT&H specification. No payment will be made without test results.

(xi) OPC cement duly ISI marked of 43 grade such as JK, Lakshmi, L&T, A.C.C, Shree and Birla or as approved by Engineer should be arranged by the contractor.

(xii) TMT Steel Fe-500 duly ISI marked of reputed brand such as of RINL/ TISCO /SAIL / JSW/Jindal Panther/ Electrosteel etc. shall be arranged by the contractor.

(xiii) Before executing the work of drain, proper drawing depicting L-section and X-section of drain alongwith is proper disposal will be got approved by S.E. in writing. All culverts and bridges will be constructed as per IRC-SP-13 and also approved by the SE-in-Charge.

(xiv) Agency will have to submit to the Engineer, the original bills of cement and steel etc. in token of proof of purchase of material alongwith quality control test certificate of manufacturer failing which no payment shall be released.

(xv) Agency will get the material tested from any approved laboratory as directed and whenever required by Engineer and all liability of testing shall be borne by the agency.

(xvi) The rates are inclusive of cost of traffic management during construction, Contractor shall provide road signages, boards, gunny bags, sheet etc. for safety of traffic during construction period which will be incidental to work. Nothing extra shall be paid on this account.

(xvii) The contractor will supply bills for purchase of RCC Hume Pipes clearly indicating name of manufacturer, date of manufacturing, Lot no. etc. These details must painted on the RCC Hume Pipe. The pipe should be ISI marked. The manufacturer should give proof for validity of ISI license. In case of non supply of bills, no payment will be released.

(xviii) The contractor himself will arrange all the material such as bitumen, cement, steel, bricks etc. at his own cost.

(xix) The riding quality of reach after giving treatment of wearing coat will not have roughness more than 2000mm/km.

(xx) The contractor shall submit the proposal of widening of existing stretch to get the centerline decided before commencement of work from Engineer.

(xxi) For work of embankment, sub grade & pavement, construction of subsequent layer of same or other material over the finished layer shall be done after obtaining written permission from the Engineer. Similar written permission from the Engineer shall be obtained in respect of all other items of work prior to proceeding with the next stage of construction.

(xxii) Before start of the work contractor will get his machinery inspected and approved from the Engineer.

(xxiii) If at any stage, panel of concrete pavement develops cracks/disintegration during Defect Liability-cum-Maintenance Period, the whole panel will be changed by contractor at his own cost and nothing extra shall be paid.

(xxiv) 80% material from scarification shall be credited & used at site in items as mentioned in the BOQ.

(xxv) The pits on account of de-forestation of trees / roots, shall be filled with sand and compacted to the specification by the agency at his own cost in the entire length. No payment shall be made and the cost is incidental to work.

F. Requirements for use of Paver Blocks

There are 2 types of requirements for use of paver blocks:-

(a) Obligatory Requirements:- As per clause 6.2 of IS Code-15658:2006

(i) Visual Inspection.
(ii) Dimensions and Tolerances.
(iii) Thickness of Wearing Layer
(iv) Water Absorption.
(v) Compressive Strength.
(vi) Abrasion Resistance.

(b) Optional Requirements:- As per Clause 6.3 of IS Code-15658:2006
(i) Tensile Splitting Strength.
(ii) Flexural Strength / Breaking Load.
(iii) Freeze-Thaw Durability.
(iv) Colour and Texture.

G. TECHNICAL CONDITIONS

(a) A register in prescribed form showing day to day receipt, consumption and balance of cement at site of work will be maintained at the work/test site by the department, which shall invariably be signed by the contractor or his authorized representative in token of its correctness.

(b) The following basic records, in addition to what might be considered necessary, shall be kept at site and be made available to the inspecting officers.

i. Record of placement of concrete and test cubes shall be maintained in the following form:

Date	Time of Start	Time of Completion	Unit/Member concreted	Bulking of sand if any	Extra sand used to take care of bulking
1	2	3	4	5	6

Water Cement Ratio Mix				
Water content of course aggregate	Water contents of fine aggregate	Extra water added	Total water content	Water cement ratio
7	8	9	10	11
Slump of concrete	Sources of supply of cement and batch No.	Whether the batch of cement tested or not	Identification number of concrete cube taken	7 days cube Strength as specified as per actual test
12	13	14	15	16
25 days cube Strength as specified / as per actual test	Sign of J.E.	Sign of SDE	Sign of Contractor	Remakrs of Engineer-in-Charge.
17	18	19	20	21

ii. Record of test for controlling the quality of concrete such as grading, analysis of Aggregates, silt content of fine aggregates, water content of fine aggregates, water content of coarse aggregate etc.
iii. Record of test results on samples of mild steel. For steel, high tensile steel.
iv. Record of cement tests for different consignment/batches/sources of supply.
v. C.P.M/PERT chart, original and as revised/updated.

H. MATERIALS AND WORKS TEST REGISTER.

Register on prescribed proforma showing test results of materials and work tests will be maintained at the site of work by the department and every entry thereof, shall invariably be signed by the contractor or his authorized representatives in token of its correctness.

Technical Specifications
For
Building Works

1. SPECIFICATIONS

The work will be executed as per Haryana PWD B&R Specifications as per latest amendment. In case of any discrepancy the Bureau of Indian Standards shall be followed and then CPWD specifications shall be followed. These will be in order of preference as mentioned below:

i) Haryana PWD (B&R) Specifications.
ii) Bureau of Indian Standards.
iii) CPWD Specifications.

In case, any item is not covered by all three above, then the decision of 'Engineer' shall be final.

1. PREAMBLE

1.1 The technical specifications contained herein shall be read in conjunction with the other bidding documents as specified in volume-1.

3. SITE INFORMATION

3.1 The information given here under and provided else, where in these documents is given in good faith by the employer but the contractor shall satisfy himself regarding all aspects of site conditions and no claim will be entertained on the plea that the information supplied by the employer in erroneous insufficient.

3.2 The area in which the works are located is mostly plain terrain.

4.0 GENERAL CLIMATIC CONDITIONS

4.1 The Variation in daily temperature in this region is as under :-

i) During summer months, from about 20º C minimum to 46º C maximum.
(ii) During winter months, from about 2º C minimum to 28º C maximum.

4.2 The average annual rainfall in the area is of the order of 500mm. A good portion of which is concentrated during the months of August and September each year.

4.3 The range of relative humidity varies from a minimum of 40% to a maximum of 80%.

EXPLANATORY NOTES

1. The rates are for complete work including cost of all materials, labour, tools and plants and water etc. unless or otherwise specified.
2. All clauses and notes given in the Haryana PWD schedule of rates 2021 with latest modifications and latest DSR with upto date correction slips issued upto the date of tender shall be applicable to all above items wherever necessary.
3. The description, rates, units, etc. of above schedule shall be corrected as per Haryana PWD schedule of rate 2021 with latest modifications in case of any error or omission.
4. Chapter numbers with items referred to above are of Haryana PWD schedule of rates 2021 with latest modifications, corrected upto date.
5. The whole work shall be carried out strictly in accordance with the Haryana PWD specifications book 1990 latest edition as applicable to Haryana State with upto date correction slips and CPWD / MoRT&H / MoRD Specifications as applicable.
6. No premium shall be payable on the items which are not provided in the Haryana PWD schedule of rates 2021, corrected-up-to-date.
7. Samples of all building materials, doors and windows, fittings and other articles required for use on the work shall be got approved from the 'Engineer', Articles manufactured by firms of repute, approved by the 'Engineer' shall only be used. Only articles classified, as First Quality by the manufactures shall be used. Articles which are not First quality shall be rejected by the 'Engineer'. Preference shall be given to those articles, which bear I.S.I. certification mark. In case articles bearing ISI certification mark are not available, the quality of samples brought by the contractor shall be judged by the standards laid down in the relevant ISI specifications. All materials and articles brought by the contractor to the site of work for use shall confirm to the samples approved, which shall be preserved till the completion of work. Final decision to reject any material shall rest with the 'Engineer'.
8. The contractor shall provide suitable measuring arrangements at site for checking of various articles brought by him to ensure mixing in specified proportions.
9. The contractor shall provide such recesses, hole, openings etc. as directed by 'Engineer' as required for the Electrical / sanitary work and nothing shall be payable on this account.
10. Thickness of RCC shall be measured and paid for structural sizes designed.

11. **Reinforcement shall be measured in length including hooks, if any, separately for different diameters actually used in work, during overlaps. From the length so measured, the weight of reinforcement shall be calculated in tones on the basis of IS:1732 Wastage, overlaps couplings, welded joints, spacer bars, chairs, stays, hangers and annealed steel wire or other methods for binding and placing, shall not be measured and cost of these items shall be deemed to be included in the rates for reinforcement.**

12. Where there is a provision for flush door shutters, only doors which bear the ISI certification marks and arranged from manufacturer of good repute like Green, Duro, Durenzo, Century shall be accepted. In case flush door shutters bearing ISI certification marks are not available in the market, flush door shutters

confirming to ISI specifications and arranged from manufacturer of good repute shall only be accepted. They should be water proof, termite proof and have a guarantee for 10 years for any defect liability. The plyboard / mica / laminate / veneers / teak veneers/ block boards should also be of premium quality of reputed makes like Green, Duro, Durenzo, Century with ISI mark.

13. Steel butt hinges shall strictly confirm to Indian standard specification, IS-1341-1970 (Latest edition) and dimensions given in table 2 for medium weight cold rolled mild steel butt hinges of the above specifications Hinges shall be of good workmanship and manufactured by the firm of good repute.

14. Analysis of rates for non-schedule / non agreement items i.e. items which are not provided in the Notice Inviting Tender / Haryana PWD Schedule of Rates, 2021 2nd editions corrected upto date shall be payable as per actual lowest market rates from the recognized public market suitable to the executing division and wages of labour as applicable at the time of execution of work, plus admissible contractors profit and over head charge. For such items of materials the contractor shall be required to produce original vouchers which shall be subjected to verification by the 'Engineer'. The rates for non-schedule items shall be approved by the competent authority as recognized in the departmental financial rules in existence at the time of approval.

15. First Quality glazed/ceramic/vitrified tiles of reputed manufactures such as Kajaria, RAK, NITCO, Somany, Orient Bell, Jhonson, Simpolo to be supplied by the Deptt. or arranged by the contractor.

16. Waterproofing Compound, membrane, PU coating for basement podium terrace puf insulation, sunken portion treatment, Plasticizer, Super Plasticizer, Admixtures, Tile / Stone Adhesive /Tile / Epoxy Grout / Injection Grout, FRP / Fibre reinforcement wrap of reputed manufactures such as ASIAN SMARTCARE / GCP / BASF / Bitumet / Technonicol / Fosroc / Sika / Pidilite to be supplied by the Deptt. or arranged by the contractor.

17. The Tender with the condition regarding steel work to be done at labour rates shall be considered invalid and rejected straightway.

18. The quantities of all items given in the Schedule are tentative. These can be increased or decreased as per working Architectural drawings / structural drawings & nothing extra shall be paid.

19. For quality control, the contractor shall be required to use cement concrete mix giving a minimum cube strength as may be prescribed in the relevant structural drawings of work. For cement concrete and cement mortar work and other items the test should be regularly carried out as per procedure laid down in relevant I.S.I. & other codes at the expense of the contractor. The rates provided in the H.S.R. 2021 2nd edition included the cost of such testing.

20. Irrespective of what is stated in para 6 of General Rules of Haryana P.W.D. schedule of rates, 2021 2nd edition no carriage of cement, steel, bricks and

water or any other type or material shall be admissible irrespective of any lead involved.

21. All the flooring like terrazzo, Kotah stone or marble flooring should be granite polish finished. No extra rate shall be paid on this account to the contractor

22. Where-ever brick work or earth filling/embankment work is to be executed, the same has to be executed in accordance with the provision in the Fly Ash Notification dated 14.9.99 & 27.8.2003 i.e. by using Fly Ash brick and filling/embankment constn. by Pond Ash/Fly Ash as specified in the aforesaid notification after getting the design approved from 'Engineer's . Only I.S.I. marked factory manufactured flush door shutter ply and block board should be used, where ever required.

23. In case factory manufactured items, the contractor will get the name of manufacturers approved form deptt. and a warranty of 5 years certificate in favour of 'Engineer' in charge. In case of door shutters the type of wood used shall also be given by the manufacturer. The agency shall produce a certificate that door & window shutters fixed at site are actually factory manufactured - in case agency fails to do so the rate for the same shall be paid for site manufactured shutters as per HSR 17.30 & 17.31 of HSR 2021 2nd edition.

24. The agency will provide 2 Nos. boards of size 4' X 2½' at the site of work intimating the details of the project otherwise deduction will be made from the first running bill of the Agency @ Rs 150000/- per board.

25. Contractor will use coarse aggregate (all type of stone grit) and course sand i.e. stone dust (Zone IInd as per IS code). The material should confirming to the latest IS specification.

26. Regular and monthly quality control test as per frequency as per IS code specification / PWD specification is to be done by the Contractor at his own cost and submit the result to the 'Engineer' regularly and in case if he fails to do the same, 'Engineer' will got conduct all quality control test as per frequency for any reputed lab & amount of the same will be recovered for the agency. Beside this 'Engineer' will carry out their own quality control test and also will engage IIIrd party quality control agency for proper quality control work and charges of this will be borne by the Govt.

27. All aluminum fittings for doors and windows shall be of 'Classic'/ or equivalents make confirming to I.S. Specifications as approved by the 'Engineer'.

28. Third Party Inspection - The Engineer-in-Charge may opt for 3rd party inspection other than department in addition to inspection by department staff, the 3rd party would inspect to ensure execution of work as per specification/ agreement and also quality control i.e. draw of samples, testing and other items etc. The report of the same would be submitted to Engineer-in-Charge by the

3rd party. The agency/ contractor shall be bound by the report of 3rd party inspection and shall take remedial measures for execution of work as per specifications in agreement at their own cost. The cost of 3rd party inspection will be borne by the employer.

29. Cement contents - Actual cement required for the aggregates in concrete to be used shall be determined by laboratory test while designing the concrete mixes. If the cement contents of the design mix of that grade come less than the provision of cement contents provided in the Haryana Scheduled of Rates, (with latest amendments) due to durability conditions, the cement contents as provided in the Haryana Schedule of Rates shall be used and no extra payment on this account shall be made to the contractor. No extra amount over and above the minimum cement content as provided in the Haryana Schedule of Rates shall be paid.

30. Design Mix Design mix will be got carried out by the Engineer-in-Charge from any of the reputed laboratory at the cost of contractor. The source of aggregate shall be identified by the contractor and Engineer-in-Charge's representative shall be present while taking sealed samples for the design mix from such source. Frequency of carrying out Design Mix shall be as per relevant IS Codes and also when the source of aggregate will change, the design mix shall be carried out again.

31. Conditions for Quality Control and Lab:

i. The contractor shall have to provide a field laboratory fully equipped at work site before starting the execution of works for conducting all the relevant tests mentioned in the Haryana PWD specification subject to the approval of the 'Engineer's -in-charge or his representative. The record of such tests is to be maintained in proper register duly signed by the Contractor or his representatives, which will become the property of the department. The Contractor will bear all the running expenses for conducting such tests. All the tests will be carried in the presence of S.D.E.-in-charge of the work. All the entries are to be signed by the contractor, S.D.E. and J.E.-in-charge. **In case the contractor does not set up the field laboratory, an amount of Rs 10.00 lacs shall be withheld from the first running bill and if the contractor does not setup the laboratory, the same will be setup by the department from the withheld amount.**

ii. The quality control tests which are carried out by the department and the material for such tests will be supplied by the contractor free of cost. In case the material is not found up to the requirement, the same will be rejected.

iii. Contractor shall provide suitable measuring arrangement and leveling instruments latest quality duly approved by 'Engineer's -in-charge at the site of work.

iv. No extra payment on account of quality control measures shall be paid to the contractor.

v. The 'Engineer's -in-charge at his discretion can get any type/Nos. of tests carried out any other approved laboratory for his satisfaction for which all the expenses incurred would be borne by the agency. The results so obtained from the laboratory would be acceptable and binding to the agency.

vi. The Contractor shall be required to provide all such materials/equipment's at site to conduct field tests and to ensure that the quality of aggregate shall be according to the prescribed specification and no payment for material required for sample for such tests shall be made to him. In case, the material is not found up to mark, the same will be reject.

vii. For cement, steel and similar other material, the essential tests are to be carried out at the manufacturer's plants or at laboratories other than the site laboratory, the cost of samples, testing and furnishing of test certificates shall be born by the contractor. He shall also furnish the test certificates to the 'Engineer'.

viii. 25 % of the beams and columns in each floor before laying of slab for that floor of the building, shall be subjected to Rebound Hammer Test conforming to IS 13311 (Part 2): 1992 before proceeding further with construction of next story of Building. The tests shall be witnessed by SDE. In case the test result fails the column in parameters it shall be demolished and reconstructed at the cost of the contractor. The test results shall be tabulated and made part of the final bill.

ix. The liquidated damages can be deferred/reduced/waived (whole or part) by the SE concerned for contract(s) upto Rs.1.00 cr., CE from Rs.1.00 cr. to Rs.10.0. cr. and E-In-C of Haryana PW (B&R) Deptt. for contract(s) above Rs.10.00 cr. This will be done on the written request of the contractor and written recommendations of EE/SE as the case may be.

x. Upon completion and before offering the work for acceptance, the contractor shall remove all false work, excavated and useless materials, rubbish, temporary building constructed by him and shall leave the site and adjacent area in a neat and clean condition to the entire satisfaction of the 'Engineer's. The 'Engineer's , reserves the option to take away any item of work or any part thereof at any time during the currency of the contract and reallocate it to any other agency with due notice to the contractor without liability of any kind or payment of any compensation. Extra amount if incurred will be recovered from the agency.

xi. The contractor has to make his own arrangements for water, bricks, wood and every item required directly or indirectly for completion of work.

xii. No claim shall be entertained on account of increase in price of labour and material other than provided in the contract due to any cause whatsoever.

xiii. In case of emergency the Contractor shall be required to pay his labour every day and if this is not done, the 'Engineer' will make the requisite payment and recover the same from the contractor.

xiv. Actual quantities of completed and accepted work shall only be paid.

xv. No pits shall be dug by the contractor near the site of work or within Govt. land for taking out earth for use on the works. In case of default the pits so dug will be filled in by the department at the cost of the contractor plus fourteen percent departmental charges.

xvi. The rates to be quoted by the contractor shall be inclusive of octroi terminal tax, royalty, cess and all other taxes and charges. These are for complete work in all respects

xvii. The Contractor shall not be entitled for any payment on account of work done untill he signs the agreement.

xviii. Nothing extra shall be paid for any lead and if unless otherwise specified for any material required directly or indirectly and the rates to be given in the tender shall include all leads in the contract schedule.

xix. The Contractor shall be responsible for any /all losses of material, damage done to unfinished work as a result of floods and other acts of God. The Govt. will not be responsible for any compensation as a result of such damage or loss to the Contractor and the Contractor shall be liable to set right such damage at his own cost to the satisfaction of the 'Engineer's .

xx. Any cost of execution of item(s) of work, royalty, sales tax, cess and any other taxes, if any shall be paid by the contractor direct to the respective department in accordance with their rules and regulations in force from time to time without intervention of the Public Works Department.

xxi. Amount of work may be increased or decreased and any item committed and substituted in accordance with the requirement of the department and no claim on this amount shall be entertained. **The contractor will have to complete the whole building as per architectural plans submitted by the Chief Architect Haryana or by the Architect hired by the department for the work**.

xxii. All material left at site by the contractor for a period of more than one month after the completion of work shall become the property of the public works department and Contractor shall have no claim whatsoever for such material.

xxiii. The Contractor shall maintain at site of work full details of specification of the work fixed by the 'Engineer' and approved drawing of the work.

xxiv. Nothing extra shall be paid to the Contractor for diversion of water in the channels stream if it becomes necessary for the execution and completion of the work.

xxv. The Contractor will not have any claim in case of delay by the Department for removal of tree or shifting, raising, removing of telegraph, telephone

or electric lines (Over head or under ground) and other structure, if any, which comes in the way of the work.

xxvi. The percentage above and below HSR including ceiling premium if any should be quoted by the Contractor after making due diligence of the items in the BOQ and item rates for NS items in BOQ should be quoted without any condition. In case any condition is tendered this will be considered as null and void and only percentage above and below HSR item rates quoted for NS items by the tenderer shall be considered. In case any tenderer refuses to accept this, action shall be initiated as per provisions in the Bid Security Declaration Form or Bid Security shall be encashed.

32. Relation with Public Authorities:

The Contractor shall comply with all legal orders and directions given from time to time by any local or public authorities and shall pay out of his own money the fees or charges to which he may be liable.

33. Additional Conditions applicable to performance of Contractor

i. Item for which no rate or price have been entered in, will not be paid for by the employer when executed and shall be deemed covered by the other rates and prices in the bill quantities (Refer: ITB Clause 13.2 and conditions of contract Clause 43.3).

ii. Where there is discrepancy between percentage written in figures and words while quoting rates for HSR items, the percentage written in words shall be considered. Where there is a discrepancy between unit rate and the figures written in words for NS items, total resulting from multiplying the unit rate by quantity, the unit rate quoted shall govern (ITB clause 27.1(b)).

iii. The agency to whom the work is allotted will have to produce original voucher for all quantities in lieu of purchase of bitumen, steel and cement from the original manufacture or the authorized dealer/ distributors to the satisfaction of the 'Engineer' for ascertaining the genuineness of material. Attested copy of such voucher will have to be submitted along with the bills.

iv. The documentary proof of procurement of cement & steel from the reputed source and test result from CRRI or Sri Ram Test House, New Delhi will be produced by the agency.

v. The contractor will be held strictly responsible to the true intent of the specification in regard to quality of materials, workmanship and the diligent execution of the contract.

vi. All materials and each part of detail of the work shall be subject at all times to inspection by the Engineer-in. Departmental Representative or other authorized subordinate who shall be furnished with reasonable facilities and assistance by the contractor for ascertaining

whether or not the work as performed or the materials used are in accordance with the requirements and intent of the plans and specifications.

vii. The contractor shall furnish written information to the 'Engineer' stating the original source of supply and dates of manufactures of all materials manufactured away from the actual site of work. The information shall be furnished at least two weeks (or such other period as may be directed by 'Engineer' in advance of the incorporation of any such materials in the works.

viii. Any work done or materials used without supervision or inspection by the 'Engineer' /Departmental Representative is liable to be ordered to be removed and replaced at the contractor's expenses.

ix. If so directed the Contractor shall at any time before the acceptance of the work, remove or uncover such portion of the finished work as may be directed. After examination, the contractor shall restore the said portion of the work to the standards required as per specifications. The work shall not be considered to have been completed in accordance with the terms of the contract until the 'Engineer's -in-charge shall have certified in writing that it has been completed to his satisfaction. No approval of materials or workmanship or approval of part of the work during the progress of execution shall bind the Engineer in any way or effect his power to reject the work when alleged to be completed or to suspend the issue of his certificate of completion until such alterations or modifications or reconstructions have been affected as shall enable him to certify that the work has been completed to his satisfaction.

x. The inspection of the work or materials shall not relieve the Contractor any of his obligation to fulfill the terms of the contract as herein prescribed by the plans and specifications.

xi. Failure to reject any defective work or material will not in any way prevent later rejection when such defect is discovered or obligate the department to make final acceptance.

xii. If, the contractor seeks to some assistance from the department in connection with arranging water/electric connection from the public utility service authorities for the purpose of Govt. work such assistance only to the extent of writing a letter from the 'Engineer' to the authority concerned for giving such connection may be provided. All charges etc. shall be borne by the contractor.

xiii. The contractor may, on application of the contractor, issue essentiality certificate for Diesel/Petrol (if it becomes a controlled commodity) required for materials to be used on the work but the department will not undertake any responsibility for the arrangement of such Petrol/Diesel, Non availability of any such materials will not absolve the contractor of his contractual obligation. No claim of any kind what-so-ever shall be

entertained for any and all the losses or damages to the contractor due to the completion of the work getting delayed due to the failure or delay on the part of the public works department under the terms and conditions of the contract.

xiv. The contractor shall supply at his own cost and expenses all labour materials etc. for labour and checking of any portion of the work during construction. Whosesoever required by the 'Engineer' or his representative and nothing extra shall be paid for same.

xv. Occupation of Additional Lands:
In case, when it becomes necessary for due fulfillment of the contract for the contractor to occupy land outside the P.W.D. limits the contractor shall make his own arrangement with the land owners and pay such amount, as may be mutually agreed upon by them.

xvi. No claim by the contractor for additional payment will be allowed on the ground of any misunderstanding or misapprehension in respect of any such matter or otherwise on the ground of any allegation or fact that incorrect information was given to him by any person whether in the employ of the Govt. or not or of the failure on his part to obtain correct information nor shall the contractor be relieved from any risk or obligations imposed on or undertaken by him under the contract on any such ground or on the ground that he did not or could not fore-see any matter which may in fact, effect or have affected the execution of the work.

xvii. During the absence on work of the 'Engineer' he shall be represented by one of his subordinate whose duties are to watch and supervise the works, to test and examine any materials to be used or workmanship employed to ensure that the works are performed in conformity with the plans, estimates and specifications in all respects and to keep 'Engineer' informed of the progress of the works and the manner in which they are done. The 'Engineer' may from time to time delegate any of the powers and authorities vested in him to the departmental representative in writing.

xviii. The Departmental representative shall have no authority to alter or waive the provisions of plans and estimates and specifications or to relieve the contractor or any of his duties or obligations under the contract. He shall however, have the authority to inform the contractor in writing to replace any materials considered defective and to suspend, to do, or rectify the work improperly performed or not according to plans and estimates or specifications in his judgment and the contractor shall comply.

xix. Failure of the Departmental Representative to disapprove any work of materials shall not prejudice the power of the 'Engineer' thereafter to

disapprove such work or materials and to order the pulling down, removal or breaking up thereof. If the contractor shall be dissatisfied by reason of any decision of the Departmental representative, he shall be entitled to refer the matter to the 'Engineer'. Who shall thereupon confirm or reverse such a decision.

xx. The contractor shall also inform the 'Engineer' in writing when any portion is ready for inspection giving him sufficient notice to enable him to inspect the same without retarding the further progress of the work.

xxi. Unless otherwise provided in the contract document materials such as rubble, gravel sand, murrum, kankar earth, soil, etc. obtained from excavation and materials obtained by dismantling any existing structures shall remain the property of the Government.

xxii. Any tress branches, bushes, crops etc. which may be required to be cut during the execution of the work shall be handed over to the Public Works Department or disposed of as directed.

xxiii. The contractor will submit the design of temporary structure scaffolding to department in advance without any cost. The contractor will remain responsible for design and safety of scaffolding irrespective of approval by the Engineer-in Charge.

xxiv. The contractor shall use canal water for construction of building or water from any other sources as approved by the 'Engineer'. Water should be got tested at regular intervals i.e. maximum of 2 (two) months from the laboratory approved by the 'Engineer' and no extra cost will be paid for the same. Water to be used shall meet latest IS standard as per IS 456/other relevant codes.

A. <u>FOR EXCESS CONSUMPTION OF MATERIALS FROM THE THEORETICAL CONSUMPTION</u>

(i) No Claim for Excess Consumption of material other than those specified shall be entertained by the department.

B. <u>FOR SHORT CONSUMPTION OF CEMENT</u>

(i) Upto 5%, the recovery of cost of material thus saved shall be made from the contractor at the base price as applicable on the date of tender.

(ii) Less consumption by more than 5% (i.e. above 5 %) the rates of items of work involved shall be reduced. If it is not possible to determine the exact items on

which less material has been used, the cost of the material so saved shall be recovered from the contractor at double the issue rate. The Executive Engineer reserves the right to take any other deterrent action which he deems fit against the contractor. It shall be at the discretion of the department to determine whether the stability of the structure is affected adversely due to less consumption of materials and in case it is felt that it is likely to be so, the Executive 'Engineer' shall reject the work and the decision of 'Employer' in such matter shall be final.

Conditions for MAINTAINENCE-CUM-DEFECT LIABILITY PERIOD [Building Works]

38.1 The defect liability-cum-maintenance period shall be **two years** from the date of completion in case of original works. For maintenance and S/R works, defect liability period will be **one year** and re-painting / white wash / snowcem / distempering will not be required. The date of completion shall be considered as the date certified by the 'Engineer'.

38.2 The Engineer shall give notice to the contractor of any defects before the end of the effects Liability-cum-Maintenance Period. The Defects Liability-cum-Maintenance period shall be extended for as long as defects remain to be corrected.

38.3 The Contractor shall correct the notified Defect / Defects within the length of time as specified by the Engineer's, notice.

38.4 The contractor will be fully responsible for the quality and workmanship of the works executed by him. The liability on account of shortcomings in executed items found by any investigating agency during the defect liability period or afterwards shall be born by the agency.

38.5 The Contractor shall do the routine maintenance of building to the required standards in the manners as per Haryana PWD specifications latest edition, DNIT, agreement conditions and keep the whole building in defect free condition during defect liability period as defined above.

38.6 The routine maintenance standards shall meet the following minimum requirements to the entire satisfaction of 'Engineer':-

i) Plaster work and flooring work to be repaired soon after these appear or brought to his notice either during contractor's monthly inspection or by the Engineer or otherwise. Repair shall be carried out in a manner which does not affect the aesthetics.

ii) Defective joinery such as door, window, cup-board shutters, chowkhats, wire gauge, glass panes, fitting, fixtures etc. to be rectified / replaced immediately after the defects appear.

iii) Any structural damage / fault / defect to be rectified to the satisfaction of 'Engineer' as soon as the same appears.

iv) Defective or incomplete/improper white washing / colour washing, distempering, painting etc. to be rectified immediately on notice by the 'Engineer's .

v) All rain water pipes, sun-shades and the like components to be inspected every fortnightly and cleaned as and when required.

vi) Leakage of water of any kind in the building to be set right immediately on priority.

vii) All electrical / Public Health installations including wiring, pipelines etc. made in the building to be repaired / rectified / replaced as soon as any defect has appeared / notice.

viii) The agency shall make good all the items / works damaged during the repair being done by him and bring the same in original form.

ix) Any other maintenance operation required to keep the building use worthy at all the time during the maintenance period.

x) He shall maintain a register in the building for daily recording the defects, damages, shortcomings noticed by user and address the problem within three days or else he will approach the 'Engineer' for extension of this time.

xi) Before the end of defect-cum-maintenance period is completed, all damaged door /window should be replaced as per original work. All malfunctioning fittings and fixtures of doors/ windows and woodwork, Public Health fixtures, taps etc. of the whole building should be replaced to the satisfaction of Engineer/ Employer as per original work will be carried out by the contractor.

38.7 To fulfill the objectives laid down in above sub clauses, the Contractor shall undertake detailed inspection of the building at least once in a month. The 'Engineer' can reduce this frequency in case of emergency. The Contractor shall forward to the 'Engineer' the record of inspection and rectification every month. The contractor shall pay particular attention on the maintenance of building during rains and rainy season.

38.8 The Engineer may issue notice to the Contractor to carry out maintenance or remove defects, if any, notice in his inspection, or brought to his notice. The contractor shall remove the defects within the period specified in the notice and submit to the 'Engineer' a compliance report. By not giving notice, will not absolve the contractor from his responsibility.

38.9 In case the Contractor fails to make good the defects, the Executive Engineer may employ any other person to make good such defects and all expenses consequent and incidental there to shall be borne by the Contractor.

38.10 The contract shall not be considered as completed until a defect liability-cum-maintenance certificate has been signed by the Executive Engineer and delivered to the contractor stating that the works have been completed and maintained to his satisfaction. The defect liability-cum-maintenance certificate shall be given by the SE or the recommendations of XEN. SE will send copy of such certificate to CE (Bldgs) alongwith CD.

38.11 Department shall not be responsible for any depreciation in the value of securities, not for any loss of interest thereon.

38.12 There will be double lock system for the cement store. One Key of the lock will be with the representative of the department and other key of the lock will be with the agency.

Technical Specifications For Electrical Works, Lifts, Medical Gas Pipeline, HVAC, Air Conditioning, LAN, EPBAX, CCTV, Fire Alarm, Audio Video System, Public Address, BMS, Access Control, DG Set

TECHANICAL CONDITION FOR EI WORK

1. The recovery of the pipe already laid will be made on measurement rate basis or point rate basis or on actual expenditure basis which ever is on high side. In case of Departmental work, 10% supervision charges shall also be added.

2. Conduit pipe where already laid for wiring purpose will be delivered to the contractor in absolutely clean condition with round inspection boxes duly painted, covered and whole system tested. After the conduit system is handed over to the contractor to whom the work is allotted, he will be responsible for its upkeep.

3. During execution of work, if the contractor does not lay pipe and its accessories in the slab within time prescribed by the Engineer-in-Charge of the work, the Deptt. can then lay the said pipe-departmentally at contractors risk and cost without operating the clause 2 and 3 of the contract agreement.

4. Separate conduit pipe for power plug with independent circuit wires shall be laid.

5. Multi plugs shall be provided in all the buildings.

6. C-Series MCB will be provided for air conditioner wiring and no extra payment will be made and only one make of MCB's will be used in whole work.

7. Vertical type of MCB distribution boards will be provided wherever required as per design.

8. The contractor is also allowed to use MCBs duly ISI marked of more then 9 KA breaking capacity for which no extra payment will be made.

9. The make of enclosure will be same as that of MCB of standard size having thickness 1.6 mm and 1.2 mm in case of TPN and SPN enclosure respectively.

10. All MCCBs upto 220 Amp will have 25 KA minimum breaking capacity and above 220 amp. MCCBs will have 50 KA minimum breaking capacity. All MCCBs will have magnetic thermal release and rotary operating mechanism duly interlocked and only one make of MCCBs shall be used in whole work. No extra payment on this account shall be made.

11. The thickness of M.S. Sheet of switch boxes should be of 16 gauges for which no extra payment will be made.

12. The fan boxes sheet should be 16 gauge and anodized for which no extra payment will be made.

13. The contractor shall install the material from the list of approved electrical material appended in the NIT. Material not covered in the list will be used as per HSR-2021, and PWD Specifications-1990.

14. The contractor must ensure preparation and submission of pipe diagram, wiring diagram, key diagram etc. as required vide PWD Specifications.

15 Where ISI recommends multi stranded conductor of cable, cable with multi- stranded conductor only will be used on work.

16. Rates should be quoted by the tenderer both in word and in figure, in case of any difference between the two, the lowest of the same shall be considered as final rate.

17. The rates of bus bar includes the cost of all Labour and material required to complete the job in all respect including thimbles etc. of the same material as that of bars. The support for bars will be made of porcelain. No extra payment in this regard will be given.

18. The tenderer must either be 'A' Class Electrical Contractor enlisted with Haryana PW(B&R) Deptt. or he must sublet the electrical work to a sub contractor possessing the above qualification. The Sub contracting will be done with the written approval of Superintending Engineer, Elect. Circle PW(B&R) Deptt., concerned or Executive Engineer, Elect. Divn. PW(B&R) Deptt. (concerned division) as per competency.

19. All the street light fittings, bulbs and cables will be got inspected by the contractor at the works/Go down of the manufacturer before installation at site. A certificate will also be produced/ submitted by the contractor about the authenticity of purchase of above material from the authorized source.

20. Only HYLAM make ISI make (I.S.2036-1995) white Bakelite sheet will be used without any extra cost.

21. The rates mentioned in the NIT are for complete item including cost of all accessories, material, labour, tool plants, water electricity bills etc. Unless otherwise specified. No extra payment for the same shall be made.

22. The minimum size of MS control switch boards for controlling one fan point and one light point shall not be less than 20cm x 25cm x 10cm.

23. The MS box for telephone, Intercom and Bell push shall be installed of size 100 mm x 100mm x 60mm in place of 75mm x 75mm x 60mm.
24. The tender having ambiguous/confusing rates and conditions shall be summarily rejected.
25. The quantity/amount of NIT can be increased or decreased.
26. No Road cut charges shall be paid.
27. The contractor shall install two number check nuts and one No. PVC threaded Bush for each pipe in MS inspection boxes. The contractor shall also install PVC flanged bush in the junction boxes for each pipe. No extra payment on this account will be made. The contractor shall quote the rates accordingly.

L.T. panel: -

General: - This distribution board shall be fabricated out of 14 gauge sheet steel cubical type suitable for floor mounting end or dead front type. Suitable rubber gaskets shall be provided between all opening and joint to make the distribution board dust, moisture and vermin proof. The distribution board shall be suitable for indoor location and shall consist of the bus bar chambers both vertically and horizontally and the cable entry for the distribution shall be from bottom. Distribution board will consist of a number of vertical sections. Each vertical section shall be divided in to a few standard sizes of the compartment. The equipment for the various incoming and out going feeders shall be housed in a separate compartment. Each compartment door of distribution board shall be provided with inter locking arrangement with the handle of the respective switches/ MCCB such that the door can not be opened unless the switches are in the off position. Vertical cable entry shall be provided on each section of the distribution board for cabling purpose. Continues bus bar of copper shall be provided at the bottom along the entire length, cable compartment with concealed hinged front door will be fully segregated from the main horizontal/ vertical bus bar of equipment module. The distribution board shall be painted with a suitable enameled shade after necessary primary treatment. The distribution board shall be suitable for operation on 415 volts 3 phase 50 cycles per second A.C. supply system.

Bus Bar: - The high conductivity copper bus bar provided in the chambers shall be duly tinned and insulated and rigidly supported at the short intervals by strong 12mm thick non inflammable hylam partitions. The partitions shall be so designed so as to with stand the stress, which can normally occur on short circuits. Further, The bus bars and links shall be of flat copper dully tinned so that the contract between bus bars shall be easily accessible from front for any connections and inspection etc.

The bus bars chamber should have of strong metal having no possibility of any dents, due to accidents and damage, which could result into electrical fault. Bus bars chamber shall be of unit type construction and have standard flanges opening at the top and bottom on both side so that any modification, extension can be easily effected at the site.

Test Certificate: - A test certificate from the manufacturer shall be handed over to the department before installation of the panel specifying that the panel conform to relevant ISS/ PWD specifications.

Wiring Diagram: - After completion of the work complete diagram showing connections to the various equipment on the board is to be prepared by the contractor and to be submitted to the department along with final bill of the work. In case contractor fails to supply the diagram amount @ 0.5% of the work executed shall be deducted from the contractor's final bill.

Connection: - Inter connections from bus bar chamber to the different molded case circuit breaker / air circuit breaker should be through solid copper bars of the required capacity duly tinned and insulated for which no extra payment will be made.

ADDITIONAL CONDITIONS (E.I.)

1. A tenderer shall be deemed to have full knowledge of the relevant documents, samples, site etc. whether he inspects them not.

2. The department reserves the right to withdraw any item or any portion of the work while allotting the work / approving the tender case or during execution of work.

3. The rates mentioned in the NIT are for complete items including cost of all accessories, materials, labour, tools plants and water electricity bill etc. Unless otherwise specified.

4. In case of any error or omission in the description rates and unit etc. of HSR items it will be applicable as mentioned in the schedule of rate 2021 corrected up to date except mentioned as above. Further in case of any confusion or imperfection of the HSR item the confidential detailed analysis of HSR shall be applicable and still there is any dispute in this regard the decision of Superintending Engineer Electrical Circle PWD B&R concerned shall be final.

5. The jurisdiction of the court will be the District Court of concerned district head quarter.

6. The recovery of the pipe already laid will be made on measurement rate basis or point rate basis or on actual expenditure basis which ever is on high side. In case of Departmental work, 10% supervision charges shall also be added.

7. Conduit pipe where already laid for wiring purpose will be delivered to the contractor in absolutely clean condition with round inspection boxes duly painted, covered and whole system tested. After the conduit system is handed over to the contractor to whom the work is allotted, he will be responsible for its upkeep.

8. During execution of work, if the contractor does not lay pipe and its accessories in the slab within time prescribed by the Engineer-in-Chief of the work, the Deptt. can then get the said pipe laid departmentally/other sources at contractors risk and cost without operating the clause 2 and 3 of the contract agreement. Recovery of such work executed departmentally/other source shall be made at market rate+10%.

9. Separate conduit pipe for power plug with independent circuit wires shall be laid.

10. Multi plug socket shall be provided for light & power plugs.

11. Call bell shall be dingdong/music only as per site requirement.

12. C-Series MCB will be provided for air conditioner / motor wiring without any extra cost.

13. MCB's shall be of minimum 9 KA breaking capacity.

14. The make of enclosure will be same as that of MCB of standard size having thickness 1.6 mm and 1.2 mm in case of TPN and SPN enclosure respectively.

15. All MCCB's up to 220 Amp. will have 25KA minimum breaking capacity and above 220amp. MCCB's will have 50 KA minimum breaking capacity. All MCCB's will have magnetic thermal release and rotary operating mechanism duly interlocked and only one make of MCCBs shall be used in whole work. No extra payment on this account shall be made.

16. The thickness of M.S. Sheet of switch boxes/ fan boxes should of minimum 16.6 mm.

17. The contractor shall install the material from the list of approved electrical material appended in the NIT. Material not covered in the list will be used as approved by Engineer-in-charge of site.

18. The contractor must ensure preparation and submission of pipe diagram, wiring diagram, key diagram etc. as required vide PWD Specifications.

19. PVC insulated Stranded / multi strand wire shall be allowed to be used. Similarly where ISI recommends multi stranded conductor of cable, cable with multi- stranded conductor only will be used on work. PVC insulated PVC sheathed under ground cable as per IS: 1554 Part-I is to be used. However the firm shall be allowed to used XLPE insulated PVC sheathed cable as per IS: 7098 Part-I. No extra payment on this account shall be made. The contractor should quote the rate accordingly.

20. The rates of bus bar include the cost of all Labour and material required to complete the job in all respect including thimbles etc. of the same material as that of bars. The support for bars will be made of porcelain.

21. The tenderer must either be 'A' Class Electrical Contractor enlisted with Haryana PWD B&R or he must sublet the electrical work to a sub contractor possessing the above qualification. The Sub contracting will be done with the written approval of Executive Engineer, Elect. Divn. PWD B&R Br. (concerned division) for value upto 25 lacs. For work more than Rs. 25 Lacs Superintending Engineer Elect. Circle PWD B&R Br., concerned shall be competent authority.

22. The Electrical part of bill of quantity of the agreement will be got executed by and under the supervision of Executive Engineer, Elect. Divn. PWD B&R Br., (concerned division) and all the running payment of electrical works will be made by him. However copy of final bill will be sent to

Executive Engineer (Civil) to include in the final bill. The over all technical supervision of electrical work shall be of Superintending Engineer Elect. Circle PWD B&R Br., concerned and any technical instructions given by him will have to be adhered to strictly by the contractor.

23. If desired by Engineer-in-charge, the electrical material will be got inspected by the contractor at the works / Go down of the manufacturer / dealer before installation at site. A certificate will also be produced/ submitted by the contractor about the authenticity of purchase of above material from the authorized source.

24. ISI make (I.S.2036-1995) white Bakelite sheet 3mm thick will be used on the work. The contractor should quote rates accordingly.

25. The rates mentioned in the NIT are for complete item including cost of all accessories, material, labour, tool plants, water electricity bills etc., unless otherwise specified.

26. The minimum size of MS control switch boards for controlling one fan point and one light point shall not be less than 20cm x 25cm x 10cm.

27. The contractor shall install two number check nuts and one No. PVC threaded Bush for each pipe in MS inspection boxes. The contractor shall also install PVC flanged bush in the junction boxes for each pipe.

28. If the agency does not fill / quote the rate of any item then it will be considered as nil and same item will be executed by the agency free of cost. The agency will have to give an undertaking on account of above otherwise earnest money will be forfeited. In addition to this Engineer-in-Charge of work may also black list the agency.

29. The department can withdraw any item from the contract agreement of the agency and gets it executed from other sources.

30. In case of rewiring & special repair work the old dismantled material if any will be handed over to the department by the contractor and the receipt obtained will be submitted along with first bill.

31. The MS box for telephone, TV, intercom and bell push shall be installed of size 100mm x 100mm x 60mm.

32. In case of over head line, minimum distance of street light poles from the over head line must be maintained as per Indian Electricity rule direction. Shut down to the over head line from electricity department should be taken before doing the work under such over head lines. Work in the campus where over head line is existing should be carried out in the

presence of SDE / ASDE / JE. The contractor will be fully responsible for any damage / loss due to laps on this account.

33. Only experience of Central Govt. / State Govt. Department will be considered for this work.

34. The date of warranty will be start on the date of installation of the transformer, Panel and allied equipments for this work

35. Minor civil repair including but not limited to chiseling plaster, paint will be in the scope of firm / contractor.

36. The bidder will offer inspection at the place of manufacturing. The bidder will bear the cost of travelling (to and fro). Boarding on lodging of atleast two officers/ officials.

37. These conditions shall supersede the similar conditions found contrary elsewhere in the DNIT.

38. It will be mandatory for contractor to get the complete installation cleared / approved from CEI Haryana after completion. The inspection fee will be deposited by the firm metering equipment will also be got cleared for DHBVNL by the contractor including depositing necessary feed etc.

39. Firm/ contractor will offer inspection of all major materials at manufacturer place and will bear the to and fro including boarding & loading expenses for atleast two person.

40. A tenderer shall be deemed to have full knowledge of the relevant documents, samples, site etc. whether he inspects them not.

41. The department reserves the right to withdraw any item or any portion of the work while allotting the work / approving the tender case or during execution of work.

42. The rates mentioned in the NIT are for complete items including cost of all accessories, materials, labour, tools plants and water electricity bill etc. Unless otherwise specified.

43. In case of any error or omission in the description rates and unit etc. of HSR items it will be applicable as mentioned in the schedule of rate 2021 corrected up to date except mentioned as above. Further in case of any confusion or imperfection of the HSR item the confidential detailed analysis of HSR shall be applicable and still there is any dispute in this regard the decision of Superintending Engineer Electrical Circle PWD B&R concerned shall be final.

44. The jurisdiction of the court will be the District Court of concerned district head quarter.

45. The recovery of the pipe already laid will be made on measurement rate basis or point rate basis or on actual expenditure basis which ever is on high side. In case of Departmental work, 10% supervision charges shall also be added.

46. Conduit pipe where already laid for wiring purpose will be delivered to the contractor in absolutely clean condition with round inspection boxes duly painted, covered and whole system tested. After the conduit system is handed over to the contractor to whom the work is allotted, he will be responsible for its upkeep.

47. During execution of work, if the contractor does not lay pipe and its accessories in the slab within time prescribed by the Engineer-in-Chief of the work, the Deptt. can then get the said pipe laid departmentally/other sources at contractors risk and cost without operating the clause 2 and 3 of the contract agreement. Recovery of such work executed departmentally/other source shall be made at market rate+10%.

48. Separate conduit pipe for power plug with independent circuit wires shall be laid.

49. Multi plug socket shall be provided for light & power plugs.

50. Call bell shall be dingdong/music only as per site requirement.

51. C-Series MCB will be provided for air conditioner / motor wiring without any extra cost.

52. MCB's shall be of minimum 9 KA breaking capacity.

53. The make of enclosure will be same as that of MCB of standard size having thickness 1.6 mm and 1.2 mm in case of TPN and SPN enclosure respectively.

54. All MCCB's up to 220 Amp. will have 25KA minimum breaking capacity and above 220amp. MCCB's will have 50 KA minimum breaking capacity. All MCCB's will have magnetic thermal release and rotary operating mechanism duly interlocked and only one make of MCCBs shall be used in whole work. No extra payment on this account shall be made.

55. The thickness of M.S. Sheet of switch boxes/ fan boxes should of minimum 1.6 mm.

56. The contractor shall install the material from the list of approved electrical material appended in the NIT. Material not covered in the list will be used as approved by Engineer-in-charge of site.

57. The contractor must ensure preparation and submission of pipe diagram, wiring diagram, key diagram etc. as required vide PWD Specifications.

58. PVC insulated Stranded / multi strand wire shall be allowed to be used. Similarly where ISI recommends multi stranded conductor of cable, cable with multi- stranded conductor only will be used on work. PVC insulated PVC sheathed under ground cable as per IS: 1554 Part-I is to be used. However the firm shall be allowed to used XLPE insulated PVC sheathed cable as per IS: 7098 Part-I. No extra payment on this account shall be made. The contractor should quote the rate accordingly.

59. The rates of bus bar include the cost of all Labour and material required to complete the job in all respect including thimbles etc. of the same material as that of bars. The support for bars will be made of porcelain.

60. The tenderer must either be 'A' Class Electrical Contractor enlisted with Haryana PWD B&R or he must sublet the electrical work to a sub contractor possessing the above qualification. The Sub contracting will be done with the written approval of Executive Engineer, Elect. Divn. PWD B&R Br. (concerned division) for value upto 25 lacs. For work more than Rs. 25 Lacs Superintending Engineer Elect. Circle PWD B&R Br., concerned shall be competent authority.

61. The Electrical part of bill of quantity of the agreement will be got executed by and under the supervision of Executive Engineer, Elect. Divn. PWD B&R Br., (concerned division) and all the running payment of electrical works will be made by him. However copy of final bill will be sent to Executive Engineer (Civil) to include in the final bill. The over all technical supervision of electrical work shall be of Superintending Engineer Elect. Circle PWD B&R Br., concerned and any technical instructions given by him will have to be adhered to strictly by the contractor.

62. If desired by Engineer-in-charge, the electrical material will be got inspected by the contractor at the works / Go down of the manufacturer / dealer before installation at site. A certificate will also be produced/ submitted by the contractor about the authenticity of purchase of above material from the authorized source.

63. ISI make (I.S.2036-1995) white Bakelite sheet 3mm thick will be used on the work. The contractor should quote rates accordingly.

64. The rates mentioned in the NIT are for complete item including cost of all accessories, material, labour, tool plants, water electricity bills etc., unless otherwise specified.

65. The minimum size of MS control switch boards for controlling one fan point and one light point shall not be less than 20cm x 25cm x 10cm.

66. The contractor shall install two number check nuts and one No. PVC threaded Bush for each pipe in MS inspection boxes. The contractor shall also install PVC flanged bush in the junction boxes for each pipe.

67. If the agency does not fill / quote the rate of any item then it will be considered as nil and same item will be executed by the agency free of cost. The agency will have to give an undertaking on account of above otherwise earnest money will be forfeited. In addition to this Engineer-in-Charge of work may also black list the agency.

68. The department can withdraw any item from the contract agreement of the agency and gets it executed from other sources.

69. In case of rewiring & special repair work the old dismantled material if any will be handed over to the department by the contractor and the receipt obtained will be submitted along with first bill.

70. The MS box for telephone, TV, intercom and bell push shall be installed of size 100mm x 100mm x 60mm.

71. In case of over head line, minimum distance of street light poles from the over head line must be maintained as per Indian Electricity rule direction. Shut down to the over head line from electricity department should be taken before doing the work under such over head lines. Work in the campus where over head line is existing should be carried out in the presence of SDE / ASDE / JE. The contractor will be fully responsible for any damage / loss due to laps on this account.

72. Only experience of Central Govt. / State Govt. Department will be considered for this work.

73. The date of warranty will be start on the date of installation of the transformer, Panel and allied equipments for this work

74. Minor civil repair including but not limited to chiseling plaster, paint will be in the scope of firm / contractor.

75. The bidder will offer inspection at the place of manufacturing. The bidder will bear the cost of travelling (to and fro). Boarding on lodging of atleast two officers/ officials.

76. These conditions shall supersede the similar conditions found contrary elsewhere in the DNIT.

77. It will be mandatory for contractor to get the complete installation cleared / approved from CEI Haryana after completion. The inspection fee will be deposited by the firm metering equipment will also be got cleared for DHBVNL by the contractor including depositing necessary feed etc.

78. Firm/ contractor will offer inspection of all major materials at manufacturer place and will bear the to and fro including boarding & loading expenses for atleast two persons.

TECHNICALL SPECIFICATION OF LIFTS

ALARM BELL

1. A battery operated emergency alarm bell with rechargeable cells and recharger including wiring shall be provided and connected to a clearly marked push button in the car operating panel. Alarm bell shall be located outside at the ground floor landing.

RAILING

2. Suitable size of railing shall be provided on the car top for safety.

PAINTING

3. All exposed elevator material shall be properly painted to the entire satisfaction of Engineer-in-charge.

COUNTER WEIGHT SCREEN

4. Proper counter weight screen shall be provided at the hoist way pit.

5. Fire resistant traveling cable shall be used as per relevant ISI specifications.

HOISTWAY DOOR INTERLOCKS

6. Each hoist way door shall be provided with approved interlocks which will protect the movement of car away from the landing unless all doors are closed and locked. The interlocks shall also prevent opening of the door except at the landing where the car is stopping or has stopped.

SAFETY GEARS

7. The car movement shall be controlled through Governor including speed in descending and free fall, limiting the speed to safe limits as per relevant I.S.I.

HANDICAP COMPATIBILITY

8. All Lift of capacity 13 passenger or more than 13 persons shall be handicapped compatibility and necessary provisions shall be made accordingly.

9. Enlistment as contractor in the department for original manufacturer of elevators is not required

10. Erasing and over Writings are not permissible. All amendments, corrections and insertions must be signed by the firms

11. Rates should be quoted for complete LIFT with ARD and AMC separately in words and in figures. In case there is any difference in rates between words and figures, the lower of the two will be taken as correct.

12. The tender shall remain valid upto 120 days from the date of opening of quotation. With the issuing of acceptance/ allotment letter to the contractor within this period, the contract agreement will stand concluded even without signing of contract agreement and in case the contractor fails to commence the work, his earnest money will stand forfeited and action under clause 45 of A & B of the contract agreement will also be taken in addition to the forfeiture of earnest money. In case the contractor withdraws or amends his offer within this period i.e. 120 days or before the issue of acceptance/allotment letter, his earnest money will only stand forfeited. The contractor will also be liable to be debarred/ blacklisted in both the cases.

13. Only Manufacturer of lift as mentioned in BOQ are allowed to bid for the work.

14. Firms are advised to visit the site sufficiently in advance of the date fixed for submission of the quotation. The firms shall be deemed to have full knowledge of all the relevant documents, samples, sites etc. whether they inspect them or not.

DATE OF COMPLETION

15. Certified date of completion will be accepted after 30 days uninterrupted trouble free trail run of lift after commissioning. This trail run period is excluded from the contractual period

ACCOMMODATION

16. Necessary lockable accommodation for storing of lift material shall be provided by the department. The contractor shall however, be responsible for watch and ward of material brought at site against damage and theft and losses due to any reason including natural calamities.

17. No living accommodation for the elevator staff shall be provided by the department.

LIFE OF LIFT.

18. The lifts are deemed to have life span of 20 years. Under no circumstances, the lifts will be declared obsolete during the above period by the firm. The firm shall be bound to keep/maintain sufficient inventory of Parts/Assemblies required for maintaining the lifts for 20 years' life.

20) The work shall conform to IS- 1860 –1980/ or latest, IS: 4666-1980 and all other relevant IS (BIS) specifications mutatis mutandis.

21 The reference floor for call collection and start of lift, in case of any fault shall be the nearest/same floor where the lift will stop after operation of ARD. offer should be inclusive of this arrangement and no extra payment will be made for this.

22) For wiring purposes ISI mark heavy gauge welded MS conduit/GI/aluminum troughing /flexible pipe shall be used.

SAFETY

23 Under no circumstances the lift shall operate when the car door or landing door is in open position. If lift will be found in operation without proper barricading when the door of either landing or car is open, it will be treated as serious negligence on the part of firm and firm shall be held responsible for all direct damages arising there from.

SCOPE OF WORK TO BE DONE BY DEPTT.

24 (a) To provide proper hoist way along with pit in plumb with permissible variation of + 100mm, (-) 50mm, without any projection inside the hoist way, duly plastered and white washed.

(b) To provide light with bulb & 5amp plug point in the middle of each landing level inside hoist way.

(c) To provide adequate size machine room with hoisting beam / hook, doors and windows of proper size, ventilation, duly plastered and white washed.

(d) To provide sufficient light , power socket & exhaust fan in machine room.

(e) To provide trap door of desired size (exact dimensions to be supplied by the contractor) with 5mm thick MS plate cover fixed in angle iron frame.

(f) To provide permanently fixed 3 phase and single phase supply terminated through main switches / MCCBs, along with double earthling in machine room. Electricity shall be provided by the department on payment basis for erection purpose and free of cost for testing and commissioning

(g) To provide proper access to machine room. If steel step ladder will be provided then it will have proper hand rail on both sides.

SCOPE OF WORK TO BE DONE BY CONTRACTOR

25 (a) To provide doorsills, doorframes, machine beams, bearing plates, buffer support channels, facia plates.

(b) To provide scaffolding.

(c) To provide all cut pockets / rope holes and grout bolts to fix rails, brackets.

(d) To do all minor building work comprising cutting and repair thereof.

(e) To adjust doorsills.

(f) To furnish drawings showing general arrangements of the elevator equipment for approval from Engineer-in-Charge before the work is begun.

(g) To provide temporary barricading with caution boards at each landing to prevent accident during execution and maintenance of work.

(h) To provide steel ladder for access to lift pit.

(i) To do all necessary work to support machines in machine room including RCC pedestal if required.

AMBIENT TEMPERATURE

26. The lift should work satisfactorily without requiring /necessitating cooling system for control panel, motor or any system or part thereof on ambient temperature upto 55 degree centigrade.

COST COMPARISION OF TENDER.

27 For cost comparison of quotation, maintenance charges shall be added to the cost of original work as per formula: Total cost of quotation = Cost of original work + AMC charges quoted in quotation x No. of years of AMC.

PAYMENT

28 The firm shall not be entitled for any payments on account of work done by them till he signs the agreement.

29 30 % advance against bank guarantee of equal cost, 50% supply of material, 10 % on completion & balance 10% on commissioning

FINANCIAL & TAXES

30. Earnest money in the shape of bank guarantee valid for one year will also be acceptable.

31 10% (Ten Percent) security shall be deducted from each bill of the firm subject to maximum 5% (inclusive of earnest money already deposited) of the agreement amount. The security/performance guarantee in shape of bank guarantee valid for 18 months shall also be acceptable which shall be deposited in full before the first payment & will be refunded after completion of free maintenance period.

32 Income Tax / Sales tax /works contract tax/ labour cess /service tax at source as and if applicable will be deducted on the amount of the work done from all running and final bills .Necessary TDS certificate will be issued by the department.

33 The rates shall be inclusive of all charges at the time of quotationing however variation due to increase/decrease in rates of statutory duties, taxes etc. and any new levies during execution of original/maintenance work, as per the contract agreement shall be to the account of the department.

34 IEEMA price variation is not acceptable within the original time limit. If the delay is on account of department IEEMA will be payable for such period only. If the delay in completion is on the part of firm, no IEEMA price variation shall be payable.

35 In case of force major circumstances, time extension will be granted on proof of the same but no IEEMA price variation will be payable.

36 The agencies shall submit separate rates for lifts with vandal proof and Moon Rock/Honey Comb Scratch resistant stainless steel. Stainless steel to be used shall be decided by the department.

JURISDICTION OF COURT

37 Jurisdiction of court will be at concerned district head quarter.

INSPECTION

36) Manufacturer test certificate should be given by the contractor for Motors, Ropes, control panels and other assemblies. It will be certified by the firm that all the equipment supplied is tested and it conforms to relevant standards and specifications provided in contract agreement. Contractor shall get the lifts inspected from Chief Electrical Inspectorate/Nodal agency for inspection of lifts. The required inspection charges shall be paid by the firm and reimbursed to the firm by the department on proof of payment.

FREE MAINTENANCE

37 After 30 (thirty) days uninterrupted and trouble free operation maintenance Service for equipment furnished under the specifications shall be provided free of cost for labor, material and spare parts for a period of 12 (Twelve) months. The free service shall include examination of the installation during regular working hours by trained employees and shall include all necessary adjustments, greasing, oiling, cleaning, setting right of defects including replacement of defective parts with genuine standard parts as required to keep the equipment in proper operation.

38 During the free maintenance period lift will have to be maintained and inspected regularly at least once in a month and as and when called by Engineer-in-Charge or his representative due to fault / breakdown without any charges.

39 There shall not be delay of more than 24 (Twenty four) hours in removal of minor break down /defect and four days including day of complaint and holidays for the major break down /defect reported in station where

quotationer has lift service organization. At other place it shall not be more than 48 (Forty eight) hours and 6 (six) days inclusive of holidays respectively. In case firm do not attend to above complaint and rectifies defects within above specified period then, free maintenance period will be extended by 2 (Two) times the delayed period beyond the prescribed period .

GUARANTEE

40 The elevator contractor shall guarantee that the material and workmanship of the

Apparatus installed by him under these specifications are new and of first quality in every respect and for that he will make good any defect for the period for 12 (Twelve) months plus extended period of free maintenance from the date of completion of 30 (thirty) days trouble free operation .

COMPENSATION FOR DELAY

41. 0.5% of incomplete portion of work per week, maximize 5 % of the contract value.

NOTICE / RESCINATION OF AGREEMENT:-

42. In any case in which under clause or clauses of this contract the contractor has rendered himself liable to pay compensation amounting to the whole of his security deposit (whether paid in one sum or deducted by installments. The Executive Engineer on behalf of Govt. Of Haryana shall have power to adopt any following course s he may deem best suited to the interest of Govt.

(a) To rescind the contact of which recession notice in writing to the contractor under the hand of Executive Engineer shall be conclusive evidence & in which case the security deposit of the contractor shall stand forfeited & be absolutely at the disposal of Govt.

(b) To measure the work of the contractor, & to take such part there of as shall be unexpected out of his hands & to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor of the whole work had been executed by him (of the amount of such excess, the certificate in writing of the Executive Engineer shall be final & conclusive shall be borne & paid by the original contractor & may be deducted from any money due to him by Govt. under the contract or otherwise or from his security deposit.

In the event of any above courses being adopted by the Executive Engineer, the Contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or produced any material or entered into any engagement or made any advances on account of or with a view to the execution of the work for the performance of contract. And in

case of the contract shall be rescind under the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work there to for actually performed under the contract, unless & until the Executive Engineer will have certified in writing the performance of such work & the payable in respect thereof & he shall only be entitled to be paid the value so certified.

43. Agreement amount will stand automatically enhanced if there is any increase due to applicability of IEEMA clause or any other statutory variation in taxes and duties levied after the date of quotationing subject to the condition that this enhanced amount does not require revision of detailed estimate/administrative approval. For any other excess proper enhancement will be sought from the competent authority as per usual practice/rules.

44. The agencies shall submit their tender of lifts with the specifications/conditions given in the quotation document only. They will not give their own specifications/conditions separately in general. If there is any deviation in specifications/conditions from those given above then only those particular specifications/conditions shall be given in the first envelop meant for technical bids.

45. **TRAVEL:** - Travel of lift will be measured as per IS 3534-1976 or latest i.e from floor level of Ist landing to floor level of last landing.

46. Before quoting the rates the bidder should visit the site and ensure that the lift well is as per the size/ specifications given in the tender documents. In case the lift well is under construction, it will be liability of bidder to timely check the same.

47. The lower of quoted AMC rates and standard AMC rates as mentioned in DNIT will be payable to L-1 bidder.

IEEMA PRICE VARIATION CLAUSE FOR ELEVATOR WORKS CONTRACTS

The price quoted/confirmed is based on the cost of raw materials/components and labour cost as on the date of quotations and the same is deemed to be related to wholesale price index number for metal products and all India average consumer price index number for industrial workers as specified below. In case of any variation in these index numbers, the price shall be subject to adjustment up or down in accordance with the following formula:-

$$P = \frac{Po}{100}\left[15 + 55\,\frac{MP}{MPo} + 15\,\frac{Wo}{Wo}(D) + 15\,\frac{Wo}{Wo}(D)\right]$$

P = Price payable as adjusted in accordance with the above price variation formula.

Po = Price quoted/confirmed.

Mpo = Whole sale price index number for metal products as published by the office of "the Economic Advisor, Ministry of Industry, Government of India, in their weekly bulleting, Revised Index Number of wholesale prices for the week ending first Saturday of the relevant calendar month.

Wo = All India Consumer price index number for industrial workers as published by Labour Bureau, Ministry of Labour, Government of India for the relevant calendar month.

The above index numbers Mpo & Wo are those published by Government of India as prevailing on the first working day of the calendar month FOUR months prior to the date of tendering e.g. when offer is submitted in June 1998 then the applicable indices Mpo will be as prevailing of the 1st Saturday of February 1998 and Wo would be that for the month of February 1998.

MP = Whole sale price index number for metal products as published by the office of "the Economic advisor, Ministry of Industry, Government of India, in their weekly bulletin revised index number of wholesale prices. The applicable whole sale price index number for metal products as the 1st Saturday of month covering the date FOUR months prior to the date of delivery.

Wo(D) = All India average consumer price index number for industrial workers as published by Labour Bureau, Ministry of Labour, Government of India.

The applicable all India. Average consumer price index number for Industrial workers prevailing for the month covering the data FOUR months prior to the date of delivery of manufactured material and would be as published by Govt. of India.

PRICE VARIATION CLAUSE FOR COMPREHENSIVEMAINTENANCE CONTRACTS FOR ELEVATORS/ESCLATORS

The price of comprehensive maintenance contractors for elevators/escalators is to be revised oat the end of one year period on the basis of the following variation formula :-

$$P = \frac{Po}{100}\left(15 + \frac{50W}{Wo} + 25\,\frac{MP}{MPo} + 10\,\frac{FP}{FPo}\right)$$

Wherein:

P= Revised price payable in accordance with the above formula.

Po = Previous year's confirmed price for the maintenance contract.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India. This index number is as applicable for the month, six months prior to the date of commencement of previous year's contract.

MPo= The final wholesale price index number for metal products as published by the office of the Economic advisor, Ministry of Industry, Govt. of India. This index number is as applicable on the 1st Saturday of the month, six months prior to the date of commencement of previous year's contract.

FPo= The final wholesale price index number for fuel, power, light and lubricants as published by the office of the Economic Advisor, Ministry of Industry, Govt. of India.
This index number is as applicable on the 1st Saturday of the month, six months prior to the date of commencement of previous year's contract.

W= All India average consumer price index number for Industrial workers is as published by the Labour Bureau, Ministry of Labour, Govt. of India. This index number is as applicable for the month, six months prior to the date of commencement of the revised contract.

MP= The final wholesale price index number for metal products as published by the office of the Economic Advisor, Ministry of Industry, Govt. of India. This index number is as applicable on the 1st Saturday of the month, six months prior to the date of commencement of previous year's contract.

FP= The final wholesale price index number for fuel, power, light and lubricants as published by the office of the Economic Advisor, Ministry of Industry, Govt. of India.
This index number is as applicable on the 1st Saturday of the month, six months prior to the date of commencement of previous year's contract.

ADDITIONAL CONDITIONS FOR MTC. CONTRACT.

1. *AMC means AMC after completion of free maintenance period specified in the agreement.*

2. *The work will be carried out as per relevant IS: Specifications and other general codes and practices.*

3. *Sales Tax / Income Tax/ labour cess /Service tax as and if applicable will be deducted from all bills. However, certificate for TDS will be issued by the department.*

4. *The jurisdictions of court shall be at district head quarter concerned of work.*

5. *After expiry of free maintenance period, AMC shall come into force. AMC charges for first year will be calculated on updated value of original work contract agreement after including up to date IEEMA price variation. The maintenance charges will be increased/ decreased every year on the basis of IEEMA Price variation clause. The first maintenance period will be from expiry of free maintenance period to the end of financial year i.e. 31st March Subsequently the maintenance charge shall be fixed on Ist April every year and will remain current throughout the financial year without any variation. However any statutory variation / new imposition of taxes and duties will be to the account of the department*

6. *The firm will maintain a reasonable inventory of genuine spares parts in their service depot, so that faults in the lifts do not remain unattended for want of spares. During the free maintenance period lift will have to be maintained and inspected. Regularly at least once in a month and as and when called by Engineer-in- Chief Charge or his representative, due to fault/breakdown without a charges.*

7. *The firm will deploy only trained and appropriate skilled personnel to keep the equipment properly adjusted and they will use all reasonable care to maintain the elevator in proper and safe operating conditions, which will include manpower i.e. 2 operators cum technician with 10 hr. shift of each on all the seven days of week.*

8. *This maintenance contract includes replacement of all minor and major parts/assemblies including their cost and cost of all other material/consumable and tools etc. and labour required to maintain these*

lifts in proper working order. The maintenance of the following items will also be included in the contract.

9. *Denting /Painting of Car enclosure panels, Car doors, Landing doors, Handrails. Replacement of Light diffuser, Bulbs, Tubes, Mirrors, Floor covering carpets, external wiring to elevator, hoist way and machine room, other Architectural features & replacement of batteries for alarm, Emergency light, ARD, Intercom,*

10. *The firm shall remove the breakdown during or after working hours and even on holidays on receipt of information at the firm control station from the authorized representatives of PW (B&R) Department or the client department in whose premises the lifts are working. The firm will intimate the complaint number to the complainant at the time of reporting the breakdown. Machine room key shall be made available to authorized technician of the firm on arrival at site. The break-down rectification report shall be signed by the department for record of issue of spares and keeping time record of the firms service personnel. The firm personnel will also sign the log book of respective lift in token of attending the complains & removal of defects and other observations recorded by department officers /officials to complete satisfaction.*

11. *The firm shall set right the lift in working condition within 24 (Twenty-four) hours for the minor defects and within 4(four) days including day of complaint for the major breakdown after receipt of the complaint at their center, if service center of the firm exists at that station and within 48(Forty-Eight) hours and 6(six) days for minor and major breakdown respectively, in case service center of the firm does not exist at that station. If the complaint is not attended within the specified period, beside not paying AMC charges for delayed period, compensation of two days AMC charges for every delay of one day or part thereof per lift shall be levied, but the total amount of compensation during a year shall not exceed 10% (Ten Percent) of the annual maintenance charges of relevant year. The Superintending Engineer on representation from the firm may reduce the amount of compensation and his*

speaking decision in writing shall be final. Even after levying the compensation equivalent to 10 % (Ten percent) of the contract amount if the firm does not attend the complaint, the firm will not be paid AMC for the defaulting period.

12. *Any work which may be rendered necessary due to revision of the existing Govt. Municipal or elevator acts promulgated subsequent to the date of installation of elevator or new design/development/modernization work will be covered under maintenance contract. The lift will have to be got inspected for requisite clearance from the Nodal inspecting agency after every specified time fixed by the Nodal agency.*

13. *The firm shall become liable for compensation in accordance with the Indian law and Regulations in the event of any accident occurring to any person using, intending to use the elevator or otherwise due to the fault in the elevator on account of failure to keep the lifts in proper working order or non compliance of statutory provision for safety measures.*

14. *The parts if replaced by the firm shall be OEM parts matching with the existing equipment. Defective/removed /unserviceable parts will be the property of the firm.*

15. *The bill of maintenance charges should be properly prepared and scrutinized by the Chartered Accountant of the firm with the supporting papers of price indices at the time of submission of first maintenance contract bill of financial year.*

16. *After completion of maintenance contract or termination of contract mid-way due to any reason what-so-ever, the firm will hand over the lift in working order with every parts /assembly intact. In case, if any part / assembly is found missing/defective or of substandard specifications due recovery will be made for such a deficiency and other measures to effect such recovery as deemed fit will be taken against the firm.*

17. *The department will have prerogative to discontinue the maintenance contract of any or all the lifts without assigning any reason at any time for any or all the lifts without paying any compensation for such an act.*

However, a valid one-month notice will be given before taking any such action as mentioned above or maintenance charges will be paid for the period for which notice falls short.

18. *Separate agreement of AMC shall be prepared yearly on agreed rates, terms and conditions on completion of one-year free maintenance period. It shall stand concluded and will become operative from the next day of expiry of free maintenance period even without signing of contract agreement.*

19. *10% (Ten percent) security shall be deducted from each bill of the firm which shall be maximum to 5% of contract value and shall be refunded after completion of AMC period. Or alternatively security can be deposited by the firm in shape of bank guarantee for the required amount and validity.*

AMC CHARGES

20. *After completion of free maintenance period of one year from the date of completion as above, the firm will be bound to carry out paid comprehensive maintenance i.e. repair and replacement of all installation including consumable items etc. for next ten years for which the firm will quote the rates on BOQ template.*

21. *The bidder will arrange the necessary safety certificate from Chief Electrical Inspector including insurance and all other formalities. However, department will reimburse the Govt. fee and other charges subsequently.*

Payment of this maintenance will be done on half yearly basis after deducting the Statutory taxes.

22. The standard AMC rates are as following: -

(i)	**1st year (after one year guarantee period)**	**@ 4% of capital cost**
(ii)	**2nd year**	**@ 4.5% of capital cost**
(iii)	**3rd year**	**@ 4.75% of capital cost**
(iv)	**4th year**	**@ 5% of capital cost**
(v)	**5th year**	**@ 5.5% of capital cost**
(vi)	**6th year**	**@ 5.75% of capital cost**
(vii)	**7th year**	**@ 6% of capital cost**

(viii)	**8th year**	**@ 6.5% of capital cost**
(ix)	**9th year**	**@ 6.75% of capital cost**
(x)	**10th year**	**@ 7% of capital cost**

The lower of above mentioned rates and quoted AMC rates will be paid to L-1 bidder**.**

These additional conditions shall supersede the similar conditions found contrary elsewhere in DNIT.

TECHNICAL SPECIFICATION FOR MEDICAL GAS PIPE LINE SYSTEM

A **MEDICAL OXYGEN SYSTEM**

1.0 Liquid tank (Indian)

SCOPE OF SUPPLY

a) Design, manufacture and supply of vacuum + perlite insulated vertical storage tank (Non- Thermosiphon) as per technical specification and flow scheme enclosed.

b) Design, fabrication and supply of Low Pressure Atmospheric Vaporizer as per technical specification and GA cum foundation drawing enclosed

DOCUMENTATION FOR STORAGE TANK

Operating and maintenance manual - 1 set along with shipment shall be given.
Quality test certificate – 1 set for Cryogenic pressure vessel shall be submitted along with the shipment. The cryogenic tank Quality certificate shall comprise of:

a) Approval letter along with approved drawings from CCOE for inner vessel
b) Certificate from third party inspection Agency for inner vessel
c) Material Heat chart for inner vessel pressure parts.
d) Mechanical properties test report for production test coupon
e) History sheet for inner vessel
f) Material test report for pressure parts (inner vessel)
g) Name plate photo copy
h) Certificate of safety valve, pressure gauge, level gauge

DOCUMENTATION FOR VAPORISER

Inspection and test reports - 1 set along with the equipment shall be provided
Operation & Maintenance manual - 1 set along with the equipment shall be provided

INCLUSIVE

- Civil foundation / foundation bolts, any other civil work within battery limit
- Spares, bursting disc, etc for the equipment.
- Unloading, Erection and Commissioning of Equipment at site
- Inter connecting piping between tank and vaporizer and downstream of vaporizer
- Fencing, gates, fire-fighting equipment etc required on the tank yard layout.
- CCOE license for the usage of equipment
- Cold test at our Works/Site
- Liquefied gases for commissioning of the system

INSPECTION

TECHNICAL SPECIFICATIONS FOR COLD CONVERTERS

DESCRIPTION	UNIT	
CONFIGURATION	-	VERTICAL
GROSS VOLUME	LIT	10600

NET CAPACITY	LIT	10000
INNER VESSELMATERIAL DESIGN MANUFACTURING CODE	-	X5 CrNi 18-10 EN13458-2:2002
MAX. ALLOW ABLE WORKING PRESSURE	KG/CM2 (G)	17
DESIGN PRESSURE (corrected for vaccum	KG/CM2 (G)	18.033
HYDRO TEST PRESSURE	KG/CM2 (G)	AS PER CODE
DESIGN TEMPERATURE	DEG.C	- 156
N2	M3	3985 x2
CAPACITY OF GAS AT 27 DEG. CENT. 02	KG M3	4539x2 4927x2
AR	KG	6401x2
	M3	4815x2
	KG	7845
CEANING DUTY INSULATION INSPECTION		OXYGEN VAC+PERLITE THIRD PARTY
OUTER VESSEL : MATERIAL DESIGN CODE	- -	CARBON STEEL CGA-341, 2002
OPERATING PRESSURE	-	VACUUM
EMPTY WEIGHT (APPROX)	Kg.	3650
FULL WEIGHT (APPROX.) N2 02 AR	Kg. Kg. Kg.	8189 10051 11495
OUTSIDE DIAMETER OVERALL HEIGHT	mm mm	2116 4121
EXTERNAL SURFACE PRIMER FINAL POINT (POLYEURETHENE)		MECH. CLEANING TWO COATS TWO COATS

Exact volume could be +/-3% after stretching

TECH. SPEC. OF LOW PRESSURE ATMOSPHERIC VAPORISERS

S.no.			Unit
1	Duty	HRS	8
2	CAPACITY - LOX - LIN - LAR	NM3/HR NM3/HR NM3/HR	200 230 260
3	INLET TEMP.	DEG.C	-196 to + 40
4	OUTLETTEMP.	DEG.C	10 Deg. Below amb.
5	SURFACE AREA	SQ.M	65
6	HEATING MEDIUM	-	AMBIENT
7	MAX. OPERATING PRESSURE	KG/CM2	25
8	DESIGN PRESSURE	KG/CM2	27

9	PNEUMATIC TEST PRESSURE	KG/CM2	30
10	RADIOGRAPHY	-	NIL
11	CLEANING DUTY	-	OXYGEN
12	DESIGN & MFG. CODE	-	ASME SEC.VIII, DIV.I 2013
13	MTL. OF CONSTR. TUBES	-	SB221 A96063 T5
14	OVERALL DIMENSION Lx W x H	MM	900*1520*2770
15	INLET FLANGE ANSI B 16.5	NB	25
16	OUTLET FLANGE ANSI B 16.5	NB	40
17	EMPTY WEIGHT [APPROX.]	KG.	280

Note : Specifications are subject to change due to continuous technical up gradation.

Empty weight of the vaporizer might change during detail

2.0 Oxygen Manifold (Indian)

The oxygen cylinder manifold should comprise of two cylinder Banks which can accommodate 16 cylinders in each Bank (means 16+16) complete with copper tail pipes with bull nose fittings of RH External threading suitable for cylinder valves conforming to IS 3234 (Oxygen service) and Cylinder support system.

Manifold should be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Oxygen Cylinders and manifold.

Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 14swg with high pressure brass fittings made of high tensile brass and connections through non- return valves.

High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 16 swg.

The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely. The manifold should be tested (hydraulically) at 250kg / cm sq.

The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation.

Each manifold should be provided with one terminal header and a NPT connection for the Automatic control panel.

3.0 Fully Automatic Oxygen Gas Control System – (Imported) as per NFPA -99 Std with latest amendments / HTM -2022/02-01 of UK

Digital / Analog Display Gas Manifold should be fully automatic, self – shifting to reserve bank on exhaustion of the service bank without interruption of gas delivery to the system. A critical connections should be gas specific, non-interchangeable and should be designed to eliminate gas supply error. The manifold control system should supply a flow of 1000 L/ Min at 50 psi. The dual line regulator/single vent Medical Gas Manifold control unit should include right and left header bars and pigtails for the appropriate medical gas. The installed system should automatically switch over to the reserve bank when the primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system should automatically reset itself in preparation for the next bank change. The primary side bank in use and the remaining side bank on reserve. This designation should automatically change from left to right and right to left as each bank is depleted and, in turn, refitted with full gas cylinders.

The LED indicator should show a depleted bank by turning red. A buzzer should also sound to indicate an empty bank. When the system is reset by replacing the depleted cylinders, the indicator should turn green and also silence the buzzer. If the manifold is connected to the health care facility's central alarm system that should also indicate that the bank was depleted and, in turn, was reset. The only manual activity Medical gas Manifold requires is the changing of the depleted cylinders. When a bank is depleted, Manifold should automatically switch to the fresh bank, delivering an uninterrupted gas supply to the health care facility. Changeover is performed by solenoid valves contained in the control cabinet. In the event of an electrical power failure, both solenoid valves should automatically open to provide an uninterrupted gas flow. Under normal operating conditions, the gas should leave the high pressure cylinders through the pigtails into the header bars.

The pigtails should have on-way Valves (check valves) to allow the replacement of depleted cylinders without gas pressure back-flow into the remaining depleted cylinders on that bank. In the event a safety relief device on an individual cylinder should activate or a pigtail should leak excessively, the local check vale should also prevent loss of gas from the rest of the cylinders on that bank.
The gas should flows through the manually operated shutoff valve into the primary regulator. This regulator should reduce the high cylinder pressure to an intermediate pressure. The intermediate pressure gas flows through the solenoid valve to the line regulator for its final (Line) pressure reduction for use in the health care facility. Two line pressure regulators should be installed in parallel, and each should be capable of maintaining a constant dynamic delivery pressure at the maximum designed flow rate of the system.

The solenoid valve should be the key to the automatic mechanism the manifold. This component ensures that the flow of gas is not interrupted and the pressure does not fluctuate during normal operation. When the operating bank pressure

falls to a predetermined level, which is controlled by the preset pressure switches (for high at 60 PSI and for low at 40PSI) , the switches should activate the solenoids to switch to the fresh (reserve) cylinder bank .

The manifold control cabinet should have three means of giving continuous information on the system status: first pressure gauges to indicate the bank pressure and the delivery pressure: second six indicator LEDs , two green that indicate which cylinders is in use, two yellow for Reserve Ready and two red that indicate a bank is now depleted : third, a loud audible buzzer gives an alarm when either or both banks are depleted.

The six indicators should controlled by sensing the bank pressure. Replacing the depleted cylinders on the empty bank resets the system, changing the indicator form red to yellow. At the same time the yellow LED should change to green to go form Reserve Ready to In Service. LEDs should show red prior to initial pressurization or whenever both cylinder banks are below the present value.

4.0 Emergency Oxygen Manifold (Indian)

The oxygen cylinder manifold should comprise of one cylinder Banks which can accommodate 12 cylinders complete with copper tail pipes with bull nose fittings of RH External threading suitable for cylinder valves conforming to IS 3234 (Oxygen service) and Cylinder support system.

Manifold should be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Oxygen Cylinders and manifold.

Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 14swg with high pressure brass fittings made of high tensile brass and connections through non- return valves.

High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 16 swg.

The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely. The manifold should be tested (hydraulically) at 250kg / cm sq.

The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation.

5.0 Terminal / Gas Outlet with probes– as per NFPA-99 std with latest amendments / HTM -2022/02-01 of UK (Imported)

Oxygen
Air-4Bar
Air-7Bar
N2O
Vacuum
AGSS/WAGD

Surface mount, non interchangeable, self sealing outlets, outlets should consist of a roughing in assembly and a finishing assembly. A non removable positive-

pin keying arrangement for each specific gas service. Installed in the mounting box a fully assembled brass secondary check valve.

Design of outlet should be such that it should have 100% metal construction for corrosion resistance fire safety & push button mechanism for quick release of adaptor. The secondary check valve automatically should form a positive seal to prevent a gas flow when the finishing assembly is removed. The secondary check valve to include 7'' (17.78cm) of 1/2'' Type K copper tubing with a label affixed which identifies the specific gas by name and colour. A plastic cap inserted at the end of the inlet tube. Rotation of the inlet tube should allow gas connection from the top or bottom. the finishing assembly should consists of a die cast chrome plated cover plate , a machined brass housing for the primary check valve, and a positive –pin keying device to prevent accidental installation into a roughing in assembly of a dismal gas. The finishing assembly incorporates a double seal arrangement which automatically engages when a hose adapter or patient treatment device is removed from the outlet. The design of the outlet should be such that if can be easily repaired without disassembly of the outlet.

The finishing assembly should have a colour coded (specific gas) keying disc to prevent connection of hose adapters or patient treatment device to the wrong gas service. The primary check allows absolutely no gas flow to take place until the keying devices are engaged. It should be manufactured in accordance with all applicable NFPA and CGA standards. The locking device should be in the probe instead of gas outlet.

Matching probe for outlets – Imported as per NFPA-99 / HTM 02-01 UL Listed / CE Marked Matching probes to the gas outlet mentioned above. That is adapter for Gas outlets each adapter should have suitable barb or threads so that it can be connected to tube or flow meter /suction regulator. Adapter should have clear gas service embossed on it.

Oxygen Flow meter & Humidifier Bottle for critical area

6.0 – (Imported)European CE Certified with notified body no./UL listed

- The graduated scale should have an oval shape this allows a "lens effect" get the scale values easy-reading in any condition of use.
- I/0 switch button green and red allows the operator to quickly lock and reactivate the flowmeter gas supply, keeping unchanged the previous flow preset value.
  When the flowmeter is not working, the green button is visible and pushing it, the flow is activated. On the contrary, to stop the flow, the red button must be pushed.

- It should have ADJUSTING KNOB WITH PUSH&LOCK SYSTEM: it keep locked the pre-set flow value. To adjust the flow pull the knob, set the flow value you need to deliver to the patient and push the knob to lock the selected value.
- The flowmeter should have an integrated pressure reducer for the stabilization of supplied pressure at 2.8bar, to guarantee always and in any condition the flow accuracy of the device. The flowmeter can be used in any hospital with different pressure from the plants and it is not necessary to calibrate it.
- The outlet nipple should have a double thread interchangeable by the end user.
- The flowmeter should have 50 mm adjusting knob with soft grip inserts for easy handling
- The humidifier should completely made of polycarbonate and it can be sterilized in autoclave at 121 °C for 15 min
- For the inlet connection it should have some snap inserts, identified with color-code, with different threads to be chosen by the end user
- An ergonomic and big size rotating nut allows to easily connect and disconnect the humidifier to the oxygen supply device, the 360° rolling positioning hose connector ø 6÷9 mm allows an easy use of the humidifier.
- The bottle should have hollow shape, besides being a design unique element, offers the operator an easy and safe handling.
- The humidifier should have an integrated relief valve

6a **Oxygen Flow meter & Humidifier Bottle – (Imported) CE Certified with 4 digit notified body no./UL Listed for other area**

Brass body chrome plated Flowmeter with colour coding to match with the gas being used. The housing should be made of polypropylene to ensure high durability. The flow range should be 0-15 LPM. The Flowmeter should be fitted with matching adaptor (probe) for Oxygen Gas Outlet Point.

Humidifier bottle should be compatible with Oxygen Flowmeter & it should be reusable type. The bottle should be shatterproof & made of polypropylene/polycarbonate. Metal components of humidifier bottle should be made of brass with anti-corrosion nickel plating.

<u>D-Type Big size Medical Oxygen Cylinder lSI Mark (220 CU.FT.)</u>

1. D-Type high pressure seamless cylinder for medical oxygen gas, cylinder are ISI marked confirming to IS: 7285 part 2, certified by the Bureau of Indian Standards (BIS) and approved by the chief controller of explosive (CCOE) Government of India.
2. Cylinder made. from Manganese Steel.
3. 46.7 Ltr. water capacity (220 CU.FT.).
4. Fitted with bull nose type valve as per IS: 3224, and neck cap.
5. Valve made of Brass and Chrome Plated.

6. Working pressure 150 Kg. f/cm2 at 15 deg. C.
7. Hydraulic test pressure 250 Kg. f/cm2.
8. Color code of the cylinder should as per IS 3933-1966 with updating till date.

B MEDICAL NITROUS OXIDE SYSTEM

1.0 Nitrous Oxide Manifold (Indian)

The N2O cylinder manifold should comprise of two cylinder Banks which can accommodate 2 cylinders in each Bank (means 2+2) for cylinder valves conforming to IS 3234 (N2O service) complete with copper tail pipes with fittings.

Manifold should be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Nitrous Cylinders and manifold.
Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 14swg with high pressure brass fittings made of high tensile brass and connections through non- return valves.

High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 16 swg.

The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely. The manifold should be tested (hydraulically) at 250kg / cm sq.

The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation. Each manifold should be provided with one terminal header and a NPT connection for the Automatic control panel.

2.0 Fully Automatic Nitrous Oxide Gas Control System – As per NFPA-99 std with latest amendments / HTM -2022/02-01 of UK(Imported)

Gas Manifold should be fully automatic, self – shifting to reserve bank on exhaustion of the service bank without interruption of gas delivery to the system. A critical connections should be gas specific, non-interchangeable and should be designed to eliminate gas supply error. The manifold control system should supply a flow of 1000 L/ Min at 50 psi. The dual line regulator/single vent Medical Gas Manifold control unit should include right and left header bars and pigtails for the appropriate medical gas. The installed system should automatically switch over to the reserve bank when the primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system should automatically reset itself in preparation for the next bank change. The primary side bank in use and the remaining side bank on reserve. This designation should automatically change from left to right and right to left as each bank is depleted and, in turn, refitted with full gas cylinders.

The LED indicator should show a depleted bank by turning red. A buzzer should also sound to indicate an empty bank. When the system is reset by replacing the depleted cylinders, the indicator should turn green and also silence the buzzer. If the manifold is connected to the health care facility's central alarm system that should also indicate that the bank was depleted and, in turn, was reset. The only manual activity Medical gas Manifold requires is the changing of the depleted cylinders. When a bank is depleted, Manifold should automatically switch to the fresh bank, delivering an uninterrupted gas supply to the health care facility. Changeover is performed by solenoid valves contained in the control cabinet. In the event of an electrical power failure, both solenoid valves should automatically open to provide an uninterrupted gas flow. Under normal operating conditions, the gas should leave the high pressure cylinders through the pigtails into the header bars.

The pigtails should have on-way Valves (check valves) to allow the replacement of depleted cylinders without gas pressure back-flow into the remaining depleted cylinders on that bank. In the event a safety relief device on an individual cylinder should

Activate or a pigtail should leak excessively, the local check vale should also prevent loss of gas from the rest of the cylinders on that bank.

The gas should flows through the manually operated shutoff valve into the primary regulator. This regulator should reduce the high cylinder pressure to an intermediate pressure. The intermediate pressure gas flows through the solenoid valve to the line regulator for its final (Line) pressure reduction for use in the health care facility. Two line pressure regulators should be installed in parallel, and each should be capable of maintaining a constant dynamic delivery pressure at the maximum designed flow rate of the system.

The solenoid valve should be the key to the automatic mechanism the manifold. This component ensures that the flow of gas is not interrupted and the pressure does not fluctuate during normal operation. When the operating bank pressure falls to a predetermined level, which is controlled by the preset pressure switches (high and low) , the switches should activate the solenoids to switch to the fresh (reserve) cylinder bank .

The manifold control cabinet should have three means of giving continuous information on the system status: first pressure gauges to indicate the bank pressure and the delivery pressure: second six indicator LEDs , two green that indicate which cylinders is in use, two yellow for Reserve Ready and two red that indicate a bank is now depleted : third, a loud audible buzzer gives an alarm when either or both banks are depleted.

The six indicators should controlled by sensing the bank pressure. Replacing the depleted cylinders on the empty bank resets the system, changing the indicator form red to yellow. At the same time the yellow LED should change to green to go form Reserve Ready to In Service. LEDs should show red prior to initial pressurization or whenever both cylinder banks are below the present value.

3.0 **Emergency N2O System – (Indian)**

The Emergency supply manifold should be connected to downstream of the manifold control panel. The assembly should consist of 1 (one) cylinders connection supplying a manually adjusted regulator via a common header assembly. The delivery system is isolated from the main system by an isolation valve. Pressure gauges should indicate cylinder and delivery pressure & valves conforming to IS 3234 (N2O service)

C **MEDICAL COMPRESSED AIR SYSTEM**

1.0 **Duplex MEDICAL DRY COMPRESSED AIR SUPPLY SYSTEM -as per NFPA-99 std with latest amendments / HTM -2022/02-01 of UK(Imported)**

a)The total plant capacity running and standby should be 110 scfm capacity @ 100psi oil-less air compressors and associated equipment, one vertical ASME Tank and one control panel. The entire system including the receiver should be mounted on a common structural steel stack base. The only field connections required would be system intake, exhaust and power connection at the control panel. All components should be completely prepiped and pre-wired to single-point service connections. All interconnecting piping and wiring should be completed and operationally tested at the site of manufacturer.

b)The medical air compressors should be of the totally oil-less scroll air-cooled design. Connecting rod and bearings should be packed with lifetime lubrication and sealed.

c) Each compressor should be belt driven by a suitable HP, 3 phase, 50 cycle, 415 volt, ODP NEMA construction motor. Slide bases for convenient belt tension adjustment and totally enclosed OSHA approved belt guards should be provided.

d) Each air compressor should have a capacity of 55 scfm
at 100 PSIG.

e) The system should include individual compressor inline intake filters, discharge check valves of bronze construction, safety relief valves, bronze intake and discharge flexible connectors, solenoid unloaders, isolation valves, air cooled after coolers for each compressor, high discharge temperature shut down switches on each cylinder, pressure control switches, as well as copper tubing with shut-off cock for gauge and switches. The system should include a 120 gallon. Pressure

storage tank of ASME construction rated for 200-PSI MWP service. The tank should be equipped with a pressure gauge, safety relief valve, 3-way by-pass; gauge glass and automatic electronic tank drain with manual override. The inside of the tank should be coated for rust protection with a two component coating which provides a hard, durable lining. Provide spring vibration isolators for each compressor.

f)The system should include a UL listed control panel in a NEMA 12 enclosure with the following accessories for each pump:

g) Externally operatable fusible disconnect with door interlock, control circuit transformer with fused primary and secondary coils, H-O-A switch, magnetic starter with 3 leg overload protection, hour meter, motor running light. Provide the panel with a multiple position selector switch for selection of normal operation (automatic alternation) or manual selection of lead and lag pumps if one of the pumps is taken out of service due to scheduled maintenance. Provide audible and visual local alarm (complete with indicating lights and individual sets of auxiliary contacts wired to the terminal strip for remote alarm indication) for the following: compressor temperature malfunctions and reserve compressor in use.

Provide manual reset for thermal malfunction shutdown. All control and alarm functions should remain energized while any compressor in the system remains electrically on-line. The lag compressor should be able to start automatically if the lead compressor fails to operate. All models should operate between 65-90 dBa

STANDARD BILL OF MATERIAL FOR DUPLEX

DESCRIPTION	Qty
DUPLEX	
Oil-Less Compressor	2
Belt Guard	2
Electric Motor	2
High Air Temperature Switch	2
Air Receiver (ASME Rated)	1
Control Pressure Switch	2
Three-Valve By pass	1
Sight-Gauge Glass	1
Pressure Gauge	1
Pressure Relief Valve	1
Automatic Tank Drain	1
Electrical Control Panel	1
NEMA 12 Enclosure	1
Power Distribution Block	1
Combination Motor Starters with Circuit Breaker Disconnects	

Automatic Alternation	1
Running Lights	2
Hour Meters	2
Control Transformer	2
Hand-Off Automatic switch	2
High-Air Temperature Light with contacts	2
Lag On Alarm with Horn, Light & contacts	1
Interconnecting piping	1 lot
Compressors Isolating Valve	2
Check Valve	2
Compressor Inlet flex connectors (installed)	2
Compressor Discharge Flex Connectors (installed)	2
System Flex Connector (shipped loose)	2
Vibration Dampeners (Shipped Loose)	1 set

D **Duplex MEDICAL VACCUM CENTRAL SYSTEM**

1.0 **VACUUM (SUCTION) SUPPLY SYSTEM – as per NFPA-99 std with latest amendments / HTM -2022/02-01 of UK (Imported)**

Medical Vacuum should be provided by vacuum plant reference and capable of providing a flow rate of 4200 LPM with one Pump running and one pump standby, pumps running simultaneously at a vacuum level of 19" Hg. The total plant capacity should be 150 SCFM .

The Oil Lubricated Rotary Vane Medical vacuum System should provided superior performance with minimal maintenance. The packaged system should contain all necessary controls and components to meet or exceed NFPA99 recommended guidelines. Systems should be available in simplex and all multiplex arrangements. The factory packaged vacuum system consists of rotary vane vacuum pumps, pre-wired control panel, receiver, and interconnecting wiring and piping, requiring only two plumbing connection. The Medical Vacuum systems should be available as base mounted with vertical receiver size .The vacuum pumps should be continuous duty, rotary vane, oil-sealed, air cooled, direct driven units capable of continuous operation over a working range of 18" to 29" Hg. Each pump should have single shaft seals and should be equipped with an automatic gas ballast valve to prevent condensation of water vapor, extending the life of the oil and the system.

The pump should include an integral, multi-stage oil-removal system featuring a built in exhaust demister that should remove and reclaim 99.9% of the exhausted oil. Additionally each pump should include exhaust back pressure gauge to indicate the need for filter maintenance and an oil sight glass for monitoring oil level. Lubrication should provided by the integral, fully re-circulating oil supply. The pump inlet should be protected by means of a wire mesh screen. An internal anti suck back valve should included to prevent oil from entering the vacuum

piping network. Pump vanes, because of their construction, should provide superior heat transfer and long life. The pumps should be dynamically balanced and virtually vibration free.

Each pump should be driven by a direct flanged three-phase, standard TEFC motor via a pin and bush coupling. All models should operate between 58-83 dBa,. Pumps require standard automotive grade SAE-30 non-detergent oil for lubrication.

The UL listed / CE marked electrical control panel should be mounted in a control cabinet. The standard control panel includes the following components:

Integral circuit breaker disconnected with door interlock, across-the-line motor starters with three-phase overload protection
A programmable logic controller to cycle lead pump with each use
Hand off Automatic selector switch for each pump
Lag pump in use indicator light with horn and connection for remote annunciation
Hour meters to monitor factory recommended service intervals.
Pump running lights to indicate pump in operation.

Each system should include an ASME coded receiver rated for full vacuum service. The system receiver should include a 4-1/2" vacuum gauge, manual drain, and three- valve by pass. Additionally, each system should include properly sized inlet and exhaust flex connectors and vibration isolation pads for filed installation. the pump has the facility that in case one pump stop the standby pump should automatically start. if any pump fails the system should automatically revert to the stand by pump. All the status monitoring of the pump can be connected to the Master Alarm. The system should also includes factory installed 5 micron pump inlet filters to promote longer life.

Standard Bill of Material
Oil-Lubricated Rotary Vane Vacuum System

DESCRIPTION	Qty
DUPLEX	
Rotary Vane Pump	2
TEFC Motors	2
Back Pressure Indicator Gauge	2
Oil Reservoir	2
Oil Sight-Gauge Glass	2
Air Receiver (ASME Rated)	1
Three Valve Bypass	1
Control Vacuum Switch	2

Vacuum Gauge	1
Manual Drain	1
Electrical Control Panel	1
NEMA 12 Enclosure	1
Integral Motor Starter with Circuit Breaker Disconnect	2
Automatic Alternation	1
Running Light	2
Hour Meter	2
Minimum Run Timer (7.5 hp and larger)	2
Control Transformer	2
Hand-Off-Automatic Switch	2
Lag On Alarm with Horn, Light & contacts	1
Interconnecting piping	1 lot
Pump Isolation Valve	2
Check Valve	2
5 Micron Pump Inlet Filter	2
Pump Inlet Flex Connector (installed)	2
Pump Discharge Flex Connector (Shipped loose)	2
Receiver Flex Connector (Shipped loose)	1
Vibration Dampeners (Shipped Loose)	1 set

3 **Ward Vacuum Unit with Suction Jar - Imported CE certified with 4 digit notified body no./ UL Listed for critical area**

- The digital vacuum regulator should have a digital vacuum gauge with monochromatic LCD display, it is available with three possible end of scale: -250 mbar, -600 mbar and -1000 mbar.
- The scale should be able to set in mbar/hpa or mmhg by the end user
- The numerical display should show the vacuum value and a sector bar proportional to the adjusted de-pressure. The reading resolution is 1 mbar/hpa (1 mmhg).
- The frontal part of the digital gauge should be equipped with 3 buttons: one to switch ON/OFF the vacuum regulator, the other 2 for various settings such as: set the timer for the automatic switch off of the regulator; select the unit scale (mbar/hPa or mmHg); set up a preferred vacuum value; zeroing the device at any time.
- The device should have a quick I/0 switch button that allows the operator to quickly lock and reactivate the vacuum, keeping unchanged the previous preset value. When the device is suctioning, the red button is outside and by pushing it, the operator can stop the vacuum at any time. While, to reactivate the vacuum, at the same pre-set value, the operator have to simply push the green button (visible when the device is not working).
- A vacuum adjustment knob with Soft Grip inserts for an easy handling with a “Push & Lock” position system, the operator have to pull the knob, by rotating it regulate the level of vacuum needed and then push the know to lock the selected value.

- Suction jar should be made of polycarbonate autoclave up to 121ºC. The jar capacity is 1000 ml . The float & cap assembly includes a patient port inlet that is horizontal to help prevent kinking of suction tubing . All collection bottle assemblies allow visual inspection of fluid level, color & consistency & can be steam autoclaved or gas sterilized. Polycarbonate bottles offer the additional advantage of eliminating breakage

3b **Ward Vacuum Unit with Suction Jar - Imported CE certified with 4 digit notified body no. / UL listed for other area**

W.V.Unit should have soft touch knob for easy access to (a) On/off mode (b) Regulation mode (c) full flow of vacuum pressure directly form vacuum line. Mode. The analogue gauge should have 2'' dia color coded; glow – in – the – dark face for easy readability under any condition. High vacuum setting 0-760" Hg.

Suction jar should be made of polycarbonate autoclave up to 121ºC. The jar capacity is 1000 ml. The float & cap assembly includes a patient port inlet that is horizontal to help prevent kinking of suction tubing . All collection bottle assemblies allow visual inspection of fluid level, color & consistency & can be steam autoclaved or gas sterilized. Polycarbonate bottles offer the additional advantage of eliminating breakage.

Filter is designed to help protect the vacuum system from contamination due to aerosols or collection bottle overflow. This high efficiency bacteria filter features a hydrophobic, micro- porous membrane which filters air with maximum efficiency while helping block the flow of aqueous fluids and aerosol contaminants.

Filter efficiency is superb: 99.97% D.O.P. retention (.3 micron particle size). Filters are available with 1/8" NPT male pipe thread on one end to connect to almost any vacuum regulator and a ¼" hose barb for connection of vacuum tubing.

4 **Theatre Vacuum Unit with Suction Jar - Imported CE certified with 4 digit notified body no. / UL listed**

- The digital vacuum regulator should have a digital vacuum gauge with monochromatic LCD display, it is available with three possible end of scale: -250 mbar, -600 mbar and -1000 mbar.
- The scale should be able to set in mbar/hpa or mmhg by the end user
- The numerical display should show the vacuum value and a sector bar proportional to the adjusted de-pressure. The reading resolution is 1 mbar/hpa (1 mmhg).
- The frontal part of the digital gauge should be equipped with 3 buttons: one to switch ON/OFF the vacuum regulator, the other 2 for various settings such as: set the timer for the automatic switch off of the regulator; select the unit scale (mbar/hPa or mmHg); set up a preferred vacuum value; zeroing the device at any time.

- The device should have a quick I/0 switch button that allows the operator to quickly lock and reactivate the vacuum, keeping unchanged the previous preset value. When the device is suctioning, the red button is outside and by pushing it, the operator can stop the vacuum at any time. While, to reactivate the vacuum, at the same pre-set value, the operator have to simply push the green button (visible when the device is not working).
- A vacuum adjustment knob with Soft Grip inserts for an easy handling with a "Push & Lock" position system, the operator have to pull the knob, by rotating it regulate the level of vacuum needed and then push the know to lock the selected value.
- Suction jar should be made of polycarbonate a autoclave up to 121ºC. The jar capacity is 2000 ML.. The float & cap assembly includes a patient port inlet that is horizontal to help prevent kinking of suction tubing .All collection bottle assemblies allow visual inspection of fluid level, color & consistency & can be steam autoclaved or gas sterilized. Polycarbonate bottles offer the additional advantage of eliminating breakage.

DA Duplex AGSS/WAGD SYSTEM
AGSS/WAGD SUPPLY SYSTEM – as per NFPA-99 std / HTM -2022/02-01 of UK (Imported)
Waste Anesthetic Gas Disposal System (WAGD) / Anesthetic Gas Scavenging System (AGSS) Imported -as per NFPA -99 Std / HTM -2022/ 02-01 of UK

The duplex oil less rotary vane medical vacuum system skid mounted with Vertical reservoir suitable for OT with total plant capacity of minimum 10 SCFM (280 LPM).

The WAGD pumps should be continuous duty dry-running units with carbon graphite self-lubricating rotary vanes.

The pumps should be air cooled and direct driven, capable of continuous operating over a working range of 0" to 25.5 Hg. The pumps should completely self-contained units, requiring no external coolers, pumps, separators or reservoirs.

Lubrication should provided by the self-lubricating self-adjusting carbon graphite vanes. The carbon graphite vanes should have a life of 8,000 to 15,000 hours, depending on the size of the pump.

The pump inlet should be protected by means of an integral, 5 micron inlet filter. The rotary design should be dynamically balanced and virtually vibration free.

The pumps should be constructed of heavy-duty aluminium alloy, providing superior heat transfer and long life.

The pumps should be equipped with large cooling fins and a sound-attenuating enclosure to assure cool, quiet operation.

Remote switches are not required for WAGD system as per NFPA-99 Guidelines. The WAGD arrangement should a reservoir hence it provides the WAGD service round the clock. It should be duplex model of WAGD.

If pump in use fails second pump will start automatically without fluctuating in line pressure. This equipment should operate at 83 DBA. The pumps should require no oil or other service liquid for operation. Each pump should drive by a direct-flanged three-phase standard TEFC motor via a pin and bush coupling. The UL listed electrical controls should mounted in a NEMA 12 control cabinet.

The standard controls include:

a) Combination circuit breaker disconnects, non reversing, across-the line motor starter with three-phase overload protection
b) A programmable controller to cycle lead pump with each use.
c) Hand-Off Automatic selector switches
d) Lag pump in use indicator light with horn and connection for remote annunciation
e) Hour meters to monitor factory recommended service intervals
f) Running lights indicating pump in operation
g) The system should be supplied with properly sized inlet, discharge flex connectors and vibration isolation pads for field installation. As options, the system can be supplied with a discharge silencer and / or bacterial filters for field installation.

E **MEDICAL COPPER PIPE**

Copper Piping :

Installation:

Installation of piping should be carried out as per international standards with utmost cleanliness. Only pipes, fittings and valves which have been degreased as per International standards should be used. Pipe fixing clamps for upto 28mm diameter. Pipes should be non ferrous suitable for the diameter of the pipe. For the pipes of the sized above 28mm rigid metallic hanging or cemented supports to be used.

The main lines to the building to be taken overhead through metallic poles or through underground ducts with inspection removable slabs, All pipe joints should be made using inert gas flux less brazing method. All joints should be of copper to copper and should be brazed by silver brazing filler material without flux while being brazed joints shall be continuously purged with oil free dry nitrogen to prevent the formation of copper oxide on the inside surface of the joint.

All pipes should be installed without springing or forcing. All pipes should be protected against mechanical injury in a manner satisfactory to authorities having jurisdiction.

Test: After erection, all the new pipes cleaned or purged with the help of dry nitrogen gas. Complete system should be tested with dry nitrogen at 2 times of working pressure for 24 hours.

Painting: All existing and proposed exposed pipes/should be painted with two coats of Synthetic enamel paint & color codification as per international standards. All concealed pipes to have gas identification bands / labels at appropriate distance. Similarly all pipes which need embedding in the wall should be tested/painted/labelled and properly insulated.

Certification: To be certified that pipes are suitable for the particular service and complete cross connection (anti-corrosion) test will be carried out.

Distribution piping system:

MATERIAL (PIPE):

Solid drawn, seamless, deoxidized, non arsenical, half hard, tempered and degreased materials conforming to BS: EN 13348 Medical Grade Kite Marked Pipe All copper pipes will be KITE MARKED for medical use before dispatch and the pipe will be delivered plugged or capped at both ends.

Pipe sizes to be used as under:

54mmOD X 1.2mm thk
42mmOD X 1.2mm thk
28mmOD X 1.00mm thk
22mmOD X 1.00mm thk
15mmOD X 1.00mm thk
12mmOD X 1.00mm thk

Fittings will be made of copper conforming to BS 864 and suitable for a steam of working pressure of 35 bar and especially made for brazed socket type connections.

F **MEDICAL AREA LINE PRESSURE ALARM:**

Medical Gas Alarm – As per NFPA -99 std with latest amendments / HTM -2022/02-01 of UK (Imported)

2 services
3 services
4 services
6 services

Area Alarms are designed to include all necessary displays, factory wiring, transformers and circuitry requiring only 230 VAC primary powers. Internal voltage should be stepped down to 5 VDC and 15 VDC for control circuit Power. Voltage to external pressure or vacuum transducers should be 15 VDC.

The Area Alarm should have digital display facility. Each area alarm should monitor up to 6 or 12 medical gas & / or Vacuum services.
Area alarm panels should be modular in design. Each gas monitored should have a light Emitting Diode (LED) display to continuously indicate actual line pressure. A vertical series of LED's should further indicate relative line pressure.
The control module should include a silence/enter button, a Test/Shift button, an Up button and a Down button. These buttons should be used to silence the audible alarm, set up the alarm panel and to test the alarm panel. The test button should test all modules one at a time. An LED on the control module should illuminate green to indicate Power on.

The LED should show Normal pressure at 50 psi . apart from Normal it should also show low risk of 40 PSI as low-pressure and 60 psi as high. High risk of 30 psi as low pressure & 70 psi as High pressure.

Line pressure modules should be available in dual display configuration, dual display modules should accept any
Combination of pressure or Vacuum.

The back box should contain factory installed copper tube extensions 6" Long , 3/8" ID (1/2"OD) , to accept installer furnished lines form the medical gas system.

Each inlet tube should accept gas – specific DISS fittings for transducers, to prevent cross-connection. The power supply should be installed in the back box Power supply should include an on / off rocker switch and a fuse holder.

The audible alarm tone should pulsate, 90 dBa at 2 meters. The audible signal should be cancelled only by the alarm silence button or fault correction. The display should remain illuminated to indicate the presence of the alarm condition. The alarm should automatically reset with the correction of the fault condition. A new alarm should occur while the panel is silenced, the audible alarm should reactivate. The area alarm should store the last four alarm conditions in memory at the alarm panel. These conditions can be indicated by using the buttons on the alarm panel control module.

The alarm should be capable to be connected with the HIS system.

Line pressure Alarm panel for Medical Gas Piping System should monitor the following indication:-
2 gas service :
Oxygen Normal / High / Low
Vacuum Normal / Low
3 gas service

Oxygen	Normal / High / Low
Medical Air	Normal / High / Low
4 gas service	
Oxygen	Normal / High / Low
Medical Air	Normal / High / Low
surgical Air	Normal / High / Low
Vacuum	Normal / low

Medical Air	Normal / High / Low
Tool Air (Surgical)	Normal / High / Low
Vacuum	Normal / low

G **MEDICAL AREA VALVE SERVICE UNIT (VALVE BOX WITH ISOLATION VALVE) AS PER ENCLOSED TECHNICAL SPECIFICATIONS**

ZONE VALVE BOX CE Marked with CE no./ UL Listed

1/2" x 3/4" (2 Gas)
1/2" x 1/2"x 3/4" (3 Gas)
1/2" x 1/2"x ½"x3/4" (4 Gas)
1/2"x1/2"x1/2"x 1/2" x1/2"X 3/4" (6Gas)

Adopter having opening by quarter turn of handle. The valve should be pneumatically tested as per BSEN 1057 for twice the working pressure and degreased for medical gas service before supply. Valve boxes should be equipped with components for shutting off and supervising individual /parts of central systems in hospital, laboratories and the like. They should be allowed the ward staff to allow isolating of the areas for maintenance and repair work. The pressure monitoring of the distribution system is done by pressure gauges. In case of emergency the door can be glass break opened or by un-locking using the key.

H **MEDICAL LINE VALVE, AS PER TECHNICAL SPECIFICATIONS**

ISOLATING VALVE

15mm OD
22mm OD
28mm OD
42mm OD
54mm OD

All ball valves as per BS 1057 are rated at 400 psig, as well as full vacuum (29.9" Hg). Valves go from full ON to full OFF by turning the vinyl-gripped valve handle 90 0 Locking-type handles may be ordered separately when required. Copper tubing is factory installed to help prevent valve seat damage during soldering. main and riser valves are not required to be installed in a box unless specially noted or required.

I Bedhead panel for Low Equity Ward Areas, 1500mm length, with provision of Gas outlets & provided with electrical sockets & accessories complete as per enclosed tender technical specifications

Bed Head Panel – CE Marked / UL Listed

The system should provide a safe, efficient means of delivering services to patients/staff in general ward application.

The Bed Head Panel should meet the following criteria.

Robust design in extruded aluminium sections

Ability to house medical gas terminal units and Electrical Sockets.

Ease of installation via separate wall mounting plates.

The system should consist of a number of aluminium extrusions joined together to form a carcass to suit the particular application.

Each Bed Head Panels will have three extruded section compartments

. One for MGPS outlets with copper pipe

. One for electrical receptables 6, 6/16 Amps receptacles

. One for low voltage like nurse call, data points & voice points

Each Bed unit should have

· Length of panel should be 1500 mm.

· 1 Nurse Call Button – Provision only

· Gas Outlets as per list attached O2, Air-4 , Vac (Provision only – Gas outlets calculated separately)

· Electricals – 2 nos. (5/15 Amps switched socket)

· Electricals – 2 nos. (5 Amps switched socket)

· 1 IV Pole with 4 Bottle Holder

Note: All system for Medical Gas Pipe line System must be certified by third party: i.e.(i) - For system installed as per NFPA standard , NFPA appointed inspector must certified system and relevant documents for inspector must be submitted with bid documents . (ii) - For system installed as per HTM standard, HTM appointed Pharmacist must certify system and relevant document for pharmacist must be submitted with bid documents.

Technical Specifications for Modular Pre- Fabricated Operation theatres

J Ceiling Construction – (Indian) (cladding type OT)

The inner ceiling will be constructed with 1.60mm thick EGP sheet panel / SS with 120 GSM as per IS 277, backed by 12-mm gypsum board panel. The Panel will be flame resistance to BIS 1142 part 3. The EGP sheet will be indigenous of reputed make and will be provided with test certificate. The inner surface ceiling will be fixed to the brick ceiling with essential supports.

The individual ceiling panels will be welded together. All joints will be filled with metal filler (Dupont / 3M) make and will be sanded flush on site till ready to receive the plastic finish. Ceiling panel joints will not be visible after the final wall coating is applied.

The gap between the inside and outside surfaces of the theatre will be variable to suit the architects' layout, but will be sufficient for the flush mounting of equipments.

The gap between the inner and outer ceiling will be left to accommodate the equipment at a later date and to enable services, pipes, conduits etc, to be run within the gap. All ceiling-mounted equipment will be flush mounted and sealed into theatre. All the sharp edges and corners will be in radius to avoid bacterial contamination. The ceiling and wall panel design will be such that is allow to installation and support of all equipment and the provision of openings required for the installations, without affecting rigidity and strength. Access boxes will be fitted to the rear of all ceiling & wall-mounted equipment to enable maintenance to be carried out from outside the operating theatre. There will be 4 return air ducts with grills provided to meet the HVAC requirements.

K **Sterile Anti-bacterial Coating – (cladding type OT)(Imported)**

Anti-bacterial epoxy and Anti-fungus sterile coating will be applied on the EGP/SS finished walls & ceiling with atleast 3-4 coats to achieve a thickness of minimum 200 micron. Before application of sterile wall coating an appropriate primer will be applied. The Primer will be supplied along with the paint and will be imported.

The prima will be applied prior to coating of Anti – bacterial & Anti- Fungus sterlite paint an EGP /SS walls & ceiling. 3 to 4 coates will be applied to achieve a thickness of 200microne s.

Sterile coating and primer will be applied on the surface by air-less spray gun. Sterile coating will be to withstand with commonly used cleaners in the operation rooms and even withstanding with regular steam cleaning.

We will provide the colour of paints approved by Engineer-in-Charge.

L **Planair Ceiling (Plenum box – Air Diffuser) – (cladding type OT) (Indian)**

The plenum box (2400mm x 2400mm) will be made of high quality Aluminium 2mm thick & Air diffuser will be made of Woven polyester cloth that will introduce the highest air quality into the Operation Theatre. There will be 6-8, H-14 HEPA

filters 0.3 microns size (as per plenum size) with 99.97% efficiency to ensure high quality clean air & tight control of bacteria infection system. Air will be diffused into the theatre uniformly over the total area through perforated aluminium sheet / SS 304. The air distribution system serving to the Operation Theatre will be tested as per DIN 4799 standards / HTM 03-01 standard.

The Unidirectional laminar flow installation & lighting system will be design to provide the Operation Theatre as key to preventing patients being infected during operation lies on the design of sterilized air conditioning system and the flow pattern of draught as well as the quality of engineering.
The airflow should be Unidirectional, downwards and the average velocity of the diffusers should be 25 to 35 fpm . It should have a low noise recirculation system, compliance with noise level of ≤ 45 to 48dB.

The ceiling will incorporate supports to secure it to the main structural frame of the modular operating theatre.

M Double peripheral lights– (cladding type OT) (Indian)

Double peripheral OT lights each set having two lights IP 54 Grade will be provided with stepped finish aluminium reflector and will be of A class for use in clean room application. The peripheral light diffusers will be constructed from opal prismatic diffuser material in aluminium frames.

Light will be generated from high frequency electronic ballast's complete with colour corrected fluorescent tubes. The ceiling will incorporate supports to secure it to the main structural frame of the modular operating theatre. The laminar flow ceiling will be able to provide integrated lamp support system, ease of maintenance and long life system. Control equipment for the peripheral lighting will be provided in the theatre control panel to allow independent control of the lighting levels by the surgical team.

The operation procedures can never be affected by shadows, shimmering lights and dazzling eyes. This has been achieved by the lighting system with sufficient illumination level at the wound site and to provide flicker less design lighting control system

Controls for the peripheral lighting will be provided in the theatre control panel to allow independent control of the lighting levels by the surgical team.

N **Surgeon's Control Panel with Separate Distribution Board – (Indian)**

The Control panel will be "Tiled Membrane" type, can be configured to incorporate all the services that Operation Theatre staff required. The connection between the

surgeon control panel and the distribution board will be by a multiplexed system, providing a PWM signal on a two-core cable.

The panel will contain 6 services Tiles as follows:
a). Time day clock
b). Time Elapsed Clock
c). Temperature , Humidity Indicator & pressure indicator
, Hepa filter status.
d). General/peripheral Lighting control
e). Medical Gas Alarm Panel – upto 6 gases
f). Hand Free telephone with memory card.

Time Day Clock will be digital type and clocks have high brightness characters, not less than 30mm in height. Time Elapsed Day Clock will be digital type and clocks have high brightness characters, not less than 30mm in height. Temperature Indicator will indicate the theatre temperature will be connected to the local pressure switches of Air-Conditioning system. Indicator will be digital type have high brightness characters, not less than 30mm in height.

General Lighting System incorporates all the necessary controls of the lighting system inside the theatre. The medical gas alarm will indicate High and Low gas pressure for each gas service present in the operating theatre and will have an audible buzzer with mute facility. The medical gas alarms will be connected to local pressure switches located downstream of the last isolation valves. A Hand Free Set Telephone system incorporated in the panel with memory type card.

The size of the each tile will not be more than 300mm x 200mm. Colour will be RAL 9002 for the frame and membrane fascia. The Control Panel will be designed for front – access only.

All high voltage equipment is installed in a separate enclosure. The remote cabinet will house the operating lamp transformers, mains failure relays, electrical distribution equipment and circuit protection equipment for all circuits within the operating theatre. All internal wiring will terminate in connectors with screw and clamp spring connections of the Clip-on type mounted, on a DIN rail and labelled with indelible proprietary labels. Individual fuses or miniature circuit breakers will protect all internal circuits. All internal wires will be marked with plastic ferrule type cable markers, for ease of identification.

O **X-ray Viewing Screen – (cladding type OT) (Indian)**
The theatre will be equipped with a 2-plate X-Ray viewing screen. It will be designed to provide flicker free luminance for the film viewing purpose. It is installed flushed with the theatre wall for hygienic and ease of cleaning purpose. The X-Ray viewing screen is designed for the purpose of front access. The X-Ray

viewing screen will be illuminated by 4 pieces of high frequency fluorescent lamps and the dimming will controlled by the usage of dimming ballast with Philips make rotary control. The diffuser is able to diffuse the light evenly and to provide enough luminance for film viewing. It is made of high quality opaque acrylic sheet. The film is held firmly by using spring-loaded clips for ease of mounting and demounting. The body is built by using electrolysed steel with powder coated to BS standards.

P Static dissipative Flooring (Tile Form) – (cladding type OT)(Imported)

The floor finish in the operating room will be 2mm Static dissipative PVC tiles, laid on a semi conductive adhesive base. The floor finish will terminate at the room perimeter passing over a concealed cove former and continuing up the wall for 100mm.

Flooring will fulfil EN 649 of US requirements. It will have chemical resistance as per EN 423 . It will have electrical resistance conforming to EN 1081/IEC 61340.

All joints will be welded and the plastic wall finish will overlap the floor coving by 25mm, to provide a continuous sealed surface.

A floor screed will be provided, flat to within a tolerance of +/- 3mm over any 3-metre area. Onto this sub floor, a self-levelling compound will be laid prior to laying of the floor finish.

The self-levelling compound will be of the type that does not promote bacteriological growth. Copper grounding strips (0.05mm thick, 50mm width) will b laid flat on the floor in the conductive adhesive and connect to copper wire of grounding

Q Scrub Station – (cladding type OT)(Indian)

The scrub station will be equipped with 2 bay bay scrub stations. The scrub station will be made of high-grade stainless steel 304 with stain polish finish and wired to the current IEE regulations & BS 7971. The scrub stations control system will be based on advanced microprocessor. The scrub station will be sensor-activated 24VAC. The scrub station will be provided with user selectable time out control. The supply will not be interrupted in case of power failure or maintenance.

The station will be equipped with thermostatic mixing valve to control the temperature of hot / cold water supply. The washing faucet will be made of Chrome plated brass hand.

R **Swievel Single arm Anesthesia Ceiling Pendent - Imported**

Multi-movement Pendent is a new design motorized Single arm(900mm)with up & down movement of 515 mm and load carrying capacity of 80 kg. The arm can be rotated upto 330º- 340ºwith adjustable stopper. An extremely quite electric motor reduces noise to a minimum, dampened stoppers and very low hand forces for horizontal movements contribute to an ergonomically optimised workplace. The newly developed pneumatic brake system can be adapted to various safety requirements and construction facilities. Modern and very quite, high performance motors as well special spindles are used to realise precise & steady movement. As a safety feature the motor is equipped with an over load protection. The large interior cross section for supply lines offers completely new applications with 120 mm diameter. The stoppers are infinitely variable from 0-330º-340º service head is provided with the modular design square in shape to achieve maximum supply with minimum required space. service head is designed to hosts, Base, Gas Module, Electric Module and shelves . Upto 8 Gas outlets & 10 Electrical switches. Racks & shelves are provided to mount the equipments like monitor etc. Surgeon pendent will have 2 arms with shelves as per following details:

a. Horizontal arm system - 1
b. Weight carrying capacity - 80kg
c. 5/15 Amp. Electrical sockets with switches - 8 to 10 Nos.
d.Shelfs with side rails - 2 Nos.
e.Provision to fix Gas outlets(i.e.) Oxygen- 2, Vaccum- 2, Air 4 bar-1, Air 7 bar-1, N2O -1 & WAGD-1 no.
f. Gas interface set for interface plate - 1No.
g.Ceiling mounting system for interin ceiling upto 1000 m - 1 No.
h. Interface plate with electrical fittings - 1No.
i. Ceiling cover for interin ceiling - 1No.

S **Swivel Double arm Surgeon Pendent (Imported)**

Multi-movement Pendent is a new design motorized (1000+800)mm arm with up & down movement of 515 mm and load carrying capacity of 80 kg. The arm can be rotated upto 330º- 340ºwith adjustable stopper. An extremely quite electric motor reduces noise to a minimum, dampened stoppers and very low hand forces for horizontal movements contribute to an ergonomically optimised workplace. The newly developed pneumatic brake system can be adapted to various safety requirements and construction facilities. Modern and very quiet, high performance motors as well special spindles are used to realise precise & steady movement. As a safety feature the motor is equipped with an over load protection. The large interior cross section for supply lines offers completely new applications with 120 mm diameter. The stoppers are infinitely variable from 0-330º-340º

service head is provided with the modular design square in shape to achieve maximum supply with minimum required space. Service head is designed to hosts, Base, Gas Module, Electric Module and shelves . Upto 8 Gas outlets & 10 Electrical switches. Racks & shelves are provided to mount the equipments like monitor etc. Surgeon pendent will have 2 arms with shelves as per following details:

a. Horizontal arm system - 2
b. Weight carrying capacity - 80kg
c. 5/15 Amp. Electrical sockets with switches - 8Nos.
d. Shelfs with side rails - 2 Nos.
e. Provision to fix Gas outlets(i.e.) Oxygen- 2, Vacuum- 2, Air 4 bar-1, Air 7 bar-1 & WAGD-1 no.
f. Gas interface set for interface plate - 1
g. Ceiling mounting system for interim ceiling upto 1000 mm-1no .
h. Interface plate with electrical fittings - 1No
i. Ceiling cover for interim ceiling - 1No

T Automatic Sliding Door

The main door will be of Single Flap with frame size 1500mm wide x 2100mm height.

Frames

The constructions Frames will be in accordance with the existing prefabricated wall thickness, with the necessary anchors for hidden fastenings to the wall panel, with horizontal upper drive gear boxes and in the double door width, included hinged-up inspection fascia. Running in front of the wall. Floor instand for the frame pillar: 30 mm.

The frames will be provided in Aluminium extruded profiles which will withstand better structural load. Aluminium profiles will be anodised to make dust free. The frame thickness will be 2.0mm & sheet thickness will be 1.5mm The apparent frames will have a width of 50 mm. only extruded profiles shall be used for construction of frames.

Sandwich door leaf of thickness 35 – 40 mm will be completely covered with a high-density solid care board for silent movement and in order to prevent the door from buckling by using a special glue on both sides, steel ground to grain size 240, enamel

Door leaves

Sandwich door leaf of thickness 35 – 40 mm will be completely covered with a high-density solid care board for silent movement and in order to prevent the door from buckling by using a special glue on both sides, steel ground to grain size 240, enameled or coated.

The total thickness shall be 60mm

The door leaves will be manufactured without impact at the front surface. They will close tightly and side .A rubber rebate will be installed at the front and rear to prevent the door from closing sharply.
Each leaf will have:
A pull steel handles on one wall at each side, which allows the door to be opened with hand, elbow and knee.
Moderately heavy mortise lock, upward closing, pre-fitted for profile cylinder, including closing angle, basquille rod and 2 steel cover collars.
Inspection window
An inspection window will be installed in the, glass strips in stainless steel sheet of thickness 1,5 mm, with glass 35 mm (window above 70 mm).

Coating in NCS-colour in accordance with the architect's / hospital's choice. Double panes with 2 laminated safety glasses , installed hermetically between the windows.
The window size will be 300x300mm

Vertical Blend Motorized Window (Indian)

U Window made of double glaze glass with vacuum impregnation with motorized vertical blends. Window size should be 1000 mm x 1000 mm.

V **LED light-Double Dome (imported) CE certified / UL listed**

(a) The double dome operating light must be designed for the use in high demanding surgical procedures. State-of-the-art LED bulbs should be used to ensure a low energy consumption and a long service life.
(b) Outer handles at the light head should be provided to allow for non-sterile positioning.
(c) Light head must be designed with smooth transitions and surfaces, without slots, gaps or exposed screwing to ensure fast and effective cleaning.
(d) The light head with streamlined shape is favourable within laminar flow. The light head must be resistant to disinfectant.
(e) For sterile positioning an ergonomic, exchangeable and centrally positioned sterile handle within the light head should be provided.
(f) All main joints of surgical light must be provided with unlimited rotation (360°). Light head and suspension must be sealed dustproof.
(g) Color temperature should be homogeneous at every illumination intensity.
(h) Control of illumination intensity must be possible via wall control panel

(i) Classification
a. Protection class acc. to IEC 60601-1 -
i. Mains connection component - Protection class 1
ii. Light head – SELV

b. Protection class acc. to IEC 60529
i. Arm system/mains connection component - IP 30
ii. Light head - IP 42
c. Classification in accordance with EU Directive 93/42/EEC Annex IX - Class I
d. UMDNS-Code (Universal Medical Device Nomenclature System) - 12-282
e. IEC 60601-1 - Medical electrical equipment – Section 1-1
f. IEC 60601-2-41 - Medical electrical equipment – Section 2-41
g. IEC 60601-1-2 - Medical electrical equipment – Section 1-2

(j) The surgical light should be complete with all components for ceiling mount and electrical feed-in, incl. finalised installation.

(k)Technical data for main dome: - 1nos.
i. Central illumination intensity Ec 160000 Lux
ii. Light field diameter at a distance of 1 m 200 mm
iii. Depth of illumination L1+L2 1300 mm
iv. Average Color rendering index Ra 95
v. Color rendering index R9 (red) 93
vi. Color temperature 5000K
vii. Central illumination at 1m distance with:
I. Tube 100%
II. one mask: 40%
III. tube and one mask: 40%
IV. two masks: 48%
V. tube and two masks: 48%
viii. Central irradiance Ee 580 W/ m^2 ± 50 W/ m^2
ix. Ee/Ec ratio - 3.5 W/m2 x Lux
x. Adjusting the illumination intensity 40000 to 160000 Lux
xi. Number of LED 66 units
xii. Number of LED stripes 11 units
xiii. Service life LED bulbs approx. 30000 hours
xiv. Replacement of LED bulbs possible
xv. Ambient light mode (Endolight) 300 Lux
xvi. Diameter of light head 620 mm

(L) Technical data for satellite dome - 1 nos.
i. Central illumination intensity Ec 120000 Lux
ii. Light field diameter at a distance of 1 m 200 mm
iii. Depth of illumination L1+L2 1300 mm

iv. Average Color rendering index Ra	95
v. Color rendering index R9 (red)	93
vi. Color temperature	5000K
vii. Central illumination at 1m distance with:	
I. Tube	100%
II. one mask:	41%
III. tube and one mask:	41%
IV. two masks:	49%
V. tube and two masks:	49%
viii. Central irradiance Ee	430 W/ m^2 ± 50 W/ m^2
ix. Ee/Ec ratio -	3.5 W/m2 x Lux
x. Adjusting the illumination intensity	40000 to 120000 Lux
xi. Number of LED	48 units
xii. Number of LED stripes	8 units
xiii. Service life LED bulbs	approx. 30000 hours
xiv. Replacement of LED bulbs	possible
xv. Ambient light mode (Endolight)	300 Lux
xvi. Diameter of light head	620 mm

X Storage Unit (Indian)

The storage unit should be made with 1.50 mm thick EGP Zinc coated sheet panels. Storage Cabinet should be divided in two equal parts and each part should have individual glass doors with high quality locking system. Each part should be provided with racks.

Y Pressure Relief Damper (Indian)

Pressure Relief Dampers should be provided in each room to prevent cross contamination of air from clean and dirty areas. Suitably sized air pressure relief damper should be strategically placed, enabling differential room pressure to be maintained and ensure that when doors are opened between clean and dirty area. Counter-weight balancing system should be provided in the PRD to maintain positive pressure inside the operation room. Air pressure stabilizers should have unique capability of controlling differential pressure to close tolerance. The PRD should remain closed at pressure below the set pressure and should open fully at pressure only fractionally above the threshold pressure. Blades should be of SS304 grade.

Z Writing Board (Indian)

One Operating List Board should be provided in each Operating Theatre and should be made of Ceramic Magnetic white board. Operating List Board should be flush mounted.

13 HATCH BOX (Indian)

A Hatch of 600mm x 600mm size should be provided in the Operation Theatre as specified in the scope of the work to remove waste materials from the Operation Theatre to Dirty linen Area just adjacent to Operation Theatre. Each Hatch should be equipped with two doors and the door should be operated electronically. The Hatch should be designed in such a way that only one door should be opened at one time. The UV light should be so installed that it is kept on while both the doors are closed, this UV light has to be automatically turned off in case of opening of either of the doors. There should be indicators on both sides of the OT so that the door open/close status can be monitored from both ends. Hatch Box should be manufactured from Stainless Steel (Grade 304).

14.(ii) HD Camera PAL for OT Ceiling Light:

for displaying real time images during surgery

Features: Centrally mounted in the light head

Touch screen Surface Controls

Glass Surface for hygiene requirements

Technical Data:

Image Device Sensor: 1/3"

Video standards: Full HD 1920x1080

Pixels: 20,00,000

Video outputs: lx Y/Pb/Pr,1x DVI, 2x HD SDI

LAN, RS232, RS485

Zoom: 10x optical zoom

12x digital

Electronic

Minimum Illumination: 12 Lux

Signal to Noise Ratio: >50dB

Minimum Working distance: 10mm- wide end

800 -tele-end

Image rotation: Via OP lighting, 360 deg

Power connection: Yes

Image stabilizer: Auto, manual

Focus: Auto, manual

Iris: Auto, manual

White balance: Auto, manual

14.(iii) Flat Panel Monitor

Should be 23" High Definition Progressive Scan Flat-panel Monitors with ceiling mounted spring arm suspension to support high-definition/HDTV progressive Scan images and should be able to support and display DVI/HDTV, RGBHV, S-Video, Composite video signals. The flat Panel suspension should be ready with the cables for integration of High Definition Digital (DVI/HDTV). RGBHV (High Resolution), SVHS (S-Video), Composite video signals to travel from the various sources of video like endoscopic camera, room camera, in light Camera, high definition flat panel monitors, while assuring native resolution /signal. Each Monitor should at least meet the following technical criteria: Resolution: 1600 dots x J200 dots, Progressive Scan Display Colors: 16 Million Colors, Inputs: DVI, RGBHV, S-Video, Composite Video, Synchronization: 2.5-5.0 Vpp separated sync, Response time: <25ms, Travel: 33Qc- 340c, Forward Tilt: 3Qc -40c, Backward Tilt:45c-5Qc,Cable Kit for Integration: DVI, Fiber Optic. RGBHV, S-Video, Composite

19 Isolation Panel 10KVA

Isolation Panel System of minimum 10KVA capacity should be provided for every operation theatre which ensures the safety of staff and patient. System should have isolators provided through leakage relays etc. (If required) according to IEC recommendation. This unit should be EN/CE/UL/BIS/FDA/IEC certified. These systems are to be commissioned by specialists.

Should be medical grade Isolation panel

Should have fault detection feature

Should be compliant to CEI 64-8 / IEC 60364-7-710/BS7671 Standard

Should be compact and mountable on wall or flush on brick wall

The IPS should be able to integrate with HIS/BMS and Surgeon Control Panel as standard

Isolation panel system should have facility to detect fault of leakage current for each circuit(minimum 12 circuits) and same should be integrated with touch screen control panel of MOT and alarm status should be displayed on the touch screen control panel

20 Internal Ducting

The internal ducting inside of the Operation theatre should be done duly fabricated out of 22 /24 swg Aluminium sheet complete with flanges and accessories such as GI suspenders and GI supports completely sealed with Silicon sealant duly insulated with Aluminium foil Nitrile rubber self-adhesive type insulation.

SPECIAL CONDITION OF CONTRACT

Qualification Criteria

A. To qualify for award of the contract:-

a) The Bidder should be public undertaking Autonomous Body, Public Ltd./ Pvt. Ltd./ Partnership Company or Proprietary firm/Company at least for the minimum three years in existence from the date of Notification of this tender.

b) The bidder must have experience of having successfully completed Supply Installation Testing & Commissioning of Liquid Tank, central medical gas pipeline system , modular operation theatre and operation maintenance in govt. / PSU hospital during last minimum 3 years ending last day of month previous to the one in which applications are invited should be either of the following:

i Three similar completed (S/I/T/C of central medical gas pipeline system, modular operation theatre and operation maintenance in Govt. / PSU hospital) works costing not less than the amount equal to 40% of the estimated cost.

ii. Two similar completed (S/I/T/C of central medical gas pipeline system, modular operation theatre and operation maintenance in Govt. / PSU hospital) works costing not less than the amount equal to 50% of the estimated cost.

iii. One similar completed (S/I/T/C of central medical gas pipeline system, modular operation theatre and operation maintenance in Govt. / PSU hospital) work costing not less than the amount equal to 80% of the estimated cost.

Cost of work shall mean gross value of the completed work including the cost of materials supplied by the Govt. / Client, but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer/ Project Manager or equivalent (calculated on the basis of 10% value added compounded per year). Bidder must compulsory submit Completion Certificate & Complete order copy in this regard otherwise Bid will be rejected.

c) The applicant should have minimum Average Annual financial turnover during the last 3 years, ending 31st March of the previous financial year, at least 30% of the estimated cost.
The Balance Sheet should be duly audited by a Chartered Accountant (10% compounded value per year to be added)

d) The applicant should not have incurred any loss in more than three years during the last three years ending last day of tender duly certified by the Charted Accountant.

e) The applicant's performance for each work completed in the last 3 years and in hand should be certified by an officer not below the rank of Executive

Engineer/Project manager or equivalent and should be obtained in sealed cover.

f) The bidder must have been awarded CMC (Comprehensive Maintenance Contract) / operation contact of similar work by at least one 100 bedded Govt. Hospitals & should be operational.

g) The bidder should be authorized distributer of the foreign principal from last 3 years w/o break. Bidder to submit affidavit that he shall supply the equipment and spares of the same brand for which he is distributor for 10 Years.

h) Bidder should clearly mention country of origin with name of Mfg. company for each and every imported products quoted by them and origin of country for imported products must be from USA , UK & EU only and failing which bid will be straight way rejected.

i) Bidders should not quote any optional items. Firm must quote strictly as per the desired specifications and items mentioned in Tender requirement and fulfilling intent and purpose of the work failing which bid will be rejected.

j) Bidder should submit an affidavit that all items will be provided strictly as per approved makes.

k) Bidder should submit original leaflet & letter of authority from the manufacturer of BS EN

13348 Kite Marked Medical Grade Copper pipe & fittings without original leaflet & letter of authority tender should be straight way rejected.

l.) The contractor shall arrange & provide License to operate and use liquid oxygen system as a part of this contract from government of India at no added extra cost and must complete all statutory obligations.

m) Bidders should submit an affidavit that their Company has never been Blacklisted or Debarred by any Central/State Govt. Organization.

n) Before start of work the sample of material are to be approved by Engineer-in-charge.

NOTE: All system for medical gas pipeline system must be certified by third party: i.e.

(i) – For system installed as per NFPA standard, NFPA appointed inspector must certified system and relevant documents for inspector must be submitted with bid documents.

(ii) – For system installed as per HTM standard, HTM appointed Pharmacist must certify system and relevant document for pharmacist must be submitted with bid documents.

LIST OF APPROVED MAKES FOR MEDICAL GAS PIPELINE

Sr. No.	Item of Description	Approved Make
1.	Oxygen Manifold	MPS/ Linde/Prime Technomed / Synergic
2.	Emergency Oxygen Manifold	MPS/ Linde/ Synergic
3.	Nitrous Oxide Manifold	MPS/ Linde/ Synergic
4.	Emergency Nitrous Oxide Manifold	MPS / Linde/ Synergic
5.	Copper Piping & fittings Brand with BSI Kite marked certified BSEN 13348-2008/Llyod Certified	Mehta Tube / Rajco / Mandev / Lawton / Cubax / Star
6.	Zonal Valve Box	MPS/ Supreme / Krishna Engg./ Synergic / Linde/Prime Technomed
7.	Medical Line Valve	MPS/ Supreme / Krishna Engg./ Synergic / Linde/Prime Technomed
8.	Bed Head Panel	Prime Technomed/MPS/Synergic /Hi tech Engg.
9.	Liquid Oxygen Tank	Inox / VRV/Linde / Air Lique
10.	OT Wall & Ceiling panel system	Tata/ Salem / MPS / Bhushan
11.	Laminar Flow(Planair)	MPS/ Voltas / Supreme / Linde
12.	Peripheral lights	Philips / Trilux / Zumtobel / LT
13.	Surgeon Control panel	MPS/ Supreme / Linde
14.	X-ray viewing Screen	MPS/ Supreme / Linde
15.	Scrub	MPS/ Supreme / Linde
16.	OT Doors	Metaflex / HPK / MPS
17.	Electrical switch / sockets etc.	Legrand/MK/Anchor/AVE/ Zencelo/Schnieder
18.	Conducting (PVC Pipe & fittings)	Finolex / Lappkabel.
19.	Storage Unit	MPS/ Supreme / Linde
20.	Hatch Box	MPS/ Supreme / Linde
21.	IPS	FUZI CONSULE/3EM/SERVOKON/BENDER

Note: In case if the brand/ make of any item being used is not available in the above list the same should be got approved from the consultant/ engineer in charge before installation

LIST OF IMPORTED APPROVED MAKES FOR MEDICAL GAS PIPELINE

Sr. No.	Item of Description	Approved Make
1.	Fully automatic Oxygen Control Panel	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA / Precision UK / Ohio./ Reanimed
2.	Gas Oultet point for Oxygen, Vacuum, Air-4 ,Air-7 & N2O –	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA / Precision UK./Reanimed
3.	Oxygen Flow meters with humidifier bottle	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA / Flowmeter/Reanimed
4.	Fully automatic Nitrous Oxide Controls	Allied Health Care USA/Power Ex USA/Phoenix Pipeline UK / Tri Tech USA / Precision UK / Ohio./ Reanimed
5.	Air compressor system	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA /Reanimed
6.	Vacuum system	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA ./Reanimed
7.	Ward vacuum unit	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA / Ohio / Flow Meter / Medepha./Reanimed
8.	Theatre Vacuum Unit	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA / Ohio/ Flow Meter / Medepha/Reanimed
9.	ALARM SYSTEM	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA / Precision UK./Reanimed
10.	OT Flooring	Tarket / Gerfloor / LG / Armstrong
11.	Single arm pendent	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA

		/Pneumatik Berlin /Medepha / Precision UK./Reanimed
12.	Double arm pendent	Allied Health Care USA / Power Ex USA / Phoenix Pipeline UK / Tri Tech USA /Pneumatik Berlin /Medepha / Precision UK./Reanimed
13.	LED OT Lights	Simeon / Trumph / Steris / KLS / Martin/ Etkin
14.	camera system	Simeon / Trumph / Steris / KLS / Martin/ Etkin
15.	Monitor system	Simeon / NDS/Advantech/ Etkin

SPECIAL CONDITIONS FOR COMPREHENSIVE MAINTENANCE CONTRACT (MEDICAL GAS PIPELINE SYSTEM)

After completion of the installation the firm shall get the installations inspected from authorized person deputed by department and prepare as built drawings with complete detail of installations along with inventory of equipment with their make Sr. No. model size etc.. the firm shall also obtain a certificate of OEM of the equipment installed for proper installation and backup guarantee by OEM of major items.

The firm after successful completion of the work, shall stand guarantee for all material, equipment and installation for one year from date of completion. This will include repair, replacement and all labour of all installation including consumable items if any. **This will be treated as free maintenance period. The firm will hand over the system as per para above before completion of Defect Liability period / free maintenance period free maintenance period / Defect Liability of period will be considered as extended till hand over the system**. **The decision for allotment of maintenance work will be on the discretion of client department.** However for operation of system during this period the firm shall be paid @ 1% of the value of original work done. The decision for allotment of operation and maintenance work will be allotted on the discretion of client department.

After completion of free maintenance period of one year from the date of completion as above, the firm will be bound to carry out paid comprehensive maintenance i.e. repair and replacement of all installations including consumable items etc. and operation of system for next Four year for which the firm will be paid as under: -

A.

1. For 1st year (After free maintenance period or actual handover the system to Client deptt. whichever is later) @ (5.50% of the original work done.
2. For 2nd year @ 6.05% of the original work done.
3. For 3rd year @ 6.66% of the original work done.
4. For 4th year @ 7.30% of the original work done

NOTE:-

The contractor would submit an affidavit in the technical bid that he shall undertake to carry comprehensive maintenance as brought out in the DNIT. In case of failure to do so, the department is at liberty to take any due action including proceeding under criminal negligence against the firm / contractor.

Payment of this maintenance will be done on quarterly basis. After deducting the statutory taxes.

Other terms and conditions of comprehensive maintenance contract_have been as depicted under heading addition condition for free maintenance period and annual maintenance contract of this DNIT.

IMPORTANT:-

After completion testing and commissioning the installations will be handed over to the authorized authority of Hospital. The contract for operation and comprehensive maintenance contract_on the rates terms and conditions for the period as per this DNIT / Agreement will be done with the firm by authorized authority of Hospital. The firm will be bound to carry out the comprehensive maintenance and operation contract accordingly for which necessary payments etc. will be done by Hospital authority.

Note:- Operation means day and night around the year (24x7x365)

ABBREVIATION

NFPA – NATIONAL FIRE PROTECTION ASSOCIATION

HTM – HEALTH TECHNICAL MEMORANDUM

MGPS – MEDICAL GAS PIPELINE SYSTEM

BSEN – BRITISH STANDARD

NEMA – NATIONAL ELECTRICAL MANUFACTURAS ASSOCIATION

PERLITE – NON INSULATED MATERIAL & IT DOES NOT ALLOW HEAT TO PASS. IT IS A CEILING BETWEEN INNER VESSEL & OUTER VESSEL

NON-THERMOSIPHON – VALUE FOR FILLING TANK

GA CUM – GENERAL ASSEMBLE

CCOE – CHIEF CONTROLLER OF EXPLOSIVE

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

DISS - DIAMETER INDEXING THREAD ADAPTOR

HIS - HOSPITAL INFORMATION SYSTEM

ASME - AMERICAN SOCIETY OF MECHNICAL ENGINEERS

AGSS - ANESTHESIA GAS SCAVANGING SYSTEM

WAGD - WASTE ANESTHETIC GAS DISPOSABLE SYSTEM

TECHNICAL SPECIFICATIONS (5 KVA to 2500 KVA) DG SETS

Detailed Specifications :- (Diesel Generating Sets 5 KVA, 7.5 KVA, 10 KVA, 15 KVA, 20 KVA, 25 KVA, 30 KVA & 40 KVA)

Diesel Engine and Alternator should be close coupled and mounted on a base plate of robust construction.

1. **DIESEL ENGINE : (Manufactured in India)**

Diesel Engine shall be Liquid Cooled, electric start developing required B.H.P. at 1500/ 3000 rpm WITH Class A-I Governor or Electronic Governor suitable for alternator to deliver specified continuous KVA output at 0.8 lagging PF at NTP conditions (Rating shall be tested at Unity PF). The Diesel Engine should be capable of providing 10 % overload for one hour continuous running at full load after every 11 Hours continuous running.

The Diesel Engine shall be complete with the following accessories:-

a) Engine instrument Panel consisting of starting switch/push button, Lube Oil and Pressure Gauges, Water Temperature Gauge, RPM indicator and Hour meter.
b) Low lube oil pressure safety required in Engines, High Water temperature safety for water cooled Engines is required. The safety should include audio alarm and trip facility also to avoid damage to the engine.
c) Radiator.
d) Exhaust silencer of Residential type.
e) 12V/24V starting system complete with starter motor, charging alternator and Cutout.
f) Lead Acid battery of suitable ratings with connecting cables. The batteries shall be supplied in uncharged conditions and of Make :
EXIDE/ STANDARD FURUKAWA/ AMARON/ TATA-GREEN/ AMCO/ LUMINOUS/ PACESETTER.
g) The Diesel Engine fitted with Common Rail Direct Injection Fuel Pump shall be only accepted.

The Engine should confirm to applicable Emission Norms.
The Engine shall be accepted only which conforms to BIS : 10000/1/2 or BS:5514.

2. **ALTERNATOR :-**

The Alternator shall be self – excited, self – regulated of specified KVA rating in three phase at 220V/415 Volts, 50 Hz, 1500/ 3000 RPM and 0.8 pf

lagging (Rating shall be tested at Unity PF). The alternators shall be of brushless type only. The alternators shall be screen-protected drip proof with Min. IP-21 or improved degree of protection for outdoor installations. The class of insulation of the Alternator would be F/H. The rated voltage of Alternator will be 415 V for 3 phase.

Make of Alternator: Kirloskar / Kirloskar Green/ Crompton – Greaves/ Leroy Somer / Trident/ Stamford/ Meccalte.

3. **AMF CONTROL PANEL:-**

Automatic mains failure (AMF) control panel shall be able to start up the DG set and can transfer the load on to D.G. set on mains failure without requiring any human intervention, similarly, on restoration of main supply, it shall be able to transfer the load to mains supply and switch off the D.G. Set automatically.

The AMF panel enclosure should be with the IP-53 degree of protection and shall be fabricated from minimum 16 SWG thick steel sheet duly pre-treated and aesthetically finished and Power coated.

The AMF Control Panel shall have the following instruments:

a) Microprocessor based relay with composite/separate meter for digital display of:

1. Generator voltage/AC Mains voltage.
2. Generator Current.
3. Load Current.
4. Power Factor.
5. Frequency.
6. Energy.
7. Three attempts engines start/ engines cranking relay.
8. On delay timer for load change over.
9. On delay timer for engine shut off.

b) Mode selector switch for setting the panel on any one position such as off or auto or manual or test.

c) Engine On-Off switch (Push button type)

d) MCCB/Fuses of suitable rating shall be provided.

e) Rectangular Aluminium Bus Bars (one number for each phase, neutral and Earthing terminal) of adequate ratings duly colour coded with heat shrinkable PVC Sleeves or Copper Cables.

f) Two contactors/ACB of suitable rating (one for DG set & one for AC mains) with over load relay.

g) Under + Over Voltage Relay.

h) Automatic Battery charger with on-off switch, voltmeter and ammeter for charging the battery from mains. This will be addition to the battery charging alternator fitted on the engine.

i) Instrument & Control Fuses/MCB.

j) Four number indicating lamps to indicate 'load on mains' 'set running' 'load on set'and 'battery charger on'.

k) Audio visual alarm for 'Low lubricating oil pressure' High water temperature' (for water cooled), 'Start failure', and 'DG overload'

l) Any other switch, instrument, relay or contactor etc. essential for smooth and trouble free function of DG set with AMF Panel (to be specified by the tenderer in their offer with complete detail of the item).

m) All Electro components/ parts such as MCCB/ MCB/FUSE/ Contactor/ Meters should be of L&T/ ABB/ SCHINEDIER/AE/ENERZON/GE/HAVELLS/ SIEMENS make.

4. **MANUAL CONTROL PANEL** :-

The Control Panel shall be made out of fabricated sheet 16 gauge (min) thick duly powder coated of suitable size for indoor/outdoor floor mounting installation. Aluminium Busbar/copper cables, internal wiring with suitable provision for/connection incoming/ outgoing leads. The Control Panel shall include following instruments:-

a. Composite meter for digital display of

i. Voltage

ii. Current.

iii Frequency

b. One MCB/MCCB/ACB of suitable Rating.

c. Push Button switch for on off operation.

d. Indication lamps.

e. Automatic Battery charger with on-off switch, voltmeter and ammeter for charging the battery from mains. This will be addition to the battery charging alternator fitted on the engine.

5. **SOUND PROOF ENCLOSURE (CANOPY)**

The generator shall be in a sound proof (Acoustic) enclosure suitable for Diesel Generating Set complete in all respect having following specification/ Feature:-

Fabricated as per standard specification of manufacturer, stuffing done with suitable Foam/ Rock. Rock wool supported with Tissue Paper or perforated sheets having holes. Residential type silencer provided to lower the noise of exhaust outlet. Canopy treated for antirust with powder coating. Should have fresh Air inflow and proper ventilation. Modular in construction and provided with lockable doors. The Sound proof enclosure shall be strictly as per CPCB prevalent norms. The sheet thickness should be 18 gauge (min) as per manufacturer standard and as per CPCB rules.

CABLING:

Supply & erection of underground Aluminum armoured cable ISI mark including necessary connections, thimbling, glands alongwith digging & re-filling of cable trenches, complete in all respect, inclusive of cost of earth excavation. Makes Finolex, Havells, Gloster, Grandlay, Polycab/ RR Kabel, Plaza, Kalinga, Hyglow (ISI Marked) suitable for D.G. Set as per manufacturer standard / recommendation.

SWITCHES : Change over switch, Supply & erection of change over switch, TPN on angle iron frame including earthing, necessary connections complete in all respect, Make:- Havells, MEX, SSK, Standard, DPPL, Crystal ,C&S – Capacity 32, 63, 100, 200 Amps.

Main Switch :- I) Supply & Erection of following Main switches, TPN Re-wireable/HRC on angle iron frame including earthing necessary connections

complete in all respect, Make:- MEX, SSK, DPPL, Standard, Havells, Crystal. Capacity 32, 63, 100, 200 Amps.

EARTHING

a) Supply and erection of plate earthing as per IS specification with 600mm x 600mm x 3mm of copper plate below ground upto 2.13 meter with 20mm x 3mm copper strip of electrolytic grade as per specification. The strip is to be inserted through G. I. pipe of medium class of suitable size. Earthing should be complete with charcoal, salt & provision of watering arrangement & manhole cover of size 1 ft x 1ft including all bricks masonary work, digging & refilling etc., complete in all respect as required inclusive of the cost of earth excavation work & required material.

Detailed Specifications :- (Diesel Generating Sets 50 KVA to 320 KVA)

Diesel Engine and Alternator should be close coupled and mounted on a base plate of robust construction.

1. **DIESEL ENGINE : (Manufactured in India)**

Diesel Engine shall be Liquid Cooled, electric start developing required B.H.P. at 1500 rpm suitable for alternator to deliver specified continuous KVA output at 0.8 lagging PF at NTP conditions (Rating shall be tested at Unity PF). The Diesel Engine should be capable of providing 10 % overload for one hour continuous running at full load after every 11 Hours continuous running. Diesel Engine should be fitted with Electronic Governor.

The Diesel Engine shall be complete with the following accessories:-

a) Engine instrument Panel consisting of starting switch/push button, Lube Oil and Pressure Gauges, Water Temperature Gauge, RPM indicator and Hour meter.
b) Low lube oil pressure safety required in Engines, High Water temperature safety for water cooled Engines is required. The safety should include audio alarm and trip facility also to avoid damage to the engine.
c) Radiator.
d) Exhaust silencer of Residential type.
e) 12V/24V starting system complete with starter motor, charging alternator and Cutout.
f) Lead Acid battery of suitable ratings with connecting cables. The batteries shall be supplied in uncharged conditions and of Make:
EXIDE/ STANDARD FURUKAWA/ AMARON/ TATA-GREEN/ AMCO/ LUMINOUS/ PACESETTER.

Diesel Engine of direct injection or Diesel Engine fitted with common Rail Direct Injection Pump shall be accepted.

The Engine should confirm to applicable Emission Norms. The Diesel Engine shall be accepted only which conforms to BIS: 10000/1/2 or BS:5514.

2. ALTERNATOR :-

The Alternator shall be self – excited, self – regulated of specified KVA rating in three phase at 415 Volts, 50 Hz, 1500 RPM and 0.8 pf lagging (Rating shall be tested at Unity PF). The alternators shall be of brushless type only. The alternators shall be screen-protected drip proof with Min. IP-21 or improved degree of protection for outdoor installations. The class of insulation of the Alternator would be F/H. The rated voltage of Alternator will be 415 V for 3 phase.

Make of Alternator : Kirloskar / Kirloskar Green/ Crompton – Greaves/ Leroy Somer / Trident/ Stamford/ Meccalte.

3. **AMF CONTROL PANEL :-**

Automatic mains failure (AMF) control panel shall be able to start up the DG set and can transfer the load on to D.G. set on mains failure without requiring any human intervention, similarly, on restoration of main supply, it shall be able to transfer the load to mains supply and switch off the D.G. Set automatically.

The AMF panel enclosure should be with the IP-53 degree of protection and shall be fabricated from minimum 16 SWG thick steel sheet duly pre-treated and aesthetically finished and Power coated.

The AMF Control Panel shall have the following instruments:

a) Microprocessor based relay with composite/separate meter for digital display of:

1. Generator voltage/AC Mains voltage.
2. Generator Current.
3. Load Current.

4. Power Factor.
5. Frequency.
6. Energy.
7. Three attempts engines start/ engines cranking relay.
8. On delay timer for load change over.
9. On delay timer for engine shut off.

b) Mode selector switch for setting the panel on any one position such as off or auto or manual or test.

c) Engine On-Off switch (Push button type)

d) MCCB/Fuses of suitable rating shall be provided.

e) Rectangular Aluminium Bus Bars (one number for each phase, neutral and Earthing terminal) of adequate ratings duly colour coded with heat shrinkable PVC Sleeves or Copper Cables.

f) Two contactors/ACB of suitable rating (one for DG set & one for AC mains) with over load relay.

g) Under + Over Voltage Relay.

h) Automatic Battery charger with on-off switch, voltmeter and ammeter for charging the battery from mains. This will be addition to the battery charging alternator fitted on the engine.

i) Instrument & Control Fuses/MCB.

j) Four number indicating lamps to indicate 'load on mains' 'set running' 'load on set'and 'battery charger on'.

k) Audio visual alarm for 'Low lubricating oil pressure' High water temperature' (for water cooled), 'Start failure', and 'DG overload'

l) Any other switch, instrument, relay or contactor etc. essential for smooth and trouble free function of DG set with AMF Panel (to be specified by the tenderer in their offer with complete detail of the item).

m) All Electro components/ parts such as MCCB/ MCB/FUSE/ Contactor/ Meters should be of L&T/ ABB/ SCHINEDIER/AE/ENERZON/GE/HAVELLS/ SIEMENS make.

4. **MANUAL CONTROL PANEL** :-

The Control Panel shall be made out of fabricated sheet 16 gauge (min) thick duly powder coated of suitable size for indoor/outdoor floor mounting installation. Aluminium Busbar/copper cables, internal wiring with suitable provision for / connection incoming/ outgoing leads. The Control Panel shall include following instruments:-

a. Composite meter for digital display of
   i. Voltage
   ii. Current.
   iii Frequency
b. One MCB/MCCB/ACB of suitable Rating.
c. Push Button switch for on off operation.
d. Indication lamps.
e. Automatic Battery charger with on-off switch, voltmeter and ammeter for charging the battery from mains. This will be addition to the battery charging alternator fitted on the engine.

5. **SOUND PROOF ENCLOSURE (CANOPY)**

The generator shall be in a sound proof (Acoustic) enclosure suitable for Diesel Generating Set complete in all respect having following specification/ Feature :-

Fabricated as per standard specification of manufacturer, stuffing done with suitable Foam/ Rock wool. Rock wool supported with Tissue Paper or perforated sheets having holes. Residential type silencer provided to lower the noise of exhaust outlet. Canopy treated for antirust with powder coating. Should have fresh Air inflow and proper ventilation. Modular in construction and provided with lockable doors. The Sound proof enclosure shall be strictly as per CPCB prevalent norms. The sheet thickness should be 18 gauge (min) as per manufacturer standard and as per CPCB rules.

CABLING :

Supply & erection of underground Aluminum armoured cable ISI mark including necessary connections, thimbling, glands alongwith digging & re-filling of cable trenches, complete in all respect, inclusive of cost of earth excavation. Makes Finolex, Havells, Gloster, Grandlay,Polycab, RR Kabel, Plaza, Kalinga, Hyglow (ISI Marked) suitable for D.G. Set as per manufacturer standard / recommendation.

SWITCHES : Change over switch, Supply & erection of change over switch, TPN on angle iron frame including earthing, necessary connections complete in all respect, Make:- Havells, MEX, SSK, Standard, DPPL, Crystal , C&S – Capacity 200, 320, 400, 630, 800, 1000, 1250 Amps.

Main Switch :- I) Supply & Erection of following Main switches, TPN Re-wireable/HRC on angle iron frame including earthing necessary connections complete in all respect, Make:- MEX, SSK, DPPL, Standard, Havells, Crystal. Capacity 200, 320, 400, 630, 800, 1000 Amps.

EARTHING

a) Supply and erection of plate earthing as per IS specification with 600mm x 600mm x 3mm of copper plate below ground upto 2.13 meter with 20mm x 3mm copper strip of electrolytic grade as per specification. The strip is to be inserted through G. I. pipe of medium class of suitable size. Earthing should be complete with charcoal, salt & provision of watering arrangement & manhole cover of size 1 ft x 1ft including all bricks masonary work, digging & refilling etc., complete in all respect as required inclusive of the cost of earth excavation work & required material.

b) Supply and erection of copper strip earthing of 25mm x 3mm copper earth strip & suitable size medium class GI pipe including all necessary material and termination etc. complete in all respect.

Detailed Specifications :- (Diesel Generating Sets 400 KVA to 2500 KVA)

Diesel Engine and Alternator should be close coupled and mounted on a base plate of robust construction.

1. **DIESEL ENGINE : (Manufactured in India)**

Diesel Engine shall be Liquid Cooled, electric start developing required B.H.P. at 1500 rpm suitable for alternator to deliver specified continuous KVA output at 0.8 lagging PF at NTP conditions (Rating shall be tested at Unity PF). The Diesel Engine should be capable of providing 10 % overload for one hour

continuous running at full load after every 11 Hours continuous running. Diesel Engine 400 KVA and above should be fully electronic i.e. governing, fuel injection, monitoring of engine and its parameters should be all electronic. Diesel Engine Monitoring & Controlling & Controller for Generator Operation Monitoring & Synchronization Function shall be Independent of Each other.

The Diesel Engine shall be complete with the following accessories:-

a) Engine instrument Panel consisting of starting switch/push button, Lube Oil and Pressure Gauges, Water Temperature Gauge, RPM indicator and Hour meter.
b) Low lube oil pressure safety required in Engines, High Water temperature safety for water cooled Engines is required. The safety should include audio alarm and trip facility also to avoid damage to the engine.
c) Radiator.
d) Exhaust silencer of Residential type.
e) 12V/24V starting system complete with starter motor, charging alternator and Cutout.
f) Lead Acid battery of suitable ratings with connecting cables. The batteries shall be supplied in uncharged conditions and of Make :
EXIDE/ STANDARD FURUKAWA/ AMARON/ TATA-GREEN/ AMCO/ LUMINOUS/ PACESETTER.

The Engine should confirm to applicable Emission Norms. The Diesel Engine shall be accepted only which conforms to BIS : 10000/1/2 or BS:5514.

2. <u>ALTERNATOR (LT) :-</u>

The Alternator shall be self – excited, self – regulated of specified KVA rating in three phase at 415 Volts, 50 Hz, 1500 RPM and 0.8 pf lagging (Rating shall be tested at Unity PF). The alternators shall be of brushless type only. The alternators shall be screen-protected drip proof with Min. IP-21 or improved degree of protection for outdoor installations. The class of insulation of the Alternator would be F/H. The rated voltage of Alternator will be 415 V for 3 phase.

Make of Alternator : Kirloskar / Kirloskar Green/ Crompton – Greaves/ Leroy Somer / Trident/ Stamford/ Meccalte.

2A. ALTERNATOR (HT) for 1500/2000/2275/2500 KVA in addition to LT:-

The Alternator shall be self – excited, self – regulated of specified KVA rating in three phase at 3.3/6.6/11KV, 50 Hz, 1500 RPM and 0.8 pf lagging (Rating shall be tested as per standard design of Manufacturer). The alternators shall be of brushless type only. The alternators shall be screen-protected drip proof with Min. IP-21 or improved degree of protection for outdoor installations. The class of insulation of the Alternator would be F/H. The rated voltage of Alternator will be 3.3/6.6/11 KV for 3 phase as per Manufacturer design with Latest amendment.

Make of Alternator : Kirloskar / Leroy Somer / Stamford/ TDPS/ABB/ Siemens.

3. **AMF CONTROL PANEL :-**

Automatic mains failure (AMF) control panel shall be able to start up the DG set and can transfer the load on to D.G. set on mains failure without requiring any human intervention, similarly, on restoration of main supply, it shall be able to transfer the load to mains supply and switch off the D.G. Set automatically.

The AMF panel enclosure should be with the IP-53 degree of protection and shall be fabricated from minimum 16 SWG thick steel sheet duly pre-treated and aesthetically finished and Power coated.

The AMF Control Panel shall have the following instruments :

a) Microprocessor based relay with composite/separate meter for digital display of :

1. Generator voltage/AC Mains voltage.
2. Generator Current.
3. Load Current.
4. Power Factor.
5. Frequency.
6. Energy.
7. Three attempts engines start/ engines cranking relay.
8. On delay timer for load change over.

9. On delay timer for engine shut off.

b) Mode selector switch for setting the panel on any one position such as off or auto or manual or test.

c) Engine On-Off switch (Push button type)

d) MCCB/Fuses of suitable rating shall be provided.

e) Rectangular Aluminium Bus Bars (one number for each phase, neutral and Earthing terminal) of adequate ratings duly colour coded with heat shrinkable PVC Sleeves or Copper Cables.

f) Two contactors/ACB of suitable rating (one for DG set & one for AC mains) with over load relay.

g) Under + Over Voltage Relay.

h) Automatic Battery charger with on-off switch, voltmeter and ammeter for charging the battery from mains. This will be addition to the battery charging alternator fitted on the engine.

i) Instrument & Control Fuses/MCB.

j) Four number indicating lamps to indicate 'load on mains' 'set running' 'load on set'and 'battery charger on'.

k) Audio visual alarm for 'Low lubricating oil pressure' High water temperature' (for water cooled), 'Start failure', and 'DG overload'

l) Any other switch, instrument, relay or contactor etc. essential for smooth and trouble free function of DG set with AMF Panel (to be specified by the tenderer in their offer with complete detail of the item).

m) All Electro components/ parts such as MCCB/ MCB/FUSE/ Contactor/ Meters should be of L&T/ ABB/ SCHINEDIER/AE/ENERZON/GE/HAVELLS/ SIEMENS make.

4. **MANUAL CONTROL PANEL (LT)** :-

The Control Panel shall be made out of fabricated sheet 16 gauge (min) thick duly powder coated of suitable size for indoor/outdoor floor mounting installation. Aluminium Busbar/copper cables, internal wiring

with suitable provision for / connection incoming/ outgoing leads. The Control Panel shall include following instruments :-

a. Composite meter for digital display of
   i. Voltage
   ii. Current.
   iii Frequency
b. One MCB/MCCB/ACB of suitable Rating.
c. Push Button switch for on off operation.
d. Indication lamps.
e. Automatic Battery charger with on-off switch, voltmeter and ammeter for charging the battery from mains. This will be addition to the battery charging alternator fitted on the engine.

4A. **MANUAL CONTROL PANEL (HT)** :-

The Control Panel shall be made out of fabricated sheet 14 gauge (min) thick duly powder coated of suitable size for outdoor floor mounting installation. Aluminium Busbar, internal wiring with suitable provision for / connection incoming/ outgoing leads. The Control Panel shall include following instruments :-

a. Composite meter for digital display of
   i. Voltage
   ii. Current.
   iii Frequency
b. One VCB of suitable Rating.
c. Push Button switch for on off operation.
d. Indication lamps.
e. Automatic Battery charger with on-off switch, voltmeter and ammeter for charging the battery from mains. This will be addition to the battery charging alternator fitted on the engine.
f. Neutral Ground Resistor (NGR) Panel suitable for 3.3/6.6/11KV shall be included with HT Manual Control Panel.

5. **SOUND PROOF ENCLOSURE (CANOPY)**

The generator shall be in a sound proof (Acoustic) enclosure suitable for Diesel Generating Set complete in all respect having following specification/ Feature:-

Fabricated as per standard specification of manufacturer, stuffing done with suitable Foam/ Rock wool. Rock wool supported with Tissue Paper or perforated sheets having holes. Residential type silencer provided to lower the noise of exhaust outlet. Canopy treated for antirust with powder coating. Should have fresh Air inflow and proper ventilation. Modular in construction and provided with lockable doors. The Sound proof enclosure shall be strictly as per CPCB prevalent norms. The sheet thickness should be 18 gauge (min) as per manufacturer standard and as per CPCB rules.

CABLING :

Supply & erection of underground Aluminum armoured cable ISI mark including necessary connections, thimbling, glands alongwith digging & re-filling of cable trenches, complete in all respect, inclusive of cost of earth excavation. Makes Finolex, Havells, Gloster, Grandlay, Polycab, RR Kabel, Plaza, Kalinga, Hyglow (ISI Marked) suitable for D.G. Set as per manufacturer standard / recommendation.

SWITCHES : Change over switch, Supply & erection of change over switch, TPN on angle iron frame including earthing, necessary connections complete in all respect, Make:- Havells, MEX, SSK, Standard, DPPL, Crystal , C&S – Capacity 630, 800, 1000, 1250 Amps.

Main Switch :- I) Supply & Erection of following Main switches, TPN Re-wireable/HRC on angle iron frame including earthing necessary connections complete in all respect, Make:- MEX, SSK, DPPL, Standard, Havells, Crystal. Capacity 630, 800, 1000 Amps.

EARTHING

a) Supply and erection of plate earthing as per IS specification with 600mm x 600mm x 3mm of copper plate below ground upto 2.13 meter with 20mm x 3mm copper strip of electrolytic grade as per specification. The strip is to be inserted through G. I. pipe of medium class of suitable size. Earthing should be complete with charcoal, salt & provision of watering arrangement & manhole cover of size 1 ft x 1ft

including all bricks masonary work, digging & refilling etc., complete in all respect as required inclusive of the cost of earth excavation work & required material.

b) Supply and erection of copper strip earthing of 25mm x 3mm copper earth strip & suitable size medium class GI pipe including all necessary material and termination etc. complete in all respect.

c) Foundation of DG set will be made suitable for capacity of DG set as under:
Specification:- Const. of foundation for Diesel Generator of size length and width 300mm more all around the DG set having foundation with 150mm CC 1:4:8 with stone aggregate 40mm nominal size in foundation and brick work in cement motor 1:6:600mm (300mm underground and 1000mm above ground) and earth filling inside and cement concrete 1:1:5:3 slab with stone aggregate 20mm nominal size with steel reinforcement 10mm dia 150mm center to centre both way. Including cement plaster 1:4 all around as per PWD specification and up to entire satisfaction of Engineer-In-Charge of work.

TECHNICAL BID DOCUMENTS

a. Compliance report of the NIT specifications.

b. Manufacturing proof i.e. SSI Registration Certificate/ Large Medium Registration Certificate or any other proof in case of original manufacturer.

c. G. S.T. Registration No. & details alongwith attested copy of that.

d. Copy of PAN card & PAN details including the details of Assessing Authority.

e. Complete tender form duly stamped & signed on each page must be put in Technical Bid without quoting rates/ taxes and duties.

l. Any other supporting technical documents.

PAYMENT TERMS:

For D.G. Set supply:

90% shall be released after successful delivery at Site.

Balance 10% after satisfactory installation & commissioning at Site.

AMC for DG Set:

Quarterly Payment shall be released supporting with 10% Bank Guarantee.

Regarding downtime penalty shall be AMC + 10% if AMC service not rendered by the bidders.

DELIVERY PERIOD:

3 months for supply of material.

NOTE :

All other remaining documents other than mentioned above be put in the Technical Bid as per requirement of the NIT.

TERMS & CONDITIONS :-

1. **F.O.R.**
Destination anywhere in Haryana, Chandigarh and other Haryana government offices located outside the State.

2. The bidder must submit authority letter from Diesel Engine manufacturer alongwith valid Nodel Agency Certificate for DG Sets in Diesel engine manufacturer name, failing which offer will be rejected straightway.

3. DG sets shall meet the requirements of Environmental (Protection) Rules 1986 as laid down by Min. of Environmental & Forests read with GSR 371 (E) dated 17.2.2002. GSR 520 (E) dated 1.7.2003 and No.448 (E) dated 12.07.2004 in respect of noise and emission norms. The supplier shall furnish copy of Type approval certificate from authorized agency for emission norms and noise level norms for each DG Set giving detail of Model No. of Engine and Alternator which such approval is applicable. The tenderer shall furnish copy of COP for each Model of DG Set form and authorized agency with the tender.

4. **Warrantee**: One year from the date of satisfactory trial working of sets or commissioning at destination.

5. Rates of AMC including parts (Comprehensive) for 5 years after the warrantee period.

6. **AUTHORITY LETTER**
In case offers are submitted by the Authorised Dealer, letter of Authority from the Diesel Engine manufacturer to quote rates on their behalf must be furnished alongwith their offers, duly supported with the documents as required above. The authority letter must be signed and stamped by the Proprietor/ Partner/ M.D./ Director/ Manager of the firm/ company and must be valid for the period of rate contract.

7. **INSPECTION : (FOR GENUINESS OF MATERIAL)**
The stores for inspection may be offered to this office within the stipulated delivery period and the inspection will be carried out by the representatives of the indenting Deptts. before despatch of D.G. Set at Diesel Engine

manufacturers premises. You are, therefore, requested to keep adequate stock ready for inspection at your godown and dispatch only such material, which has been duly inspected and accepted. The inspection of stores shall only be arranged after execution of agreements.

SECURITY is to be kept till expiry of warrantee period by the office of Director General Supplies & Disposals Haryana.

8. **SPARES AVAILABILITY:**
   Guarantee that the equipment being offered is the latest model and that spare for the equipment will be available for a period of at least 10 years and also guarantee that they will keep the institution informed of any update of the equipment over a period of next 10 years.
9. Tenderer should also have Service Centers throughout Haryana & Chandigarh. He should submit list of such Authorised Service Centres along with complete address Phone Nos. and Email etc.

CONDITION :
The Diesel Generating Sets above 1000 KVA, which are not approved from Central Pollution Control Board nodel agency, have to submit Performance Certificate of approx. 25 Nos. Diesel Generating Sets from 1010 KVA to 2500 KVA which are installed with Govt. Departments or Private Consumers with minimum 2 years performance.

FINANCIAL DOCUMENTS :-

Rates offered must be quoted including Taxes, Duties including GST, Freight, etc.

ADDITIONAL CONDITIONS FOR OPERATION AND MTC. CONTRACT

1. AMC means annual comprehensive maintenance contract after completion of free
2. maintenance period specified in the agreement.
3. The work will be carried out as per relevant IS: Specifications and other general codes and practices.
4. GST / Income Tax/ labour cess as and if applicable will be deducted from all bills. However, certificate for TDS will be issued by the department.
5. The jurisdictions of court shall be at concerned district head quarter.

6. After expiry of free maintenance period, AMC shall come into force. AMC charges for first year will be calculated on updated value of original work contract agreement. The first maintenance period will be from expiry of free maintenance period.

7. The firm will maintain a reasonable inventory of genuine spares parts in their service depot, so that faults in the system do not remain unattended for want of spares. During the free maintenance period lift will have to be maintained and inspected regularly.

8. The firm will deploy only trained and appropriate skilled personnel to keep the equipment properly adjusted and they will use all reasonable care to maintain the elevator in proper and safe operating conditions,

9. This maintenance contract includes replacement of all minor and major parts/assemblies including their cost and cost of all other material/consumable and tools etc. and labour required to maintain these lifts in proper working order.

10. The firm shall remove the breakdown during or after working hours and even on holidays on receipt of information at the firm control station from the authorized representatives of PW (B&R) Department or the client department in whose premises the system is working. The firm will intimate the complaint number to the complainant at the time of reporting the breakdown .Machine room / Control room keys shall be made available to authorized technician of the firm on arrival at site. The break-down rectification report shall be signed by the department for record of issue of spares and keeping time record of the firms service personnel. The firm personnel will also sign the log book of respective system in token of attending the complains & removal of defects and other observations recorded by department officers /officials to complete satisfaction.

11. The firm shall set right the system in working condition within 24 (Twenty four) hours for the minor defects and within 4(four) days including day of complaint for the major breakdown after receipt of the complaint at their center, if service center of the firm exists at that station and within 48(Forty Eight) hours and 6(six) days for minor and major breakdown respectively, in case service center of the firm does not exist at that station. If the complaint is not attended within the specified period ,beside not paying AMC charges for delayed period, compensation of two days AMC charges for every delay of one day or part thereof shall be levied ,but the total amount of compensation during a year shall not exceed 10% (Ten Percent) of the annual maintenance charges of relevant year. The Superintending Engineer on

representation from the firm may reduce the amount of compensation and his speaking decision in writing shall be final. Even after levying the compensation equivalent to 10 % (Ten percent) of the contract amount if the firm does not attend the complaint, the firm will not be paid AMC for the defaulting period.

12. Any work which may be rendered necessary due to revision of the existing Govt. Municipal or elevator acts promulgated subsequent to the date of installation of system or new design/development/modernization work will not be covered under maintenance contract.

13. The firm shall become liable for compensation in accordance with the Indian law and Regulations in the event of any accident occurring to any person due to the fault in the system on account of failure to keep the system in proper working order or non compliance of statutory provision for safety measures.

14. The parts if replaced by the firm shall be OEM parts matching with the existing equipment. Defective/removed /unserviceable parts will be the property of the firm.

15. The bill of maintenance charges should be properly prepared and scrutinized by the Chartered Accountant of the firm with the supporting papers of price indices at the time of submission of first maintenance contract bill of financial year.

16. After completion of maintenance contract or termination of contract mid way due to any reason what-so-ever, the firm will hand over the system in working order with every parts /assembly intact. In case, if any part / assembly is found missing/defective or of sub standard specifications due recovery will be made for such a deficiency and other measures to effect such recovery as deemed fit will be taken against the firm.

17. The department will have prerogative to discontinue the maintenance contract of any or all the lifts without assigning any reason at any time without paying any compensation for such an act. However, a valid one month notice will be given before taking any such action as mentioned above or maintenance charges will be paid for the period for which notice falls short.

18. Separate agreement of operation & AMC shall be prepared yearly on agreed rates, terms and conditions on completion of one year free maintenance period. It shall stand concluded and will become operative

from the next day of expiry of free maintenance period even without signing of contract agreement.

19. 10% (Ten percent) security shall be deducted from each bill of the firm subject to maximum 5% of agreement value and shall be refunded after completion of Operation & AMC period. Or alternatively security can be deposited by the firm in shape of bank guarantee for the required amount and validity i.e upto expiry to 5 years after completion.

20. These additional conditions shall supersede the similar conditions found contrary elsewhere in DNIT.

ADDITIONAL CONDITIONS FOR SUBSTATION/ OVER HEAD HT/LT AND DG SET

1. The transformer, G.O switch LT panel, Shall be got inspected / approved from Engineer-in-Charge or his authorized representative before its installation at site. The inspecting authorized / approving authority may get tested the above noted items at the work of manufacture's firm, if desired by the inspecting / approving authority.

2. The contractor shall be responsible for getting inspected / passed the electrical substation from Chief Electrical inspector, Haryana, Chandigarh & he will also make necessary payments of fees for this purpose to his office. The department will however give render necessary assistance to the contractor in this regard.

3. All testing charges of the various equipments of electrical substation required by DHBVNL authorities will be borne by the contractor.

4. The Contractor shall submit the original manufacture's test certificate in respect of DG set, Transformer, LT panel, HT panel MCCB's, PVC armored underground LT cable, XLPE 11 KV cables, CT's, PT's, Isolator and electronics Digital metering panel.

5. The Voltmeter, Amp. Meter etc. will be of AE / IMP make.

6. The tenderer must be himself 'A' class electrical contractor license holder from Chief Electrical inspector, Haryana for execution of 11 KV works and is specialized for doing the same type of works.

7. The Air Circuit breaker and MCCB in LT panel shall be of same make.

8. The material and installation will be got checked by the contractor from local DHBVNL authorities during execution. Makes as approved by DHBVNL will be allowed.

9. It will be mandatory for contractor to get the complete installation cleared / approved from CEI Haryana after completion. The inspection fee will be deposited by the firm. Metering equipment will also be got cleared from DHBVNL by the contractor including depositing necessary fee etc.

10. All material will be got inspected from department before dispatch to site of work.

11. Firm / contractor will offer inspection of all major materials at manufacturer place and will bear the to and fro including boarding & loading expense.

ADDITIONAL CONDITIONS FOR EPABX, LAN, FIRE ALARM, PUBLIC ADDRESS, CCTV CAMERAS AND INFORMATION DISPLAY SYSTEM/BMS/AUDIO VISUAL SYSTEM

1. Bidders to submit along with the data sheet of their make & model as per BOQ along with their technical bid.
2. Bidders should submit along with technical bid certificate from OEM regarding technical compliance of their model as per technical specification attached on their letter head.
3. Bidder should submit along with technical bid certificate from OEM that their products/ Brands are not debarred / blacklisted from Govt. semi Govt. deptt. / Undertaking.
4. The bidder to submit the authorization letter from OEM along with technical bid
5. Bidder to submit backup guarantee of principle manufacturer.
6. In addition to above the contractor will have to arrange certificate from OEM that the installation have been checked by him and the material installed is genuine and the OEM stands for back up guarantee of material/ equipment's.
7. Bidder should submit list of works executed & their performance certificates of similar work in addition to the above contractor.

NONE SUBMISSION OF ABOVE ALONGWITH TECHNICAL BID WILL LEAD TO OUTRIGHT REJECTION OF TECHNICAL BID ADDITIONAL CONDITIONS FOR OPERATION AND MTC. CONTRACT

1. AMC means annual comprehensive maintenance contract after completion of free

2. maintenance period specified in the agreement.

3. The work will be carried out as per relevant IS: Specifications and other general codes and practices.

4. GST / Income Tax/ labour cess as and if applicable will be deducted from all bills. However, certificate for TDS will be issued by the department.

5. The jurisdictions of court shall be at concerned district head quarter.

6. After expiry of free maintenance period, AMC shall come into force. AMC charges for first year will be calculated on updated value of original work contract agreement. The first maintenance period will be from expiry of free maintenance period.

7. The firm will maintain a reasonable inventory of genuine spares parts in their service depot, so that faults in the system do not remain unattended for want of spares. During the free maintenance period lift will have to be maintained and inspected regularly.

8. The firm will deploy only trained and appropriate skilled personnel to keep the equipment properly adjusted and they will use all reasonable care to maintain the elevator in proper and safe operating conditions,

9. This maintenance contract includes replacement of all minor and major parts/assemblies including their cost and cost of all other material/consumable and tools etc. and labour required to maintain these lifts in proper working order.

10. The firm shall remove the breakdown during or after working hours and even on holidays on receipt of information at the firm control station from the authorized representatives of PW (B&R) Department or the client department in whose premises the system is working. The firm will intimate the complaint number to the complainant at the time of reporting the breakdown. Machine room / Control room keys shall be made available to authorized technician of the firm on arrival at site. The break-down rectification report shall be signed by the department for record of issue of spares and keeping time record of the firm's service personnel. The firm personnel will also sign the log book of respective system in token of attending the complains & removal of defects and other observations recorded by department officers /officials to complete satisfaction.

11. The firm shall set right the system in working condition within 24 (Twenty four) hours for the minor defects and within 4(four) days including day of complaint for the major breakdown after receipt of the complaint at their center, if service center of the firm exists at that station and within 48(Forty Eight) hours and 6(six) days for minor and major breakdown respectively, in case service center of the firm does not exist at that station. If the complaint is not attended within the specified period ,beside not paying AMC charges for delayed period, compensation of two days AMC charges for every delay of one day or part thereof shall be levied ,but the total amount of compensation during a year shall not exceed 10% (Ten Percent) of the annual maintenance charges of relevant year. The Superintending Engineer on representation from the firm may reduce the amount of compensation and his speaking decision in writing shall be final. Even after levying the compensation equivalent to 10 % (Ten percent) of the contract amount if the firm does not attend the complaint, the firm will not be paid AMC for the defaulting period.

12. Any work which may be rendered necessary due to revision of the existing Govt. Municipal or elevator acts promulgated subsequent to the date of installation of system or new design/development/modernization work will not be covered under maintenance contract.

13. The firm shall become liable for compensation in accordance with the Indian law and Regulations in the event of any accident occurring to any person due to the fault in the system on account of failure to keep the system in proper working order or non-compliance of statutory provision for safety measures.

14. The parts if replaced by the firm shall be OEM parts matching with the existing equipment. Defective/removed /unserviceable parts will be the property of the firm.

15. The bill of maintenance charges should be properly prepared and scrutinized by the Chartered Accountant of the firm with the supporting papers of price indices at the time of submission of first maintenance contract bill of financial year.

16. After completion of maintenance contract or termination of contract midway due to any reason what-so-ever, the firm will hand over the system in working order with every parts /assembly intact. In case, if any part / assembly is found missing/defective or of substandard specifications due recovery will be made for such a deficiency and other measures to effect such recovery as deemed fit will be taken against the firm.

17. The department will have prerogative to discontinue the maintenance contract of any or all the lifts without assigning any reason at any time without paying any compensation for such an act. However, a valid one month notice will be given before taking any such action as mentioned above or maintenance charges will be paid for the period for which notice falls short.

18. Separate agreement of operation & AMC shall be prepared yearly on agreed rates, terms and conditions on completion of one year free maintenance period. It shall stand concluded and will become operative from the next day of expiry of free maintenance period even without signing of contract agreement.

19. 10% (Ten percent) security shall be deducted from each bill of the firm subject to maximum 5% of agreement value and shall be refunded after completion of Operation & AMC period. Or alternatively security can be deposited by the firm in shape of bank guarantee for the required amount and validity i.e upto expiry to 5 years after completion.

20. These additional conditions shall supersede the similar conditions found contrary elsewhere in DNIT.

21. AMC (Annual comprehensive maintenance contract) during next four years after free mtc period will be paid as below: -

(a) 1st year after free mtc period @ 3%
(b) 2nd year after free mtc period @ 3.5%
(c) 3rd year after free mtc period @ 4 %
(d) 4th year after free mtc period @ 4.5% of original work.

ADDITIONAL CONDITION FOR MAINTENANCE OF HVAC SYSTEM

1. The firm shall set right the breakdown in working condition within 24 hours for the minor defects and 48 hours for the major breakdown after receipt of the complaint at their centre. If the complaint is not attended to within the specified period and monthly examination is not done on due date compensation for delayed period, compensation @ 0.5% work done of original work for every delay of one day or part thereof shall be levied but the total amount of compensation shall not exceed 5% of the work done of original work. The Superintending Engineer may, on representation from the firm, reduce the amount of compensation and his decision in writing shall be final. It the firm does not attend to the complaint / monthly examination for further four days of the above specified period i.e. 24 and 48 hours the same shall be got attended to at his risk and cost from other source.
2. The firm will also attend to the breakdown after normal working hours, if necessary, to keep the system in working condition. In a such case department will provide necessary assistance but no extra charges will be paid.
3. The part, if replaced by the firm shall be OEM parts matching with the existing equipment. Defective / removed parts will be the property of the firm.
4. The department will have prerogative / option to discontinue the maintenance work of complete / part system without assigning any reason at any time without paying any compensation for such an act. However, a valid one month notice will be given before taking any such action as mentioned above or maintenance charges will be paid to firm for the period for which notice falls sort.
5. All T&P items required shall be of the agency.
6. The successful tenderer will have to train two persons nominated by the department for proper handling and minor routine maintenance.
7. The system will have to be serviced & demonstrated once in every three months during defect liability period free of cost.
8. **Retention Money for AMC**
   10% (Ten percent) retention money shall be deducted from running bills subject to a maximum of 5% of the agreement amount and shall be refunded 100% after completion of work to the satisfaction of Engineer-in-Charge and handing over (back) complete installation in good / working condition. However, retention money can be released against unconditional Bank Guarantee in favour of department valid for 60 days beyond AMC period.
9. The firm shall become liable to pay compensation in event of any accident occurring to the person using or intending to use the system instrument due to the fault in the system on account of non keeping the system in proper working order and other safety measures.

SPECIAL CONDITIONS FOR COMPREHENSIVE MAINTENANCE CONTRACT (HVAC)

After completion of the installation the firm shall get the installations inspected from authorized person deputed by department and prepare as built drawings with complete detail of installations along with inventory of equipment with their make Sr. No. model size etc.. the firm shall also obtain a certificate of OEM of the equipment installed for proper installation and backup guarantee by OEM of major items.

The firm after successful completion of the work, shall stand guarantee for all material, equipment and installation for one year from date of completion. This will include repair, replacement and all labour of all installation including consumable items if any. **This will be treated as free maintenance period. The firm will hand over the system as per para above before completion of Defect Liability period / free maintenance period free maintenance period / Defect Liability of period will be considered as extended till hand over the system**. **The decision for allotment of maintenance work will be on the discretion of client department.** However for operation of system during this period the firm shall be paid @ 2% of the value of original work done. The decision for allotment of operation and maintenance work will be allotted on the discretion of client department.

After completion of free maintenance period of one year from the date of completion as above, the firm will be bound to carry out paid comprehensive maintenance i.e. repair and replacement of all installations including consumable items etc. and operation of system for next Four year for which the firm will be paid as under: -

A.

1. For 1st year (After free maintenance period or actual handover the system to Client deptt. whichever is later) @ (4%+2%=6% of the original work done.
2. For 2nd year @ 6.60% of the original work done.
3. For 3rd year @ 7.26% of the original work done.
4. For 4th year @ 8% of the original work done

NOTE:-

The contractor would submit an affidavit in the technical bid that he shall undertake to carry comprehensive maintenance as brought out in the DNIT. In case of failure to do so, the department is at liberty to take any due action including proceeding under criminal negligence against the firm / contractor.

Payment of this maintenance will be done on quarterly basis. After deducting the statutory taxes.

Other terms and conditions of comprehensive maintenance contract have been as depicted under heading addition condition for free maintenance period and annual maintenance contract of this DNIT.

IMPORTANT:-

After completion testing and commissioning the installations will be handed over to the authorized authority of Hospital. The contract for operation

and comprehensive maintenance contract_on the rates terms and conditions for the period as per this DNIT / Agreement will be done with the firm by authorized authority of Hospital. The firm will be bound to carry out the comprehensive maintenance and operation contract accordingly for which necessary payments etc. will be done by Hospital authority.

Note:- Operation means day and night around the year (24x7x365)

TECHNICAL SPECIFICATION FOR

FIRE FIGHTING SYSTEM.

SPECIAL CONDITION FOR FIRE FIGHTING WORKS

1. SCOPE OF WORK

The scope of work covers the supply, installation, erection testing, commissioning of followings :

a) Internal hydrant system.

b) External hydrant system.

c) Related piping with all accessories.

d) All type of valves, connections, headers.

e) Hydrant valves, hose reel, hose pipes, Fire hose cabinets etc.

f) Electrical and diesel operated Fire fighting pumps with all accessories.

g) Electrical works, Panels, cables and earthing.

h) Automatic sprinkler system with accessories.

i) Fire extinguishers.

j) All other allied and necessary equipment and accessories to complete the system up to the satisfaction of engineer-in- charge and for proper functioning of the entire system.

k) The system shall be maintained by the contractor at its cost by the contractor for a period of 3 years from issue of completion i.e The Defects Liability-cum-Maintenance period for the work and system is 3 years with all the cost borne by the contractor.

l) Contractor shall carry out successful mock drill and provide training to the user's staff and also educate them about fire fighting on quarterly basis for 3 years.

It will be the responsibility of the contractor to get all **approval and completion certificate** from the Local Fire Authorities without which the work will not be considered complete and will not be taken over. The contractor shall bear all the expenses required to obtain these certificates. The contractor has to prepare the necessary drawings and documents for the submission to fire authorities. Nothing extra will be paid for the work done and follow up by him in this regard. However, any statutory fees paid by the contractor shall be reimbursed by the client on depositing the proper receipt.

The complete installation of Fire Fighting System shall strictly confirm to the minimum specifications and guidelines given in NBC – 2005 (part IV), IS : 15105 for sprinkler system, IS : 13030 for external hydrant system, other relevant IS code of practice and Haryana PWD/ CPWD specifications (part V) amended up to date.

2. FEE AND PERMITS

It will be the responsibility of the contractor to get all approval and completion certificate from the Local Fire Authorities without which the work will not be considered complete and will not be taken over. The contractor shall bear all the expenses required to obtain these certificates. The contractor has to prepare the necessary drawings and documents for the submission to fire authorities. Nothing extra will be paid for the work done and follow up by him in this regard. However, any statutory fees paid by the contractor shall be reimbursed by the client on depositing the proper receipt.

3. GUARANTEES / DEFECT LIABILITY PERIOD

a) The contractor shall provide guarantee against manufacturing defects for 36 months from the date of actual completion or complete and satisfactory handing over to the Client whichever is later.

b) In the event of failure of any particular part of any equipment more than three times during the guarantee period. It shall not be repaired but the complete part shall be replaced by the contractor and the guarantee for this particular part shall be extended by one year from the date of last replacement.

c) In case it is found that the above mentioned failure is due to some connected part of the equipment, that part shall also be rectified or replaced by the contractor to avoid such failure. The guarantee for such replaced part shall be extended by one year from the date of replacement.

In the event of failure of any particular equipment which fails more than three times during the guarantee period as mentioned in clause-b above, the contractor shall replace at his own cost that equipment with another equivalent make as approved by the consultant/engineer-in-charge.

Manufacturer's/Contractor's guarantee as mentioned in clause-b above for such replaced equipment shall be kept valid at least for one year from the date of last replacement.

d) For electrical motors during the guarantee periods in case some important part of motor like starter winding shaft bearing squirrel cage, motor etc. become defective the guarantee shall cover their complete replacement and no repairs shall be allowed.

4. SITE CONDITIONS

It is assumed that before tendering the Contractor would have visited the site and familiarized himself with all the local conditions and means of transportation and communications. No claim of whatsoever nature would be entertained at a later date on account of the Contractor's ignorance of the local conditions.

5. WORKMANSHIP

The workmanship shall be best of its kind and shall conform to the specifications, as below or Indian Standard Specifications in every respect or latest trade practices and shall be subject to approval of the Architects/consultants. All materials and/or Workmanship which in the opinion of the Engineer is defective or unsuitable shall be removed immediately from the site and shall be substituted with proper materials and / or workmanship forthwith.

All electrical works shall be carried out only by those Contractors who are licensed by the concerned local authorities to execute this type of work.

6. RATES

The rates mentioned in the schedule of quantities / to be quoted for any particular item by the tenderer are / shall be inclusive of the cost of material, erection, connection, testing, labour, supervision, tools, plant, transportation, storage, insurance, excise duty, local taxes, contingencies, breakage, wastage and all other sundries for execution at any level, depths, leads and height. Nothing extra shall be payable to him on these account.

The rate shall also be inclusive of cutting holes, making chases in RCC or brick, making good the same, providing sleeves for crossing of pipes, hangers for supports etc. No claim for extra would be entertained on this account.

7. DISCREPANCIES IN THE DRAWINGS

If there is any discrepancy due to in-complete description, ambiguity or omission in the drawings and other documents relating to this Contract found by the Contractor either before starting the work or during execution or after completion, the same shall be immediately brought to the attention of the Architect/Consultant and his decision would be final and binding on the Contractor.

8. MATERIALS

All materials to be supplied by the Contractor shall be new, best of their kind and shall confirm to the latest Indian standards. All packed items shall arrive at site in original packing only. Any items found defective or damaged shall be replaced by the Contractor at his own expenses.

9. INSTRUMENTS FOR MEASUREMENT AND TESTING

The Contractor shall provide, free of cost, all equipment, instruments, labour and all other allied assistance required by the Architect/Consultant or their representatives for measurement and testing of the works.

10. UP-KEEP OF THE SITE

It shall be the responsibility of the Contractor to clear away, from time to time all debris and excess material generated by the activities of his workers.

11. PROTECTION

All work shall be adequately protected, to the satisfaction of the Architect, so that the whole work is free from the damage throughout the period of construction up to the time of handing over.

Before handing over the work, the Contractor shall clean all elements of the complete installation, remove plasters, stickers, rust stains and all other foreign matter and leave every part in acceptable condition and ready for use to the satisfaction of the Architect/Consultant.

12. SAFETY CODES AND LABOUR REGULATIONS

(i) In respect of all labour employed directly or indirectly on the work for the performance of the fire fighting contractor's part of work, the contractor at his own expense, will arrange for the safety provisions as per the statutory provisions, B.I.S recommendations, BOCOW (building & other construction workers) act, workman's compensation act, Haryana PWD code and instructions issued from time to time. Failure to provide such safety requirements would make the tenderer liable for penalty for Rs. 20000/- for each violation. In addition the Engineer-in-charge, shall be at liberty to make arrangements and provide facilities as aforesaid and recover the cost incurred thereon from the contractor.

(ii) The contractor shall provide necessary barriers, warning signals and other safety measures while laying pipelines, cables etc. or wherever necessary so as to avoid accident. He shall also indemnify client against claims for compensation arising out of negligence in this respect.

Contractor shall be liable, in accordance with the Indian Law and Regulations for any accident occurring due to any cause. The client shall not be responsible for any accident occurred or damage incurred or claims arising there from during the execution of work. The contractor shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the contractor due to the above provisions thereof.

13. WORKS TO BE ARRANGED BY THE CLIENT

Unless otherwise specified in the tender documents, the following works shall be arranged by the Client:

(i) Space for accommodating all the equipments and components involved in the work

(ii) One point metered Power supply and Water supply.

14. WORK TO BE DONE BY THE CONTRACTOR

Unless otherwise mentioned in the tender documents, the following works shall be done by the contractor and therefore, their cost shall be deemed to be included in their tendered cost- whether specifically indicated in the schedule of work or not :-

(i) Foundations for equipments including foundation bolts and vibration isolation spring/pads,

(ii) Suspenders, brackets and floor/ wall supports for suspending/supporting pipes.

(iii) Suspenders and/or cable trays for laying the cables.

(iv) Excavation and refilling of trenches in soil wherever the pipes are to be laid directly in ground, including necessary base treatment and supports.

(v) Sealing of all floor slab/wall openings to be provided by the Client for pipes and cables, from fire safety point of view, after laying of the same. (Client's scope).

(vi) Painting of all exposed metal surfaces of equipments and components with appropriate colour.

(vii) Making openings in the walls/ floors/ slabs or modification in the existing openings wherever provided for carrying pipe line, cables etc.

(viii) All electrical works including cable/wires, earthing etc. beyond power supply made available by the contractor.

(ix) Making good all damages caused to the structure during installation, and restoring same to their original finish.

(x) Approval from local fire authorities as may be required as per local bye-laws. (The contractor's responsibility shall be limited to the work executed by him.)

15. COMPLETENESS OF THE TENDER, SUBMISSION OF PROGRAMME, APPROVAL OF DRAWINGS AND COMMENCEMENT OF WORK

Completeness of the tender :-

All sundry equipments, fittings, assemblies, accessories, hardware items, foundation bolts, supports, termination lugs for electrical connections, cable glands, junction boxes and all other items which are useful and necessary for proper assembly and efficient working of the various equipments and components of the work shall be deemed to have been included in the tender, irrespective of the fact whether such items are specifically mentioned in the tender or not.

Submission of programme :-

Within fifteen days from the date of receipt of the letter of award, the successful tenderer shall submit his programme for submission of drawings, supply of equipment, installation, testing, commissioning and handing over of the installation to the Engineer-in-Charge. This programme shall be framed keeping in view the building progress and the priority fixed by Engineer in-charge. Items like piping etc. that directly affect the building progress shall be given priority. Hose pipes, branch pipes, first aid hose reel pipes shall be supplied just before commissioning the system.

Submission of Shop Drawings:-

The contractor shall submit the drawings to the Engineer-in-Charge as per para of "drawings for approval on award of work" for approval before start of work.

Commencement of Work:-

The contractor shall commence work as soon as the drawings submitted by him are approved either in full or in part as the case may be.

16 CO-ORDINATION WITH OTHER AGENCIES

The contractor shall co-ordinate with all other agencies involved at the site of work so that the work of other agencies is not hampered due to delay in his work. Piping, cabling or any other work, which directly affect the progress of work of other agencies, shall be given priority.

18 CARE OF THE BUILDING

Care shall be taken by the contractor during execution of the work to avoid damage to the building. He shall be responsible for repairing all such damages and restoring the same to the original finish at his cost. He shall

also remove all unwanted and waste materials arising out of the installation from the site of work from time to time.

19 COLOUR SCHEME FOR THE EQUIPMENT AND COMPONENTS.

The entire metal work related to fire fighting above ground level shall be painted with red colour shade No. 536 of IS: 5.

20 INSPECTION AND TESTING

Initial Inspection and testing

(i) Initial inspection of materials and equipments at manufacturer's works shall be done by the Engineer-in-Charge or his representative. For item/ equipment requiring initial inspection at manufacturer's works, the contractor will intimate the date of testing of equipments at the manufacturer's works before dispatch. The contractor shall give sufficient advance notice regarding the dates proposed for such tests to the client's representative(s) to facilitate his presence during testing. The Engineer-in-charge at his discretion may witness such testing. Material / Equipments will be inspected at the manufacturer/ authorized dealer's premises, before dispatch to the site by the contractor.

(ii) The client also reserves the right to inspect the fabrication job at factory and the successful tenderer has, to make arrangements for the same.

(iii) The materials duly inspected by Engineer-in-Charge or his authorized representative shall be dispatched to site by the contractor.

(iv) No additional payment shall be made to the contractor for initial inspection/testing at the manufacturer's works by the representative of the Engineer-in-Charge. However, the client will bear the expenses of its representative deputed for carrying out initial inspection/testing.

Final Inspection and testing:

Final Inspection and testing will be done by the Engineer-in-Charge or his representative.

The necessary test certificates shall be submitted before dispatch of material.

The installation will be offered for inspection by local bodies (Chief Fire Officer). The contractor or his representative shall attend such inspection of the Chief Fire Officer, extend all test facilities as are considered necessary, rectify and comply with all observations of the Chief Fire Officer which are part of the agreement and arrange for obtaining necessary clearance certificate in favour of the client. In case the contractor fails to attend the inspection and make desired facilities available during inspection, the client reserves the right to provide the same at the risk and cost of the contractor and impose penalty for the same. The installation will be accepted by the client only after receiving clearance from Chief Fire Officer for the work executed by the contractor under the agreement.

21 SAFETY MEASURES

All equipments shall incorporate suitable safety provisions to ensure safety of the operating personnel at all times. The initial and final inspection reports shall bring out explicitly the safety provisions incorporated in each equipment.

22 TENDER DRAWINGS, DRAWINGS FOR APPROVAL AND AS BUILT DRAWINGS

Tender Drawings

The drawings appended with the tender documents are intended to show the areas for various equipments, tentative pipe routes. The equipments offered shall be suitable for installation in the spaces shown in these drawings.

Drawings for approval on award of the work / shop drawings

The contractor shall prepare and submit following drawings and get them approved from the Engineer-in-charge before the start of the work. The approval of drawings however does not absolve the contractor of his responsibility to supply the equipments/materials as per agreement. In case of any contradiction between the approved drawings and agreement the decision of the Engineer –in-Charge shall be final and binding on the contractor.

(a) Lay out drawings of the equipments to be installed in pump room and terrace.
(b) Drawings showing the detail of erection of entire equipments including their foundations.
(c) Fire drawings showings the layout of entire piping, dia. and length of pipes, hydrant, air vessel, valves and isometric drawings showing connections to various equipment.

(d) Sprinkler drawing indicating layout and sizes of pipe, location of valves, sprinklers etc.
(e) Electrical wiring diagrams for all electrical equipments and controls including the sizes and capacities of the various cables and equipments.
(f) Dimensioned drawings of all electrical and control panels,
(g) Drawings showing details of supports for pipes, cable trays etc.
(h) Any other drawings relevant to the work.

As built Drawings

Three sets of the following laminated drawings shall be submitted by the contractor while handing over the installation to the Client. Out of this one of the sets shall be laminated on a hard base for display in the fire control room. In addition one set soft copy will be given on compact disc.

(a) Installation drawings giving complete details of all the equipments, including their foundations.

(b) Fire drawings giving sizes and lengths of all the pipes and the sizes and locations of all types of valves, and including isometric drawings for the entire piping including the pipe connections to the various equipments.

(c) Line diagram and layout of all electrical control panels giving switchgear ratings and their arrangement, cable feeder sizes and their layout.

(d) Control wiring drawings with all control components and sequence of operations to explain the operation of control circuits.

(e) Schematic diagrams.

DOCUMENTS TO BE FURNISHED ON COMPLETION OF INSTALLATION

There sets of the following documents shall be furnished to the client by the contractor on completion of work :-

(a) As built drawings as mentioned above

(b) 3 sets of manufacturer's technical catalogues of all equipments and accessories.

(c) Operation and maintenance manual of all major equipments, detailing all adjustments, operation and maintenance procedure.

(d) Approval of drawing/scheme by District fire officer.

(e) The contractor/ Agency should arrange approval of fire scheme and fire NOC Certificate from fire authority.

(f) The contractor shall submit the ISI certificate of all the firefighting equipments. Test certificates of Manufacturing company, ISI and

explosive certificate with Serial number of Carbon dioxide type fire extinguishers to the department.

INSTRUCTION MANUAL / TRAINING

The contractor shall furnish in 3 copies details instruction and operation manual to the consultant/engineer-in-charge. The contractor shall guide owner's / client's staff for operation and maintenance of the entire installation for at least fifteen days.

The manual shall contain detailed technical data and drawings for each equipment installed, the erection, testing, operation and maintenance procedures, spare parts manual and recommended spares for 3 years period of maintenance of each equipment.

TECHNICAL SPECIFICATION

FIRE PUMPS

1. SCOPE

This covers the general requirements of water pumps for main fire pump and jockey pump.

2. TYPE

The pumps shall be centrifugal type direct driven with a 3 phase, 415 V ± 10%, 50 Hz., A.C. motor. The standby fire pump shall be driven by diesel engine. The pumps may be either of horizontal split casing (HSC) type with operating speed 1500 / 2900 rpm, or end suction type / solid casing or multi stage with operating speed not exceeding 3000 rpm as specified in the BOQ.

3. RATING

The main fire pumps shall be suitable for continuous operation in the system. The jockey pumps shall be suitable for intermittent operation to built up pressure in the system on account of leakage. The head and discharge requirements shall be as specified in the tender documents. The head shall be suitable for the system and shall take into consideration the pressure drops across the various components in the water circuit as well as the frictional losses.

Pump shall be capable of discharging not less than 150 percent of the rated discharge at a head of not less than 65 percent with the rated head. The shut off head shall not exceed 120 percent of the rated head.

4. MATERIAL AND CONSTRUCTION

(i) The centrifugal pumps shall conform to IS 1520.

(ii) The pump casing shall be of heavy section close grained cast iron and designed to withstand 1.5 time the working pressure. The casing shall be provided with shaft seal arrangement as well as flanges for suction and delivery pipe connections as required.

(iii) The impeller shall be of bronze. This shall be shrouded type with machined collars. Wear rings, where fitted to the impeller, shall be of the same material as the impeller. The impeller surface shall be smooth finished for minimum frictional loss. The impeller shall be secured to the shaft by a key.

(iv) The shaft shall be of stainless steel and shall be accurately machined. The shaft shall be balanced to avoid vibrations at any speed within the operating range of the pump.

(v) The shaft sleeve shall be of bronze or gunmetal.

(vi) The bearings shall be ball or roller type suitable for the duty involved. These shall be grease lubricated and shall be provided with grease nipples/cups. The bearings shall be effectively sealed against leakage of lubricant or entry of dust or water.

(vii) The shaft seal shall be mechanical type, so as to allow minimum leakage. A drip well shall be provided beneath the seal.

(viii) The pumps shall be directly coupled to the motor/diesel engine shaft through a flexible coupling protected by a coupling guard.

(ix) The pump and motor / diesel engine shall be mounted on a common base plate fabricated from mild steel section. The base plate shall have rigid, flat and true surfaces to receive the pump and motor/diesel engine mounting feet. The pump will be perfectly aligned with the motor/engine so as to avoid any vibration during operation.

5. ACCESSORIES

Each pump shall be provided with the following accessories: -

(a) Butterfly valves on suction and discharge (If positive suction is not provided butterfly valve at suction is not to be provided)

(b) Reducers, as may be required to match the sizes of the connected pipe work.

(c) Non-return valve at the discharge.

(d) Pressure gauge at discharge side between pump and the non-return valve.

6. INSTALLATION

(i) The pump and motor assembly shall be mounted and arranged for ease of maintenance and to prevent transmission of vibration and noise to the building structure or to the pipe work.

(ii) The pump and motor assembly shall be installed on suitable RCC foundation. The length and width of the foundation shall be such that 100 mm. space is left all around the base frame. The height of foundation shall be so decided that the total weight of foundation block is 1.5 times the operating weigh of the pump assembly. The foundation shall be isolated from the floor by vibration isolating pads. Angle iron frame of size 35 mm x 35 mm x 3 mm shall be provided on the top edges of the foundation.

(iii) More than one pump and motor assembly shall not be installed on a single base or cement concrete block.

(iv) the suction/discharge pipe shall be independently supported and their weight shall not be transferred to the pump. It should be possible to disconnect any pump for repairs without disturbing the connecting pipe line.

(v) The suitable clearance have to be provided around the fire pumps as per drawings.

(vi) Sufficient space is to be left in front for the radiator of diesel engine for free discharge of hot air. Arrangement for discharge hot air to outside the pump house shall be provided so that hot air does not stagnate in the pump house.

7. OPERATING CONDITIONS

Fire pumps shall operate on drop of pressure in the mains header as given below. The pump operating sequence shall be arranged in such a manner to start the pump automatically but should be capable of being stopped manually by stop push buttons only.

Operating conditions for fire hydrant and sprinkler pumps

	Operating Pressure "a" Kg/Sqcm	**Cut in**	**Cut out**
a.	Jockey pump (Sprinkler system)	"a" – 1.0 Kg/Sqcm	"a" Kg/Sqcm
b.	Jockey pump (Hydrant system)	"a" – 1.5 Kg/Sqcm	"a" Kg/Sqcm

	Operating Pressure "a" Kg/Sqcm	Cut in	Cut out
c.	Sprinkler pump - duty (Electric)	"a" – 2.0 Kg/Sqcm	Manual
d.	Hydrant pump - duty (Electric)	"a" – 2.5 Kg/Sqcm	Manual
e.	Hydrant / Sprinkler - Standby (Diesel)	"a" – 3.0 Kg/Sqcm	Manual

Notes On Starting System

- Jockey pumps shall start and stop through pressure switch automatically.
- Jockey pump shall stop when the main pump starts.
- Main Fire pump shall start automatically on fall of pressure but stopping shall be manual.
- Diesel Fire pump shall start automatically on further fall of pressure but stopping shall be manual.

The 'Cut in' and 'Cut out' pressures shall be reconfirmed at detailed design stage.

DIESEL ENGINE FOR FIRE PUMP (IF PROVIDED)

1. **SCOPE**

This covers the details of requirements of a diesel engine for main fire pump to act as standby.

2. **GENERAL**

The diesel engine shall be suitable for automatic operation complete with necessary automatic starting gear, battery system and shall be complete with all accessories. Both engine and pump shall be assembled on a common bed place, fabricated from mild steel channel.

3. **DRIVE**

The pump shall be only direct driven by means of a flexible coupling. Coupling guard shall be provided. The speed shall be 1500 to 2300 RPM.

4. **DIESEL ENGINE**

a) **Environment conditions-** The engine shall be suitable to operate under the conditions of environment at site

b) Engine Rating- The engine shall be multi cylinder/vertical 4 stroke cycle, water cooled, developing suitable HP at the operating speed specified to drive the fire pump. Continuous capacity available for the load shall be exclusive of the power requirement of auxiliaries of the diesel engine, and after correction for altitude, ambient temperature and humidity for specified environment conditions. The engine rating shall be suitable to drive the pump at 150 percent of its rated discharge with at least 65 percent of rated head. The engine shall have 10% overload capacity for one hour in any period of 12 hours continuous run.

The engine shall be suitable for cold starting for which suitable heaters shall be provided in lubricating oil.

The engine shall develop full load within 15 seconds from the receipt of signal to start. The diesel engine shall conform to BS 649/IS 1601/IS 10002, amended upto date.

c) Engine Accessories- The engine shall be complete with following accessories.

(i) Fly wheel dynamically balanced.

(ii) Direct coupling for pump and coupling guard.

(iii) Radiator with hoses, fan, water pump, drive arrangement and guard.

(iv) Air cleaner dry type.

(v) Fuel service tank with necessary pipe work.

(vi) Pump for lubricating oil and Lub.oil filter.

(vii) Elect. starting battery 12 V /24 V with 2 Nos. battery.

(viii) Exhaust silencer with necessary pipe work.

(ix) Speed Governor.

(x) Instrument panel housing all the gauges, including Tachometer, hour meter and starting switch with key (for manual starting).

(xi) Necessary safety controls.

d) Cooling System- The engine shall be radiator water cooled. The radiator assembly shall be mounted on the engine. The radiator fan shall be driven by the engine as its auxiliary with multiple fan belts. When half the belts are broken, the remaining belts shall be capable of driving the fan. Cooling water shall be circulated by means of an auxiliary pump of suitable capacity driven by the engine in a closed circuit.

e) **Fuel System-** The fuel, system shall be gravity fed from the fuel tank to the engine driven fuel pump. The engine fuel tank shall be mounted either adjacent to the engine are suitably wall mounted on brackets. The fuel filter shall be suitably located to permit easy servicing.

All fuel piping to the engine shall be with M.S. 'C' class pipe with flexible hose connections where required. Plastic tubing shall not be permitted.

The fuel tank shall be of welded steel construction (2 mm. thick) and of capacity sufficient to allow the engine to run on full load for at least 2 hours. The tank shall be complete with necessary floor mounted supports, level indicator (protected against - mechanical injury) inlet, outlet, overflow connections and drain plug and piping to the engine fuel tank. The outlet should be so located as to avoid entry of any sediments in to the fuel line to the engine.

f) **Lubricating Oil System-** Forced feed Lubricating Oil system shall be employed for positive lubrication. Necessary Lub. oil filters shall be provided, located suitably for convenient servicing.

g) **Starting System-** The starting system shall comprise necessary batteries 12 Volts / 24 Volts, starter motor of adequate capacity and axle type gear to match with the toothed ring on the fly wheel. Suitable protection to protect starting motor from excessively long cranking runs shall be suitably integrated with engine protection system.

The capacity of the battery shall be suitable for meeting the needs of the starting system.

The battery capacity shall be adequate for 10 consecutive starts without recharging with cold engine under full compression.

Three attempt starting facility shall be provided. If the engine fails to start after third attempt, the engine shall be locked out and suitable audio-visual alarm shall be giver to indicate engine failure.

The scope shall cover all cabling, terminals, initial charging etc

h) **Exhaust System-** The exhaust system shall be complete with residential silencer suitable for outdoor installation and silencer piping shall be extended up to 1 m above the nearest boundary wall, outside pump house duly insulated with 50 mm. thick glass wool and 1.0 mm. thick aluminum sheet cladding.

i) **Engine shut down mechanism-** This shall be manually operated and shall return automatically to the starting position after use.

j) Governing System- The engine shall be provided with an adjustable governor to control the engine speed within 5% of its rated speed under all conditions of load upto full load. The governor shall be set to maintain rated pump speed at maximum pump load.

k) Engine instrumentation - Engine instrumentation shall include the following:-

(i) Lub. oil pressure gauge.

(ii) Lub. oil temperature gauge.

(iii) Water temperature gauge.

(iv) Tachometer.

(v) Hour meter.

The instrumentation panel shall be suitably mounted on the engine.

l) Engine protection devices - Following engine protection and automatic shut down facilities shall be provided:

(i) Low lub. oil pressure.

(ii) High cooling water temperature.

(iii) High lub. oil temperature.

(iv) Over speed shut down.

m) Pipe work- All pipe lines with fittings and accessories required shall be provided for fuel oil, lub. oil and exhaust systems.

n) Anti vibration mounting- Suitable vibration mounting duly approved by engineer-in-charge shall be employed for mounting the unit so as to minimize transmission of vibration to the structure.

o) Battery Charger- Necessary float and boost charger shall be incorporated in the control section of power and control panel, to keep the battery under trim condition. Voltmeter to indicate the state of charge of the batteries shall be provided.

p) The engine installation shall be approved by the representative of engine manufacturer (who shall carry out after sales service under AMC).

PIPE WORK

1. SCOPE

This covers the requirements of pipe work in fire fighting installations. The work will be executed as per Haryana PWD B&R Specifications as per latest amendment. In case of any discrepancy the Bureau of Indian Standards shall be followed and then CPWD

specifications shall be followed. These will be in order of preference as mentioned below:

i) Haryana PWD (B&R) Specifications.
ii) Bureau of Indian Standards.
iii) CPWD Specifications.

In case, any item is not covered by all three above, then the decision of Engineer-in-Charge shall be final.

2. PLUMBING DESIGN

Pipe sizes shown in tender documents are purely for contractor's guidance. The contractor shall be responsible for selection of sizes as per detailed engineering to be done by him. Plumbing design to be done by the contractor shall incorporate the following:-

(i) (a) Butterfly valves shall be provided at suction and delivery sides of pumps. (If positive suction is not provided valve at suction is not to be provided).

(b) External hydrant

(c) Fire service connection/inlet.

(d) Test valve.

(e) Drain connections.

(ii) For testing the system healthiness and automatic operation on daily basis, one test pipe with butterfly valve shall be provided in common discharge header. For avoiding wastage of water, this pipe shall discharge water in the tank.

(iii) Non return valve shall be provided at the delivery of each pump and fire service inlet. This shall be of swing type.

(iv) Air Cushion Tank and Air release valves with ball valve shall be provided in the piping system for venting trapped air.

(v) Fire drawings showing the sizes of pipe, valves, layout and other details shall be prepared and shall be got approved from the Engineer-in-Charge before the execution of the plumbing work.

4. PIPE MATERIALS

(i) Pipes shall be of the following materials.

(a) Mild steel heavy class (C-class) conforming to IS: 1239 for sizes upto 150 mm. For sprinkler drain pipe the pipe class will be G. I. medium duty (B-class)

(b) Welded black steel pipe, conforming to IS: 3589, for sizes greater than 150 mm. These pipes shall be factory rolled and fabricated from minimum 6mm thick M.S. Sheet for pipes upto 250 mm dia

(ii) Cadmium plated steel nuts/bolts/washers shall be used.

5. PIPE JOINTS

i) For 50 mm dia and above pipe size, Electric welding joints with V groove shall be provided in the M.S.pipe work. For up to 40 mm dia, threaded joints by Teflon tape shall be provided in the M.S. pipe work. Flanged joints to be provided for connections to valves, pumps, vessels etc. and also on straight lengths at suitable points to facilitate erection and subsequent maintenance.

ii) M.S.pipe laid at such locations shall be provided anti-corrosive treatment.

iii) Mild steel flanges shall be in accordance with Table - 17 of IS : 6392 i.e. "Plate Flanges for Welding" and flange thickness shall be as under. Gasket thickness shall not be less than 3 mm.

Pipe dia	Flange Thickness	No. of holes
200 mm.	24 mm.	12
150 mm and 125 mm.	22 mm.	8
100 mm and 80 mm.	20 mm.	8
65 mm.	18 mm.	4
40 mm and below.	16 mm.	4

All hardware items such as Nuts, Bolts, Washers shall be of appropriate size.

Washers shall be used on both sides of the bolt.

6. SLUICE AND BUTTERFLY VALVES

Sluice valve conforming to IS:14846 or butterfly valve conforming to IS: 13095 shall be provided. All valves shall be suitable to with-stand the pressure in the system and rating shall be as per BOQ; All valves shall be right handed (i.e. handle or key shall be rotated clock wise to close the valve), the direction of opening and closing shall be marked and an open/shunt indicator fitted.

(i) The material of valves shall be as under : Body - Cast iron / cast steel
Disc - Stainless
Steel Seat - EPDM

(ii) Non return valves shall be swing check type in horizontal run and lift check type in vertical run of pipe or dual plate type as per BOQ.

7. STRAINERS

Stainless steel strainers shall have 1.6 mm thick screen with 3 mm perforations.

8. ORIFICE PLATE

Orifice plate shall be made of 6 mm. thick stainless steel and shall have an identification tag projecting beyond any flange between which it is clamped. The orifice shall be plain central hole without burs and diameter not less than one-half of the internal diameter of the pipe to which it is fitted.

9. INSTRUMENTS

(i) Pressure gauge of appropriate range and 150 mm. dia size shall be provided.

(ii) The pressure gauge shall be duly calibrated before installation and shall complete with shut off valve.

9A. AIR CUSHION TANK

Air cushion shall be provided on top of each riser, and shall be fabricated out of 8 mm thick M. S. Sheet. The ends shall be dished. This shall be of 250 mm. dia, 1.2 m. high and installed vertically on suitable legs. The legs shall be provided with M. S. Plate of size 75mm x 75 mm x 5 mm at the bottom so that the legs do not puncture the roof. The legs shall be grouted in CC foundation. Flange connection shall be provided for connection with pipe. Air release valve and pressure gauge with shut off valve shall be provided. The air cushion tank shall be tested at 25 kg/cm^2 pressure before installation.

10. PRESSURE VESSEL TANK

Pressure vessel shall be provided inside fire pump house connected to main header of fire pumps and shall be fabricated out of 10 mm thick M. S. Sheet. The ends shall be dished. This shall be of 450 mm. dia, 2 m. high and installed vertically on suitable legs. The legs shall be provided with M. S. Plate of size 75 mm x 75 mm x 5 mm at the bottom. The legs shall be grouted in CC foundation. Flange connection shall be provided for connection with header pipe. Air release valve and pressure gauge with shut off valve shall be provided.

The pressure vessel tank shall be tested at 25 kg/cm2 pressure before installation. Suitable pressure switches shall be installed for automatic operation of fire pumps.

11. INSTALLATION

(i) The installation work shall be carried out in accordance with the detailed drawings prepared by the contractor and approved by the Engineer-in-charge.

(ii) In pipe above ground level, expansion loops or joints shall be provided to take care of expansion or contraction of pipes due to temperature changes.

(iii) Tee-off connections shall be through equal or reducing tees, otherwise ferrules welded to the main pipe shall be used. Drilling and tapping of the walls of the main pipe shall not be resorted to.

(iv) Open ends of piping shall be blocked as soon as the pipe is installed to avoid entrance of foreign matter.

(v) Piping installation shall be supported on or suspended from structure adequately. The contractor shall provide, clamps, hangers etc. in accordance with Para under pipe support

Proper lines and levels shall be maintained while installing exposed pipes.

(vi) The Spacing of fire pipe supports for sprinkler / clevis hanger shall not be more than that specified below: -

Nominal Pipes Diameter (meter)	**Spacing between supports (meter)**	**Hanger rod diameter (mm)**
Up to 25		
32 to 50		
65 to 80		
100		
150		
200 & above		

Extra supports shall be provided at the bends and at heavy fittings like valves to avoid undue stress on the pipes.

(vii) Anti vibration pads, springs or liners of resilient and non-deteriorating material shall be provided at each support, so as to prevent transmission of vibration through the supports.

(viii) Pipe sleeves of diameter larger than the pipe by least 50 mm shall be provided wherever pipes pass through walls and the annular spaces shall be filled with felt and finished with retaining rings.

(ix) (a)Vertical risers shall be parallel to walls and column lines and shall be straight and in plumb. Risers passing from floor to floor shall be supported at each floor by MS angle with clamp as per specification of pipe support

(b) The space in the floor cut outs around the pipes work shall be closed using cement concrete (1:2:4 mix) or steel sheet, from the fire safety considerations, taking care to see that a small annular space is left around the pipes to prevent transmission of vibration to the structure.

(c) Riser shall have suitable supports at the lowest point.

(x) Where mild steel pipes are to be buried under ground the same shall be treated in accordance with Para under anti corrosive treatment before laying. The top of the pipes shall be not less than 100 cms. below the ground level. Where this is not practicable, permission of the Engineer-in-charge shall be obtained for burying the pipes at lesser depth. Masonary or C.C. blocks shall be provided for supporting the pipes at interval in accordance with Para (vi) above. After the pipes have been laid, the trench shall be refilled with the excavated soil in layers of 20 cm. and rammed and any extra soil shall be removed from the site of work by the contractor.

(xi) Underground pipe shall be laid at least 2 m. away from the face of the building preferably along the roads and foot paths. As far as possible laying of pipes under road, pavement and large open spaces shall be avoided. Pipes shall not be laid under building and where unavoidable, these shall be laid in masonry trenches with removable covers.

(xii) To facilitate detection of leak and isolation of defective portion of pipe, valves shall be provided in under ground pipe at suitable locations. As far as possible such valves shall be provided over ground. If the valves are to be provided below ground, suitable masonry chamber with cover plate shall be provided. Locations where vehicles can pass shall be avoided for provision of valve below ground.

(xiii) Pipe over ground shall be painted in red colour shade No 536 of IS : 5 Suitable identification shall be provided to indicate the run of under ground pipe where the route of underground pipe cannot be ascertained from the location of yard hydrant/isolating valves.

(xiv) It shall be made sure that proper noiseless circulation is achieved in the system. If proper circulation is not achieved due to air-bound connections, the contractor shall rectify the defective connections. He shall bear all the expenses for carry out the above rectification, including the tearing up and refinishing of floors, walls etc. as required.

(xv) Thrust blocks shall be installed for underground pipe line wherever there is a change in the direction / size of the pipe line or the pressure line diagram, or when the pipe line ends at a dead end and at locations determined by the Engineer-in-Charge. If necessary, thrust blocks may be constructed at valves also. Thrust blocks (1:2:4 cement concrete) shall be constructed taking into account the pipe size, water pressure, type of fitting, gravity component shell when laid on slopes and the type of soil.

12. PRESSURE TESTING

(a) All piping shall be tested to hydrostatic test pressure of at least the 1.5 times of operating pressure, but not less than 15 kg./sq.cm. for a period not less than 24 hours. All leaks and defects in joints revealed during the testing shall be rectified to the satisfaction of the Engineer-in-Charge.

(b) Piping repaired subsequent to the above pressure test shall be re-tested in the same manner.

(c) System may be tested in sections and such sections shall be securely capped.

(d) pressure gauges may be capped off during pressure testing of the installation.

16.1 ANTI-CORROSIVE PROTECTION ON UNDER GROUND PIPE

Corrosion protection tape shall be wrapped on M. S. Pipes to be buried in ground. This corrosion protection tape shall comprise of coal tar/asphalt component supported on fabric of organic or inorganic fiber and minimum 4 mm. thick and conform to requirement of IS : 10221-Code of practice for coating and wrapping of underground mild steel pipe line. Before application of corrosion protection tape all foreign matter on pipe shall be removed with the help of wire brush and suitable primer shall be applied over the pipe thereafter. The primer shall be allowed to dry until the solvent evaporates and the surface becomes tacky. Both primer and tape shall be furnished by the same manufacturer. Corrosion protection tape shall then be wound around the pipe in spiral fashion and bounded completely to the pipe. There shall be no air pocket or bubble beneath the tape. The overlaps shall be 15 mm. and 250 mm. shall be left uncoated on either end of pipe to permit installation and welding. This area shall be coated in situ after the pipe line is installed. The tapes shall be wrapped in accordance with the manufacturer's recommendations. If application is done in cold weather, the surface of the pipe shall be pre- heated until it is warm to touch and traces of moisture are removed and then primer shall be applied and allowed to dry.

PIPE SUPPORTS

For installing pipes vertically or horizontally inside the building standard pipe supports of reputed make shall be used. Following supports shall be used.

(i) Split pipe support clamps with rubber lining for vertical, horizontal and roof hanging.

(ii) Clevis Hangers for horizontal supports to adjust varying heights.

(iii) Sprinkler Hangers for horizontal supports for pipes from 15 mm dia to 150 mm dia.

Fasteners and fully threaded rods shall be used for installing the pipe supports. The sizes of pipe supports and installation shall be in accordance with manufacturers recommendations.

For pipes of size 100 mm and above, with the prior approval of Engineer-in-Charge, 50x50x6 mm MS angle iron with 'U' clamp with dash fastener may be used for supporting horizontal pipe from ceiling.

14. MEASUREMENT

Measurements of plumbing work shall be on following basis:-

(a) Piping shall be measured along the centre line of installed pipes including all pipe fittings and accessories but excluding valves and other items for which quantities are specifically indicated in the schedule of work. No separate payment shall be made for fittings and accessories.

(b) The rates for piping work shall include all wastage allowances, flanges pipe supports, hangers, excavation, refilling, testing, nuts and check nuts, vibration isolators, suspension where specified or required, and any other item required to complete the piping installation. None of these items will be separately measured and paid.

FIRE FIGHTING ACCESSORIES

1. SCOPE

This chapter covers landing valves, first aid hose reels, hose pipes, branch pipes etc, which are vital tools for fire fighting.

2. LANDING VALVE

Landing valves are provided in the system for connection of hose pipes for discharging water for fighting fire by brigade or trained personnel.

a) The landing valves shall be as per I.S.: 5290

b) The landing valves are of single and double head outlet types as per BOQ.

c) Material of construction.

(i)	Body outlet and cap etc	stainless steel (as per BOQ)
(ii)	Spindle	stainless steel for stainless steel body
(ii)	Hand wheel	Mild steel or cast iron.

Installation

i) The landing valve shall be fitted to a T connection of the riser at the landing in such a way that the valve is in the centre of the internal hydrant opening and at a height of 1 M. from floor level.

ii) The valve base shall be vertical and the valve facing out side. There should be no hindrance in operation of the handle.

3. FIRST AID HOSE REEL

First Aid Hose Reel is meant for delivering small quantity of water in early stage of fire and can be operated even by untrained personnel, and thus provides a most effective fire fighting facility. It consists of a length of 20 mm (nominal internal) diameter hose tubing wraped around a reel with water inlet pipe, stop valve and shut off nozzle. The entire assembly is mounted on a MS wall bracket and can swing 180 degree. The water inlet is connected to the riser pipe by means of 40 mm socket and 20 mm dia valve. The hose tube can be pulled out easily for the purpose of discharge of water on fire.

First aid hose reel shall be as per IS – 884. The coupling, branch pipe and nozzle shall be as per IS:8090.

d) Material of Construction:-

(iii)	Hub and sides:		Aluminium Alloy/ Mild steel/ Aluminium sheets
(iv)	Wall Bracket / Mild steel	:	Cast iron
(v)	Hose tube (20 mm) hose pipe as	:	high pressure rubber braided per IS : 444
(vi)	Nozzle with branch pipe	:	SS (as per BOQ)

Normally M S construction is used. Other material may be used in areas having corrosive atmosphere.

c) The water flow rate shall not be less than 24 lpm and the range of jet shall be not less than 6 meter.

d) Installation

First aid hose reel are installed in suitable size MS cabinet as per BOQ and shall be pained red as per colour shade No. 536 of IS:5. The size & location of the cabinet shall be such that it does not form an obstruction in passage/escape route.

The length of hose tube shall be 30 meter.
There shall be no obstruction in swinging the hose reel and should be installed above landing valve where provided.
The inlet valve shall be at 900 mm above floor level.
Hose reel bracket should be firmly grouted on the wall with the help of rawl bolts / fastener.

4. FIRE HOSE DELIVERY COUPLING, BRANCH PIPE AND NOZZLES

These are important accessories used for fire fighting operations.

Material of Construction - Stainless Steel (as per BOQ).

a) Delivery Hose Coupling's

The delivery hose coupling consist of male half coupling and female half coupling. Groves are provided on outer side on both coupling for binding hose pipes with wires. In female coupling spring loaded cam tooth is provided for holding male half coupling in position. Male half coupling and female half coupling are provided on both sides (i.e. on one side male and on other side female) of hose pipes. Two or more pipes can be joined together with the help of these couplings instantaneously, Sizes:- 63 mm nominal.

b) Branch Pipe and Nozzle:-

Branch pipes with nozzle are mounted at the end of hose pipe. Branch pipe is properly finished and free from sharp edges. During operation, a fireman has to hold the branch pipe. One end of branch pipe is fixed with hose coupling and the other end is threaded to fit the nozzle.
Nozzle is tapered pipe with one end threaded internally which is fixed on branch pipe. The size of other end i.e. nozzle shall be 15 mm. (nominal internal diameter).

5. FIRE SERVICES INLET AND FIRE SERVICE CONNECTION

a) These are provided for connection of fire service hose pipes for either directly pressurizing the system with their pumps or filling water in the tank from a distance. In the first case non return valve with butterfly valve shall be provided for holding water pressure. Fire service inlet shall be provided with each wet riser/down comer and the ring main. These are fixed to 150 mm dia. pipe and located in MS box made of 2 mm thick mild steel with openable glass cover.

b) These shall be as per IS: 904.

Material of Construction - Cast iron body

6. HOSE PIPES

Hose pipes shall be rubber lined woven jacketed and 63 mm in diameter. They shall conform to Type A (Re-inforced rubber lined) of IS:636. They shall be flexible and capable of being rolled. Length of hose pipe will be 15 m.
The hose pipe shall be complete with male and female coupling at the ends. Besides keeping hose pipe with internal and yard hydrant, spare hose pipes along with branch pipes shall be kept in fire control room/pump room.

AUTOMATIC SPRINKLER SYSTEM

1. SCOPE

This covers the general requirement of selection, design, installation, testing commissioning and maintenance of automatic sprinkler system for fire fighting buildings used for other than industrial and storage purpose.

References: For additional information regarding definitions, planning, design, hydraulic calculations, tables etc. following documents are to be referred to.

(i) IS: 15105:- Design and Installation of Fixed Automatic Sprinkler, Fire Extinguisher Systems- Code of Practice.

(ii) IS: 9972:- Specification for Automatic Sprinkler Heads for Fire Protection Service.

2. GENERAL SPECIFICATION

a) The sprinkler heads are to be fixed into heavy duty (C Class) steel pipes, conforming to 1S:1239. The size of pipe will vary from 25 mm to 150mm to suit the hydraulics of the system and in conformity with the guide lines laid down under IS : 15105-2002. The System shall conform to above code for the installation of sprinkler systems in general for 'Moderate Hazard' category-in respect of design, density and spacing of sprinkler heads for basement and parking areas. Whereas “Light Hazard” category is to be used for residential apartment floors. Some important points of the system are mentioned below.

b) The entire system shall be capable of with standing an test pressure of 15 Kg / Sq.cm. or the 1.5 times of operating pressure whichever is higher. All pipe fittings shall be malleable cast iron or ductile iron. Pipe of 40mm dia and less shall have screwed joints.

c) Reduction in pipe sizes shall not be made by use of bushings. All piping shall be done by means of V groove welding, screwed & flanged jointing as per codes.

d) Pipe hanger and clamps: Sprinkler system piping attached to structural members of the building, suitable type of hangers of steel bars or angles painted with zinc chromate and synthetic enamel paint of approved shade to protect from corrosive conditions. Due care shall be taken that sprinklers are not applied with paint at the time of applying paint to piping and fittings.

e) Sprinkler System Test Pipe: A test pipe of 25 mm dia in size with a drain valve to test alarm device shall be provided.

f) All control, drain, test and alarm valves shall be provided with signs to identify their purposes, functions, direction of flow the satisfaction of the Engg-in-charge.

g) Testing: Before connecting sprinkler risers for testing, all piping and devices under pressure including yard piping and fire hydrant connections shall be tested hydrostatically for strength and leakage with pressure not less than 15 Kg/Sq.cm or 1.5 times the working pressure whichever is higher for 24 hour.

3. QUARTZOID BULB AUTOMATIC SPRINKLER

a) Sprinkler heads shall be made of gun metal / quartzoid bulb sufficiently strong, in compression to withstand any pressure, surge or hammer likely to occur in the system. The yoke & body shall be made of high quality gun metal with arms streamlined to ensure minimum interference with the spread of water. The deflector of suitable design shall be fitted to give even distribution of water over the area commanded by the sprinkler.

b) The sprinkler heads shall have current certification of underwriter's laboratory (UL) and Factory Manual (FM) approved. The certificate of acceptance shall be obtained from local fire authorities prior to the procurement of sprinkler heads.

c) The bulb shall contain a liquid having a freezing point below any natural climatic figure and a high coefficient of expansion. The temperature rating of the sprinkler shall be stamped on the deflector. The colour of the liquid filled in the bulb shall be according to the temperature rating as per international standard. The sprinkler heads shall be of type & quality approved by the Chief Fire office of the area.

d) The sprinklers shall have 15 mm nominal size of the orifice for light / ordinary hazard and the orifice size shall be marked on the body or the deflector of the sprinkler.

e) Metal guards for protection of sprinkler against accidental or mechanical damage shall be provided.

4. OPERATING TEMPERATURE

a) The Operating temperature, at which the quartzoid bulb of the sprinkler head shall actuate, shall be 68 degree C or as specifically mentioned.

5. FLOW REQUIREMENTS

a) **Moderate hazard:** The density of water discharge shall be at least 5 lit/min/sqm over an assumed area of operation covering 360 sqm. The flow requirement for sprinkler system shall be 1800 Ipm at not less than 2 bar pressure at installation valve.

b) **Light hazard :** The density of water discharge shall be at least 2.25 lit/min/sqm over an assumed area of operation covering 84 sqm. The flow requirement for sprinkler system shall be 225 Ipm at not less than 2.2 bar pressure at installation valve.

6. PIPE & FITTINGS FOR SPRINKLER SYSTEM

a) Pipes must be of Heavy grade M.S. pipe conforming to IS 1239. The pipes, fittings and installation shall be hydraulically tested to a pressure of 15 Kg/Sq.cm. or 1.5 times the working pressure whichever is higher.

b) Fittings for M.S. pipes shall be of MS (IS 1239) or malleable iron (IS 1879) or Ductile Iron. The fitting of 40 mm dia and less shall be screwed only.

c) All bolt holes & flanges shall be drilled. The drilling of each flange shall be in accordance with the relevant Indian Standard.

d) Flanges shall be faced & shall have jointing of rubber insertions or asbestos compound.

e) All installation pipe work above ground shall be installed at a slope not less than 1:500 for horizontal run of pipes towards the installation control valve for drainage purpose.

f) The necessary MS sleeve of suitable dia and length shall be kept in RCC beams, walls and other structural members during the casting, for the passing of sprinkler piping.

7. ORIFICE PLATES

a) For restricting pressure at lower levels in the sprinkler system, orifice plates of appropriate sizes shall be fitted at different floor levels, at the branching points from Riser Main.

b) The Diameter of such orifice shall not be less than 50% of the dia of pipe into which it is to be fitted, which shall not be less than 50mm dia. These orifice plates must be of stainless steel with plain central hole without burrs, and the thickness shall be 6 mm for pipe size upto 150 mm dia pipes and 9 mm for above 150 mm dia pipe size.

8. PIPES FOR DRAINAGE

a) Sprinkler pipes shall be so installed that the system can be thoroughly drained. As far as possible all pipes shall be arranged to drain to the installation drain valve as shown in the drawing for ordinary hazard system.

b) In the case of basement & other areas where sprinkler pipe-work is below the installation drain valve & in other trapped points in the system, auxiliary valves of the following sizes shall be provided.

i) 20 mm valves for pipes upto 50mm dia.

ii) 25 mm valves for 80mm dia pipe.

iii) 50 mm valves for pipes larger than 80mm dia.

9. PIPE PROTECTION

All pipes & fittings above ground and in exposed locations shall be painted with two coat of zinc chromate primer and two or more coats of synthetic enamel of fire red colour paint.

10. SYSTEM DESIGN

The entire piping for sprinkler installation shall be designed to make it a hydraulically balanced system to fulfill the various requirements of IS: 15105. The guidelines given in the IS: 15105 is minimum prescribed.

11. Components of sprinkler system

Following types of valves of are used in the installations.

i) Stop valve

ii) Test Valve.

iii) Drain Valve.

iv) Flushing Valve.

v) Check Valve.

vi) Installation Valve and Alarm Valve.

vii) Pre action Valves.

viii) Subsidiary Valves.

ix) Alarm Device.

x) Pressure Gauges.

The location of above valves shall be as under.

a) Main Stop Valve:- Only one main stop valve shall be provided immediately after main alarm valve at a location which is readily accessible.

b) Test Valve: For testing hydraulic alarm or electric alarm by drawing water from down stream side, test valve shall be connected with down stream of the water flow alarm.

c) Drain Valve:- For drainage of system, drain valve 50 mm. dia shall be provided down stream of installation valve/stop valve or any subsidiary stop valve.

d) A common valve can perform the functions of test drain. The outlet shall be connected with a 50mm dia G. I. drain pipe along with riser pipes.

e) Flushing Valve -: If the water used for sprinkler is not portable. Flushing valves shall be provided at the end of a distribution pipe. The valve size shall be same as distribution pipe. Valve outlet shall be fitted a brass plug and extended to not more than 3 m. above floor

f) Check Valve:- Check valve shall be provided where more than one water supply is available and same shall be fitted on each water supply pipe.

g) Subsidiary Stop Valve:- Subsidiary stop valve which shall be of the same dia. as the pipe line in which they are fitted shall be provided to control water supply to sprinklers of highly sensitive areas like computer rooms.

h) Installation and alarm Valve:- A sprinkler installation shall be fitted with suitable main installation valve to control water supply to the installation. The valve set shall comprise of following:

i) a main stop valve.

ii) an alarm valve.

iii) a water monitor alarm gong.

The main stop valve shall be placed in the vicinity of the main entrance of the protected area at an easily accessible place. The valve shall be secured open by a pad locked and protected against damage. A location plate shall be fixed near the valve bearing the following words in raised letters: **SPRINKLER STOP VALVE**

Alarm valve shall be fitted on the main supply pipe immediately after the main control valve and before any connection is taken off to supply any part of the installation.

h) Alarm Device:- Water monitor alarm suitable for sprinkler services shall be provided very close to the installation and alarm valve. This alarm shall be provided on the out side of an external wall. Strainer shall be fitted between the motor nozzle and the alarm valve connection. The water outlet shall be positioned so that any flow of water can be seen. The alarm device shall provided audibility level of 85 dB above the back ground noise level.

i) Pressure Gauges: - Pressure gauges shall be provided at each of the following points.

j) Immediately down stream of the alarm valve.

k) Immediately up stream of the main stop valve.

Stop cock shall be provided before pressure gauges for removal without interruption of water supply of the installation. Pressure gauges shall be per IS: 3624.

12. SPRINKLER ANNUNCIATION PANEL AND ALARM

Electrically operated alarm shall be provided for indication of operation of sprinkler an area. Water flow switches shall be installed in main distribution pipes which shall be wired to sprinkler annunciation panel. In the event of operation of a sprinkler, the flow switch will operate and give signal to the annunciation panel to indicate operation of sprinkler in the area. This will initiate an electrically operated alarm. The system shall be independent of fire alarm system.

Construction Details

a) The Panel shall be fabricated out of not less than 1.6 mm thick CRCA sheet and powder coated after 9 tank treatment process and shall be totally enclosed damp and vermin proof. Suitable knockout shall be provided for the entry cables. The panel shall be designed such that the equipment for power supply to battery charging are housed in independent compartments. Sealed maintenances free batteries shall also be accommodated inside the panel.

b) Indicating lamps control switches, buttons and fuses shall be suitably located the front and properly labeled.

c) The indicating lamps shall be LED type of following colours. The flow switch operation conditions shall be indicated by twin lamps.
   i) Red to indicate flow switch operation.
   ii) Amber to indicate fault condition.
   iii) Green to indicate healthy condition.

d) The test buttons to test the indication lamps shall be provided.

e) The panel shall be solid state type or microprocessor type as indicated in the tender.

f) The primary function of the panel shall be to respond automatically to the operation of one or more flow switches to give alarm and to indicate area/areas where the device has activated. The operation of one or more flow switches shall result' simultaneous alarm given by the following:-

i) External alarm hooter(s).

ii) A visible indication on panel.

iii) Audible alarm on panel itself (common for all zones.)

g) The panel shall indicate the fault within the system and immediate fault warning shall be given by an audible and visible signal on the panel in case of open circuit short circuit and earth fault in cable between flow switch and annunciation panel.

h) The panel shall be complete with mimic diagram for the areas covered by different flow switches. The layout of mimic diagram shall be got approved from Engineer-in-Charge.

i) Battery backup with trickle cum boost charger shall be provided for operation of the system. Indication of mains failure and low battery voltage shall be provided. The batteries shall be sealed maintenance free. The capacity of the battery shall be 12 Volt 2 Nos. 24 AH each. All standard accessories shall be provided.

13. INSTALLATION

The installation shall be carried out as per good practices. Following additional Points are to be taken care for sprinkler installations.

a) For fixing sprinkler heads, 15 mm. dia. M.S. Socket is to be screwed to range pipes at the locations as' per drawings. Dead plug shall be fixed in the socket.

b) If sprinkler head is to be provided away from range pipe, M.S. Pipe nipple of suitable size be used to extend the sprinkler head and socket is welded at desired location.

c) After completion of the entire work, pressure testing of entire pipe work shall be carried out for 24 hrs. at a pressure of 15 kg/cm^2. The drop of pressure up to 0.5 kg/cm^2 shall be accepted.

d) The lines shall be flushed before completion of building work so that any foreign matter which might have entered the system is taken out. The pressurization pump (Jockey pump) be operated and valves opened at different locations.

e) During occupation of the building, sprinkler heads shall be provided in place of dead plugs. Teflon tape shall be used on threaded portion. The sprinkler heads shall be properly tightened in the socket.

f) When all sprinklers heads are installed, pressure is built up in the system by pressurization pump slowly and in case no leak is found, desired pressure is developed and maintained. In case any leak is detected, the same shall be attended before pressurizing the system further.

APPROVAL BY LOCAL BODIES

It shall be the responsibility of the contractor to obtain the approval of the system from the Authorities on relevant drawings before actual installation at site and to get the complete installation inspected and passed by the concerned authorities, as may be necessary as per local bye laws.

ELECTRICAL WORK

1. SCOPE

This covers the requirements for the electrical works associated with fighting installations, namely, motors, switch boards, power cabling, control earthing and remote control-cum-indicating panels.

2. GENERAL

a) Unless otherwise specified in the tender specifications, all equipment and materials for electrical works shall be suitable for operations on 415 V / 240 V ± 10%(3 phase/single phase), 50 Hz. AC system.

b) All electrical works shall be carried out complying with the Indian Electricity Rules, 1956 as amended to date.

c) All parts of electrical works shall be carried out as per appropriate General Specifications for Electrical works published by Haryana PWD all amended up to date.

d) All materials and components used shall conform to the relevant IS specifications amended to date.

3. POWER SUPPLY

Following 3 phases, 415 Volts, 50 Hz., supplies shall be made available for fire fighting installations directly from sub-station.

(i) Normal supply for fire pumps near under ground tank.

(ii) Essential supply for terrace pump

In buildings where power failures are likely to be for long duration, in order to facilitate operation of Jockey Pump and maintain pressure in the system, essential supply for Jockey Pump and control for diesel engine shall be made available in the pump house.

a) Power cable of adequate size shall be laid from the sub-station directly to the switch board of above pumps. Independent supply shall be provided for

water supply pumps if installed in the same pump house. The power supply for fire fighting is not used for any other purpose.

b) If the fire pump house, is away from the sub-station building, the route of the cable shall not pass under the building or permanent structure. Cable shall be laid along the route which is safe from fire.

c) Sufficient spare power shall always be available to drive pumping sets at all times throughout the year. Suitable capacity ACB/MCCB/Fuse Switches/Switch Fuses shall be provided in the electrical panel for extending supplies to fire pumps. Such switches shall be suitably marked with "FIRE SWITCH" and shall not be switched off without permission/intimation to appropriate authority. In case any maintenance work is to be carried out on the electrical panel where from supplies to fire pumps have been extended, alternative arrangement shall be made to ensure that power supply to fire pumps continue to be available for operation any time.

4. MOTORS

The motors shall be squirrel cage AC induction type. The motors shall be suitable for continuous duty and rating necessary to drive the pumps at 150 percent of its rated discharge with at least 65 percent rated head. The motor shall be totally enclosed fan cooled type confirming to protection clause IP 21 of IS: 4691. The class of insulation shall be 'F' having IP 55 protection. The synchronous speed shall be 1500/3000 rpm as per requirement of the pumps. The motor shall conform to IS: 325.

5. MOTOR STARTER

a) The motor starter shall conform to IS: 1822 "Motor starters of voltage not exceeding 1000 volts" and shall be air insulted and suitable for 415 V, ± 10% HZ, 3 phase AC supply and shall be integrated in the panel.

b) Starter for the motor shall be direct on line (D.O.L) for motors up to and including 7.5 H.P. rating and automatic star-delta type for motors of higher rating unless otherwise specified in the tender specifications.

c) Each starter shall be provided with the following protections :-

i) Thermal overload on all the three phases with adjustable settings.

ii) Independent single phase preventer. (current sensing type)

d) Adequate number of extra NO / NC contacts for interlocks, indicating lamps, remote operation etc. shall be provided on the starter / contactor.

e) Under voltage/No volt trip shall not be provided.

6. SWITCH BOARDS

a) The main panel shall be floor mounted, free standing or wall mounted cubical type and shall be factory built fabricated by one of the approved switch board manufacturer. The board shall be fabricated from 2 mm. thick CRCA sheet and powder coated after 9 tank treatment process. The board shall be fabricated with IP 52 degree of protection. It shall be suitable for termination of the incoming cable (s) from bottom.

b) The capacity of switch gear shall be suitable for the requirements of motor fed controlled. Starting currents shall be duly considered.

c) MCCB's shall be used upto and including 630 amp. and ACB shall be used for 800 amp. and above ratings.

d) All switch fuses/SDFU shall be of AC 23 duty as per IS: 4064-1978 as amend upto date. They shall be complete with suitable HRC cartridge type fuses.

e) Switch boards shall house starters for motors with independent current sensing type single phase preventer for each starter.

f) Volt meter with selector switch, a set of indicating lamps and fuses for voltmeter and lamps shall be provided. Ammeter with CTs, and selector switch shall provided with each motor starter. Instruments shall be flush mounted with the panel and have a class index not higher than 1.0. The instruments and accessories shall be provided whether or not specifically indicated in the tender specifications.

g) The fabrication of switchboard shall be taken up only after the drawings for the fabrication of the same are approved by the Engineer-in-charge.

h) Switchboards shall be fabricated as per specifications indicated in sub-para above.

i) The layout shall be designed for convenient connections and inter-connections with the various switchgear. Connections from individual compartments to cable alleys shall be such as not to shut down healthy circuits in the event of maintenance work becoming necessary on a defective circuit.

j) Care shall be taken to provide adequate clearances between phase bus bars as well as between phase bus bars, neutral and earth.

k) Where terminations are done on the bus bars by drilling holes therein, extra cross section shall be provided for the bus bars. Alternatively, terminations may be made by clamping.

l) Provision shall be made for proper termination of cables at the switchboards such that there is no strain either on the cables, or on the terminators. Cable connected to the upper tiers shall be duly clamped within the switchboard.

m) Identification labels shall be provided against each switchgear and starter compartment, using Plastic/Aluminium engraved labels.

n) Metallic danger board conforming to relevant IS shall be fixed on each electrical switchboard.

7. SYSTEM ANNUNCIATION

For controlling operation of pumps and indicating fault, system annunciation shall be provided. The system shall consist of relays timer, contactors etc and shall be designed to operate the fire pumps with interlocking and fault indication Annunciation window shall be provided to indicate following faults.

Low water level in UG tank. Main pump failed to start.
Main pump failed during operation. Diesel pump failed to start.
Diesel pump failed during operation. Supply to Main Pump failed.
Supply to Pressurization Pump failed.
Suitable sensors, differential pressure switches, monitors shall be provided at respective location, the control system shall be operational on 12 / 24 volt DC batteries of engine starting. Battery chargers shall be provided to ensure that batteries remain charged. Batteries shall be sealed maintenance free type.

8. REMOTE INDICATING PANEL

a) Remote indicating panel shall be provided in the fire control room. This panel shall have necessary status indication of all electrical motors.

b) Back indication to show the status of operation of all the motors and also pressure in the system, water level in under ground and over head tank etc. shall be provided.

c) Panel shall be fabricated from not less than 1.6 mm thick CRA sheet and powder coated after 7 tank treatment process. The panel shall be dust, damp and vermin proof. This shall be of wall mounting type. This shall be complete with necessary termination arrangements, multicore cables, tag blocks, control transformer, designation plastic labels, double earth studs etc. as required.

9. POWER CABLING

a) Unless otherwise specified, the power cables shall be XLPE insulated, PVC outer sheathed aluminium conductor, armoured cables 1100 V grade.

b) Power cables shall be sizes to meet the starting and running current of motors fed and shall be as approved by the Engineer-in-Charge, after taking into consideration the load, the length of cabling.

c) Cables shall be laid in suitable metallic trays suspended from ceiling, or mounted on walls. Cable ducts shall not be provided in pump rooms. Cable trays shall be of perforated steel sheet with adequate structural strength and rigidity. Necessary supports and suspenders for cable trays shall be provided by the contractor as repaired.

10. CONTROL WIRING

a) Control wiring shall be done using ISI marked FRLS, PVC insulated and PVC sheathed, 2.5 sq. mm, 250 V grade, armoured multi-core copper conductor cable. The control cable shall also be laid in the same manner as power cable.

b) The number and size of the control cables shall be such as to suit the control system design adopted by the contractor.

c) Runs of control wires within the. Switchboard shall be neatly bunched and suitably supported / clamped. Means shall be provided for easy identification of the control wires.

d) Control wiring shall correspond to the circuitry/sequence of operations and interlocks approved by Engineer-in-Charge.

11. EARTHING

a) Provision of earth electrodes and the type of earthing shall be as specified in Schedule of quantities.

b) The earth work shall be carried out in conformity with Haryana PWD / CPWD Specifications for Electrical works.

c) Metallic body of all motors, medium voltage equipments and switch boards shall be connected by two separate and distinct earth conductors to the earth stations of the installations. Looping of such body earth conductors is acceptable from one equipment, or switch board to another.

d) The size of earth conductors for body earthing of equipments shall be 2 Nos. 25 x 3 mm G.I. strip. / 2 Nos. 32 x 6 mm G.I. strip as required & as specified in BOQ.

e) Armouring of cables shall be connected to the body of the equipments/switch board at both the ends. Compression type glands shall be used for all such terminations in the case of PVC cables.

12. PAINTING

All panels shall be supplied with the manufacturer's standard finish painting or as indicated in the Schedule of Work.

INSTALLATION, TESTING AND COMMISSIONING

1. SCOPE

This covers the requirement of Installation, testing and commissioning fire fighting system.

2. PREPARATION AND APPROVAL OF DRAWING

On award of the work, the contractor has to prepare shop drawings as per special conditions of contract and submit to the Engineer-in-charge for approval. The work is to be executed as per approved drawing. The stage of approval of drawings is therefore very important. All drawings should be carefully and critically examined before approval. The requirements of various components of fire fighting system have been described with the components of fire fighting system. However generally following points are to be taken care while examining and approving the drawings.

a) Site survey should be carried out in detail.

b) In addition to building plans, layout plan along with landscape plan/horticulture plan and other services plans should be consulted while deciding route of under ground pipes from pumps house and around the building.

c) As for as possible, under ground pipe are not to be laid under road, pavement, building and along open spaces. The locations along road, foot path in earth may be preferred.

d) The location of yard hydrants, fire services inlet and fire service connection are to be decided based on National Building code. However necessary adjustments are to be made so that these components do not become hindrance in vehicular movement and entrance to the building. Requirement of other building services are also to be given due consideration. Symmetry should be maintained for aesthetic considerations.

e) Pipe sizes are to be decided in accordance with provision of NBC.

f) Pump House:- The layout of equipment in pump house is very important from operation and maintenance considerations. The requirement of pumps and engine have been described in earlier chapters. In case other equipment 's i.e. water supply pumps etc are to be installed in the same pump house, sufficient space shall be left for them as well. The dimensioned foundation drawing of pumps should be available for marking in the pump room layout. The layout is to be prepared in such as a way that it should be possible to maintain any equipment without disturbing the adjoining equipment.

Electrical panels are to be installed at a location which is easily accessible near the entrance to the pump house and there should be no possibility of water dripping over or near the electrical panel.

g) Electrical Panel:- Complete wiring drawing, layout etc. are to be examined to ensure that provisions of agreement are incorporated in the drawing. Sizes of various panel and mounting arrangement may be decided keeping in view ease of operation and aesthetic consideration as well.

3. INSTALLATION

The requirements of installation of various components have been described with different equipments. However following precautions are to be taken during execution of the work.

a) The pump and motor/engine are to be perfectly aligned on the base plate so that there is no vibration during operation. All nuts, bolts, washers shall be of adequate size and galvanized.

b) The pipe supports should be decided in a way that the weight of pipes and valves are not transferred to the pumps and supports do not cause hindrance in movement inside the pump house. As far as possible, floor supports may be provided in pump house.

c) All valves shall be installed at a height and in a position that their operation by right hand is conveniently possible.

d) All pressure gauges should be installed so that the dial is vertical and is visible while entering the pump house.

e) Electrical panels should not be installed at floor level. The panels shall be sufficiently raised above ground level. If panels are to be mounted on wall, an angle iron frame shall be provided so that at least 75 mm space is left behind the panels. The panels shall be easily approachable.

f) Cable trays are to be used for laying of power and control cable inside pump house. No cable is to be laid at floor level/in trench. Cable tray layout should give neat appearance. All cable tray shall be adequately supported from the ceiling /floor.

g) Drain pump of suitable size as per drawings shall be installed in the sump provided in pump house. The pump shall operate automatically for which water level sensor shall be provided.

h) In no case any structural member i.e. RCC wall, column, beam and floor are to be damaged during installation. Mechanical fasteners are to be used for grouting support. U.G. tank wall is not to be used for any support. No

pipe/cable is to cross the pump house below ground level. Openings above ground level are only to be used for this purpose.

i) The engine installation work shall be carried out in accordance with the requirement of engine manufacturer and be got approved by the manufacturer or their authorised service centre. The exhaust pipe should be suitably extended out side the pump house so that smoke does not effect nearby structure. Fuel tank shall be properly supported and located in way that the same does not cause hindrance in movement in the pump house.

j) While excavating for laying of external pipes, suitable sign board/ barricading shall be provided to ensure that no person falls in the trench.

k) The width and depth of trench shall be adequate for laying the pipe 1 m below ground level.

l) No earth or any other matter is to be allowed to enter the pipes. The ends shall be kept closed always.

m) The anticorrosive treatment is to be applied on the entire length laid under ground in accordance with specifications. The treatment is not to be damaged.

n) Pressure testing is to be carried out in sections before filling the earth back in the trench.

o) The earth filling is to be done in layers of 20 cm each and properly rammed so as to avoid possibility of settlement. Surplus earth / malba shall be removed from the site by the contractor.

p) where pipes crossing road likely to have heavy traffic, additional protection over pipe shall be provided to ensure that pipe is not damaged.

q) External hydrants and fire service connection/ inlet shall be located parallel to the nearby road/foot path so as to give proper appearance. Foundation shall be raised from below ground level and shall be properly plastered in plumb. The hydrants shall be facing the road/ approach. There shall be no obstruction in approaching the hydrants for operation.

r) Risers shall be parallel to the wall and in plumb. Adequate supports shall be provided from the wall. Opening around the pipe in slab shall be filled with CC and finished with plaster.

s) Internal hydrant shall be provided in the centre and facing out side for ease of operation. Sufficient space shall be provided around the handle for operation. There shall be no hindrance in moving the first aid hose reel.

t) Terrace pipe shall be supported on CC pedestals of adequate height. The pipe route shall be such as no hindrance is created in movement at the terrace.

Pipes shall be sufficiently raised above terrace. It is to be ensured that water proofing is not damaged during laying of pipes.

4. TESTING

a) Initial Testing

i) During laying of pipes, the same shall be subjected to 15 kg./cm^2 hydraulic pressure for a period of 24 hours, in sections.

ii) After completion of the work, all valves/ fittings shall be installed in position and entire system shall be tested for 24 hours at a pressure of 15 kg/ cm^2. The drop of pressure up to 0.5 kg/cm^2 shall be accepted.

b) Final Testing

i) After completion, all operation checks shall be carried out for automatic operation of the systems. For this purpose, landing valves may be opens at different locations. The exercise shall be repeated couple of times to ensure trouble free operation of the system.

ii) **Flow Test:-** The design flow of pumps shall be checked. The pump shall be operated after opening a number of landing valves at different locations. Design pressure is be maintained in the pump house. Water discharge is to be measured by drop in level in UG tank for a certain period. All pumps shall be tested one by one. The flow rate shall be not less than as specified while maintaining the design pressure in pump house.

5. INSPECTION BY LOCAL FIRE OFFICER AND SAFETY DIRECTOR

After completion of the work and testing to the entire satisfaction of Engineer-in Charge the installation shall be offered for inspection by Chief Fire Officer or his representative. Testing as desired by the Fire Officer shall be carried out. The contractor will extend all help including manpower during testing. The observation of Chief Fire Officer which are a part of agreement shall by attended by the contractor. Nothing extra is to be paid for testing as above. If required installation are to be inspected and approved by Director Safety or his authorized representative.

6. COMMISSIONING

a) **Flushing the System:** - Before commissioning, the entire system shall be flushed to ensure that any earth/ foreign matters which might have entered during Installation are taken out. For this, pump may be operated and valves opened at different location.

b) As soon as the work is complete, the system shall be commissioned and made available for use. Requirement of fire fighting installations is equally important during occupation of the building. If the building is to be occupied

in part, fire fighting system of building completed shall be commissioned by isolating the system of under construction portion of the building.

c) The fire fighting system shall be maintained and manned from the very first day of its commissioning.

d) Any defects noticed during the warranty period shall be promptly attended by the contractor and availability of the system at all time is to be ensured.

SCHEDULE OF TECHNICAL PARTICULARS		
Sl. No.	**Description**	
	Pumps	**Electrical Motor Driven Main Fire Pump**
01	Make	
02	Pump Model No.	
03	Pump Type	
04	Duty of Pumps	
05	Discharge (LPM)	
06	Head (Mtrs.)	
07	Efficiency	
08	Speed (RPM)	
09	Power Absorbed at duty point (kw)	
10	No. of Stages	
	Pump performance at 150% of D.P.	
11	Capacity (LPM)	
12	Head (Mtrs.)	
13	Efficiency	
14	Power absorbed	
	Material of Constructions	
15	Casing	
16	Impeller	
17	Shaft	
18	Shaft sleeve	
	Prime Mover	
19	Make	
20	Type	
21	H. P.	
22	Full load speed (RPM)	
23	Full load current (amp.)	
24	Design Standard	
25	Supply Voltage & Variations	
26	Frequency & Variations	
27	Cooling Type	
28	Protection Class	
29	Insulation Class	
30	Duty	
31	Colour Shade of Paint	
32	Terminal Connection	
	Pump Accessories	
33	Base Plate	
34	Coupling	
35	Coupling Guard	
36	Foundation bolts, nuts & washers	
37	Mechanical Seal	

Sl. No.	**Description**	
	Pumps	**Diesel Engine Driven Standby Pump**
01	Make	
02	Pump Model No.	
03	Pump Type	
04	Duty of Pumps	
05	Discharge (LPM)	
06	Head (Mtrs.)	
07	Efficiency	
08	Speed (RPM)	
09	Power Absorbed at duty point (kw)	
10	No. of Stages	
	Pump performance at 150% of D.P.	
11	Capacity (LPM)	
12	Head (Mtrs.)	
13	Efficiency	
14	Power abrosbed	
	Material of Constructions	
15	Casing	
16	Impeller	
17	Shaft	
18	Shaft sleeve	
	Prime Mover	
19	Make	
20	Type	
21	Rating (BHP)	
22	Full load speed (RPM)	
23	Engine Starting	
24	Design Standard	
25	Cooling Type	
26	Duty	
27	No. of Cylinder	
28	Silencer Type	
29	Governing Std.	
30	Fuel Tank Capacity	
31	Fuel Consumption at full load	
32	Battery Details	
33	Control Panel & wiring Harness	
	Pump Accessories	
34	Base Plate	

35	Coupling	
36	Coupling Guard	
37	Foundation bolts, nuts & washers	
38	Mechanical Seal	

Sl. No.	**Description**	
	Pumps	**Jockey Pump**
01	Make	
02	Pump Model No.	
03	Pump Type	
04	Duty of Pumps	
05	Discharge (LPM)	
06	Head (Mtrs.)	
07	Efficiency	
08	Speed (RPM)	
09	Power Absorbed at duty point (kw)	
10	No. of Stages	
	Pump performance at 150% of D.P.	
11	Capacity (LPM)	
12	Head (Mtrs.)	
13	Efficiency	
14	Power abrosbed	
	Material of Constructions	
15	Casing	
16	Impeller	
17	Shaft	
18	Shaft sleeve	
	Prime Mover	
19	Make	
20	Type	
21	H. P.	
22	Full load speed (RPM)	
23	Full load current (amp.)	
24	Design Standard	
25	Supply Voltage & Variations	
26	Frequency & Variations	
27	Cooling Type	
28	Protection Class	
29	Insulation Class	
30	Duty	
31	Colour Shade of Paint	
32	Terminal Connection	
	Pump Accessories	

33	Base Plate	
34	Coupling	
35	Coupling Guard	
36	Foundation bolts, nuts & washers	
37	Mechanical Seal	

ANNEXURE – A

LIST OF APPROVED MANUFACTURERS FOR FIRE FIGHTING SYSTEM

S.No.	DESCRIPTION	MANUFACTURER'S NAME
1	Hydrant Valves / Fire Brigade Inlet / Draw out	Newage /Fire cut/ Safeguard / Padmini / Safex/ New age /Minimax/Atasee
2	Sluice Valves / Butterfly valves / Non Return Valves	IVC/ Venus / Audco / Advance / SKS/ CRI / AIP
3	Ball Valves	CIM / Leader / Audco / Advance
4	Air Release Valves	Newage / CIM / Leader / Sant
5	Strainers	Advance / Audco / SKS / AIP
6	Fire Extinguishers	Minimax / Cease Fire / Safex / Safeguard / UFS / Fire cut/ Atasee
7	Fire Mans Axe	Newage / Safeguard / Padmini/ Atasee
8	Air Release Valve	CIM / Newage / Leader / Sant
9	Pressure Reducing Valve	WILKINS (Newage) / AIP / SKS
10	Branch Pipe and Nozzle	Newage /Fire cut/ Safeguard / Padmini / Safex/ New age /Minimax/ Atasee
11	Galvanized Iron Pipe / MS Pipe – IS : 1239	Jindal (Hissar) / Praksh surya
12	G.I. / MS / M.I. Fittings	Unik / Jainsons
13	Ductile Iron Fittings	Jainsons Industries
14	MS Forged Fittings	VS / B M / True forge
15	Fire Hose Pipe	Newage /Fire cut/ Safeguard / Padmini / Safex/ New age /Minimax/ Atasee
16	Hose Reel	Newage /Fire cut/ Safeguard / Padmini / Safex/ New age /Minimax/ Atasee
17	XLPE / PVC Insulated Aluminium Conductor Armoured Cables	Universal (Satna) / CCI / Nicco / Finolex / Polycab / Skytone / RR
18	Copper Conductor Armoured Control Cables	Universal (Satna) / CCI / Nicco / Finolex / Polycab / Skytone / RR
19	Cable Tray	Indiana / Bharti / Slotco /

S.No.	DESCRIPTION	MANUFACTURER'S NAME
		Steelways / Skaber / Profab / Rico / Dynamic
20	MCCB	ABB / L & T / Schneider / Siemens / Legrand
21	Relays / Contactors	L & T / ABB / Siemens / Schneider / Automatic Electric
22	Current Transformer	Kappa / Pragati / AE / Gilbert & Maxwell / Vishal
23	Voltage Transformer	Kappa / AE / Gilbert & Maxwell / Vishal
24	Ammeter / Voltmeter / Metering Equipment's	L & T / Siemens / Neptune / Enercon / Automatic Electric
25	Selector Switches	Kaycee / Salzer / L & T
26	LED Lamps	L & T / Vaishno / Siemens
27	Pump Control Panel	Tricolite / Advancve (Delhi) / Ambit / Adlec / Milestone / Attack fire / Vidyut control / RST / Dynamic
28	Fire Fighting Pumps	Kirlosker / Mather+ Platt / Grundfos
29	Diesel Engine	Kirlosker / Cummins
30	Electric Motors	Kirlosker / Crompton / Siemens
31	Pressure switches	Danfoss / Indfoss
32	Pressure Guage	H Guru / FIBIG
33	Flow Switches	System sensor / HD
34	Sprinkler Annunciation Panel	Safeway / Agni/ Fire cut / Attack fire Daksh Morley /
35	Sprinklers	Tyco / Globe / Viking / Reliable / Fire cut / HD/ Atasee
36	Sprinklers Flexible Hose	Tyco / Globe / Viking / Padmini / Newage / Fire cut / Attack fire/ Atasee
37	Installation Control valve	Tyco / Globe / Viking
38	Anchor Fastner / U clamp / Celvis / sprinker hangers	Hilti / Intello tech / Hightech / Fisher / Easyflex
39	Anti Vibration Mounting / Expansion Joint	Easyflex / Resistoflex / Kanwal / Precise

S.No.	DESCRIPTION	MANUFACTURER'S NAME
40	Exit Sign	Glow light / Legrand / Autoglow / Pierlite / Agni / Attack fire / Atasee
41	Paint	Asian / Berger / Nerolac / ICI
42	Any Other Items	On Approval of Consultant or Engineer-In-Charge

S.No	Details of Material /Equipment	Manufacture's Name
1.	Pipes	1. Tata 2. Jindal Hissar 3. Surya Roshni
2.	Single headed Hydrant valves, three way Fire Brigade inlet, Branch pipe & shut off nozzle	1. Newage 2. Fire cut 3. Safeguard 4. Padmini 5. 6. Safex 7. New age 8. Minimax 9. Suprex 10. Cease fire 11 Atasee
3.	20 mm dia rubber pipe for Hose reel	12. Shah Bhogi Lal 13 Atasee
4.	Starters, switches, T.P.N switch	1. L&T 2. Siemens 3. GE Power 4. Schneider
5.	Pressure Switch	1. Indofoss 2. Switzer
6.	Pressure Guages	1. H Guru Fiebig
7.	Enamel Painting of Pipes etc.	1. Asian 2. Goodlas 3. Nerolac 4. ICI
8.	Paint Primer	1. Asian 2. Jenson Nicholson
9.	Fasteners	1. Hilti

		2.Fischer 3.Bosch
10.	Weld Rods	1.Adwani
11.	Fire Extinguishers	1.Superx 2.Fire cut 3. Safeguard 2.Cease Fire 5. 6.Safex 7.Shah Bhogi Lal 8.Minimax 9.Suprex 10. Cease fire 11.Shah Bhogi Lal 12. Atasee
12.	RRL Hose	1.Superx 2.Fire cut 3. Safeguard 2.Cease Fire 5. 6.Safex 7.Shah Bhogi Lal 8.Minimax 9.Suprex 10. Cease fire 11.Shah Bhogi Lal 12. Atasee
13.	Thermoplastic Hose Reel	1.Superx 2.Fire cut 3. Safeguard 2.Cease Fire 5. 6.Safex 7.Shah Bhogi Lal 8.Minimax 9.Suprex 10. Cease fire 11.Shah Bhogi Lal 12. Atasee
14.	Rubber Gaskets	1.CIC 2.Varuna
15.	Hose Drum	1.Superx 2.Fire cut 3. Safeguard

		2.Cease Fire 5. 6.Safex 7.Shah Bhogi Lal 8.Minimax 9.Suprex 10. Cease fire 11.Shah Bhogi Lal 12. Atasee
16.	Mechanical Seal	1.Durametallic 2.Burgmann
17.	Strainer	1.NVR 2. LP Valves 3. Castle
18.	Installation Control Valve	1.Omaxe 2.HD 3.Grinell 4.Tyco 5.Viking
19.	Pipe Supports(Band Hanger)	1.Mupro
20	Flow Switch	1.System Sensor 2.Potter
21	Pipe Fittings	1.New 2. S.S.
22.	Sluice,Butterfly and Non Return Valves	1.NVR 2.LP Valves 3.Castle
23.	Ball Valve	1.NVR 2.LP Valves 3.Castle
24.	Anti Vibration Mounting	1.Dunlop Resistoflex
25.	Fire Sealent	1.Birla 3M 2.Hilti
26.	Fire Electrical panel	A to Z/Tricolite /Attack fire
27.	Fire Sprinkler test and drain assembly	1.Castle 2.Giacomini

		3. Fire cut
28.	Fire Pumps	1. Lubi 2. Groundfoss 3. Armtrong 4. Kilosker

(Note:Pump and motor shall be assembled in Pump's Manufacturer's works)

ANNEXURE – B

LIST OF RELEVANT INDIAN STANDARDS

S.No	I.S. No.	Title
1.	IS-8757	Glossary of terms associated with fire safety
2.	IS-884.	Specification for first-aid hose reel for fire fighting
3.	IS-901.	Specification for couplings, double male and double female instantaneous pattern for fire fighting.
4.	IS-902.	Specification for fire hose delivery couplings, branch pipe, nozzles and nozzle spanner.
5.	IS-903.	Specification for fire hose delivery couplings, branch pipe, nozzles and nozzle spanner.
6.	IS-904.	Specification for two way and three – way suction collecting heads for fire fighting purposes.
7.	IS-907.	Specification for suction strainers, cylindrical type for fire fighting purpose.
8.	IS-908.	Specification for fire hydrant, stand post type.
9.	IS-909.	Specification for under ground fire hydrant.
10.	IS-636.	Non percolating flexible fire fighting delivery hose.
11.	IS-7637.	Glossary of terms for fire fighting equipment.
12.	IS-937.	Specification for washers for water fittings for fire fighting purposes.
13.	IS-1641.	Code of practice for fire safety of buildings (general): General principles.
14.	IS-1642.	Code of practice for fire safety of buildings (general): Details of Construction.
15.	IS-1643.	Code of practice for fire safety of buildings (general):Exposure hazard.
16.	IS-1644.	Code of practice for fire safety of buildings (general): Exit requirements and personal hazard.
17.	IS-1646.	Code of practice for fire safety of buildings (general): Electrical installations
18.	IS-2871.	Specification for branch pipe, universal for fire fighting purposes.
19.	IS-2930.	Functional requirements for hose laying tender for fire brigade use.
20.	IS-5290.	Specification for landing valves.
21.	IS-8090.	Specification for couplings, branch pipe, nozzle, used in hose feel tubing for fire fighting.
22.	IS-8442.	Specification for stand post type water monitor for fire fighting.
23.	IS-9972.	Specification for automatic sprinkler heads.
25.	IS-12349.	Fire protection-Safety sign.
26.	IS-12407.	Graphic symbols for fire protection plan.

S.No	I.S. No.	Title
27.	IS-9668.	Code of practice for provision and maintenance of water supplies and fire fighting.
28.	IS-3844.	Code of practice for installation and maintenance of internal fire hydrants and hose reel on premises.
29.	IS-12585.	Specification for thermoplastic hose (Textile Reinforced)
30.	IS-10221.	Code of practice coating and wrapping of under ground mild steel pipe lines.
31.	IS-15105.	Design and installation of fixed automatic sprinkler fire extinguisher system-code of Practice.
32.	IS-325.	Three phase induction motors.
33.	IS-1822.	Motor starter for voltage not exceeding 1000 volts.
34.	IS-3624.	Bourdon tube pressure and vacuum gauges.
35.	IS-1520.	Horizontal centrifugal pumps for clear, cold, fresh water.
36.	IS-1239.	Mild steel tubes, tubular and other wrought steel fittings.
37.	IS-3589.	Electrically welded steel pipes for water, gas and sewage.
38.	IS-6392.	Steel pipe flanges.
39.	IS-778.	Gun metal gate, globe and check valves for general purpose.
40.	IS-2592.	Recommendation for methods of measurement or fluid flow be means of orifice plates and nozzles.
41.	IS-732.	Code practice for electrical wiring and fittings of building.
42.	IS-900.	Code of practice for installation and maintenance of induction motor.
43.	IS-1248.	Direct acting electrical indicating instruments.
44.	IS-2516.	A.C.circuit breakers for voltages not exceeding 1000 volts.
45.	IS-4047.	Heavy duty air break switches and composite units of air break switches and fuses for voltage not exceeding1000 volts.
46.	IS-2208.	HRC cartridge fuse links upto 650 volts.
47.	IS-1554. (Part – I).	PVC insulated (heavy duty) electric cables for working voltage upto and including 1100 volts.
48.	IS-780.	Sluice valve for water works purposes (50 to 300 mm. size).
49.	IS-13095.	Butterfly valves.
50.	IS-1992.	Selection of Fire Extinguisher
51.	IS-694 - 1990	PVC insulated wires / cables for working voltage up to and including 1100V.

STANDARD SPECIFICATIONS FOR 2 Hrs. FIRE CHECK METAL DOORS

ESS Abbreviations:
BS : British Standards
EN: European Standards
IS: Indian Standard
FCD: Fire Check Door
GI: Galvanized Iron

CONTENTS

1.0 GENERAL

The Fire & smoke Check Doors/ Fire resistant Doors (hereinafter termed as FCD) shall not collapse during the rated period of fire under the specified fire conditions and shall provide safe access to the escape route.

2.0 CODES & SPECIFICATIONS

The complete assembly of the doors i.e. frame, shutter, vision glass and hardware shall have fire rating as required and shall confirm to:

1. IS 3614 Part II -1992 .Fire Resistance test & performance criteria
2. BS:476,Part-6 & 7Surface spread of flame test for FR Paint.
3. BS:476,Part-20 Method for determination of the fire resistance of elements of construction (general principles).
4. BS:476,Part-22 Method for determination of the fire resistance of non load bearing elements of construction.
5. BS:6206:1981 Specification for impact performance requirements for float safety glass and safety plastics for use in buildings.
6. EN:12600 Specification for impact performance requirements for flat safety glass .
7. EN:1634 Part-1-1999 Fire resistance tests for Glazed doors & Partition and open-able windows
8. EN:1364 Part-1-1999 Fire resistance tests for non-load bearing elements.

3.0 TESTING AND CERTIFICATION

The FCD has been tested earlier at reputed by National or international reputed approved test house

Along with all material tests, the complete system along with the framing shall be tested in accordance with the criteria of BS 476: Part 22 1987/EN 1634/EN1363 along with necessary hardware. The door must have been manufactured with galvanised - GI sheet of GPSP Grade as per IS 277. All Fire doors must satisfy the requirement of 120 minutes Fire Rating along with its Stability & Integrity for 120 minutes. The Prototype sample of the door must carry a prior test evidence as per IS 3614 part-2 / BS 476 Part 20 & 22. The manufacturer must submit the copy of test evidence prior to start of production .The offered test certificate should either carries it's Validity or certificate must not be older than 5 years from CBRI / NABL Accredited Lab .

4.0 FIRE CHECK METAL DOORS

4.1 Composition of the Fire Doors

All materials, items, hardware etc. shall be subjected to approval by Engineer-In-Charge. Necessary documentation/ test certificates shall be furnished by the Contractor for such approval. FCD shall be fabricated from ISO 9001:2015 certified Manufacturer only after approval of materials etc, by Engineer-In-Charge.

Each FCD shall be provided with a small metal identification plate in suitable location indicating Fire rating, name of the Manufacturer, date of installation and approval of approved test house.

MATERIAL

Door Frames and Leaves are made from Galvanized Steel sheet of GPSP Grade as per IS 277

DOOR LEAVES

Door leaf shall be minimum 49mm thick fully flush double skin door. The door is duly tested at CBRI /NABL as per IS 3614 part 2 – 1992 , BS 476 part 20 & 22 for minimum 120 minutes fire rating for its Stability & Integrity. Door leaf shall be manufactured from 0.8 mm minimum thick Galvanized steel sheet. The internal construction of the door should be rigid reinforcement pads for receiving appropriate hardware. The infill material shall be Rockwool / Honeycomb. All doors shall be factory prepped for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers. The edges should be interlocked with a bending radius of 1.4mm. For pair of doors astragals has to be provided on the meeting stile for both active and inactive leaf. Vision lite wherever applicable should be provided as per manufacturer's recommendation with bedding and screws from inside.

DOOR FRAMES

Door frame shall be double rebate profile of minimum size 100mm X 57 mm made out of 1.2mm thick galvanized steel sheet. Door frame shall be Single rebate profile with a factory pre-punched groove so as to accommodate Fire & smoke seal size minimum 10x4mm.Frames shall be Butt jointed and field assembled with self-bolted. The frames should be finished with Thermosetting Powder Coating in desired RAL Shade. All provision should be mortised, drilled and tapped for receiving appropriate hardware. Frames should be provided with back plate bracket and anchor fasteners for installation on a finished plastered masonry wall opening.

Unless otherwise mentioned elsewhere, all FCD shall be of two hours (120 Mins.) and all door assemblies (except fully glazed fire door) shall satisfy

criteria of fire resistance (stability, fire smoke check integrity with insulation material).

FINISH

The door frames and door shutters to be Powder coating in (70 micron) RAL desired Shades.

4.1.2 IRONMONGERY

HINGES

SS Ball Bearing Hinges of size 100 x 75 x 3mm complete with SS Screws of BB1953 Becker

F.S / 3090F DORMA Make (4 No's per panel) (Required For All Doors)

PANIC BAR

Panic Bar single / double leaf panic exit devices SBL 390/395 Becker F.S. / PHA2000 Series DORMA Make (Required for Fire Staircase Location Doors Only)

PANIC TRIM

Panic Trim For Operation From The Other Side Of The Panic Bar Becker F.S. / PHT-3905 DORMA Make (Required For Fire Staircase Location Doors)

SHASH LOCK

Mortise Sash Lock With SS Lever Handle Of SL7260/ TLH612 Becker F.S. / DORMA TH121 Type 2 Series Make (Required For Service Room Location Such As AHU, Electrical Rooms Etc.)

DEAD LOCK

Mortise Dead Lock DL7260 Becker F.S. / 288A DORMA Make.

PULL HANDLE

Supply & fixing of SS 304 Finish D Type Pull Handle of size 300mm mm Long of PHD Series Becker F.S/ TGDI DORMA Make.

FLUSH BOLTS (DOUBLE DOOR)

Stainless Steel 304 grade 600mm for up to 2100mm & 600mm for up to 2400mm height door Long Concealed Flush Bolt of BFBS1930 Becker FS/ 9114306 DORMA Make with necessary screws as required.

DOOR CLOSERS

Door closers of BLC-604 Becker F.S/ TS-71 DORMA Make. (Required For All Fire Doors except Shaft Door)

SHAFT LOCK

Shaft lock with Allen key of Becker FS/ 9119315 DORMA.

FLUSH PULL HANDLE

Supply & fixing of SS flush pull handle of BFPR1250 Becker FS/ DORMA Make.

ANCHOR FASTENERS

Anchor fasteners of HILTI/ FISHER/ Equivalent of maximum 80mm length.

SMOKE SEAL

Smoke seal batwing type on all side of frame of IS-1212 LORIENT/ Becker FS Make for air tightness.

VISION PANEL for FIRE DOOR

2Hr fire Rated glass, 5mm Keralite of Saint Gobain with UL label , non-removable stamp on every panel to be used as vision panel for Fire door

OPTIONS

Exit, Electro Magnetic Hold Open Device, Door Coordinator, Automatic Door Bottoms etc., can be provided if required.

Note: All Becker Fire Solution or Equivalent Hardware's should cover a minimum 02 Years of manufacturer warrantee from the date of supply. Hardware should pass European certificate "CE" of conformity / UL with required fire ratings.

5. INSTALLATION

Shop drawings of the doors in accordance to the prototype profiles used to obtain fire test certificate by approved national or international test house shall be prepared and submitted for approval by the Engineer-In-Charge. The shop drawings shall include all details of construction, anchoring, connections, fastenings etc. Any suitable modification in fittings, fixtures as required for project specific installations shall have to be incorporated in door profile and approval obtained prior to the installation of the door.

5.1 Door frame fixing

The door frames should be assembled adjacent to the place of installation as the frames are not designed for transporting in an assembled condition. After assembly it is to be ensured that all threaded preparations are covered from the back of the frame using self adhesive strip to prevent penetration of mortar back-fill into screw threads. The head member of assembled frame shall be positioned against jambs ensuring correct alignment and secured using M8 x 20 long plated bolts together with nuts spring and flat washers.

The assembled frame shall be kept in position within the opening by means of bracing. In order to correctly position the frame against finished floor level

or equalize on adjustable floor anchors where specified, shim shall be used under jambs. The frame shall be checked for squareness, alignment, twist etc. with carpenters bevel and plumb.

A tie rod shall be fixed to the frame during installation to ensure the correct dimensions between the frame rebated and the same may be removed after installation.

Where a 2nd fix application is required a shim detail is suggested to take up gap between frame and existing opening.

5.1.2 Door shutter fixing

Fix all the hardware to the door shutter like hinges, flush bolts, bolts, Panic Bar, mortise locks, door closer, door stoppers, handles etc. with the appropriate screws and bolts supplied.

The shutter is to be then fixed to the frame, which is already installed. Align the shutter to match the hardware to the cutouts in the frame. Tighten the hinge screws.

6. Packing

Frame & Shutter: Individual frames members & Shutter to be wrapped in protective 70-micron polyethene sheets and placed in individual card board boxes. Individual boxes to be sealed. Frames to be assembled at site with aid of roofing bolts.

7. STORAGE

All knocked down frames shall be stacked flat and shutters vertically on wooden runners and suitably covered as per the instructions of manufacturer to prevent rust and damage.

8. DELIVERABLES BY THE CONTRACTOR

Following documentation/ drawings shall be furnished along with the Doors

1. Prototype Test Certificate by National or international test house as per product.
2. Shop drawings
3. Specification/ Manufacturer's literature, Test certificates and other documentation for materials and items intended to be used.
4. Test report attested by Fire rated glass manufacturer in case of Glazed fire door.
5. The Fire rated glass applicator has to be approved by Fire rated Glass Manufacturer and Submit the approved applicator certificate.

Technical Specifications
For
Bridge Works

1.0 SPECIFICATIONS AND PLANS:

1.1 The work shall be executed as per MORT&H/PWD Standard specification/ relevant I.S./I.R.C. Code/Latest Edition for material and works with latest editions & approved drawings,

1.2 Some of the Code of practice are mentioned as under (with upto date correction slips):-

i. I.S. code of practice for plain and reinforcement concrete for general building construction (I.S. 456-2000).
ii. I.S./I.R.C. Code of Practice for plain/reinforced and pre-stressed concrete for general/bridge construction.
iii. I.S./I.R.C. Rules specifying the loads for design of super structure and substructure of Bridge work.
iv. I.S./I.R.C. Bridge substructure and foundations code-code of practice for the design of the substructure and foundation of bridges.
v. Indian Road Congress Codes for items not specially covered by any code or provision mentioned in these documents (All sections).
vi. I.S. Methods on testing of soil I.S. 2720 (all parts) latest revision with up to date correction slips).
vii. I.S code for use of structural steel in general building construction (IS 800-1984).
viii. I.S code of practice for Electric welding of mild steel IS 823-1964.
ix. IS Code of practice for fine and coarse aggregate from natural source for concrete (IS 383-1979)
x. IRC 83 (Part III) 2002 standard specifications and code of practice for road over bridges (POT, POT cum PTFE bearings)

For steel:

i. IS 226: 1975 Specification for structural steel.
ii. IS 800-1984 code of practice for use of structural steel.
iii. IS 1786: for HYSD bars of reinforcement steel.

1.3 Latest edition and upto date correction slip in all the above relevant codes will be applicable so far as this work is concerned.

1.4 In case difference between the provision of codes such as above and any discrepancy in the interpretation of codal provision, decision of Engineer-in-Charge would be treated as final and will be binding upon the contractor.

1.5 Some stipulations of relevant codes for some of the items are mentioned in this tender documents. These stipulations are only for guidance. The work shall be executed as per relevant codes.

2.0 BORED PILE FOUNDATIONS (wherever applicable)

2.1. The depth of bored pile shall be as per design and drawing.

2.2. Construction of bored pile foundations shall be strictly in accordance with the stipulations made in the building digest CBRI India 56 for bored piles for foundations and IS: 2911/1979 part-I to 4. Wherever the tilt of the piles exceeds 2% or the piles shifts by more than what is specified, area will have to be increased and also additional reinforcement will have to be added and expenditure involved including cost of cement and steel shall be borne by the contractor.

2.3. The rates quoted by the contractor shall be over all including rate, for boring through any type of road surface all type of soil whatsoever, use of special liner casing if required, use of any type of material, machinery also including all royalties, taxes etc. Nothing extra will be paid on any account whatsoever.

2.4. Well foundation:-As per MORT&H specification wherever applicable.

3. FORM WORK

3.1. Form work shall be of steel plates fixed on the angle iron frame or waterproof ply wood shuttering of adequate thickness unless otherwise directed by the Engineer-in- charge. It should be watertight sufficiently strong and rigid to resist forces caused by vibration and incidental loads associated with it and keep the form rigid.

3.2. If at any stage of work during/ after placing the concrete in the structure, the work is found defective, such concrete shall be removed and work shall be redone with fresh concrete and adequate and rigid forms at the cost of contractor. The props for the centering wherever permitted shall be supported by the double wedges in order to facilitate causing & removal of the shuttering without jarring. Centering and shuttering should be carefully released in order to prevent the loading being instantly transferred to concrete. The period that shall lapse after the last pour of concrete for easing removal of centering and shuttering shall be fixed by the Engineer-in-charge and will be binding on the contractor/s.

3.3. It may be necessary to make provision for holes/ grooves in the form work to house the various services, for which neither any extra payment shall be made to the contractor/s for making these provisions nor any deduction shall be made on a/c of any saving in RCC/PSC work due to these provision.

3.4. Wherever chamfer or rounded corners are mentioned in the drawing formwork should be such that no chiseling/cutting is required.

3.5. The surface of formwork shall be clear, smooth and free of cement mortar etc.

3.6. The Contractor shall give the Engineer In-charge due notice before placing any concrete in the forms to permit him to inspect and accept the form work and forms as to their strength, alignment and general fitness but such inspection shall not relieve the contractor of his responsibility for safety of works, men, machinery, materials and for result obtained.

4.0 Removal of Form Work:

4.1 The Engineer In-Charge shall be informed in advance by the contractor of his intension to strike any formwork.

4.2 While fixing the time for removal of form work, due consideration shall be given to the local conditions, character of the structure, the weather and the other conditions that influence the setting of concrete and of the material used in the mix.

4.3 The period shall be suitably increased in case of temperature lower than 25 degree Celsius and for any other conditions tending to delay the setting of concrete.

4.4 These field operation are controlled by strength tests of concrete, the removal of the load supporting arrangements of soffit may commence when concrete has attained strength equal to twice the stress to which the concrete will be subjected to, at the time of striking props including the effect of any further additions of loads. When field operations are not controlled by strength test of the concrete the vertical forms of beams columns & walls may be removed as per orders of the Engineer In-charge.

4.5 All formwork shall be removed without causing any damage to the concrete. Centering shall be gradually and uniformly lowered in such a

manner as to avoid any shock or vibrations. Supports shall be removed in such a manner as to permit concrete to take stress due to its own weight uniformly and gradually. Where internal metal ties are permitted, their removable parts shall be extracted without causing any damage to the concrete and the remaining holes filled with mortar. No permanently embedded metal parts shall have less than 40mm cover to the finished concrete surfaces, where it is intended to re-use released form work, it shall be cleaned and make good to the satisfaction of Engineer-in-charge.

5. REINFORCEMENT:

5.1 Reinforcement may be TMT as per the drawings and confirming to the latest ISI/IRC codes. Steel will be procured from TISCO/Rastriya Ispat Nigam Limited/SAIL/Jindal Steel and Power Ltd. (Jindal Panther), JSW Steel ltd, Electro Steel Steels Ltd(V-XEGA) and M/s Super Shakti.

5.2 Before use, contractor's will be required to obtain test certificate for the quality of reinforcement used, at his/their own cost form the laboratory/institute, approved by the Engineer-in charge.

5.3 Contractor will ensure that before fixing reinforcement, bars are cleaned with dry gunny bags to remove the light rust or other impurities, if any.

5.4 Welding of reinforcement will not be generally permitted except in special circumstances under the written approval of the Engineer-in-charge.

5.5 Binding wire of approved quality shall be arranged by the contractor's himself/themselves and the rates quoted for RCC/PSC work should include cost of this item of work.

5.6 Nothing extra will be paid for overlaps and wastage of steel.

5.7 Reinforcement steel shall be arranged by the contractor and payment made as per items of agreement.

5.8 Payment for the steel reinforcement shall be made on the basis of standard unit weights as per approved drawings and nothing extra will be paid for overlaps and wastage of steel involved in cutting the bars to their required sizes. Nothing extra will be paid for over weight steel and no deduction will

be made for under weight steel within the limit of tolerances permitted as per IS 1786-1985.

5.9 Steel having unit weights per meter not falling within the tolerances specified in above IS code shall not be accepted.

6. CEMENT:

6.0 Ordinary Portland cement grade-43 conforming to IS-8112 or as specified in drawings of reputed brand such as Ambuja, ACC, Birla, J.K., Wonder, Shree Cement capable of achieving the required design concrete strength shall only be used and will be arranged by the contractor/ agency.

6.1 To improve the workability of concrete and cement grout admixtures conforming to IS-6925 and IS-9103 could be permitted subject to satisfactory proven use. Admixtures generating hydrogen, nitrogen, chlorides etc. shall not be used.

6.2 Maximum Cement content in concrete shall be as per relevant code of practice. If desired workability is not achieved due to restrictions in cement contents, contractor have to use plasticiser of approved quality for which no extra payment shall be made.

6.3 Quality test certificate for cement as per IS-4031 Code shall be furnished by the contractor before use of cement supplied.

6.4 Cement for use in works, shall be procured by the contractor from the main producers or their authorised dealers only.

6.5 Cement older than 3 months from the date of manufacture as marked on the bags shall not be accepted. Cement bags preferably in paper bag packing should bear the following marking:-

(i) Manufacturer's name
(ii) Regd trade mark of manufacturer if any
(iii) Type of cement.
(iv) Weight of each bag in Kg or no. of bags/ tonnes.
(v) Date of manufacture generally marked as week of the year/year of manufacture.

7. Quality test certificate for cement as per IS 4031 shall be furnished by the contractor/s at his own cost from the manufacturer, before use of cement.

7.0 Engineer in Charge may also take samples during the course of execution of works and get the cement tested to ascertain its conformity to the relevant IS specifications at contractor/s cost before a particular lot is put to use. Frequency of testing shall be as prescribed by the relevant IS code. Following test interalia shall be carried out.

i) Fineness
ii) Compressive strength
iii) Initial and final setting time
iv) Consistency
v) Soundness.

7.1 In case samples tested do not pass quality tests conducted, the entire batch of cement supplied shall be rejected and returned to the contractor/s. No payment for such cement shall be made to the contractor.

7.2 For storage of cement, the contractor shall have to construct a temporary Godown of adequate capacity at his own cost. The contractor shall bring the cement to the site of work only on written instructions from representative of Engineer. It will be obligatory on the part of the contractor to get every consignment/truck of cement weighed in the presence of Engineer or his representative and supply the original copy of weight slip alongwith consignment. The representative of Engineer will verify the weight of cement brought to the site of work and return one verified weigh slip to the contractor after the same is stacked inside the cement Godown under his supervision.

7.3 The record of cement brought to the site of work, daily consumption, daily opening balance and closing balance shall be maintained at the site jointly by the representative of Engineer of work and contractor/s or his/ their authorized representative. For this purpose, 2 sets of registers duly reconciled and signed by the contractor/s and the representative of Engineer of work certifying the opening balance, consumption, closing balance should be maintained. One register each shall be kept in the custody of representative of Engineer of work and contractor or his authorized representative.

7.4 The contractor shall be the custodian of cement Godown and shall keep the Godown under his lock and key to ensure safe custody of cement. The contractor shall ensure that the cement once brought to the site and

accounted shall be used at the site only and shall not be taken away from site for any other purpose.

7.5 The contractor shall make the cement Godown available for inspection alongwith connected record to the site Engineer or his representative as and when required.

7.6 The contractor shall ensure that after completion of the work and or termination of the contract for any reason whatsoever, the temporary cement Godown shall be dismantled and all dismantled material /debris shall be removed and the clear site shall be handed over back to Department. All the released material shall be the property of the contractor/s and no payment shall be made by the Department for dismantling etc.

7.7 Tolerance requirements for the mass of cement

(i) Cement supplied one time will be taken as forming one batch. The number of bags taken for sample from each batch shall be as under:-

S.No.	Batch Size	Sample Size
1.	100 to 150	20
2.	151 to 280	32
3.	281 to 500	50
4.	501 to 1200	80
5.	1201 to 3200	125
6.	3201 and above	200

(ii) The bags in sample shall be selected at random.

(iii) The number of bags in sample showing a minus error greater than 2 percent of the specified net mass (50 kg) shall be not more than 5 percent of bags in the sample. Also the minus error in none of such bags in the sample shall exceed 4 percent of the specified net mass of cement in the bags. In case, the minus error exceeds the percentages herein specified, the entire batch of cement samples shall be rejected.

(iv) In case of a wagon/Truck load of 10 to 25 tonnes, the overall tolerance on net mass of cement shall be 0 to +0.5 percent. Any batch of cement not conforming to above tolerances will be rejected.

7.8 Stacking of cement in the Godown shall be done on a layer of wooden sleepers so as to avoid contact of cement bags with the floor; or alternatively scrap of sheets may be used in place of sleepers but these must be placed at least 20 cm above the floor. The bags shall be stacked

at least 30 cm clear of the walls to prevent deterioration. The wooden sleepers/scrap GI sheet shall be arranged by the contractor/s at his/their own cost.

7.9 Cement shall be stored in such a manner as to permit easy access for proper inspection. Cement should be stacked not more than ten layers high to prevent bursting of bags in the bottom layers and formation of clods. The stacks of cement bags shall be covered with tarpaulin during monsoons so as to obviate the possibility of deterioration of cement by moisture in the atmosphere. Cement that is set or partially set is not to be used.

7.10 Empty cement bags will be the property of contractor.

7.11 Engineer-in-Charge may also take samples during the course of execution of works and get the cement tested to ascertain its conformity to the relevant IS specifications at contractor/s cost before particular lot is put to use. Frequency of testing shall be as prescribed by the relevant IS Code or as per instructions of Engineer in charge. Following tests interline shall be carried out:-

i) Fineness
ii) Compressive strength
iii) Initial and final setting time
iv) Soundness
v) Consistency

8. FINE AND COARSE AGGREGATES.

8.0 Fine and coarse aggregate for all types of concrete work shall conform to I.S-383 (Latest Edition).

8.1 In addition to the routine tests, special tests of material will be carried out whenever required by the Engineer. The cost of the special tests will be borne by the contractor. Necessary facilities in the form of moulds, cones, scales, materials, labour for casting, curing specimens and such other facilities as per requisite in any standard concrete tests will, in any case, be afforded by the contractor free of cost. Cement for the tests shall be arranged by the contractor at his own cost and no payment shall be made for this.

9. WATER:

9.0 The contractor shall be responsible for the arrangements to get the supply of water necessary for the works at his own cost and rates quoted shall also include the cost of water or any other arrangements required to be made for procuring water and leading/ transporting and carrying water to the site of the work irrespective of the distance from the source of water. The water shall, however, conform to I.S-456 If water as per prescription of IS-456 is not available then contractor will have to install RO Plant free of cost to obtain the water as per specification. No extra payment for the same admissible at any point of time during the execution or defect liability period later on.

10. CONCRETING: -

10.1 The design mix concrete of strength as indicated as per approved drawings shall be used for foundation, sub-structure and super-structure of the bridge. The contractor will submit design mix along with the calculations to the Engineer-in-Charge. The design mix will have to be got approved from the Engineer In-Charge before use in the construction.

10.2 The concrete shall be mixed properly in mechanical mixer and shall be of proper consistency. The proper consistency shall be determined by Engineer-In charge through tests that shall be carried out by the contractor/s. The Concreting shall be commenced only after the Engineer-in charge has inspected the shuttering, the placement of reinforcement and passed the same. Cost of concrete moulds and other test shall be borne by the contractor/s.

10.3 The concrete shall be compacted immediately after placing by means of mechanical vibrator of approved quality.

10.4 The mixing time of concrete in mixer will be decided by the Engineer, depending upon the type of work and strength of concrete.

10.5 The contractor shall make adequate arrangements for casting of necessary numbers of cubes and cure and finish them as per direction of Engineer.

10.6 The contractor shall establish laboratory in field and provide the necessary equipments to carryout all preliminary test and working out

the grading and proportioning of aggregate, assessing the moisture content, casting and testing of cubes etc., in order to obtain and maintain uniform quality of work confirming to codal practices.

10.7 The exposed surface of plain, R.C.C/P.S.C. work shall be rubbed with Carborandum stone and rendered smooth if necessary with cement to leave surface smooth and even. Nothing extra will paid on this account. Cement for the same will be arranged by the contractor/s at his own cost and no payment shall be made.

10.8 The controlled concrete ingredients should be weigh batched in approved type weigh- batcher.

10.9 The slump of the approved trial mix shall be measured and this slump shall not be exceeded through out all the batches of concrete made from the same materials mixed in the same proportion as the trial mixes and used in those parts of the work as instructed.

10.10 **Concreting in hot weather:** Hot weather is defined as any combination of high air temperature, low relative humidity, and wind velocity tending to impair the quality and properties of fresh or hardened concrete. In hot weather, the contractor shall ensure that the temperature of the concrete at the time of placing does not exceed 30 degree C and that the maximum internal temperature attained during setting does not exceed 75 degree C.

The contractor shall provide the effective measures suggested by the Engineer Incharge to protect the concrete from the effects of high temperatures. No concreting in hot weather shall be put in hand until the proposed measures have been approved by the Engineer.

10.11 **Concreting in cold weather:** Cold weather is defined as the situation existing at the work where either or both of the following conditions exist:

i) The air temperature at the time considered is below 5 degree C.

ii) The mean daily air temperature over three or more successive days has dropped below 5 degree C.

On no account may concrete be placed in contact with frozen ground or for work in contact with ice, snow or frost on the ground or on form work of reinforced concrete shall not be made with frozen materials, Concreting may proceed in cold weather provided special precautions are taken to

ensure that the surface temperature of the concrete at the time of placing is not less than 5 degree C.

The contractor shall provide the effective measures suggested by the Engineer to take to protect the concrete from the effects of low temperatures and with details of the methods he proposes to use to assess the correct timing at which such protection may be removed. No concreting in cold weather shall be put in hand until the proposed measures have been approved by the Engineer.

10.12 **Concrete placed in water:** Where any concrete is to be placed in water, the contractor shall submit detailed proposals to the Engineer and shall obtain his approval before commencing the work. The quantity of cement in any concrete placed in water, shall, be increased by 10% so that the free water/cement ratio of the mix is not more than the specified.

Concrete shall not be placed in running water or be allowed to fall through water.

Concrete shall be placed in water only by means of a bottom opening watertight box or a tremie of a type approved by the Engineer. Bottom-opening boxes shall not be opened until they are resting on the work, and the lower ends of tremies shall always be kept below the surface of freshly placed concrete.

10.12.1 **PRESTRESSING:-** As per MORT&H specification wherever applicable.

10.13 MEASUREMENTS:

10.13.1 All work will be paid for at the tendered rates on the basis of actual measurements taken at site. No cognizance will be taken for heights and thickness of structural members over those shown in the plan.

10.13.2 The gross dimensions of RCC/PSC work exclusive of the thickness of plaster shall be measured for purpose of payment. No deduction shall be made for the volume of reinforcement and for small weep holes for drainage etc. No payment shall be made for plastering over the exposed surface of the RCC/PSC.

10.13.3 No deduction shall be made for the volume of sectional steel measurement on the cutting edge for the portion embedded in concrete.

10.14 **FOUNDATIONS:**

10.14.1 The bed of open foundations should be made horizontal and sides neatly dressed and in all cases got approved by the Engineer before concrete is laid. If foundations are laid in sandy or clay soil, the variation in levels should not be more than 15mm but in case it is laid on soft rock/boulder studded soil larger variation may be permitted by the Engineer, at his discretion according to condition at site. In no case concrete be laid on a sloping bed. In case of loose pockets the same will have to be filled with lean concrete, as directed by the Engineer, for which no extra payment will be made excepting that cement required for this purpose, will be paid to the contractor as per relevant item.

10.14.2 It is expected that design of open foundation will suit in all the bridges. Payment for excavation of foundation of all the structures including foundation of pucca side and catch water drains (embedded concrete and masonry portion) and floor of bridges will be made as per relevant item. It will be applicable to all types of soil including all lead and lift, including excavation water requiring pumping and bailing out of water including back filling in 15cm layers with proper watering & ramming. The payment for excavation of foundation will be as per MORT&H/PWD Standard Specification for material and works irrespective of the fact that excavation has been done in slopes and there have been slips etc. or any shoring or shuttering has been done. The surplus earthwork from foundation (quantity of excavation minus quantity of refilling of earth in foundation limited to vertical dimension) should compulsorily be lead to the adjoining filling without any extra payment for loading, unloading, crossing of nallaha/streams, rehandling, dressing the filling irrespective of facts whether surplus earthwork from foundations has been utilized or not. No cognizance for any boulder more than 15 kg and 15 cm in dimension will be taken for purpose of any claim and contractor is free to take away such boulders free of cost after paying due royalty etc. to State Govt. if any.

10.15 **FOUNDATION TRENCHES:**

The space between the side of the foundation trenches and the masonry/concrete is to be filled with the excavated material well rammed in layers not exceeding 15 cm each layer being watered, rammed and consolidated before the succeeding one is laid. Earth shall be rammed with iron rammers where feasible and with the butt ends of crow bars where rammers cannot be used. Earth used for filling shall be free from salts organic or other foreign matter. All clods of earth shall be broken or removed.

The foundation of the bridge shall be of well/pile foundations as per drawing supplied by the Department.

The contractor shall give notice to the Engineer when and as soon as the excavation of any portion of the site for obtaining foundations or bottom whether above or below water has reached the depth and width shown on the drawings. The contractor shall also give further notice to the Engineer whenever any foundation or bottom is ready for inspection and whenever it is necessary to cover up any work in respect of which previous inspection is desired by the Engineer so that the Engineer may inspect the same before it is covered up. No foundations or bottom, of work shall be covered up or filled or built upon without the previous consent of the Engineer. In default of such notice and consent aforesaid the foundation or bottom of work shall on the order of the Engineer be uncovered and any filling put in or work built thereon be removed or pulled down by the contractor at his own cost.

10.16 TESTING OF MATERIALS:

10.16.1 The contactor shall at his own cost arrange and carry out the tests on various types of materials to be used in the work. The tests shall be carry out in Laboratories approved by the Engineer in charge. The frequency of the test and different type of test to be carried out on different materials shall be decided by the Engineer-in-charge. Nothing extra shall be paid on this account.

11.0 STEEL:

11.1 Steel shall conform to latest relevant IS specifications. Test certificate for steel before use as per latest relevant IS specifications will be furnished by the contractor at his own cost from the manufacturer or the laboratories approved by the Engineer In-Charge.

11.2 The Engineer in Charge will also take samples during the course of work and get the steel tested to ascertain their conformity to the relevant IS specifications at the contractor/s cost before a particular

lot is to be used. Frequency of testing shall be as prescribed by the relevant IS Code or as per instruction of engineer in charge.

12.0 FINISHING

12.1 No plastering shall be done over the exposed surface of RCC/PSC work, special care should be taken in centering and shuttering and casting to ensure good finish, wherever necessary rendering in 1:3 (1 cement: 3 coarse sand) shall be done to the satisfaction of Engineer-In-Charge. Nozzle and form vibrators are to be used for RCC/PSC work.

13.0 QUALITY CONTROL:

13.1 The contractor shall arrange to maintain the quality of the work during the operation of construction and shall ensure that the same is maintained as laid down in the specification for road and bridge works of the Ministry of Transport and Highways, Government of India, PWD Specification or as per satisfaction of the Engineer-In-Charge.

13.2 The permissible variation from the specified value shall also conform to these specifications. It shall be sole responsibility of the contractor to arrange for quality control test during the construction as per specification. The Engineer-In-Charge shall be empowered to get the quality control tests done through other agency if required, the cost of which shall be borne by the contractor.

14.0 SETTING UP FIELD LABORATORY BY CONTRACTOR:

14.1 The contractor shall set up a field laboratory his own at work site which should be open for use and inspection by the PWD B&R Department at any time. The laboratory shall be equipped with necessary equipments to carry out the various tests such as sieve analysis, compression tests on cubes, slump tests, workability test etc. on aggregate, cement, water and concrete required for acquiring the required quality and standard conforming to codal provisions and Special specifications.

14.2 All the pressures gauges, machines, equipments and other measuring and testing equipments of the laboratory shall be got checked/calibrated regularly as directed by the Engineer and the necessary certificates produced to the Engineer.

14.3 The Contractor shall render all reasonable assistance and help in making the checks and tests. All the equipments, machinery etc. shall be kept in good working conditions.

14.4 Cost of setting up the laboratory, equipping the same, maintaining, conducting all tests on materials and cubes shall be borne by the contractor and nothing extra shall be paid on this account.

15.0 CURING:

15.1 All concrete work in cement mortar, plaster, pointing etc., shall be continuously cured for the prescribed period as per direction of the Engineer, Curing shall be done by covering the newly laid concrete with gunny bags and keeping them wet constantly. If it is found that the contractor is not observing properly these instructions, the Engineer may get the curing done through another agency, labour without any notice to the contractor at the cost of the contractor. The cost incurred along with incidental charges of 2% and along with supervision charges 12 ½ % of the cost will be debited to the contractor.

16.0 SUPPLY OF DRAWINGS :

16.1 Detailed working drawings shall be supplied by the Department during the course of execution subject to compliance to various provisions in the agreements.

16.2 It may clearly be noted that the Engineer in Charge (Const) shall have full power to make alterations in the drawings and to give such further instructions, directions as may appear to him necessary or proposed for the guidance of the contractor and for the official execution and completion and maintenance of the work.

17.0 Earthwork behind/around abutment, wing/return wall:

17.1 The earthwork will be done with contractor/s own earth by borrowing the earth from outside the PWD land and the rate quoted will be deemed to be inclusive of all taxes, royalty, loading, unloading, leading, handling and re-handling of earth, all leads, lifts, ascents, descents, crossing of nallahas, streams, tracks, leveling, dressing as a complete jobs in all respects as per specifications indicated in succeeding paras. The earthwork shall be compacted mechanically using heavy compactions as per specifications.

17.2 The contractors shall provide all stakes, ballies, bamboo, strings, pegs and labour for setting out profiles, of embankment required for the correct execution of the work and shall also be responsible to maintain in the proper order. He is also required to provide labour for the setting of the same when called upon to do so. This is deemed to be included in the item rate for the earthwork. The contractor/s shall take necessary precautions to prevent their being removed, altered and disturbed and shall be responsible for the consequence of such removal alterations and disturbance and will take action for their proper reinstatement.

17.3 The contractor shall be liable to set up field laboratory with adequate equipments so as to carry out tests of the soil as per direction of Engineer-in-Charge.

17.4 The contractor shall also be required to provide full assistance for carrying out these tests, i.e.labour and other materials etc. The rates quoted by the contractor deem to have included of this element and nothing extra shall be payable to him on this account.

17.5 Engineer-in-charge, if required may get the soil samples tested from another outside agency as deemed suitable and the cost for the same if any shall be borne by the contractor.

17.6 Before the earthwork is started by the contractor the ground between the line where filling/excavation is to be done for embankments, cuttings and training works shall be cleared of all trees along with the roots, shrubs heavy grass, and under growth of every kind. None of the items of work mentioned in this para will entitle the contractor/s to any extra payment.

17.7 The contractor should commence work systematically at one or more points in consultation with the Engineer and should maintain continuous and steady progress to complete the work in continuous length including leveling and dressing.

17.8 Any extra earth deposited on the top and slopes of the formation shall be removed within 48 hours after a written notice. If not complied, the same shall be removed by other means at contractor/s cost. Cost of which shall be recovered from contractor/s bill. The payment shall be made as per designed cross section only.

17.9 It must be clearly understood that the rates are intended to cover the full cost of the finished works . The banks and cuttings are to be correctly dressed to profile with such slopes as specified in each case by the Engineer. The rates for earth work shall also include the following:-

i) Site clearance as per specifications including cutting of trees.

ii) Benching in side long ground and existing bank.

17.10 The rates also include maintenance of the banks and cutting to correct profile including repairs of all rain cuts, making good earth work due to base settlement, natural or otherwise due to rains etc. In case of filling embankments and removal of silts and slips that may be accumulated in cutting during rains etc.

17.11 Until the final measurements have been recorded and banks/cutting taken over by the Department, the item rate of BOQ and quantities will cover the full cost of finished work of cutting and embankments.

17.12 The following category of soil shall not be permitted.

(a) Organic clays, organic silts, peat, chalks and dispersive soils as detailed below:-

(i) Poorly graded gravels sands with Cu less than 2.

(ii) Clays and silts of high compressibility i.e. MH, CH

18. CONSTRUCTION JOINTS:

18.1 A construction joint is defined as a joint in the concrete introduced for convenience in construction at which special measures are taken to achieve subsequent continuity without provision for relative movement. (Hacking of laitance, air jetting and wetting). Location of all construction joints shall be predetermined and got approved from Engineer-in-Charge.

18.2 Construction joints shall be located so as not to impair the strength of the concrete. The position of construction joints and the size of the formwork panels shall be so coordinated that where possible the line of any construction joint coincides with the line of a formwork joint and that in any case all construction joint lines and formwork joint lines appear as a regular and uniform series.

18.3 For all exposed horizontal joints and purposely inclined joints, a uniform joint shall be formed with a batten of approved dimensions to give a straight and neat joint line.

NOTE: For more details refer relevant I.S./I.R.C. Code (Latest Edition).

19. CONTRACTORS RESPONSIBILITIES FOR TEMPORARY WORKS & MATERIALS

19.1 The contractor shall from time to time, provide at his own cost all dams, coffer dams, embankments and all other temporary work of whatever nature and temporary materials necessary for the construction, completion and maintenance of works which are the subject of the contract and shall from time to time submit for the information of the Engineer, drawing showing the details, the type and construction of the temporary dams, bridges, embankments and other works which he propose to adopt and construct and the exact position in which he propose to construct and employ them and during the progress of the works he shall if so directed by the Engineer, furnish particulars and drawings of any other temporary works and details or any other temporary materials in use or contemplated to be used by him. He shall be entirely responsible for the sufficiently, security and safety of all dams, coffer dams, bridges, embankments and other temporary works or temporary materials which he may construct and/or employ and for the claims for damages to property or injury to persons arising out of any failure or accident to such dams, coffer dams bridges embankments or other temporary works, or temporary materials from where such cause damage, injury, failure or accident may arise or happen and shall replace, construct, repair and maintenance of the whole of such dams, coffer dams, bridges, embankment or other temporary works or temporary materials until they are certified by the Engineer to be no longer required for the purpose of the contract.

19.2 The contractor shall, before handing over the works or and part thereof to the Department, dismantle and remove all temporary works and temporary

materials, but such removal shall not be effected without the previous written approval of the Engineer-in-Charge and the contractor shall comply with the directions (if any) given by him as to the method or removal and/or disposal.

20. BEARINGS.

POT PTFE bearing shall be provided for the girders. The bearings shall be in accordance with the IRC-83 (Pt.III) 2002. (Latest Edition)

These bearings shall be correctly manufactured according to the approved drawings subject to the permissible tolerances. The bearing shall be got approved from Engineer In-charge prior to placement under the girder. For example (Bearing of METCO, Sanfield, Mageba), M/S Steel Auto Industries and any other brand/make with the approval of department.

21. EXPANSION JOINTS.

21.1 Compression Seal joint shall consist of steel armored nosing at two edges of joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed and fixed into the joint gap with special adhesive binder.

21.2 The manufacture /supplier of expansion joint shall be got approved from Engineer-in Charge prior to placing the order. Preference will be given to the bearing of METCO, Sanfield, Mageba and any other brand/make with the approval of department.

22. Material steel nosing: The steel nosing shall be of angle section ISA 100x100 conforming to weldable structural steel as per IS:2062. The thickness of legs shall not be less than 12mm. The top face of the angle shall be provided with Bleeder holes of 12mm diameter spaced at maximum 100mm centers so as to ensure that there are no voids in the concrete beneath the angle.

23. Anchorage: The anchorage steel shall conform to IS: 2062 or equivalent. The steel nosing shall be anchored to the deck by reinforcing bars, headed studs or bolts or anchor plates cast in concrete or a combination of anchor plate and reinforcing bars, headed studs or bolts. Anchor bars, studs or bolts shall engage the main structural reinforcement of the deck and in case of anchor plates or anchor loops, this shall be achieved by passing transverse bars through the loops or plates.

The minimum thickness of anchor plate shall be 12mm. Total cross sectional area of bars, studs or bolts on each side of the joint shall not be less than 1600 mm sq. per meter length of the joint and the center to center spacing shall not exceed 250mm. The ultimate resistance of anchorage shall not be less than 500 KN/m in any direction.

Corrosion protection: All steel section shall be protected against corrosion by hot dip galvanizing or any other approved anticorrosive coating with a minimum thickness of 100 micron.

24. JOINT SEAL:

The sealing element shall be a preformed continuous chloroprene or closed cell foam seal with high shear strength, insensitive to soil, gasoline and ozone. It shall have high resistance to ageing and ensure water tightness. The seal should be vulcanized in a single operation for the full length of the joint required for carriage way, kerbs and foot paths, if any. The seal shall cater for a horizontal movement upto 40mm and vertical movement of 3mm. EVAZOTE 380 E.S.P, which is low density closed cell, preformed, non-extruding, cross linked ethylene vinyl acetate polyethylene copolymer form to be used. The seal is bonded to the steel nosing with special bond no.1 subsequent to sand blasting of vertical faces.

The physical properties of chloroprene/closed cell foam sealing element shall conform to the following.

(a) Chloroprene seal: Shall be preformed extruded multi web cellular section of chloroprene of such a shape as to promote self removal of foreign material during normal service operations. Chloroprene of joints seal shall conform to clause 9.1.5.1 of IRC 83 (Pt.II) and satisfy the properties stipulated in Table 2 of the specifications except in respect of the working movement range of the sealing element which shall be as specified in clause 31.5.1 above.

Closed cell foam steel: Shall perform non-extruded non cellular section made from low density closed cell, cross linked ethylene vinyl acetate, polyethylene copolymer that is physically blown using nitrogen. The material shall possess properties as indicated in the table.

	Property	**Specified value**
(I)	Density	41.7 – 51.3 kg/cum
(ii)	Compression set on 25mm	50% compression samples (ASTM D 3575) for 22 hrs at 23 degree C,2 hour recovery: 13% set.
(iii)	Working temperature	-70 to + 70 deg. C
(Iv)	Water absorption (total immersion for 3 months) (ASTM D 3575)	0.09766 kg/sqm
(v)	Tensile strength	0.8 Mpa
(vi)	Elongation at break (ASTM D 3575)	195 +/- 20%

Lubricant cum adhesive: The type and application of material used in bonding the preformed joint seal to the steel nosing and concrete shall be as recommended by the manufacturer/supplier of the seal system.

Handling and storage:

a) The expansion joint material shall be handled with care and stored under cover.

b) All joint material and assemblies shall be protected from damage and assemblies shall be supplied to maintain true shape and alignment during transportation and storage.

INSTALLATION:

The expansion joint shall be installed by the manufacturer/supplier or their authorized representative, who will ensure compliance of installation procedure and instructions.

The dimension of the joint recess and the width of the gap shall conform to the approved drawing.

Anchoring steel shall be welded to the main reinforcement in the deck maintaining the level and alignment of the joint.

Concreting of pocket/recess shall be done with great care using proper mix conforming to same grade as that of the deck concrete but not less than M35 grade in any case. The water-cement ratio shall not be more than 0.40. If needed suitable admixtures may be used to achieve the workability. The width of pocket shall not be less than 300mm on either side of the joint. Care shall also be taken to ensure efficient bonding between already cast existing deck concrete and the concrete in the joint recess.

At the time of installation, joint shall be clean and dry and free from spoils and irregularities, which might impair a proper joint seal.

Concrete or metal surfaces shall be clean, free of rust, laitance, oils, dirt, dust or other deleterious materials.

The lubricant cum adhesive shall be applied to both faces of the joint and joint seal prior to installation in accordance with the manufacturer's instructions.

The joint seal shall be compressed to the specified thickness for joint opening and ambient temperature at the time of installation which shall be between + 5 to + 35 degree C.

The joint seal shall be installed without damage to the seal. Loose fitting or open joints shall not be permitted.

Steel nosing system shall be installed in correct camber and alignment of the joint in the recess provided with adequate support bars and loops which shall be welded with the sinusoidal bars of the anchorage system and the exposed reinforcement of the deck slab/PSC girder.

That recess portion shall be concreted with cement concrete (CC) in accordance with M.O.S.T. specification.

The top of expansion joint cc block and top of wearing coat shall be in the same level.

The EVAZOTE – 380 ESP shall be installed between the angle nosing subsequent to sand blasting and applying BONDER no.1 on vertical faces of nosing angle on curing of concrete. The width of seal is 25% more than the expansion gap so the seal is installed in compressed, state.

25. Acceptance Criteria:

All steel elements shall be furnished with corrosion protection system.

For the joint seal the acceptance test shall conform to the requirement stipulated in relevant clause. The manufacturer/supplier of the type of joint shall produce a test certificate to this effect conducted in a 5recognized laboratory in India or Abroad.

26. Prior to acceptance 25% of the completed and installed joints, subject to minimum of one joint, shall be subjected to water tightness test. Water shall be continuously pounded along with entire length for a minimum period of 4 hours for a depth of 25mm above the highest point of deck. The width of pounding shall be at least 50mm beyond the anchorage block of the joint another side. The depth of water shall not fall below 25mm anytime during the test. A close inspection of the under side of the joint shall not reveal any leakage.

27. Tests and standards of acceptance: The materials shall be tested in accordance with these specifications and shall meet the prescribed criteria. The manufacturer/supplier shall furnish the requisite certificates from the recognized testing laboratory of India or abroad.

The work shall conform to these specifications and shall meet the prescribed acceptance.

28. MACHINERY AND PLANT.

28.1 The contractor will be entirely responsible to arrange all necessary machinery, including concrete mixers, vibrators, compressors, pumps, pneumatic equipments, dredges derricks, cranes, service girders, staging, motor vehicles, trailer tools and plants and their spare parts required for sufficient and methodical execution of work and transport them to the site of work. Delay in procurement of such items due to their non-availability on account of import difficulties or any other cause whatsoever, will not be taken as excuse for slow or non-performance of the work. Safety of plants and machinery will be the responsibility of the contractor and for any loss due to any cause or wash away in flood, or otherwise no claim will be entertained on this account whatsoever.

29. Coordination with Railway for end span (regarding issues of bridges the coordination with Railway considered to be deleted) only for ROB & RUB.

The contractor has to made coordination with the Railway Authorities, during the execution of work. The end span of approaches shall be laid only after consultation with Railway. Nothing extra shall be paid on account of delay of railway portion. However suitable time extension on this account, if any, will be granted by the department.

Section 5

Drawings

List of Drawings:-

Section 6

Bill of Quantities
Preamble

1) The Bill of quantities shall be read in conjunction with the instructions to Bidders, Conditions of contract, Technical Specifications and Drawings.
2) The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the contractor and verified by the Engineer and valued at the rates and prices tendered in the priced Bill of Quantities, where applicable, and otherwise at such rates as the Engineer may fix within the terms of the Contract.
3) The rates and prices tendered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the Contract, include all constructional plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract.
4) The rates and prices shall be quoted entirely in Indian Currency.
5) A rate or price shall be entered against each item in the Bill of Quantities, whether the quantities are stated or not. The cost of Items against which the contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
6) The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no Items are provided the cost shall be deemed to be distributed among the rates and prices entered for the related Items of work.
7) General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant sections of the contract documentation shall be made before entering rates or prices against each item in the Bill of Quantities.
8) Errors will be corrected by the Employer for any arithmetic errors pursuant to clause of the Instructions to Bidders.
9) Any items of work not provided in the contract schedule of rates if required to be executed will be paid as per Haryana PWD schedule of rates 2021 plus ceiling premium as applicable in DNIT subject to the premium tendered by the contractor. In case of non schedule item, these

will be paid by the 'Engineer' based on market rates of that time after getting approval from the competent authority and will be binding upon the contractor.

10) The work will be carried out strictly in accordance with the PWD book of specification 1990 edition, CPWD Specifications and MoRT&H Specifications as applicable and that will form part and parcel of this contract agreement.

11) The 'Engineer' shall be entitled to order work against any item or work shown in this contract schedule of rates hereinafter called the "Schedule" to any extent and without any limitation whatsoever as may be required in his opinion for the purpose of work irrespective of the fact the quantities are omitted altogether in the "Schedule" or shown more or less than the work ordered to be carried out.

12) In this contract schedule of rates only essential portion of items has been written, but it will deem to cover the entire items as fully described in Haryana PWD schedule rates 2021 till the date of opening of tender and will be applicable on this contract schedule of rates.

13) All the items in this contract schedule of rates 2021 subject to the foot notes given in the Haryana PWD schedule of rates 2021 till the date of opening of tender and will be applicable on this contract schedule of rates.

14) Quantities given in the BOQ may vary at the time of execution of works done at site by the contractor.

15) Unless otherwise specified all material, machinery and labour input are to be arrange by the contractor.

16) All amendments issued to the Haryana PWD schedule of rates will be applicable on the contract schedule of rates.

17) As and when contractor gives condition that arrangement of water shall be made by the department, it shall be deemed that all the charges

incurred thereon shall be borne by the department and recovery on the total work done shall be made from him.

18) No claim will be entertained from the contractor in case of any mistake in description, rate or unit occurred on account of typing or comparison or over sight. If there is any mistake, the same shall be rectifiable by the 'Engineer' at any stage as per Haryana PWD schedule of rates 2021 and all the amendments received from time to time.

19) The premium should be quoted above or below for HSR items and individual rates for NS Items. No conditional offer should be made. In case any conditions is tendered, this will be considered as null and void and only the premium or discount quoted by the tenderer small be accepted. In case any tendered refused to accept the above afterwards, his earnest money will be forfeited or the action as per conditions of Bid Security Declaration Form shall be taken.

20) Tender premium will not be allowed on new N.S. items.

21) Rate quoted by the contractor for each N.S. item shall be for complete job including all taxes, carriage etc. Nothing extra on any account shall be paid.

22) The payment will be made according to the actual work done by the contractor.

BILL OF QUANTITIES

NAME OF WORK:-_____.

Sr. No	Description of Item with brief specification and reference to book of specification.	Quantity	Unit	Rate to be quoted by the contractor/ society		Amount
				In figures	In words	

Total Bid Price (in figures) ----------

(in words) ----------

Signature_____

Notes:-

1. The item for which no rate or price has been entered in will not be paid for by the Employer when executed and shall be deemed to be covered by the other rates and prices in the Bill of Quantities (Refer: ITB Clause 13.2).

2. Unit rates and prices shall be quoted by the bidder in Indian rupees [ITB Clause 14.1].

Section 7

Standard Forms

Letter of Acceptance

and

Other Forms

Standard Forms

(A) Letter of Acceptance

LETTER OF ACCEPTANCE

(Letterhead paper of the Employer)

No._____ Dated_____

To

_____ (Name and address of the Contractor)

Dear Sir,

This is to notify you that your Bid dated _____ for execution of the _____(name of the contract and identification number as given in the contract data) for the contract Price of Rupees _____(amount in words and figures), as corrected and modified in accordance with the Instructions to Bidders[1] is hereby accepted.

You are hereby requested to furnish Performance Security, (and additional security for unbalanced bids in terms of ITB Clause 29.3) *[where applicable]* in the form detailed in Clause 34.1 of ITB for an amount equivalent to Rs. _____within 15 days of the receipt of this letter of acceptance valid up to 28 days from the date of expiry of **Defect Liability-cum-Maintenance Period** i.e. up to _____and sign the contract, failing which action as stated in Clause 34.3 of ITB will be taken.

Yours faithfully,

Authorized Signature
Name and title of Signatory
Name of Employer
for and on behalf of Governor of Haryana

(B) Issue of Notice to Proceed with the Work

ISSUE OF NOTICE TO PROCEED WITH THE WORK

(Letter head of the Employer)

No. _____ Dated _____

To

———————————————— (Name and address of the Contractor)

_____

Dear Sirs:

Pursuant to your furnishing the requisite Performance Security as stipulated in ITB Clause 34 and signing of the Contract for the work of ——— ———————

——————— at a bid price of Rs. _____.

You are hereby instructed to proceed with the execution of the said works in accordance with the contract documents.

Yours faithfully,

(Signature, name and title of signatory, authorized to sign on behalf of Employer)

(C) Standard Form of Agreement

STANDARD FORM: AGREEMENT

This Agreement, made the _____day of _____20_____, between_____

_____ [name and address of Employer]

(hereinafter called "the Employer") of the one part, and

_____

_____

_____

[name and address of Contractor] (hereinafter called "the Contractor" of the other part).

Whereas the Employer is desirous that the Contractor execute

_____

_____

_____

_____[name and identification number of Contract]

(hereinafter called "the Works") and the Employer has accepted the Bid by the

Contractor for the execution and completion of such Works and the remedying of any

defects therein at a cost of Rupees.....

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to, and they shall be deemed to form and be read and construed as part of this Agreement.

2. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all aspects with the provisions of the Contract.

3. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and remedying the defects within the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

4. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz:

   i) Letter of Acceptance;
   ii) Notice to Proceed with the works;
   iii) Contractor's Bid;
   iv) Contract Data;
   v) Special Conditions of Contract and General Conditions of Contract;
   vi) Specifications;
   vii) Drawings;
   viii) Bill of Quantities; and
   ix) Any other document listed in the Contract Data as forming part of the Contract.

In witness whereof, the parties thereto have caused this Agreement to be executed the day and year first before written.

The Common Seal of _____

was hereunto affixed in the presence of:

Signed, Sealed and Delivered by the said _____

_____

in the presence of:

Binding Signature of Employer _____

Binding Signature of Contractor _____

(D) Form of Unconditional Bank Guarantee from Contractor for ~~Earnest Money, Earnest Money Declaration and Performance Bank Guarantee~~

EARNEST MONEY (BANK GUARANTEE)

WHEREAS, _____ [Name of Bidder] (hereinafter called "the Bidder") has submitted his Bid dated _____ [date] for the construction of _____ [name of contract hereinafter called "the Bid"].

KNOW ALL PEOPLE by these presents that We _____

[name of Bank] of _____ [name of country] having our registered office at _____ (hereinafter called "the Bank") are bound unto _____ [name of Employer] (hereinafter called "the Employer") in the sum of _____ * for which payment well and truly be made to the said Employer the Bank itself, his successors and assigns by these presents.

SEALED with the common seal of the said Bank this _____ day of _____, 20

THE CONDITIONS of this obligation are;

(1) If after Bid opening the Bidder withdraws his bid during the period of Bid validity specified in the from of tender.

OR

(2) If the Bidder having been notified to the acceptance of his bid by the Employer during the period of Bid validity:

(a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or

(b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders; or

We undertake to pay to the employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the three conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date _____ ** days after the deadline for submission of Bids or as such deadline as is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date.

DATE _____ SIGNATURE _____

WITNESS _____ SEAL _____

[Signature, name and address]

* The Bidder should insert the amount of the guarantee in words and figures denominated in Indian Rupees. This figure should be the same as shown in Clause 16.1 of the Instructions to Bidders.

** 45 days after the end of the validity period of the Bid. Date should be inserted by the employer before the Bidding documents are issued.

Earnest Money Declaration Form

(in case of bidder is registered as contractor with Haryana Government)

(refer Clause 16.2)

(This should be on a non-judicial stamp paper of Rs.10/- and shall be attested by Magistrate/Sub-Judge/ Notary Public)

1. I hereby submit a declaration that the bid submitted by the undersigned, on behalf of the bidder, (name of the Bidder), shall not be withdrawn or modified during the period of validity i.e. not less than 120 (one hundred twenty) days from the bid due date.

2. I, on behalf of the bidder, (Name of Bidder), also accept the fact that in case the bid is withdrawn or modified during the period of its validity or if we fail to sign the contract in case the work is awarded to us or we fail to submit a performance security before the deadline defined in clause 34.1 of the tender document, then (Name of Bidder) will be debarred for participation in the tendering process in any of the Department/Boards/Corporations etc. of the Government of Haryana for a period of Two year from the bid due date of this work.

(Signature of the Authorized Signatory)
(Official Seal)

PERFORMANCE BANK GUARANTEE

To

_____[name of Employer]

_____[address of Employer]

_____

WHEREAS _____[name and address of Contractor] (hereafter called "the contractor") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____[name of Contract and brief description of Works] (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligation in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you on behalf of the Contractor, up to a total of _____[amount of guarantee]* _____(in words), such sum being payable in the types and proportions of currencies in which the Contract Price is Payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____[amount of guarantee] as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor

shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until 28 days from the expiry of the **Defect Liability-cum-Maintenance Period**.

Signature and Seal of the guarantor_____
Name of Bank_____
Address _____
Date_____

---

* An amount shall be inserted by the Guarantor, representing the percentage the Contract Price specified in the Contract including additional security for unbalanced Bids, if any and denominated in Indian Rupees.

(E) Format for Equipment/Machinery Lease Agreement

EQUIPMENT/MACHINERY LEASE AGREEMENT

The Lease Agreement (the "agreement") is made and entered on dated_____, by and between ("Lessor) and (" Lessee") (collectively referred to as the parties).

The parties agree as follows:-

1. Lessor hereby leases to Lessee the following machinery and equipment:

   _____

   _____

   _____

2. LEASE TERM: The Lessee will start on dated _____(begin date) and will end on dated _____(end date).

3. LEASE PAYMENT: Lessee agrees to pay lessor as rent for the equipment/ machinery the amount of Rs._____("RENT") each month in advance on the first day of each month at _____ (Address for rent payment) or at any other address designated by Lessor.

4. LATE PAYMENT: If any amount under this agreement is more than _____days late, lessee agree to pay a late fees of Rs. _____per day.

5. SECURITY DEPOSIT: Prior to taking possession of the Equipment/ machinery, Lessee shall deposit with Lessor in trust, a security deposit of Rs. _____as security for the performance by Lessee of the terms under this agreement and for any damages caused by Lessee or Lessee's agents to the equipment/ machinery during the lease term. Lessor may use part or all of security deposit to repair any damage to Equipment/ machinery caused by Lessee or Lessee's agents. However, lessor is not just limited to security deposit amount and lessee remains liable for any balance. Lessee shall not use or apply any such security at any time in lieu of payment of rent. If lessee breaches any terms or conditions of this Agreement, Lessee shall forfeit any deposit, as permitted by law.

6. DELIVERY: Lessee shall not be responsible for all expenses and costs i) at the beginning of the Lease Term, of transporting the equipment/ machinery Lessee's premises and ii) at the end of the Lease Term, of transporting the equipment/ machinery back to Lessor's premises.

7. POSSESSION AND SURRENDER OF EQUIPMENT/ MACHINERY: Lessee shall be entitled to possession of the equipment/ machinery on the first day of Lease Term. At the expiration of the lease term, Lessee shall surrender the equipment/ machinery to Lessor by delivering the equipment/ machinery to Lessor or Lessor agents in good condition and working order, ordinary wear and tear excepted, as it was at the commencement of the agreement.

8. USE OF EQUIPMENT/ MACHINERY: Lessee shall only use the equipment/ machinery in a careful and proper manner and will comply with all laws, rules, ordinances, statues and orders regarding the use, maintenance of storage of the equipment/ machinery.

9. CONDITIONS OF EQUIPMENT/ MACHINERY AND REPAIR: Lessee or Lessee's agent has inspected the equipment/ machinery and acknowledges that the equipment/ machinery is in good and acceptable condition.

10. MAINTENANCE, DAMAGE AND LOSS:- Lessee will, at Lessee's sole expense, keep and maintain the equipment/ machinery clean and in good working order and repair during the Lessee Term. In the event the equipment/ machinery is lost or damaged beyond repair, Lessee shall pay to Lessor the replacement cost of equipment/ machinery, in addition, the obligations of this Agreement shall continue in full force and effect through the Lease term.

11. INSURANCE: Lessee shall be responsible to maintain insurance on the equipment/ machinery with losses payable to Lessor against fire, theft, collision and other such risks as are appropriate and specified by Lessor, upon request by Lessor, Lessee shall provide proof of such insurance.

12. OWNERSHIP: The equipment/ machinery is and shall remain the exclusive property of Lessor.

13. BINDING EFFECT: The covenants and conditions contained in the Agreements shall apply to and bind the Parties and the heirs, legal representatives, successors and permitted assigns of the Parties.

14. GOVERNING LAW: This agreement shall be governed and constructed in accordance with the Laws of State of Haryana.

15. NOTICE: Any notice required or otherwise given pursuant to this Agreement shall be in writing and mailed certified return receipt requested, postage prepaid, or delivered by courier or speed post to Lessor/ Lessee

Address of the Lessor	Address of the Lessee

Either party may change such address from time to time by providing notice as set for the above.

In witness whereof, the parties have caused this Agreement to be executed the day and year first above written.

LESSOR

_____

_____

LESSEE

_____

_____

(F) Format For Joint Venture Memorandum of Understanding/Agreement (wherever applicable)

FORMAT FOR JOINT VENTURE MEMORANDUM OF UNDERSTANDING/AGREEMENT

THIS JOINT VENTURE MEMORANDUM OF UNDERSTANDING (MOU)/AGREEMENT EXECUTED AT ..... ON THIS ..... DAY OF ..... 2021 BETWEEN M/s..... Registered office at _____ as the first party and M/s _____ Registered office at _____ as the Second party _____ as thirty party. (The expression and words of the first and second and third party shall mean and include their heirs successors, assigns, nominees execution, administrators and legal representatives respectively.)

WHEREAS the parties herein above mentioned are desirous of entering into a Joint Venture for carrying on Engineering and/or contract works, in connection with _____ and other works mentioned in Tender Notice No. _____ Dated _____ of PWD B&R Department or any other work or works, as mutually decided between the parties to this Joint Venture.

WHEREAS all the parties are desirous of recording the terms and conditions of this Joint Venture to avoid future disputes.

NOW THIS MoU/AGREEMENT WITNESSTH AS UNDER:

1. That in and under this Joint Venture agreement the work will be done jointly by the First Party and Second Party in the name and style of M/s _____ _____ M/s _____ and M/s. _____).

2. This all the parties shall be legally liable, severally and or jointly responsible for the satisfactory/successful execution/completion of the work in all respects and in accordance with terms and conditions of the contract.

3. That the role of each constituent of the said Joint Venture in details shall be as under:-

The first party shall be responsible for _____

The second party shall be responsible for _____

The third party shall be responsible for _____

4. The share of profit and loss of each constituent of the said Joint venture shall be as under:-

5. That all the parties of this Joint Venture shall depute their experienced staff as committed commensuration with their role and responsibility and as required for the successful completion of the works in close consultation with each other.

6. That the investment required for the works under this Joint Venture shall be brought in by the parties as agreed to between them from time to time.

7. That all the Bank guarantee shall be furnished jointly by the parties in the name of Joint Venture.

8. That the party number _____ to this Joint Venture shall be the prime (lead) contractor and will be responsible for timely completion of work and to coordinate with the Department to receive payments and also to make all correspondence on behalf of this Consortium/Joint Venture.

9. That all the above noted parties i.e. _____not to make any change in the agreement without prior written consent of the competent authority of the department.

NOW THE PARTIES HAVE JOINED HANDS TO FORM THIS JOINT VENTURE ON THIS _____DAY OF _____TWO THOUSAND WITH REFERENCE TO AND IN CONFIRMATION OF THEIR DISCUSSIONS AND UNDERSTANDING BROUGHT ON RECORD ON _____.

IN WITNESS THEREOF ALL/BOTH THE ABOVE NAMED PARTIES HAVE SET THEIR RESPECTIVE HANDS ON THIS JOINT VENTURE AGREEMENT ON THE DAY, MONTH AND YEAR FIRST ABOVE MENTIONED IN THE PRESENCE OF THE FOLLOWING WITNESS;

WITNESSES:

1. FIRST PARTY
2. SECOND PARTY

(G) Bank Guarantee for Advance Payment

BANK GUARANTEE FOR ADVANCE PAYMENT

To

_____[name of Employer]
_____[address of Employer]
_____[name of Contractor]

Gentlemen :

In accordance with the provisions of the Conditions of Contract, sub-clause 51.1 ("Advance Payment") of the above-mentioned Contract, _____[name and address of Contractor] (hereinafter called "the Contractor") shall deposit with _____ [name of Employer] a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____ [amount of Guarantee]* _____[in words].

We, the _____ [bank of financial institution], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ [name of Employer] on his first demand without whatsoever right of obligation on our part and without his first claim to the Contractor, in the amount not exceeding _____ [amount of guarantee]* _____[in words].

We further agree that no change or addition to or other modification of terms of the Contractor or Works to be performed thereunder or of any of the Contract documents which may be made between _____ [name of Employer] and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ [name of Employer] receives full repayment of the same amount from the Contractor.

Yours truly,

Signature and Seal of the guarantor
_____
Name of Bank _____
Address _____
Date _____

* An amount shall be inserted by the Bank or Financial Institution representing the amount of the Advance Payment, and denominated in Indian Rupees.

(H) Indenture For Secured Advances

INDENTURE FOR SECURED ADVANCES
FORM 31

(for use in cases in which the contract is for finished work and the contractor has entered into an agreement for the execution of a certain specified quantity of work in a given time).

This indenture made the _____ day of _____, 20____ BETWEEN _____(hereinafter called the contractor which expression shall where the context so admits or implies be deemed to include his executors, administrators and assigns) or the one part and the Employer of the other part.

Whereas by an agreement dated _____ (hereinafter called the said agreement) the contractor has agreed.

AND WHEREAS the contractor has applied to the Employer that he may be allowed advanced on the security of materials absolutely belonging to him and brought by him to the site of the works the subject of the said agreement for use in the constructions of such of the works as he has undertaken to executive at rates fixed for the finished work (inclusive of the cost of materials and labour and other charges).

AND WHEREAS the Employer has agreed to advance to the Contractor the sum of Rupees _____ on the security of materials the quantities and other particulars of which are detailed in Accounts of Secured Advances attached to the Running Account bill for the said works signed by the Contractor on_____and the Employer has reserved to himself the option of making any further advance or advances on the security of other materials brought by the Contractor to the site of the said works.

Now THIS INDENTURE WITNESSETH that in pursuance of the said agreement and in consideration of the sum of Rupees _____on or before the execution of these presents paid to the Contractor by the Employer (the receipt where of the Contractor doth hereby acknowledge) and of such further advances (if any) as may be made to him as a for said the Contractor doth hereby covenant and agree with the President and declare as follows:

(1) That the said sum of Rupees _____so advanced by the Employer to the Contractor as aforesaid and all or any further sum of sums advanced as aforesaid shall be employed by the Contractor in or towards expending the execution of the said works and for no other purpose whatsoever.

(2) That the materials details in the said Account of Secured Advances which have been offered to an accepted by the Employer as security are absolutely the Contractor's own propriety and free from encumbrances of any kind and the contractor will not make any

application for or receive a further advance on the security of materials which are not absolutely his own property and free from encumbrances of any kind and the Contractor indemnified the Employer against all claims to any materials in respect of which an advance has be made to him as aforesaid.

(3) That the materials detailed in the said account of Secured Advances and all other materials on the security of which any further advance or advances may hereafter be made as aforesaid (hereafter called the said materials) shall be used by the Contractor solely in the execution of the said works in accordance with the directions of the 'Engineer'.

(4) That the Contractor shall make at his own cost all necessary and adequate arrangements for the proper watch, safe custody and protection against all risks of the said materials and that until used in construction as aforesaid the said materials shall remain at the site of the said works in the Contractor's custody and on his own responsibility and shall at all times be open to inspection by the 'Engineer' or any officer authorized by him. In the event of the said materials or any part thereof being stolen, destroyed or damaged or becoming deteriorated in a greater degree than is due to reasonable use and wear thereof the Contractor will forthwith replace the same with other materials of like quality or repair and make good the same required by the 'Engineer'.

(5) That the said materials shall not be any account be removed from the site of the said works except with the written permission of the 'Engineer' or an officer authorized by him on that behalf.

(6) That the advances shall be repayable in full when or before the Contractor receives payment from the Employer of the price payable to him for the said works under the terms and provisions of the said agreement. Provided that if any intermediate payments are made to the Contractor on account of work done than on the occasion of each such payment the Employer will be at liberty to make a recovery from the Contractor's bill for such payment by deducting there from the value of the said materials than actually used in the construction and in respect of which recovery has not been made previously, the value for this purpose being determined in respect of each description of materials at the rates at which the amounts of the advances made under these presents were calculated.

(7) That if the Contractor shall at any time make any default in the performance or observance in any respect of any of the terms and provisions of the said agreement or of these presents the total amount of the advance or advances that may still be owing of the Employer shall immediately on the happening of such default be re-
payable by the Contractor to be the Employer together with interest thereon at twelve per cent per annum from the date or respective dates of such advance or advances to the date of repayment and with all costs, charges, damages and expenses incurred by the **Employer** in

or for the recovery thereof or the enforcement of this security or otherwise by reason of the default of the Contractor and the Contractor hereby covenants and agrees with the **Employer** to reply and pay the same respectively to him accordingly.

(8) That the Contractor hereby charges all the said materials with the repayment to the Employer of the said sum of Rupees _____ and any further sum of sums advanced as aforesaid and all costs, charges, damages and expenses payable under these presents PROVIDED ALWAYS and it is hereby agreed and declared that notwithstanding anything in the said agreement and with- out prejudice to the power contained therein if and whenever the covenant for payment and repayment here-in-before contained shall become enforceable and the money owing shall not be paid in accordance there with the **Employer** may at any time thereafter adopt all or any of the following courses as he may deem best :

(a) Seize and utilize the said materials or any part thereof in the completion of the said works on behalf of the contractor in accordance with the provisions in that behalf contained in the said agreement debiting the contractor with the actual cost of effecting such completion and the amount due to the contractor with the value of work done as if he had carried it out in accordance with the said agreement and at the rates thereby provided. If the balance is against the contractor, he is to pay same to the **Employer** on demand.

(b) Remove and sell by public auction the seized materials or any part there of and out of the moneys arising from the sale retain all the sums aforesaid repayable or payable to the **Employer** under these presents and pay over the surplus (if any) to the Contractor.

(c) Deduct all or any part of the moneys owing out of the security deposit or any sum due to the Contractor under the said agreement.

(9) That except in the event of such default on the part of the contractor as aforesaid interest on the said advance shall not be payable.

(10) That in the event of any conflict between the provisions of these presents and the said agreement the provisions of these presents shall prevails and in the event of any dispute or difference arising over the construction or effect of these presents the settlement of which has not been here-in-before expressly provided for the same shall be referred to the Employer whose decision shall be final and the provision of the Indian Arbitration Act for the time being in force shall apply to any such reference.

(l) Integrity Pact Format

INTEGRITY PACT FORMAT

(To be executed on plain paper and submitted alongwith Technical Bid/Tender documents for tenders having a value of Rs 1 cr. or above. To be signed by the bidder and same signatory competent/ authorized to sign the relevant contract on behalf of the State)

This integrity Pact is made at on this day of 2021.

BETWEEN

Engineer-in-Chief on the behalf of Governor of Haryana through its Superintending Engineer or Executive Engineer "Employer" through which expression shall, unless repugnant to the context or meaning thereof, include its administrators, successors and assigns)

AND

{*Name and address of the Firm/Company*}, (hereinafter referred to as "The Bidder(s)/Contractor(s) /Concessionaire (s)/Consultant(s) and which expression shall unless repugnant to be meaning or context thereof include its successors and permitted assigns.)

Preamble

Whereas, the Employer has floated the Tender (NIT No..... dtd .....} (hereinafter referred 'to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract/s for {Name of the work}(hereinafter referred to as the "Contract").

And Whereas the Employer values full compliance with all relevant laws of the land,
rules of land, regulations, economic use of resources and of fairness/ transparency in its relations with its Bidder(s) and/ or Contractor(s)/Concessionaire (s)/Consultant(s).

And whereas to meet the purpose aforesaid, both the parties have agreed to enter into this Integrity Pact (hereafter referred to as "Integrity Pact" or "Pact") the terms and conditions of which shall also be read as integral part and parcel of the Tender documents and contract between the parties.

Now, therefore, in consideration of mutual covenants contained in this pact, the parties hereby agree as follows and this pact witnesses as under:

Article-1: Commitments of the Employer

(1) The Employer commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

a) No employee of the Employer, personally or through family members, will in connection with the Tender for, or the execution of a Contract, demand, take a promise for or accept, for self, or third person, any material of immaterial benefit which the person is not legally entitled to.

b) The Employer will, during the Tender process treat all Bidder(s) with equity and reason. The Employer will in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c) The Employer will exclude all known prejudiced persons from the process, whose conduct in the past has been of biased nature.

(2) If the Employer obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act or any other Statutory Acts or if there be a substantive suspicion in this regard, the Employer will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions as per its internal laid down Rules/Regulations.

Article-2: Commitments of the Bidder(s) / Contractor(s) / Concessionaires) / Consultant(s)

The Bidder(s)/ Contractor(s)/Concessionaire (s)/Consultant(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

a) The Bidder(s)/Contractor(s) /Concessionaire (s)/Consultant(s) will not, directly or through any other person or firm, offer, promise or give to any of the Employer's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which lie/she is

not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

b) The Bidder(s)/Contractor(s) /Concessionaire (s)/Consultant(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contract, submission or non submission or bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

c) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not commit any offence under the relevant IPC/PC Act and other Statutory Acts; further the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not use improperly, for purposes of completion or personal gain, or pass on to others, any information or document provided by the Principal as paid of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract. He shall also disclose the details of services agreed upon for such payments.

e) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

f) The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) will not bring any outside influence through any Govt. bodies/quarters directly or indirectly on the bidding process in furtherance of his bid.

Article-3 Disqualification from tender process and exclusion from future contracts.

1. If the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) before award or during execution has committed a transgression through a violation of any provision of Article- 2, above or in any other form such as to put his reliability or credibility in question, the Employer is entitled to disqualify the Bidder(s)/

Contractor(s)/Concessionaire (s)/Consultant(s) from the tender process.

2. If the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) has committed a transgression through a violation of Article-2 such as to put his reliability or credibility into question, the Employer shall be entitled to exclude including blacklist and put on holiday the Bidder(s)/Contractor(s)/Concessionaire (s)/Consultant(s) for any future tenders/ contract award process. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the Employer taking into consideration the full facts and circumstances of each case particularly taking into account the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) and the amount of the damage. The exclusion will be imposed for a maximum of 3 years.
3. A transgression is considered to have occurred if the Employer after due consideration of the available evidence concludes that "On the basis of facts available there are no material doubts".
4. The Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) with its free consent and without any influence agrees and undertakes to respect and uphold the Employer absolute rights to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.

5. The decision of the Employer to the effect that a breach of the provisions of this Integrity Pact has been committed by the Bidder(s) / Contractor(s) shall be final and binding on the Bidder(s) / Contractor(s) / Concessionaire(s) /Consultant(s) however, the Bidder(s) / Contractor(s) / Concessionaire(s) / Consultant(s) can approach IEM(s) appointed for the purpose of this Pact.

6. On occurrence of any sanctions/ disqualification etc arising out from violation of integrity pact, the Bidder(s)/Contractor(s)/Concessionaire (s)/Consultant(s) shall not be entitled for any compensation on this account.

7. Subject to full satisfaction of the Employer, the exclusion of the Bidder(s)/ Contractor(s) /Concessionaire (s)/Consultant(s) could be revoked by the Principal if the Bidder(s)/ Contractor(s)/Concessionaire (s)/Consultant(s) can prove that he has restored/recouped the damage caused by him and has installed a suitable corruption prevention system in his organization.

Article-4: Compensation for Damages.

1. If the Employer has disqualified the Bidder(s) from the tender process prior to the award according to Article-o, the Employer shall be entitled to forfeit the Earnest Money Deposit/ Bid Security or demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security apart from any other legal right that may have accrued to the Employer.
2. In addition to I above, the Employer shall be entitled to take recourse to the relevant provisions of the contract related to Termination of Contract due to Contractor Default. In such case, the Employer shall be entitled to forfeit the Performance Bank Guarantee of the Contractor demand and recover liquidated and all damages as per the provisions of the contract/concession agreement against Termination.

Article-5: Previous Transgressions

1. The Bidder declares that no previous transgressions occurred in the last 3 years immediately before signing of this Integrity Pact with any other Company in any country conforming to the anti corruption/ Transparency International (TI) approach or with any other Public Sector Enterprise/ Undertaking in India or any Government Department in India that could justify his exclusion from the tender process.
2. If the Bidder makes incorrect statement on this subject, lie can be disqualified from the tender process oi action for his exclusion can be taken as mentioned under Article-3 above for transgressions of Article-2 and shall be liable for compensation for damages as per Article-4 above.

Article-6: Equal treatment of all Bidders/Contractors//Concessionaire (s)/Consultant(s)/Subcontractors.

1. The Bidder(s)/Contractor(s)/Concessionaire (s)/Consultant(s) undertake(s) to demand from all sub-contractors a commitment in conformity with this Integrity Pact, and to submit it to the Employer before contract signing.
2. The Employer will enter into agreements with identical conditions as this one with all Bidders/Contractors//Concessionaire (s)/Consultant(s) and Subcontractors
3. The Employer will disqualify from the tender process all Bidders who do not sign this Pact or violate its provisions.

Article-7: Criminal charges against violating Bidder(s)/ Contractor(s)/Concessionaire (s)/Consultant(s)/ Sub-contractor(s).

If the Employer obtains knowledge of conduct of a Bidder/Contractor/Concessionaire/ Consultant or subcontractor, or of an employee or a representative or an associate of a Bidder/Contractor or Subcontractor, which constitutes corruption, or if the Employer has substantive suspicion in this regard, the Employer will inform the same to the Chief Vigilance Officer.

Article-8: Independent External Monitor (IEM)

1. The Employer has appointed a Independent External Monitor (herein after referred to as "Monitor") for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Engineer – In – Chief (Roads/Buildings).
3. The Bidder(s)/Contractor(s)/Concessionaire (s)/Consultant(s) accepts that the Monitor has the right to access without restriction to all project documentation of the Employer including that provided by the Bidder(s)/ Contractor(s)/Concessionaire(s)/Consultant(s).
   The Bidder(s)/Contactor(s)/Concessionaire (s)/Consultant(s) will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to

treat the information and documents of the Bidder(s)/Contractor(s)/ Subcontractor(s) with confidentiality.

4. The Employer will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
5. As soon as the monitor notices, or has reason to believe, a violation of this Pact, lie will so inform the Management of the Employer and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non-binding recommendations. Beyond this, the monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
6. The Monitor will submit a written report to the Engineer – In – Chief (Roads/Buildings) within 8 to 10 weeks from the date of reference or intimation to him by the Employer and, should the occasion arise, submit proposals for correcting problematic situations.
7. If the Monitor has reported to the Engineer – In – Chief (Roads/Buildings), a substantiated suspicion of an offence under relevant IPC/PC Act, and the Engineer – In – Chief (Roads/Buildings) has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Chief Vigilance Officer.
8. The word 'Monitor" would include both singular and plural.

Article — 9 Pact Duration

This Pact begins when both parties have 1egally signed it. It expires 12 months after the Defect Liability period is over or 12 months after his last payment under the contract whichever is later and for all other unsuccessful Bidders 06 months after this Contract has been awarded. If any claim is made/ lodged during his time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the Engineer – In – Chief (Roads/Buildings).

Article - 10 Other Provisions.

1. This pact is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Employer

2. Changes and supplements as well as termination notices need to be made in writing.
3. If the Bidder/Contractor/Concessionaire(s)/Consultant(s) is a partnership or a consortium, this pact must be signed by all partners or consortium members.
4. Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
5. Any disputes/ differences arising between the parties with regard to term of this pact, any action taken by the Employer in accordance with this Pact or interpretation thereof shall not be subject to any Arbitration.
6. The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provision of the extent law in force relating to any civil or criminal proceedings.

In witness whereof the parties have signed and executed this Pact at the place and date first done mentioned in the presence of following witness:-

(For & On behalf of the Employer) (For & On behalf of the Bidder/ ContractorConcessionaire (s)/Consultant(s)/)

(Office Seal)
Place Date
Witness I : (Name & Address):
Witness 2 : (Name & Address):

(J) Undertaking

UNDERTAKING

Description of the Works :

_____

_____

_____

To :

Address :

1. With full understanding that Part II of our bid (Financial bid) will be opened only if I/We qualify on the basis of evaluation in Part I of the Bid (Technical bid), I/We offer to execute the Works described above and remedy any defects therein in conformity with the conditions of Contract, specifications, drawings, Bill of Quantities and Addenda for an amount quoted in the Financial Bid.
2. I/We agree to abide by this Bid for the period of 120 days from the date fixed for receiving the same, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
3. Unless and until a formal Agreement is prepared and executed this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.
4. I/We undertake, if our Bid is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Engineer's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the document.
5. I/We understand that you are not bound to accept the lowest or any tender you may receive.

Signature of Authorised Signatory .....
Name and Title of Signatory.....
Name of Bidder .....
Authorised Address of Communication.....
Telephone Nos (Office) .....
Mobile No. .....
Facsimile (Fax) No. .....
Electronic Mail Identification (Email ID) .....
Place: .....
Date: .....

(H) AFFIDAVIT

FORMAT FOR THE AFFIDAVIT

(NOTE: This affidavit should be on a non-judicial stamp paper of Rs.10/- and shall be attested by Magistrate/Sub-Judge/ Notary Public)

Name of work _____

_____

I, …… (name of the authorised representative of the bidder) son/daughter of …… resident of

…… (full address), aforesaid solemnly affirm and state as under:

1. I, undersigned, do hereby certify that all the information furnished and statement's made in response to this notice inviting bid are true and correct and nothing has been concealed.

2. I, undersigned or our firm M/s _____have never been blacklisted or debarred by any State Govt. /Central Government/Autonomous Body/Authority in Law.

3. I, undersigned or our firm M/s _____have never been declared bankrupt/ insolvent as on date.

4. The undersigned hereby authorize(s) and request(s) any bank, person, firm PSU/ Authority or Corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding may (our) competence and general reputation.

5. The undersigned understand and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the Department/ Project implementing agency.

6. I, the undersigned do hereby undertake that our firm M/s _____would invest a minimum cash upto 25% of the value of the work during implementation of the Contract.

7. I, the undersigned do hereby undertake that our firm M/s _____agree to abide by this bid for a period of 120 days from

the date fixed for receiving the same and it shall be binding on us and may be accepted at any time before the expiration of that period.

8. I, the undersigned do hereby undertake that our firm M/s _____ agree to deploy on this work the machinery and equipment as mentioned in ITB and technical personnels as mentioned in Contract Data of the bid document.

9. *I hereby certify that I have been authorised by …… …… (the bidder) to sign on their behalf, the bid mentioned in paragraph 1 above.

Deponent
Signed by an
Authorized
Officer of the firm
(Deponent)

Place: ……..
Date: ……..

* not applicable if the bidder is an individual and is signing the bid on his own behalf.