# MAHINDRA WORLD CITY AT JAIPUR

# Tender for
# DG Set Works
**(Block B1)**

## General Conditions
## Special Conditions
## Technical Specifications
## Technical Particulars
## List of Approved Makes of Material
## Schedule of Quantities


ARCHITECT

RAJINDER KUMAR ASSOCIATES

B 6/17 Shopping Center
Safdarjung Enclave, New Delhi-29
Tel.: 26162930 / 26162931
Fax: +91-11- 2618 6874

Sarb
CONSULTANTS PVT. LTD.

F-301, Lado Sarai, New Delhi,
Tel: 29521180
Fax: +91-11-29521183
E-mail: kka@kkapl.com


**June 2010**

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# DG Set Works
**(Block B1)**

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CONSULTANTS PVT. LTD.

**Electrical Consultants**

**KANWAR KRISHEN ASSOCIATES PVT. LTD.**
F-301, Lado Sarai, ,
New Delhi - 110030,
Tel: 29521180
Fax: +91-11-29521183

**HVAC Consultants**

**B.R.MALHOTRA & ASSOCIATES**
B1 / 1506 Vasant Kunj,
New-Delhi -110 070
Mob : 9811381370

**Plumbing Consultants**

**ASHOK KUMAR PANDE**
SF-30, Lift Block
C-Block, Sushant Lok-I
Gurgaon - 122002
Mob : 9810034874

# MAHINDRA WORLD CITY (JAIPUR) LIMITED, JAIPUR

## BID FOR DG SET WORKS AT MAHINDRA TECHNOLOGY PARK WITHIN THE IT/ITES SEZ

**Bid No** : **MWCJL/MTP/B-1/T-09**

**Date of Issue** : **25-06-2010**

**Bid Document issued to:**

M/s ……

……

……

**By**

**Mahindra World City (Jaipur) Limited**
411, Neelkanth Tower#1,
Bhawani Singh Marg, C-Scheme,
Jaipur -302001
Phone No: 0141-4007025
Fax : 0141-4007030

**CONTENTS**

**MAHINDRA WORLD CITY (JAIPUR) LIMITED, JAIPUR**

| | | |
|---|---|---|
| **Bid No** | **:** | **MWCJL/MTP/B-1/T-09** |

**(DG SET WORKS)**

| | | |
|---|---|---|
| **NAME OF WORK** | **:** | **CONSTRUCTION OF MAHINDRA TECHNOLOGY PARK AT MAHINDRA WORLD CITY** |
| **PERIOD OF ISSUE OF BIDDING DOCUMENT** | **:** | FROM: **25-06-2010** to **28-06-2010**<br>TIME:-**10:00** HOURS TO **17:00** HOURS |
| **LAST DATE AND TIME** | **:** | Date: **10-07-2010** **(Hard Copy Submission) FOR RECEIPT OF BIDS Time: 15:00 Hrs.** |

# INVITATION FOR BID

# (IFB)

**MAHINDA WORLD CITY (JAIPUR) LIMITED, JAIPUR**

**INVITATIONS FOR BIDS (IFB)**

**Date: - 25-06-2010**
**Bid No : MWCJL/MTP/B-1/T-09**

1. **MAHINDRA WORLD CITY (JAIPUR) LIMITED** having its Registered office at 411, Neelkanth Tower#1, Bhawani Singh Marg, C-Scheme, Jaipur -302001, is developing an IT/ITES SEZ and invites item rate Bids for the below mentioned works from the selected Bidders.

2. Hard copies of the document can be obtained from the Architect office at the below mentioned address by paying Rs. 2000 only upto **28-06-2010**

   **M/s Rajinder Kumar Associates**
   B-6/17 Shopping Center,
   Safdarjung Enclave
   New Delhi 110029, India
   T: (91)11-26179093
   F: (91) 11-26186874

3. Bids must be delivered to **Mahindra World City (Jaipur) Limited**, 411, Neelkanth Tower#1, Bhawani Singh Marg, C-Scheme, Jaipur -302001, on or before **15:00 Hours** on **10-07-2010** in Hard Copy. If the office happens to be closed on the date of receipt of the Bids as specified, the Bids will be received on the next working day at the same time and venue.

4. Other details can be seen in the Bidding documents.

**TABLE - IFB 1**

| Sr. No. | Name of work | Bid security / EMD (Rs.) | Cost of document (Rs.) | Period of completion |
|---|---|---|---|---|
| 1 | **DG Set Works at Mahindra Technology Park Block B1** | Rs. 50,000/- | Rs. 2000/- | Four (04) Months |

**Seal of office**

# SECTION 1: INSTRUCTIONS TO BIDDERS (ITB)

## Section 1: Instructions to Bidders

## Table of Clauses

## 1A. General Instructions

### 1. Scope of Bid

1.1 **Mahindra World City (Jaipur) Limited** ("MWCJL"), (hereinafter referred to as "**Employer**") invite Bids for the **DG Set Works for Mahindra Technology Park Block B1 at Mahindra World City being developed by it (**as defined in these documents and referred to as "**the Works**") .

### 2. One Bid per Bidder

2.1 Each Bidder shall submit only one Bid for one Contract.
2.2 Bid documents are not transferable

### 3. Cost of Bidding

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

### 4. Site visit

4.1 The Bidder, at the Bidder's own responsibility and risk is encouraged to visit and examine the Site (as defined in Clause 1 of GCC) 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.
4.2 After visiting the site the bidder shall confirm the fact of actual visit of the site to the employer which will be testimony to the fact that in fact site is available for commencing the work.
4.3 The Contractor shall be deemed to have inspected, tested and examined the site and surroundings and to have satisfied himself as to all the conditions, factors and risks which can be reasonably obtained or inferred from the inspections, and examinations that may influence or affect the progress and cost of Contract Works.

## 1B. Bidding Documents

### 5. Contents of Bidding Documents

5.1 The set of bidding documents comprises the documents listed in the table below and addenda issued in accordance with Clause 8 (if any)

| | | |
|---|---|---|
| Sections | 1 | Instructions to Bidders |
| | 2 | Letter of Acceptance and Agreement form |
| | 3 | Conditions of Contract |
| | 4 | Forms of Securities |
| | 5. | Special conditions of contract, Technical Specifications & Bill of Quantities |

5.2 Qualification of Bidders : To be qualified for award of contract, bidders are required to

a) Submit a written power of attorney authorising the signatory.
b) Update the following information submitted with the application for qualification.
   i) Financial strength.
   ii) Works in hand
   iii) litigation if any.

### 6. Clarification of Bidding Documents

Bidders requiring any clarification of the Bidding documents may notify the Employer by e-mail to verma.shiva@mahindraworldcity.com or by Fax only. The Employer will respond to any request for clarification. All such quarries shall be made at least three (03) days before date of submission of Bids as per Clause 16.

## 1C. Preparation of Bids

### 7. Language of the Bid

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

### 8. Documents comprising the Bid

8.1 The Bid submitted by the Bidder shall comprise the following:

a) The Bill of Quantities wherein the Bidder shall fill in the rates; original plus one photocopy duly signed and stamped by the Bidder on each page.

b) Specifications, original plus one photocopy duly signed and stamped by the Bidder on each page.

c) any other materials required to be completed and submitted by bidders in accordance with these instructions

The Financial Bid (BOQ) under Sections 5 of Sub-Clause 5.1 shall be filled in without exception.

### 9. Item Rate Contract

9.1 The Contractor shall note that unless otherwise stated, the Tender is strictly on item rate basis contract.

### 10. Currencies of BID and payment

10.1 The rates and the prices given are in Indian Rupees.

### 11. Bid Validity

11.1 Bids shall remain valid for a period not less than 60 (sixty) days after the date for Bid submission specified in Clause 16. A Bid corrected by the Bidder as valid for a shorter period shall be rejected by the Employer as non-responsive.

### 12. Bid Security

12.1 The Bidder shall furnish as a part of his Bid, a Bid security in the amount as shown in column 3 of the table IFB-1. The Bid security shall be in favour of **Mahindra World City (Jaipur) Limited** in the form of a Demand Draft or Banker's Cheque or Pay order payable at Jaipur.

12.2 The Bid Security of unsuccessful Bidders will be returned within 30 days of the end of the Bid validity period specified in Sub-Clause 11.1.

12.3 The Bid Security of the successful Bidder will be adjusted with Performance Security when the Bidder has signed the Agreement and furnished the required Performance Security.

12.4 The Bid Security may be forfeited

(a) if the Bidder does not accept the correction of the Bid Price, pursuant to Clause 18; or

(b) in the case of a successful Bidder, if the Bidder fails within the specified time limit to

(i) sign the Agreement; or

(ii) furnish the required Performance Security within 10 days from the date of Letter of Acceptance.

12.5 No interest shall be paid on any Bid security/Performance Security/ or Guarantee in lieu thereof.

### 13. Format and Signing of Bid

13.1 The Bidder shall prepare the Bid as specified in Clause 8 in two (02) copies.

13.2 The Rate in the original and one duplicate copy of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder. All pages of the Bid where entries or amendments have been made shall be signed by the person or persons signing the Bid.

13.3 The Bid shall contain no alterations or additions or omission or interlocation except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be signed by the person or persons signing the Bid.

**14. Salient Points**

The Scope of work proposed in this Bid is for the DG Set Works:

14.1 The Bidder should make himself acquainted with the site conditions, level and any other information required for giving a proper quote.

14.2 Bidders requiring any technical clarification should seek it from Employer's office before quoting and any ambiguity regarding quantities/specification and drawings will not be entertained after the Bids are finalised.

14.3 The Contractor should make his own arrangement of water and power for construction purposes and make all necessary arrangement. The power for commissioing will however be supplied by Employer.

## 1D. Submission of Bids

**15. Sealing and Marking of Bids**

15.1 The Bidders are not expected to include any conditions contrary to Bid provisions. However, if it is necessary to include certain conditions, the same should be submitted with proper reasons, in a separate sealed cover. The covers should be suitably super scribed indicating the contents. All letters, enclosures, and Bill of quantities shall be submitted in duplicate. Bidder should clearly indicate on each copy under their full signature, whether it is the Original or duplicate copy.

15.2 The Bidder shall submit the original Bid in one sealed envelop marking as "**FINANCIAL BID for DG Set Works for Mahindra Technical Park Block B1"** At **Mahindra World City, Jaipur".** The duplicate copy duly marked should be in separate sealed envelope.

15.3 The envelopes shall be addressed to the Employer at the following address:

**Mahindra World City (Jaipur) Limited**
411, Neelkanth Tower#1,
Bhawani Singh Marg, C-Scheme,
Jaipur -302001
Phone No: 0141-4007025

**16. Deadline for Submission of the Bids**

16.1 Bids must be received by the Employer at the address specified above no later than **15:00** hours on **10-07-2010.** In the event of the specified date for the submission of Bids declared a holiday for the Employer, the Bids will be received up to the appointed time on the next working day.

16.2 The Employer may extend the deadline for submission of Bids by issuing an amendment indicating the revised deadline.

## 1E. Bid Opening and Evaluation

**17. Process to Be Confidential**

17.1 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 Any effort by a Bidder to influence the Employer's processing of Bids or award decisions may result in the rejection of his Bid.

17.2 The employer may at its absolute discretion , ask the bidders for any clarification including breakdown of rates, subject to this no bidder shall contact the employer relating to the bid from the time of opening to the time of contract awarded.

**18. Correction of Errors**

18.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:

(a) Where there is a discrepancy between the rates in figures and in words, the rate in words will govern; and

(b) Where there is a discrepancy between the unit and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.

18.2 The amount stated in the Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and, with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount the Bid will be rejected.

**19. Employer's Right to Accept any Variation**

19.1 The Employer reserves the right to accept or reject any variation, deviation from the Bid document, or any alternative offer. Variations, deviations and alternative offers 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.

19.2 Acceptance of tender on behalf of employer (Mahindra World City [Jaipur] Ltd)shall be done by the committee empowered in this behalf or by officer of company duly authorised in this behalf.

19.3 It is made clear that the employer is not bound to accept lowest or any tender(bid). The employer reserves the right to reject any or all tenders received for consideration without assigning any reasons and without incurring any liability to affected biders.

## 1F. Award of Contract

**20. Award Criteria**

20.1 The Employer will negotiate with the Bidder whose Bid has been determined to be substantially responsive to the Bidding documents. On completion of negotiations the Employer will award the Contract to the most suitable Bidder.

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

21.1 Notwithstanding Clause 20, the Employer reserves the right to accept or reject any Bid or part of the 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.

**22. Notification of Award and Signing of Agreement**

22.1 The Bidders whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

22.2 The Agreement will incorporate all Agreements between the Employer and the successful Bidder. Within 10 days of issue of Letter of Acceptance, the successful Bidder will sign the Agreement and deliver it to the Employer.

22.3 Upon accepting the Performance Security for the Successful Bidder and signing of the Agreement, the Employer shall issue a ‘Notice to Proceed’ to the Contractor, in which the date of commencement of the Contract shall be indicated.

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

**23. Performance Security**

23.1 Within 10 days of receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance Security valid till Completion of the Contract in the form of a bank guarantee in Employer’s prescribed format for an amount equivalent to 5 % of the Contract price by adjusting Bid Security:

23.2 Failure of the successful Bidder to comply with the requirements of Sub-Clause 23.1 shall constitute a breach of Contract, cause for annulment of the award, forfeiture of the Bid security and any such other remedy the Employer may take under the Contract, and the Employer may resort to awarding the Contract to any other Bidder, on sole discretion of Employer.

**24. Corrupt or Fraudulent Practices**

24.1 The Employer expects the Bidders, Suppliers, Contractors, and Consultants, observe the highest standard of ethics and integrity during the procurement and execution of such Contracts. Therefore, the Employer will reject the Bid/ terminate the contract with no obligations

and blacklist such Bidder / contractor, barring him from participation in future Bidding in the event he found indulged in any malpractice such as gift, bribe, or other inducements to any person with a view to influence the placing or operation of the Contract.

24.2 The bidder hereby undertakes that if the information given in bidding documents or otherwise be found to be untrue or false, he will be liable to be disqualified and his security will be forfeited and further it is discovered to be false during the contract period affecting prejudicially the interest of employer, the contract will be terminated and security deposit will be liable to be forfeited.

## SECTION-2

## LETTER OF ACCEPTANCE AND AGREEMENT FORM

**Table of Forms:**

- **LETTER OF ACCEPTANCE & PROCEED THE WORK**
- **AGREEMENT FORM**

**Letter of Acceptance**
(letterhead paper of the Employer)

To,
……
……

Dear Sirs,

This is to notify that your Bid and subsequent negotiations for the execution of **DG SET WORKS AT MAHINDRA TECHNOLOGY PARK IN BLOCK B1 WITHIN THE IT/ITES SEZ** for the negotiated Contract Price of Rs……. (Rupees……. ……) is hereby accepted by Mahindra World City (Jaipur) Limited.

You are hereby requested to furnish Performance Security Deposit in the prescribed format of the Bank Guarantee attached herewith for an amount of Rs. ……. within ten (10) days, of receipt of this Letter Of Acceptance, valid up to 180 days from the Date Of Intended Completion i.e. ……. any extension thereof and sign the Contract, failing which action as per Sub-Clause 21.1 of Instruction to Bidders shall be taken.

Subsequent to furnishing the requisite security, you are hereby instructed to proceed with the execution of the said works as the site will be handed over to you on __ __2010_in accordance with the Contract documents. The stipulated date of commencement and stipulated completion dates will be _____ and _____ respectively.

Thank you

Yours faithfully,

Chief Operating Officer
**Mahindra World City (Jaipur) Limited**
411, Neelkanth Tower#1,
Bhawani Singh Marg, C-Scheme,
Jaipur -302001
Phone No: 0141-4007025

**Agreement Form (On stamp paper of Rs 100/-)**

**Agreement**

This Agreement, made the _____- 2010, between **Mahindra World City (Jaipur) Limited** (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 **DG SET WORKS AT MAHINDRA TECHNOLOGY PARK IN BLOCK B1 WITHIN THE IT/ITES SEZ** (Bid No. MWCJL/MTP/B-1/T-09 (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 Contract price of Rs. _____ (Rupees_____ _____)

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expression 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 the remedying the defects wherein 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) Contractor's Bid;
   iii) Contract Data;
   iv) Conditions of Contract (including Special Conditions of Contract);
   v) Specifications;
   vi) Drawings;
   vii) Bill of Quantities and Rates; and
   viii) 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 _____

# SECTION 3:
# CONDITIONS OF CONTRACT

## SECTION 3:
## CONDITIONS OF CONTRACT : General Conditions

### 3A. General

**1. Definitions**

The following terms shall have the meaning hereby assigned to them except where the context otherwise requires:

**ARCHITECT / CONSULTANT:**
Rajinder Kumar Associates
B-6/17 Shopping Center, Safdarjung Enclave
New Delhi 110029, India
T: (91)11-26162930 / 26162931
F: (91) 11-26186874

**Bill of Quantities or BOQ** means the priced and completed bill of quantities and rates forming part of the Contract.

The **Contract** is the binding between the Employer and the Contractor to execute, complete and maintain the Works. It consists of the documents listed in Clause 2.2 below.

The **Contractor** shall mean the successful Bidder and their heirs and legal representative, assigns and successors on whom the work order or letter of intent has been issued 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.

**Date of Commencement** is the date as stated in the Letter to Proceed from the Employer to the Contractor.

**Actual Date of Commencement** is the date from which the Contractor started his work.

**Days** are calendar days; **months** are calendar months.

A **Defect** is any part of the Works not completed in accordance with the Contract.

The **Defects Liability Period** is 24 months calculated from the Actual Completion Date

The Employer is the Party who will employ the Contractor to carry out the Works.

**Engineer in Charge** shall be HEAD (Infrastructure & Development) of the Employer or person nominated by him.

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

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 in Charge by issuing an extension of time.

The **Actual Completion Date** is the date on which the Engineer in Charges shall issue the Completion Certificate as per Clause 28

The **Site Possession Date** shall be the date within seven days from the date of issue of Notice to proceed with the work.

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

**Plant** is any integral part of the Works which is to have a mechanical, electrical, electronic or chemical or biological function.

The **Site** is located at **Mahindra World City (Jaipur) Limited, PO-Mahindra World City, Tehsil: Sanganer, District: Jaipur - 302037**

**Specification** means the Specification of the Works referred in the Contract and any modification or addition made or approved by the Engineer in Charge in writing.

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

**A Variation** is a written instruction given by the Engineer in Charge which varies the Works.

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

**Party and Parties** is the Employer and the Contractor individually and the word Parties shall be construed accordingly

**Relevant Authority** shall mean all Parties which have jurisdiction on the works.

**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 in Charge will provide instructions clarifying queries about the Conditions of Contract.

2.2 The documents forming the Contract shall be as follows and their order of priority shall be interpreted in the given order

(i) Agreement
(ii) Letter of Acceptance, Notice to proceed with work.
(iii) Contractor's Bid
(v) Conditions of Contract including Special Conditions of Contract
(vi) Bill of Quantities
(vii) Drawings
(viii) Specifications
(ix) any other document listed in the Contract Data as forming part of the Contract.

**3. Legal Construction**

3.1 Subject to provision of clause, the Work Order shall be in all aspect, construed and operated as Contract under Indian Contract Act 1872, and in accordance with Indian Laws enforce for the time being and is subject to the jurisdiction of the court, Jaipur only.

**4. Language and Law**

4.1 The language of the Contract shall be English only and the Law governing the Contract shall be Law of Republic Of India and the law which will govern the conduct of the contract and according to which the contract shall be in force in the state of Rajasthan, it will include the exemption granted under various enactments.

**5. Communications**

5.1 Communications between Parties which are referred to in the conditions are effective only when given in writing. A notice shall be effective only when it is delivered. In the case delivery is refused, it will be deemed to be received if service is effected by postal agency. Any letter, notice and notification under the contract shall be served on the party concerned when received by fax, telex, courier deliver or registered post letter at the following address of contractor or employer.

Address of Contractor :

Address of Employers

Corporate Adderess
**Mahindra World City (Jaipur) Limited**
411, Neelkanth Tower#1,
Bhawani Singh Marg, C-Scheme,
Jaipur -302001
Phone No : 0141-4007025
Fax : 0141-4007030

**6. Personnel**

6.1 The Contractor shall submit organisation chart indicating the key personnel to carry out the functions stated in the Schedule or other personnel approved by the Engineer in Charge. The Engineer in Charge will approve any proposed replacement of key personnel only if their qualifications, abilities, and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.

6.2 If the Engineer in Charge or Construction Manager asks the Contractor to remove a person who is a member of the Contractor's staff or his work force the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.

**7. Insurance** and obligation under labour and environment law :

7.1 Notwithstanding that the Contractor is to indemnify the Employer and submit the policies in original to the Employer, the Contractor shall take All Risks and Workmen's Compensation insurance policies to cover the whole project as envisaged under the Contract and without limiting the obligations, responsibilities, duties and/or liabilities of the Contractor, the Contractor shall effect at his own costs for others insurance policies deemed necessary in the joint names of the Employer and the Contractor to cover the Contract works as given below:
Insurance requirements are as under:

| Sr. No. | Policy for | Insurance cover required |
|---|---|---|
| 1 | All risk insurance for works | By Contractor |
| 2 | Loss or damage to Employer's Equipment & material. | By Contractor |
| 3 | Other Employers property | By Contractor |
| 4 | Personal injury or death insurance:<br>a) Third Party | By Contractor |
| | b) For Contractor's Employee | By Contractor<br>Contractor should ensure such insurance is in force through out the Contract period (Including defect liability period) and necessary proof to be submitted before the commencement of the project and at least a fortnight before the expiry of current insurance.<br>The Contractor should indemnify and include in the policy the Employer |
| 5 | Motor Vehicle Insurance | Comprehensive insurance policy to be taken by contractor as per statutory requirement. |
| 6 | Third Party liability insurance (Including the name of Employer) | By Contractor<br>Minimum cover Rs. 10 Lacs. |

| | | |
|---|---|---|
| 7 | Contractor's Equipments (Including liability arising out of usages of such equipment) | By Contractor. |

**8 Possession of the Site**

8.1 The Employer shall give possession of the Site to the Contractor alongwith the **acceptance letter.**

**9 Settlement of Dispute**

9.1 If any dispute of any kind whatsoever shall arise between the Employer and the Contractor in connection with or arising out of the Contract, including without prejudice to the generality of foregoing, any question regarding its existence, validity or termination or the execution of the works, whether during the process of works or after completion and whether before or after termination or breach of the Contract, the Parties shall seek to resolve any such dispute or difference by referring the matter to Engineer in Charge. The Engineer in Charge will give its decision within fifteen (15) days of referring the dispute. Either Party if not in Agreement with Engineer in Charge's decision, may within fifteen days of decision by the Engineer in Charge refer to the senior management of the Employer, who will give its decision with thirty 30) days of referring the dispute. Either Party if not in Agreement with senior management decision, may refer to arbitration pursuant to Clause no. 10 of General Conditions of Contract.

**10 Procedure for Disputes Resolution**

10.1 The Arbitration shall be conducted in accordance with the arbitration procedure stated below. The procedure for arbitration will be as follows:

10.1.1 In case of dispute or difference arising between the Employer and a Contractor relating to any matter arising out of or connected with this Agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of three (03) arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall 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 thirty (30) days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the Indian Council of Arbitration/President of the Institution of Engineer (India)/The International Centre for Alternative Dispute Resolution (India).

10.1.2 If one of the Parties fails to appoint its arbitrator in pursuance of sub-Clause 10.1.1 above within 30 days after receipt of the notice of the appointment of its arbitrator by the other Party, then the Indian Council of Arbitration/President of the Institution of Engineer (India)/The International Centre for Alternative Dispute Resolution (India), shall appoint the arbitrator. A certified copy of the order of the Indian Council of Arbitration /President of the Institution of Engineer in Charges (India)/The International Centre for Alternative Disputes Resolution (India), making such an appointment shall be furnished to each of the Parties.

10.1.3 Arbitration proceedings shall be at Jaipur, Rajasthan, India, and the language of the arbitration proceedings and that of all documents and communications between the Parties shall be English.

10.1.4 The decision of the majority of arbitrators shall be final and binding upon both Parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. 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.

10.1.5 Without prejudice to the above provision, Where the amount in dispute is Rs.50 lacs and below, the disputes or differences arising shall be referred to the Sole Arbitrator. To be nominated by employer. The arbitration will take placein accordance with the Indian Arbitration and Conciliation Act 1996. The Arbitration shall be at Jaipur. Arbitration may be commenced prior to or after completion of the contract provided that the obligation of the employer and the

contractor shall not be altered by reason of the arbitration being conducted during the progress of the contract.

10.1.6 Performance under the Contract shall continue during the arbitration proceedings and subject to the satisfactory performance of the Contractor, payments due to the Contractor by the Employers shall not be withheld, unless they are the subject matter of the arbitration proceedings.

## 3B. TIME CONTROL

### 11 Avoidance Of Delay

11.1 It is paramount that the Contractor shall constantly plan his work so as to most efficiently utilize all or any available part or parts of the Site, any completed part or parts of another Contractor's works which is to be integrated into the Contract Works (if any), the available drawings and all others matters as are available to him, as well as his own resources in order to avoid or reduce any standstill and down time.

11.2 In the event that the Contractor cannot commence or proceed with a particular part of the Contract Works as per the programme furnished to the Employer in accordance with Clause 12.1, for any reason whether attributed to the Contractor or not, the Contractor shall be obliged to reschedule and proceed with other parts of the Contract Works at no costs to the Employer to ensure that the completion date of the Contract Works will be met.

11.3 Should the Contractor fall behind any program submitted in accordance with Clause 12.2, due to any act, default, neglect or omission of the Contractor and requires over- time, night work or shift work and /or an increase of man power and/or construction plant to regain the scheduled progress (whether or not instructed by the Employer), the cost of such measures shall be borne by the Contractor.

11.4 Within the time stated in the Contract Data, the Contractor shall submit to the Engineer in Charge for approval a Construction Program.

11.5 The Engineer in Charge's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Engineer in Charge again at any time. A revised Program is to show the effect of Variations.

### 12 Extension of the Intended Completion Date

12.1 **Time shall be of the essence with respect to the commencement and completion as per the key Contractual dates as mentioned in the Contract Data as Milestones for the execution and completion of the Contract Works as stated**.

12.2 The Contractor acknowledges that a high rate of working is required to achieve the Dates for Completion of the Contract Works and Contractor shall be deemed to have allowed for shift working, sufficient plant, labour, floodlighting and any or all other measures to achieve the same.

12.3 The Dates of Completion of the Contract Works may be extended by the Employer subject to compliance by the Contractor with Clause 11 (Avoidance of Delay), by such period which reasonably reflects any delay in completion of the Contract Works which, notwithstanding due diligence and taking of all reasonable steps by the Contractor to avoid or reduce the delay as provided for in Clause 11, is caused:-

a) By the occurrence of an event of Force Majeure;
b) By a delay in handing over of the Site or part of the Site by the Employer after the Dates for Commencement of the Contract Works;
c) Any variations requested by the Employer;
d) By other Contractors carrying out works not forming part of the works to be carried out under the Contract, and employed by the Employer;
e) By an instruction to suspend the Contract Works issued by the Employer pursuant to this Contract provided that such suspension is not due to the default of the Contractor; and which affects the Contract Works PROVIDED that such delays are not due to the Contractor. PROVIDED FURTHER THAT if, while the Contractor is continuing works during the period when liquidated and ascertained damages are being deducted, the Employer gives instruction

or matters occur which would entitle the Contractor to an extension of time then the Employer shall assess and give the Contractor an extension of time and so notify the Contractor accordingly.

12.4 It shall be a condition precedent that the Contractor shall notify the Employer in writing of any factors and the relevant Contract provision (if any) which entitles Contractor to an extension of time together with a statement of :

a.) the reason why the delay in completion of the Contract Works is likely to result or has resulted;
b.) an estimate of the period by which the Contract Works are likely to be or had been delayed; and
c.) details of steps that the Contractor proposes to take to avoid or reduce the delay; within seven (07) days of the commencement or occurrence of any such factor or such extension of this seven (07) days period as the Employer may allow.

12.5 The Contractor shall notify The Employer within fourteen (14) days of the cessation of the factors notified to The Employer under Sub-Clause 12.4; to enable any provisions, that the Contractor may require to the proposed extended Date for Completion to be made as quickly as possible and such other particulars as shall be reasonably necessary to enable the Employer to properly consider the revision.

12.6 Without prejudice to any other grounds which do not entitle the Contractor to an extension of time, the Contractor shall not be entitled to extensions of time for delays resulting from weather conditions, or discrepancy in the Contract Documents, whether such events affect the Contract Works or not.

12.7 Notwithstanding the foregoing, the Employer shall not be obliged to take into account any circumstances that are not notified to The Employer in accordance with the periods referred to in Sub-Clause 12.3 and 12.4.

12.8 The Employer shall as soon as is reasonably practical after receipt of the Contractor's notification furnished in accordance with the sub-Clause 11.3 determine and notify the Contractor in writing of any extension of time to which the Employer considers the Contractor is entitled under Sub-Clause 12.4.

12.9 The Contractor had agreed NOT TO CLAIM for all costs, loss and /or expense suffered or incurred by reason of any extension of time granted by the Employer in accordance to Sub-Clause 12.4 herein.

**13 Force Majeure**

13.1 Force Majeure shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the Party affected, and shall include the following:

13.1.1 War, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war, rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, riot, civil commotion and terrorist acts, confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government authority or act of any local state or national government authority

13.1.2 Strike (other than strike by employees/staff/labour of Contractor or Sub-Contractor), sabotage, embargo, import restriction, epidemics, quarantine and plague.

13.1.3 Earthquake, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or nuclear or other natural disaster

**14 Delays Ordered by the Engineer in Charge**

14.1 The Engineer in Charge may instruct the Contractor to delay the start or progress of any activity within the Works.

## 3C. QUALITY CONTROL

### 15 Identifying Defects

15.1 The Engineer in Charge / Architect 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 in Charge may instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer in Charge considers may have a Defect.

15.2 The Contractor shall permit the Employer's technical auditor to check the Contractor's work and notify the Engineer in Charge and Contractor of any defects that are found..

### 16 Correction of Defects

16.1 The Engineer in Charge shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion and is defined in the Contract Data. Once the defects are notified to the contractor the Defects Liability Period shall extend automatically for as long as Defects remain to be corrected.

16.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Engineer in Charge's notice.

### 17 Uncorrected Defects

17.1 If the Contractor has not corrected a Defect within the time specified in the Engineer in Charge's notice, the Engineer in Charge will have the right to engage third party to the defects rectified at risk & cost of the contractor along with overheads. Such amount will be recovered from the Contractor.

## 3D. COST CONTROL

### 18 Bill of Quantities

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

18.2 The Bill of Quantity is used to calculate the Contract Price. The Contractor Shall be paid for the actual quantities executed & inspected & duly approved and accepted by the Engineer in Charge and the Contract Price shall be adjusted based on approved actual quantities of the Contract works as described in Bill Of Quantity for each item.

18.3 The rates set out in the Bill of Quantity (BOQ) are fixed, firm and shall be inclusive of all costs and expenses as under. No escalation in rate is permitted during the tenure of contract and shall not be subject to variation on any account what so ever.

18.3.1 Preliminaries works / costs such as site measurement, supervision, setting out, insurances, water, electricity/power, security/ watch & ward protection of public, working/liaison with consultant engineers, Government and other Relevant Authorities etc.
18.3.2 All associated temporary and false works.
18.3.3 All tests, sampling, inspection, reports, opening up of works and related works
18.3.4 Material, labour, plant, equipment, machinery, tools and all related costs.
18.3.5 Shifts works, night works, overtime works, incentives, bonus, related labour employment costs etc.
18.3.6 Working with site constraints and conditions.
18.3.7 Liaison, including dealing and compliances with requirements, restrictions, etc. of all Relevant Authorities.
18.3.8 Overhead cost, profits, etc.
18.3.9 Protection and maintaining all Contract works and any thing affected by the Contract works until completion and handing over.
18.3.10 Coordination with Development Commissioner Office located within the SEZ for verification etc. for availing benefits of exemptions for works within SEZ
18.3.11 Any other costs and / or expenses deemed necessary for the due execution and completion of the works.

18.4 This Project is an SEZ. As per Special Economic Zone Act 2005, all the taxes, duties, royalties, levies (except income tax on the profit of the Contractor) are exempted; hence, the quoted rates shall be exclusive of all taxes, duties, royalties, levies, service tax etc. Any tax component, considered shall be indicated separately and shall be admissible only if applicable, proof of payment of such taxes will be required for acceptance of claim in there respect. The Contractor shall put his best efforts to forward the exemptions and benefits granted by the Government he gets from time to time.Employer shall deduct Tax Deduction at Source (TDS) for such taxes at the rates fixed and revised by Relevant Authorities from each payment/bill due to Contractor. Employer shall issue TDS certificate in favour of Contractor for the TDS so recovered. In case employer is not able to avail any tax benefit due to negligence or non compliance of SEZ rule and regulation by contractor then the same will be recovered from contractor.

18.4.1 The rates as contained in the BOQ shall include all PF, ESI etc. and all other payment as per the statutory requirements. The Contractor shall produce proof of compliance of such requirement to the Employer and upon submission of such proof only, the Employer shall release periodic payments to the Contractor. In the event that the Contractor fail to produce such proof / paying such payment, Employer shall pay such payment direct (but is not obliged) to the Relevant Authorities and shall recover the same from whatsoever monies due or to become due to the Contractor along with 15% overhead charges.

**19 Tax**

19.1 The rates quoted by the Contractor shall be deemed to be exclusive of taxes which are exempted under **SEZ Act 2005** and separate disclosure of all taxes which are not exempted alongwith basic rate in the bid. In case, any tax is levied inspite of Employer giving all requisite documents to the Contractor and Contractor's best efforts, same shall be paid extra to the Contractor upon Contractor submitting proof of such payments.

19.2 INCOME TAX: Deduction of income tax at source will be made by the Employer at the applicable rates which is obligatory as per the provisions of Income Tax Act. It shall be the responsibility of Contractor to arrange and produce a "No Deduction Certificate" from the Income Tax Authorities, if the payment of their invoices are to be made without deduction of Income Tax at source.

19.3 If any tax exemptions, concessions, reductions, allowances or privileges may be available to the Employer, the Contractor shall use its best endeavours to enable the Employer to benefit from any such tax savings to the maximum allowable extent.

19.4 BASE DATE : Base date for reimbursement of any new enactment in taxes, duties and levies by central or state govt. or any other statutory authorities as applicable to the Contract, shall be seven (7) days prior to the date on which the price bid or revised price bids were stipulated to be received.

**20 Retention**

20.1. Retention Money at the rate of 5 % of the value of work done for each running bill will be deducted until the actual completion of work, up to a maximum of 5% of Contract Price.

20.2 Retention money shall be refunded within 30 days after discharge of defect liability period of 12 months.

20.3 No retention sum shall be deducted from interim progress payment subject to the submission of an unconditional bank guarantee from a scheduled bank in the Employer's format equivalent to 5% of the Contract Price which would valid up to the Completion of Defect Liability period with 180 days extra claim period.

**21 Liquidated Damages**

21.1 If the contractor fails to complete the works by the date of completion as stated in the Tender or within extended time as per agreed project baseline schedule, the Owner shall withhold a sum calculated at the rate of 1 % of the total contract value per week (or part thereof) of delay as liquidated damages for the period during which the said work shall so remain or have remained in-complete. The owner may deduct such damages from any money's otherwise

payable to the contractor under this contract, up to a maximum of 10 % of the total contract value after which Owner will have right to terminate the contract and claim for compensation from contractor for the financial losses on account of delay of project. The contractor admits that the loss shall always be caused if there is failure on its part.

21.2 The delay shall be assessed based on average delay over all due milestones. Reconcilation statement for Project Tracking giving detail of delay, duly verified by Engineer-in-Charge / project manager shall be submitted alongwith monthly running bills.

21.3 The Liquidated Damages imposed for not achieving intermediate milestone shall be subjected to refund/adjustment in case of Contractor achieve the final Milestone with the period as stipulated in the Contract.

**21.4 Time shall be of the essence with respect to the commencement and completion as per the key Contractual dates for the execution and completion of the Contract Works as stated in Contract Data,** and payment or deduction of liquidated damages shall not relieve the Contractor from his obligation to complete the work as per agreed construction program and milestones or from any other of the Contractor's obligations and liabilities under the Contract.

**22 Performance Security**

The Performance Security in the form of unconditional bank guarantee shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount equal to 5% of Contract Price from a Nationalised or Scheduled bank in the Employer's prescribed format the Performance Security shall be valid until a date 180 days from the date of expiry of Actual Date of Completion.

**23 Defect Liability and Cost of Repairs**

Loss or damage to the Works or Materials to be incorporated in the Works between the Actual Date of Completion and the end of the Defects Liability Periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions. The Contractor shall be responsible to make good at his own expense any defect which may develop within the period mentioned as Defect Liability Period in the Contract Data. The Employer shall give the Contractor a notice in writing about the defects and the Contractor shall repair the defect within maximum of seven (07) days or fourteen (14) days depending upon whether the defect is minor or major. If the Contractor fails to repair/remove the defect, the Employer may get the work execute from others at Contractor's risk & cost . The Employer shall have the right to appropriate all or part of the Retention Money towards the expense in repairing the defects.

## 3E. FINISHING THE CONTRACT

**24 Completion**

24.1 After completion of the work, the Contractor will serve a written notice to the Engineer in Charge to this effect. The Engineer in Charge upon receipt of this notice shall conduct a complete joint survey of the work within seven (07) days and prepare a defects list jointly. The defects pointed out by the Engineer in Charge or his nominee would be rectified by the Contractor within fourteen (14) days and thereafter acceptance report be signed jointly by the Contractor, Engineer in Charge and the Employer. And a '**Completion Certificate**' shall be issued to Contractor by Employer.

**25 Taking Over**

25.1 The Employer shall take over the Site and the Works within seven days of the Engineer in Charge issuing a certificate of Completion.

**26 As Built Drawings**

26.1 The Contractor shall supply "As Built" Drawings 3 sets (hard copy) and soft copies in CAD format in CD alongwith Operation & Maintenance Manuals, SOPs and Gurantees by the dates stated in the Contract Data.

26.2 Contarctor's rates include the As-built drawings and associated manuals.If the Contractor does not supply the As Built drawings by the dates stated in the Contract Data, or they do not receive the Engineer in Charge's approval, the Engineer in Charge shall withhold the amount stated in the Contract Data from payments due to the Contractor.

**27 Termination Of Contract**

27.1 Due to any default by the Contractor, the Employer shall be entitled to terminate the Contractor's employment under the Contract by giving one (01) week advanced notice in writing by stating the reason. The date after seven (07) days from the date of issuance of the Termination Notice shall hence be defined as "Date of Termination". The Contractor will be paid for all works duly and properly completed up to the Date of Termination but shall not be entitled to anticipated profit or any consequential or indirect loss or damage and shall hold harmless and indemnify the Employer against Contractor's Contractors/suppliers or third parties arising from termination under this Clause.

27.2 The Contractor had agreed in the event of delay in progress or non-achievement of the Milestone Dates, The Employer shall reserve the sole discretion right in deploying its own plant and machinery or engaging third party to speed up the Contractor's works and the Contractor's Contract shall be terminated with written notice at any point of time without any compensation or claims to be paid to the Contractor. All additional / extra cost incurred by The Employer shall be charged to the Contractor due to such event.

**28 Payment upon Termination**

28.1 Full payment to Contractor's workers, Contractors, suppliers and third parties engaged by the Contractor for any portion of the Contract works shall be paid in full by the Contractor and thereafter must be removed from site on or before the Date of Termination. If the Contractor failed to make full payment to these workers, Sub Contractors, suppliers and third parties and/or remove them from site on the Date of Termination, then the Employer will carry out such duties on behalf of the Contractor. The Employer will recover all cost incurred due to the performing of such duties on behalf of the Contractor by making deduction from amount/s due to the Contractor or by any other process.

**29 Breach Of Contract**

The following events shall be fundamental breach of Contract:

29.1 The Contractor has contravened any Clause / sub-Clause of the Conditions of Contract.

29.2 The Contractor does not adhere to the agreed construction program and agreed environmental management plan and also fails to take satisfactory remedial action as per Agreements.

The Contractor shall carry out all instruction of the Engineer in Charge which comply with the applicable laws where the Site is located if the Contractor fails to carry out the instructions of Engineer in Charge within a reasonable time determined by the Engineer in Charge in accordance with General Condition of Contract Clause **11.**

## 3F Special Conditions of Contract

**1. General**

The Contractor is advised to note that the following Special Conditions are part of the Contract and he will not have any right to claim at any time for delays or for expenditure incurred by him in fulfilling the following special conditions.

**2. Scope of Works**

2.1 The Contract Works shall comprise of but not be limited to:-

2.1.1 The scope of work is for the construction of Mahindra Technology Park DG Set Works as defined in BOQ

2.1.2 The work to be carried out under the contract shall include all the items given in the Bill of Quantities and such other item as may be instructed by the Employer time to time and shall expect as otherwise specified in these conditions include all labour, materials, tools plant equipment and transport, hoisting, etc. which may be required in preparation and completion of the works.

2.1.3 All the above shall be as per issued relevant drawings, Specifications of IS and other relevant National and International Standard Specifications and good engineering practices, safety measures as required all as per agreed construction methodology in consultation and coordination with and under the inspection of the Employer's personnel / design consultants.

2.2 All the Contract Works shall be executed in full compliance with the Specifications of the Contract and all requirements and always to the satisfaction of the Employer.

2.3 The Contractor acknowledge that he understands the Special Economic Zone (SEZ) rules and regulation as per **SEZ Act 2005** and he further acknowledge that he will abide all the rules and regulations of SEZ Act, laws related to custom duties, notified area and all other related things affecting the Contract works directly or indirectly and shall keep the employer harmless from any violation of the provisions of SEZ Act 2005.

2.4 The Contractor shall resolve local constraints and problems, liaise, seek, and obtain any consent, permit, license, approval, etc. from all Relevant Authorities including paying all fees, charges, levies, etc all at his own cost.

2.5 Clearing all debris and disposing to location approved by Municipal authorities during progress of Contract works and before and after the dates of Completion.

2.6 All temporary works, haul/access roads that are necessary for the proper and due completion of the Contract Works.

**3. Milestone dates:**

Milestone date shall be as negotiated and agreed at the time of award of contract.

**4. Schedule of Works**

The Contractor shall submit a work schedule including the commencement date, to reflect the ground realities and indicating the milestones.

**5. Measurements**

The payable quantity (ies) against the executed work shall be determined on the basis of quantity certified, wherein certification conducted jointly by the Contractor and the Engineer-inn-Charge. Work accepted, approved and certified by the Contract Dept. / PM, will only be paid for as specified in Bills of Quantities and payments shall be at the same rates.

**6. Running Account Bills**

The Contractor has to prepare and submit the Running Account Bills in triplicate once in a month along with details measurements in serially machine numbered register, abstract sheets, deviation statement and any specific instructions which may be given in this regard by the Engineer In-Charge shall also be attached to by the contractor

**Running Bill Certification:**

6.1 The Contractor shall prepare and submit running bill to the Engineer In-Charge once a month throughout the construction period considering that No payment shall be made for works estimated to cost less than rupees 1 (One) Lac.

6.2 Within 5 days of the receipt of Contractor's running bill for payment, the Engineer In-Charge / Employer's representative shall check and point out corrections, if an to be made in the bill. The Contractor shall correct the bill and resubmit the same to the Engineer In-charge.

6.3 Within 10 days of receipt of the corrected bill from the Contractor, the Engineer In-charge/ Employer representative shall check the bill and forward the same to Manger Contract for verification for certification, who will certify the amount due to Contractor and recommend payment of the amount by the accounts department to the Contractor

6.4 Within 6 days of receipt of the bill from Engineer In-Charge, account dept will release the payment along with certificate showing details pertaining to works done, total recoveries and statutory deductions.

6.5 Any running / interim Certificate of Payment given by the Infra / Account Dept. relating to work done or the materials delivered shall be adhoc in nature and may be modified or corrected by any subsequent interim Certificate or the Final Certificate of payment.

6.6 An interim payment not exceeding 75% of the provisional bill amount may be certified by the Engineer-in-charge. Balance payment shall be made once Engineer-in-charge certifies quantity and item rate. Interim payment can be made within 7 days of engineer-in-charge certificate.

**Final Bill payment**

6.7 The Final Bill shall be submitted by the Contractor within two month of the date of Completion of the Work or if the work is completed earlier, within one month of such completion. The contractor shall give to the employer a detailed account of the total amount which he consider payable to him under the contract..

6.8 The final bill will be checked in terms actual measurement at site, quality of works and material supplied / used, approved extra items, by the Engineer In-Charge within **30** days from the date of the bill is received by the Engineer In-Charge, provided the contactor has complied with all formalities as described in various clauses of the Contract and thereafter the same would be forwarded to the next concerned dept.

6.9 The payment of the final bill shall be made to the Contractor by the Employer within 15 days from the receipt of the Engineer in-charge approval certificate for payment.

6.9.1 No further claim shall be made by the Contractor in respect thereof even after submission of the final bill and the same shall be deemed to have been fully waived and absolutely extinguished.

6.10 The final billing shall be accompanied by all substantiating documents as required for running bills with the addition of the following items that shall be supplied by the contractor:

6.10.1 All written guarantees / warrantees and spares required by the Contract documents.

6.10.2 Operation and Maintenance manuals and instructions for equipment and apparatus.

6.10.3 Re producible and blue prints of all requisite As Built drawings along with the soft copy thereof on latest version of AutoCad software.

**Certificate for payment format : (may be finalized later with the Engineer In-Cahrge)**

| | | |
|---|---|---|
| | Value of Work done for Interim Certificate<br>As per Contract | (1) |
| Less (-) | **Deductions :** | |
| | Retention 5% on **'1'** subject to a maximum of 5% on Contract Value | (a) |
| | Previous Payments made<br>(Payment made till date including Advance/ Adhoc payments made upto the period of this bill) | (b) |
| | **Deductions (a+b))** | **(c)** |
| | Deduction on Govt. / Statutory liabilities such as TDS etc. | (d) |
| | **Total Deductions (c+d)** | **( 2 )** |
| | Net Value of This Bills<br>(Amount payable) | **( 1 - 2 )** |

**7. Subcontract or Subletting of Works**

7.1 **Sub-Letting:**
No part of the Contract shall be sublet without the written permission of the Employer nor shall transfers be made by the 'Power of Attorney' authorizing others to carryout the work or receive payment on behalf of the Contractor.

7.2 **Sub-Contract:**

7.2.1 The Contractor is not permitted to subcontract any part of his works in this Contract without prior approval in writing from the Employer. It may be made clear that under ordinary circumstances, no subcontract shall be permitted.

7.2.2 In any case, whether any part of the works is subcontracted or not; the principal liabilities of the works shall lie with the Contractor.

**8. Contract Drawings**

8.1 The Engineer in Charge shall give Two sets of Contract Drawings, approved for construction, to the Contractor within 2 weeks from the date of submission.

8.2 The Contractor shall ensure that a complete up to-date list of drawing is maintained at site. All Contract Drawings shall be properly filed and indexed for ready reference.

8.3 The Contractor shall ensure that only the valid up to-date Contract Drawings are used for preparation of Working Drawings.

8.4 The privilege of the authorship and Employership of drawing and designs of the building remains with Engineer in Charge. Drawings and design prepared by their Consultants shall be used only for the purpose specified in the Contract and all drawings issued shall be returned to Engineer in Charge after completion of works.

8.5 The Contractor shall submit shop and fabrication drawings as required by the Engineer- in-Charge.

8.6 Contractor is not authorize to disclose drawings or any part of drawing and photographs of site without written approval from the Employer.

**9 Additional Work**

Any additional works, instructed during the Contract Period and within the Contract Amount, will be paid as per Bill of Quantity rates and it shall not be considered as a cause for the Contractor to claim for delay, incurred overhead, mobilization etc.

**10 Protection of the Works during Contract Period**

It is clearly understood that any damage occurring to the Works (completed or under execution) is the Contractors responsibility and no claims will be entertained by the Employer since the matter shall be covered by the relevant Insurances.

**11 Discrepancies in alignment**

Discrepancies in alignment and levels etc. noticed during construction and/or on completion shall be rectified (including affected works executed by other Contractors) by the Contractor at his own cost and risk, Engineer in Charge's approval does not relieve the Contractor of his responsibilities.

**12 Temporary Power and Water Supply**

All costs, both for power supply and temporary installations and Power and Water required for construction and labour shall be borne by the Contractor.

**13 Site Offices of the Contractor**

The successful Bidder is to provide and maintain a site office at a location approved by the Engineer in Charge, within 15 days from the date of issue of Notice to Proceed.

**14 Safety on Site**

The Contractor shall ensure full compliance of Safety Code. All measures to ensure safety of workers and plant at site shall be taken by the Contractor. The cost of all safety equipments and the cost of full compliance of provisions given in safety code at site would be deemed to be included in various Items of the Bill of Quantities and Rates.

**15 As Built Drawings**

The Contractor shall prepare As Built Drawings both in hard copy and in digital format. The drawings shall be prepared for any given section of the work as soon as the work for that particular section is completed. Preparation of As Built Drawings shall keep pace with the work and shall not be left over towards the end of the project. Three (03) hard copies and one soft copy of all drawings shall be submitted.

No separate payment will be made for the preparation of As-Built Drawings; Cost of preparation of As Built Drawing is deemed to be included in all other priced bill items.

**16 Labour**

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.

The Contractor shall, if required by the Engineer in Charge, deliver to the Engineer in Charge a return in detail, in such form and at such intervals as the Engineer in Charge 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 in Charge may require.

The contractor shall make his/their arrangements for the engagement of all labour, skilled and unskilled. No Contractor shall employ any person who is under the age of 18 years.

The Contractor shall, in respect of labour employed by him, comply with or cause to be complied with the provision of various labour laws and rules as applicable to them from time to time in regard to all matters provided therein and shall indemnity the Employer in respect of all claims that may be made against the Employer for non-compliance thereof by the Contractor.

## 17 Contractor's Other Obligations

17.1 All safety training and skill development of Contractor's workers and operators shall be carried out by the Contractor and all costs related to such training shall be borne by the Contractor as required under statutory law.

17.2 The Contractor shall obtain all necessary approvals/ permission from the Relevant Authorities including where necessary securing the presence of the Relevant Authorities or their representative to inspect and supervise the operations in connection with the Contract Works. The Contractor shall bear all costs, fees, charges etc so imposed for the attendance of the Relevant Authorities or their representatives.

17.3 The Contractor shall be responsible for any damage caused by any work carried out by Contractor to the existing services and utilities whether shown or not shown in the drawings from whatsoever cause arising thereof and shall make good to its original condition at his own costs and expense to the satisfaction of the Employer.

17.4 Upon completion of the Contract Works the Contractor shall remove and clear all debris, waste and/or any excess materials, construction plant, and temporary works from the site and shall do all things to clear up the site which shall include any cleaning where instructed by the Employer to other areas affected by the Contract Works. During the Contract period the Contractor shall ensure that the site is kept clean and in proper order and free from rubbish, waste or debris and Contractor shall do all things necessary to prevent any damage to or pollution or the creation of any health or environmental hazard at or around or adjacent to the Site.

17.5 The Contractor shall defend (if requested to), save harmless and indemnify the Employer against all claims, demands, interest, penalties, proceedings, damages, loss, costs, charges and expenses arising out of or in connection with any failure, neglect or omission, by the Contractor to perform his obligations under the Contract or any damage to property (including the Contract Works) or injury to person (whether resulting in death or not) caused or contributed by the Contractor and/or his servants or agents or independent Contractors appointed by the Employer to carry out works on behalf of Contractor (whether or not such claims, losses and/or damages have been insured by the Employer). In addition, this indemnity shall include all legal costs incurred by the Employer as a consequence of such claim, demand or proceeding being made.

17.6 The Contractor shall, subject to this Contract and other obligations imposed by law, execute the Contract Works and provide all labour, materials, construction equipment and all things necessary and incidental for the Contract Works to the satisfaction of the Employer and / or the Relevant Authorities.

17.7 The contractor shall abide by labour laws. It will get itself registered under the provision of contract labours (Registration and abolition) Act'1970 and it will obtain a separate PF code number for payment of PF contribution to Fund. The contractor shall take all necessary precaution against the pollution of drinking water, underground water and for the protection of the environment, tree and vegetation etc.

17.8 The Contractor shall bear all payments and other related costs on his own in connection with the execution and completion of additional, rectification, etc, works due to or caused by any act, default, neglect or omission by the Contractor. This shall also include the employment of consulting Engineer in Charges, professional experts and such other personnel as may be necessary for such works.

17.9 The Contractor acknowledges that he will not have any objection in re-structuring the Contract with respect to material and labour in order to realize the exemptions and benefits granted by the Government whenever required, and he will pass on such benefits to the Employer.

17.10 The Contractor shall indemnify the Employer against all claims in respect of patent rights and any or all other intellectual property rights, and shall defend all actions arising from such claims, and shall himself pay all royalties, license fees, damages, cost of charges of all and every sort that may be legally incurred in respect thereof.

17.11 The Contractor shall never disclose, share, publish, and/or make copies of any drawing, specification, methodology or any other information in any manner given to the Contractor during the Contract or after the completion of the Contract without the written permission of Employer.

## 3G. SAFETY MANUAL

### CHAPTER 01

### 1.0. THE MAIN CONTRACTOR.

### 1.1. RELATIONSHIP WITH THE CLIENT.

A close relationship and continuous interaction must be maintained with the client by the Construction Manager of the main or managing contractor. The client does have specific safety and health requirements to be observed and co-operation with his contractor, throughout the contract is essential. The prospective main contractors are given information on which to base their tenders and at the Tender Stage; the prospective contractors are expected to understand fully the Scope and Design Intent of these provisions.

### 1.2. Selection of sub contractors.

Management contractors should select sub or works contractors, using the same criteria of practical safety policy. Again, it must be ensured that the terms of contracts include adequate provision for safe working and for specified safety and health items.

### 1.3. Planning.

**Detailed planning should take the following matters into account**

- Know hazardous operations, e.g., use of cranes and site transport, steel erection scaffolding, etc.
- Requirement for plant and equipment to ensure safe working, or ease of handling.
- The sequence of work and its phasing between contractors, to minimise the possibility of one contractor placing another contractor's men at risk. Where appropriate, the segregation of contractors should be considered.
- The need to provide information, instruction and appropriate training, both on general site safety and on hazards specific in the site. The latter could range from restricted zones, permit-to-work systems and lifting operation, to the wearing of safety helmets.
- The need for fire precautions and emergency procedures.
- The need for environmental monitoring and health surveillance.
- Site security and foreseeable risks to the public, including the need for directional and warning signs
- Safe access across the site for persons, vehicles and plant. Thought should be given to arrangements for keeping the site tidy, accommodation for site staff, welfare, first aid and other facilities
- The provision of safe places of work at different stages of the job, including the provision of scaffolding for a number of sub or works contractors.

### 1.4. Control.

Sub and works contractors should be briefed about the safety policy and site rules of the main contractor at an initial safety meeting. Decisions on all other matters affecting safety and health should be laid down so that the responsibilities of all parties are made clear before contractors start work. Such matters should include.

- Appropriate precautions and work methods for identified hazards or hazardous work.
- Necessary plant and equipment and arrangements for its provision, maintenance use and inspection.
- The question of trade union or other workforce safety representation and the need for a joint safety committee.
- Arrangements for some form of induction training for new-starters on site.
- Arrangements for any specialist training.
- Arrangements for promulgating safety and health information, e.g. on site notice boards.

It is important that such safety and health arrangements are reviewed at the first project meeting, where the site management can set the tone for the conduct of work by resolving, at an early stage, any difficulties which may arise.

**1.5 Co-ordination.**

The Construction Manager, appointed by the main contractor, must be totally responsible for compliance with health and safety code. He must appoint a Chief Safety Officer and form a Safety Committee along with operatives from sub vendors. This Safety Committee will be Chaired by the Client's representative and sit twice a week and report to the Project Controller. The Construction Manager must take suitable arrangements to ensure the effective co-ordination of the work of all contractors on site. He should ensure that he is kept informed on a day to day basis, of progress and problems which arise. Clear lines of communication should be set up between each contractor and the Safety Officer of the Main Contractor. Operatives must also know whom to contact over safety and health matters requiring action or a decision. Such effective co-ordination will be enhanced by ensuring that 'safety and health' figures prominently on the agenda of regular project meetings. Safety Committee's weekly report must be submitted to the Project Controller in every Project Meeting.

**1.6 Monitoring.**

Arrangements must be made for safety and health monitoring of the site on a regular basis. This will include, not only ensuring the safety of such items as scaffolding excavations and plant but also environmental matter such as hazardous dust fume noise etc. In all cases, the Construction Manager should ensure that daily site inspections are carried out, by Safety Officer, more in depth inspections being done periodically by visiting safety advisers. It may be necessary for arrangements to be made for specialist occupational health and hygiene advice. The Check List for daily inspection is given in the following Chapters.

**1.7 Records.**

The main contractor should ensure that all statutory notifications, examinations and inspections are carried out. Except for plant used exclusively by individual contractors, all records should be kept by the Construction Manager.

**1.8 Standards.**

The following standards shall be followed, unless more onerous provisions have been specified in the Safety Provisions given in this Code.

IS: 3696 (Part I) - 1966 Safety code for scaffolds and ladders: Part I Scaffolds
IS: 3696 (Part II) - 1966 Safety code for scaffolds and ladders: Part II Ladders
IS: 4082-1977- Recommendations on stacking and storage of construction materials at site (first revision)

**1.9 Non Compliance of Safety and Health Provisions:**

The Compliance of the Safety and Health provisions are of utmost important to the Client. The prospective contractors must note that the client will take a serious view of any non compliance report of Safety Committee. Based on Safety Committee's report, the Client has a right to order stoppage of work till rectification is carried out to the satisfaction of the Safety Committee and all stoppages on this account will be at the entire risk , costs and consequences of the Contractor.

**CHAPTER 2.0**

## 2.0 CONTRACTOR'S SAFETY INSPECTION CHECKS LIST.

Contractor_____ Contract No._____

Project_____

Location_____

Type of Work_____

Date_____ Checked By _____

(Inspector)

| Sr | ITEM | STATUS | REMARKS |
|---|---|---|---|
| 3.0 | **ACCIDENT PREVENTION ORGANISATION**. | | |
| 3.1 | Trained First Aid Person | | |
| 3.2 | First Aid Kit. | | |
| 3.3 | Safety Material Posted. | | |
| 3.4 | Emergency Phone # Posted. | | |
| 4.0 | **HOUSEKEEPING & SANITATION** | | |
| 4.1 | General neatness of working areas. | | |
| 4.2 | Regular disposal of waste and trash. | | |
| 4.3 | Passageways and walkways clear. | | |
| 4.4 | Adequate lighting | | |
| 4.5 | Projecting nails removed. | | |
| 4.6 | Oil and grease removed. | | |
| 4.7 | Waste containers provided and used. | | |
| 4.8 | Sanitary facilities adequate and clean. | | |
| 4.9 | Drinking water tested and approved. | | |
| 4.10 | Adequate supply of water. | | |
| 4.11 | Drinking cups, Clean Dispensers. | | |
| 5.0 | **FIRE PREVENTION**. | | |
| 5.1 | Fire extinguishers identified, checked, lighted. | | |
| 5.2 | Hydrants clear access to public thoroughfare open. | | |
| 5.3 | Good housekeeping. | | |
| 5.4 | NO SMOKING posted and enforced where needed. | | |
| 6.0 | **PERSONAL PROTECTION.** | | |
| 6.1 | Hard-hats | | |
| 6.2 | Noise Level Exposure. | | |
| 6.3 | Eye Protection. | | |
| 6.4 | Safety Lines & Belts. | | |
| 6.5 | Life Jackets. | | |
| 7.0 | **ELECTRICAL INSTALLATION.** | | |
| 7.1 | Adequate well insulated wiring. | | |
| 7.2 | Fuses & GFI provided. | | |
| 7.3 | Fire hazards checked. | | |
| 7.4 | Electrical dangers posted. | | |
| 8.0 | **HAND & POWER TOOLS** | | |
| 8.1 | Tools and cords in good condition. | | |
| 8.2 | Proper grounding. | | |
| 8.3 | All mechanical safeguards in use. | | |
| 8.4 | Tools neatly stored when not in use. | | |
| 8.5 | Right tool being used for the job at hand. | | |
| 8.6 | Wiring properly installed. | | |
| 8.7 | Enough men used to handle material. | | |
| 9.0 | **LADDERS.** | | |
| 9.1 | Stock ladders in good condition. | | |
| 9.2 | Stock ladders not spliced. | | |
| 9.3 | Properly secured, top and bottom. | | |
| 9.4 | Side rails on fixed ladders extend above top landing. | | |
| 9.5 | Built-up ladders constructed of sound materials. | | |
| 9.6 | Rungs not over 12 inches on centre. | | |
| 9.7 | Stepladders fully open when in use. | | |

9.8 Metal ladders not used around electrical hazards.
9.9 Proper maintenance and storage.
10.0 **SCAFFOLDING.**
10.1 All structural members adequate for use.
10.2 All connections adequate
10.3 Safe tie-in to structure.
10.4 Ladders and working areas free of debris, snow, ice, grease.
10.5 Proper footings provided.
10.6 Passerby protected from falling objects.
10.7 Supports plumb, adequate cross bracing provided.
10.8 Guard rails and toe boards in place.
10.9 Scaffold machines in working order.
10.10 Ropes and cables in good condition.
11.0 **HOISTS, CRANES & DERRICKS.**
11.1 Inspect cables and sheaves.
11.2 Check slings and chains, hooks and eyes.
11.3 Equipment firmly supported.
11.4 Outriggers used if needed.
11.5 Power lines inactivated, removed, or at safe distance.
11.6 Proper loading for capacity at lifting radius.
11.7 All equipment properly lubricated and maintained.
11.8 Signalmen where needed.
12.0 **MOTOR VEHICLES.**
12.1 Brakes, lights, warning devices operative.
12.2 Weight limits and load sizes controlled.
12.3 Personnel carried in safe manner.
13.0 **BARRICADES.**
13.1 Floor openings planked over or barricaded.
13.2 Roadways and sidewalks effectively protected.
13.3 Adequate lighting provided.
13.4 Traffic controlled.
14.0 **HANDLING & STORAGE OF MATERIALS.**
14.1 Neat storage area, clear passageway.
14.2 Stacks on firm footings, not too high.
14.3 Men picking up loads, correctly.
14.4 Materials protected from heat and moisture.
14.5 Protection against falling into hoppers and bins.
14.6 Dust protection observed.

17.0 **MASONRY.**
17.1 Proper scaffolding.
17.2 Masonry saws properly equipped, dust protection provided.
17.3 Safe hoisting equipment.

**CHAPTER 3.0**

## 3.0 ACCIDENT PREVENTION ORGANISATION.

### 3.1 Trained First Aid Person

A contractor shall provide, or ensure that there is provided, such number of suitable persons as is adequate and appropriate in the circumstances for rendering first aid to his employees if they are injured or become ill at work: and for this purpose a person shall not be suitable unless he has undergone -

a) Such training and has such qualifications as the Health and Safety Executive may approve for the time being in respect of that case of the class of case, and
b) Such additional training, if any, as may be appropriate in the circumstances of that case.

In practice, (a) refers to a trained first aider and (b) to an occupational first aider. In addition, a person who holds a current first aid certificate issued by registered medical association or Indian Red Cross Society will be classed as a "Suitable Person" for the purposes of Regulation.

For most sites, the contractor should ensure that at least one first aider is normally present when the number of employees at work is between 50 and 150, there should be at least one additional first aider for every 150 or so should ensure that sufficient first aiders are appointed to provide adequate coverage for each shift. Provisions for medical care must be made available by the contractor for every employee covered by the regulations. In the absence of infirmaries, clinics, or hospitals in proximity to the work site, properly trained and certified first aid personnel must be available, and first aid supplies must be provided by the contractor. Appropriate equipment for transportation of injured personnel to a physician or hospital must be provided for.

### 3.2. First Aid Kit

Regardless of the number of employees there must be at least one first-aid box on site. Every first aider and occupational first aider should have easy access to first-aid equipment, and provision should be made for every employee to have reasonably rapid access to first aid. Each box should be placed in a clearly identified and readily accessible location, and contain a sufficient quantity of suitable first-aid materials and nothing else. Boxes and kits should be checked frequently to ensure they are fully stocked and all items are in a usable condition. Sufficient quantities of each item should always be available in every first aid box or cabinet.

| Sr.No | Item | Numbers of Employees. | | | | |
|---|---|---|---|---|---|---|
| | | 1-5 | 6-10 | 11-50 | 100 | 150 |
| 1 | Guidance Card individually wrapped. | 1 | 1 | 1 | 1 | 1 |
| 2. | Sterile adhesive dressings. | 10 | 20 | 40 | 40 | 40 |
| 3. | Sterile eye pads with attachment. | 1 | 2 | 4 | 6 | 8 |
| 4 | Triangular bandages | 1 | 2 | 4 | 6 | 8 |
| 5 | Sterile coverings for serious wounds (where applicable) | 1 | 2 | 4 | 6 | 8 |
| 6 | Safety pins. | 6 | 6 | 12 | 12 | 12 |
| 7 | Medium sized sterile un medicated dressings. | 3 | 6 | 8 | 10 | 12 |
| 8 | Large sterile un medicated dressings | 1 | 2 | 4 | 6 | 10 |
| 9 | Extra Large sterile un medicated dressings. | 1 | 2 | 4 | 6 | 8 |
| 10 | Sterilc water or saline in 300 ml disposable containers, where tap water is unavailable. | 1 | 1 | 3 | 6 | 6 |

The first-aid box or cupboard should protect the contents from dampness and dust and be clearly marked with a white cross on green background.

### 3.2.1 First - Aid Rooms.

Where there is 250 or more person at work on site, a suitably staffed and equipped first-aid room should be provided. In addition, where there is a large (over 150) number of employees divided into several dispersed working groups, or the location of the site makes access to places of treatment outside it difficult, the contractor should consider whether a centralised first-aid room may be needed.

A first aid room should:

a) Be under the charge of an occupational first aider in most circumstances; names and locations of all first aiders should be displayed.
b) Be readily available and used only for the rendering of first aid
c) Be clearly identified and of sufficient size to allow access for a stretcher, wheelchair, etc. and to hold a couch with space for people to work around it
d) Contain in addition to the previously mentioned first aid materials ; a sink with hot and cold running water, drinking water, paper towels, impermeable work surfaces, clean garments for use by first aiders and occupational first aider's clinical thermometer a couch with pillow and blankets frequently cleaned
e) Be heated, lighted, ventilated and cleaned regularly
f) Be designed so that immediate contact can be made with the person on call, e.g. radio, siren, and a telephone link if feasible. It should be stressed that a sufficient number of first - aid boxes must be provided for any work area which is not within easy reach of the first aid room.

### 3.3 Emergency Phone # Posted.

Project Name _____ Project No._____

The following are the business telephone numbers where project key personnel can be reached at all times. In addition, the emergency telephone numbers of other vital agencies are listed:

| | **BUSINESS** | **RESIDENCE** |
|---|---|---|
| CLIENTS PROJECT CONTROLLER | | |
| CHIEF CONSTRUCTION MANAGER | | |
| SAFETY OFFICER (CONTRACTOR). | | |
| **OTHER EMERGENCY TELEPHONE NUMBERS** | | |
| FIRE | | |
| AMBULANCE | | |
| DOCTOR | | |
| HOSPITAL | | |
| POLICE | | |
| GAS COMPANY | | |
| ELECTRIC COMPANY | | |
| WATER COMPANY | | |
| TELEPHONE COMPANY | | |
| INSURANCE CARRIER | | |
| OTHER | | |
| OTHER | | |
| OTHER | | |

**CHAPTER 4.0**

## 4.0 HOUSEKEEPING & SANITATION

At the work site, an adequate supply of potable water must be provided, as well as clean drinking water dispensers. Potable water for cleanup must be provided. Where non potable water is used for industrial or fire fighting purposes it must be identified by appropriate signs.

**CHAPTER 5.0**

## 5.0 FIRE PREVENTION.

Electrical wiring equipment for heating, light, or power purposes must be installed in compliance with the requirements. Internal combustion engine-powered equipment must be located with exhausts well away from combustible materials. Smoking is to be prohibited in the vicinity of fire hazards, and such areas must be conspicuously posted. Care shall be taken properly to ground nozzles, hoses, or steam lines used in hazardous tankage or vessels.

In location of temporary buildings and yard storage, appropriate care shall be taken for proper separation to preclude an accumulation of fire potential. The contractor is responsible for maintaining the entire area, but particularly storage areas, free from accumulation of unnecessary combustible materials.

### Site Fire Check List

1. Are safe ashtrays provided where smoking is permitted?
2. Are heaters properly guarded?
3. Are wet clothes kept clear of heaters?
4. Are portable heaters secure from being knocked over?
5. Is all temporary wiring well supported and protected?
6. Are any circuit's overloads?
7. Are all flammable liquids, gas cylinders and flammable materials separately and properly stored?
8. Are all gas appliances fitted with control taps?
9. Is rubbish being "burned in proper fashion"?
10. Is all flame cutting and welding taking place with proper precautions?
11. Are all blowlamps and blowtorches being used correctly?
12. Do all night watchmen and security patrols know the fire routines?

### Preventing the spread of fire

1. Is waste accumulating in hoist shafts, under buts, in odd corners?
2. Are separate metal waste containers supplied for each of the following: oily rags, paint rags, paint scrapings, waste flammable liquids, wood shavings and off cuts?
3. Is all waste regularly cleared?
4. Are all huts safely sited?

### Means of escape

1. Are all gangways, stairs and platforms free from obstruction?
2. Does everyone know what to do in emergency?
3. Is fire drill practised, and is there a system to ensure that all persons have evacuated the area?

### Fire Fighting

1. Have all extinguishers been checked and / or recharged?
   Are they clearly identified and easily accessible? Are operatives trained in their use

**CHAPTER 6.0**

## 6.0 PERSONAL PROTECTION.

Workers are often reluctant to use protection equipment. Such items should not only be suitable for their purpose but also be as comfortable as possible and acceptable to the workers concerned. Only then can efforts to ensure that equipment is worn or used prove successful.

All necessary personal safety equipment as considered adequate by the Engineer-in-charge shall be available for use of persons employed on the site and maintained in a condition suitable for immediate use; and the contractor shall take adequate steps to ensure proper use of equipment by those concerned.

a) Workers employed on mixing asphaltic materials, cement and lime mortars / concrete shall be provided with protective footwear and protective gloves.

b) Those engaged in handling any material which is injurious to eyes shall be provided with protective goggles.

c) Those engaged in welding works shall be provided with welder's protective eye-shields.

d) Stone workers are employed in sewers and manholes, which are in use, the contractor shall ensure that man-holes cover are opened and manholes are ventilated at least for an hour before workers are allowed to get into them. Manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to public.

e) The contractor shall not employ men below the age of 18 and women on the work of painting with products containing lead in any form. Whenever men above the age of 18 are employed on the work of lead painting, the following precautions shall be taken :-

   i) No paint containing lead or lead products shall be used except in the form of paste or ready.
   ii) Suitable face masks shall be supplied for use by workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scraped.
   iii) Overalls shall be supplied by the contractor to workmen and adequate facilities shall be provided to enable working painters to wash during and on cessation of work.

**CHAPTER 7.0**

## 7.0 HAND & POWER TOOLS

Hand and power tools must be maintained in a safe condition, whether furnished by the contractor or by the employee. When power-operated tools are designed to accommodate guards, they must be equipped with appropriate guards when in use. Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains and other moving parts of equipment must be guarded if the parts are exposed to contact by employees.

All hand-held power tools must be equipped with a constant pressure switch that shuts off when the pressure is released. Electric power-operated tools shall be of the approved double insulated type, or grounded in accordance with good electrical practice. Pneumatic power tools must be secured to the hose or whip by positive means. Safety clips or retainers must be maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

Pneumatically driven nails, staplers, and similar equipment provided with automatic fastener feed that operate at more than 100 psi pressure at the tool must have safety devices on the muzzle to prevent the tool from ejecting fasteners, unless the muzzle is in direct contact with the work surface.

Hoses shall not be used for hoisting or lowering tools, and hoses exceeding ½-in inside diameter must have a safety shutoff at the source of supply to reduce pressure in case of a hose failure.

All fuel-powered tools must be stopped while being refuelled, serviced, or maintained.

Only trained employees may be allowed to operate a powder-actuated tool. Such tools must be tested each day before loading to see that the safety devices are in proper working condition, in accordance with manufacturer's recommended test procedure. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any employee, and hands shall be kept clear of the open barrelled end. Fasteners shall not be driven into very hard or brittle materials such as cast iron, glass block, face brick, hardened steel, or hollow tile. For driving into materials that are easily penetrated, appropriate backing must be available to prevent the pin fastener from passing completely through.

All employees using abrasive wheels must use eye protection, and other tools must be operated using appropriate personal safety equipment.

**CHAPTER 8.0**

## 8.0 LADDERS

**Use of Ladders and Folding Step-Ladders.**

- This regulation applies to all ladders and pairs of steps but not roof ladders and crawling boards.

**Ladders must :**

a) Be fixed near the top if practicable, or near the bottom if not: if suspended they must be secure,
b) Be placed (except when suspended) on a firm level base; they must not stand on loose packing (e.g. bricks),
c) Be intermediately secured, where necessary, to prevent swaying and sagging, and
d) Be supported, or suspended, equally on each stile.

- If a ladder, standing on the ground, cannot be fixed to prevent slipping, then someone must hold it at the base when it is being used.

- A ladder which is not more than 3 m in length, need not be fixed or footed, provided it is securely placed so as to prevent it from slipping or falling. This exemption does not apply to ladders which are used as a means of communication between one working place and another, or to suspended ladders.

- Ladder must :

a) Extend at least 1.05 m above any landing place beyond the highest rung from which a person may be working, or have a nearby handhold of equivalent height.

b) Be placed so that there is space behind each rung for proper foothold (e.g. no rung should coincide with a scaffold tube).

**CHAPTER 9.0**

## 9.0 SCAFFOLDING

Collapse of any scaffold or part of a substantial part of the scaffold falling or overturning; also collapse or part collapse of the suspension arrangements of a slung or suspended scaffold, causing the platform or cradle to fall more than 5m.

### 9.1. Provision of Scaffolds, ETC.

Scaffolds must be provided for all work which cannot be safely done from the ground or part of the building.

Ladders, properly secured, can be used - but only for light work which can be done with one hand.

### 9.2. Supervision of Work and Inspection of Material.

Scaffolds must be erected, altered, or dismantled only under competent supervision and, as far as possible, by experienced persons. All scaffolding materials must be inspected before use to check that they are up to standard.

### 9.3. Construction and Material.

Sufficient sound material must be provided for a scaffold to be strong enough and stable enough for the job.

Wherever timber is used for any kind of scaffolding purpose, it must be of the right type for the job, be free from back and must not be painted so that any defects are hidden.

Scaffold tubes and fittings must not be bent, distorted or unduly rusty.

### 9.4. Defective Material

- Scaffold tubes, couplers or fittings that are bent unduly rusty or distorted should be rejected.

**Timber with dangerous splits and knots should always be rejected.**

- Ropes and lashings showing signs of chafing through wear, or of being corroded, should be rejected.

- All scaffold components must be properly stored when not in use and kept separately from all other building materials.

### 9.5. Maintenance of Scaffolds.

Scaffolding must be kept in good order and every effort made to prevent the accidental displacement of any part.

### 9.6. Partly Erected or Dismantled Scaffolds.

In any scaffold is either partly erected (or partly dismantled), but nevertheless is still capable of being used to some extent, it must have a bold warning notice fixed, or all access blocked off or barred, at the point beyond which it cannot be safely used.

### 9.7. Standards or Uprights, Ledgers and Putlogs.

- Scaffold standards should be vertical and spaced closely enough for the intended use of the scaffold.
- Base plates must be used. Timber sole plates should also be used to distribute the load from the standard over a wider area, as well as to offset possible local subsidence.
- Ledgers must be level and fixed to standards with right-angle couplers.
- Putlogs and transoms must be firmly fixed to ledgers or standards.

**The flattened end of the putlog must be pushed right into the wall to provide maximum support.**

- Putlogs and transoms should be spaced according to the expected load and the thickness of the boards to be used in the platform.

  In normal use, putlogs and transoms should be spaced so that the spans of scaffold boards should not be greater than:

  32 mm boards : 1 m
  38 mm boards : 1.50 m
  50 mm boards : 4.60 m

**9.8. Ladders used in Scaffolds**

- Ladders used as uprights must be :
  a) Strong enough for the load,
  b) Equally supported on each stile, and
  c) Secured to prevent slipping.

- Ladders are only to be used to support a scaffold platform when the work is light, e.g. painting.

**9.9. Stability of Scaffolds**

- All scaffolds must be :

  a) On a solid, even base; or suspended from a sound structure.
  b) Braced to prevent failure, and
  c) Tied to the building or structure unless specially designed to be completely independent.

- Any building or structure which supports a scaffold must be strong enough to carry the scaffold and its load.
- Mobile scaffolds must :

  a) Be stable, weighted at the base if necessary.
  b) Be used only on a flat, level surface.
  c) have the wheels locked to prevent movement whilst being used for work, and
  d) Be pushed, or pulled only at the base when being moved.

- Scaffolds must not be built on loose bricks, drain pipes, chimney pots, etc. Bricks or blocks can be used to support a platform no higher than 600 mm from the ground or floor.

**9.10. Slung Scaffolds**

a) Be strong enough,
b) Be properly secured to be overhead anchor-ages and to be platform frame,
c) Be spaced so as to keep the platform stable,
d) Be vertical, and
e) Be kept taut.

- No rope other than wire rope may be used for suspension.
- Packing must be used to prevent damage to suspension ropes or chains at any point where sharp or rough - edged protrusions could cause chafing.
- The platform must be secured to prevent swaying whilst in use.

**9.11. Cantilever, Jib, Figure and Bracket Scaffolds.**

Cantilever or jib scaffolds must be anchored to a structure which is strong enough to carry the total load. Outriggers must be long enough and strong enough and the scaffold must be braced to ensure stability.

Figure or bracket scaffolds supported by dogs or spikes must not be used if there is any danger of these pulling out of the brickwork or stone-work.

**9.12. Support for Scaffolds, etc.**

No part of the building may be used to support scaffolding unless it is strong enough to do so. Unless gutters have been designed as walkways and are strong enough to bear the weight, they must not be used to support scaffolding or ladders.

**9.13 Suspended Scaffolds (Not Power Operated)**

- The ropes, winches, blocks and tackle must be strong enough and correctly rigged. A safe anchorage for the suspension must be provided.
- Winches or similar lifting devices must :

  a) Have brakes which apply when the operating lever is released, and
  b) Be protected from the weather, falling dirt, etc.

- Outriggers must :
  a) Be long enough and strong enough,
  b) Be horizontal (light cradles are excepted),
  c) Have stops at their outer ends (light cradles excepted)
  d) Be tied down or properly counterweighted at the tail, and
  e) Be close enough together to support the rails and scaffolds properly.

- Counterweights Must :

  a) Be bolted or securely attached to the outriggers, and
  b) Be at least three times the overturning moment or load.

- Platforms must be hung clear of the building or face of the structure.
- Runways must :
  a) Be strong enough and in good condition,
  b) Have stops at each, and
  c) Be bolted or tied securely to their supports.

- Suspension ropes or chains must :

  a) Be properly secured, both overhead and to the frame of the platform, and
  b) Be kept taut.

- Winches must :

  a) Have at least two full turns of rope on the drum when the platform is in its lowest position, and
  b) Be marked with the length of rope on the drum.

- Suspended scaffolds and associated equipment must be maintained in good condition. Platforms must be prevented from tipping or swaying whilst in use.
- Steel wire rope must be used for the suspension of all platforms other than lightweight cradles.

  Lightweight cradles may be suspended by fibre ropes and pulley blocks which should not be more than 3.20 m apart. (only ropes recommended by manufacturers for this purpose should be used).

- Platforms of suspended scaffold must :

  a) Be close boarded,
  b) Be at least 430 mm wide on lightweight cradles.
     be at least 600 mm wide on all other types, if used only for workmen, or be at least 800 mm wide, if used for workmen and materials, and
  c) Never be used to carry another higher platform.

Platforms should be as close as possible to the face of the building, but where persons sit on the edge of the platform to carry out their work, then the distance between platform and building can be up to 300 mm.

### 9.14. Boatswain's Chairs Cages, Skips etc. (Not Power Operated)

- Hand-operated boatswain's chairs, skips etc. must :

  a) Be well constructed, strong enough, and properly maintained.
  b) have outriggers strong enough and firmly anchored,
  c) Have chains, ropes and lifting gear firmly secured to the outriggers above and to the chair, skip etc. The construction (lifting operations) regulations apply to the lifting gear,
  d) Be designed so that the occupant cannot fall out,
  e) Carry no loose materials which could interfere with the safety of the occupant,
  f) Have means of preventing spinning and tipping (a swivel connection at the suspension point is strongly advised),
  g) In the case of skips, be at least 910 mm deep, and
  h) Be under the supervision of a competent person during installation and use.

- A boatswain's chair may only be used as a workplace when the work would not take long enough to make the use of a suspended (or standard) scaffold reasonably practicable.

**CHAPTER 10.0**

## 10.0 HOISTS, CRANES & DERRICKS

**Safety of Hoist ways. Platforms and Cages.**

- Hoist ways must be enclosed wherever access is provided or wherever persons could be struck by the platform or other moving parts. Gates must be fitted in the enclosure at all landing places and must normally be at least 2m high, but gates 910 mm high are acceptable where persons are not at risk of falling down the hoist-way or coming into contact with moving parts. Gates must be kept closed except for the movement of persons and materials; it is the duty of all persons to see that this is done.
- Hoist platforms and cages must be fitted with a device capable of supporting them, fully loaded, should hoists, ropes or driving gear fail.
- Hoists must be fitted with ver-run stops at the top.

Operation of Hoists.

- Hoists must only be capable of being operated from one position at a time, whether by rope, lever or switch. Hoists must not be operated from the cage.
- Where the hoist driver cannot see the platform or cage during its movement, a signalling system, which covers all landing places, must be used.

Safe working Load and Marking of Hoists.

- A) The platform of materials or goods hoists must carry a notice stating (I) the safe working load and (ii) that passengers must not ride on the platform.
- 
- The safe working load must not be exceeded except for test purposes.
- B) Cages for passenger's hoists must carry a notice stating (i) the safe working load and (ii) the number of passengers permitted.

- No greater number of passengers may be carried and the safe working load must not be exceeded except for test purposes.

**Cranes & Derricks**

Manufacture's recommendations on operating conditions shall be followed by the contractor. Rated load capacities and recommended operating speeds and special hazard warnings or instructions must be conspicuously posted on all equipment visible to the operator while he is at his control station.

A boom angle indicator and a load-indicating device in good working order must be provided for cranes and derricks. Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standards for the type of crane in use. Accessible areas within the swing radius of the rear of the rotating superstructure of a crane must be barricaded to prevent an employee from being struck or crushed by the crane.

In operating boom equipment, careful clearance shall be given to electrical distribution and transmission lines. For lines rated 50 kV or below, minimum clearance is 10 ft, whereas for loads rated over 50 kV, minimum clearance shall be 10 ft + 0.4 in per each kV over 50 - or use twice the length of the line insulator, but never less than 10 ft.

For hammerhead tower cranes, adequate clearance must be maintained between the moving and rotating structures and fixed objects to allow the passage of employees without harm. Employees required to perform duties on the horizontal booms of hammerhead tower cranes must be protected against falling by guard rails or by safety belts and lanyards. Overhead and gantry cranes must have the rated load of the crane plainly marked on each side, and if the crane has more than one hoisting unit, each must have its rated load marked on the load block in marking clearly legible from the ground or floor. All operation must be prescribed in ANSI B30.2, "Safety code for Overhead and Gantry Cranes"

Derricks in use must meet the applicable requirements for design, construction, installation, inspection, testing, maintenance, and operation prescribed in ANSI B30.6, "Safety code for Derricks"

**CHAPTER 11.0**

## 11.0 MOTOR VEHICLES

Motor equipment left unattended at night near areas where work is in progress must have appropriate lights, reflectors, or barricades to identify the location of the equipment. A safety tire rack, cage, or equivalent protection must be used when a worker is inflating, mounting, tires installed on split rims or rims equipped with locking rings. Heavy machinery that is suspended or held aloft by the use of slings, hoists, or jacks must be blocked or cribbed to prevent falling or shifting before employees are permitted to work under them. Bulldozer and scraper blades and similar equipment shall be either fully lowered or blocked when being repaired or when not in use. All controls must be in the neutral position and the motor stopped and brakes set, unless work being performed requires otherwise. Parked equipment must be checked and parking brakes set. All cab glass shall be safety glass. All vehicles must have a service brake system, an emergency brake system, and a parking brake system. Vehicles that require additional light shall have at least two headlights, as well as brake lights.

Other standard vehicles equipment such as seat belts, rear-view mirrors, and safety latches on operating levers shall be in accordance with standard vehicle codes, and state-inspected where appropriate.

**CHAPTER 12.0**

## 12.0 BARRICADES

i) Contractor shall erect and maintain barricades required in connection with his operation to guard or protect.
   a) Hoisting Areas.
   b) Areas adjudged hazardous by contractor or Client.
   c) Owner's existing property subject to damage by Contractor's operations.

ii) Contractor's employees and those of his subcontractors shall become acquainted with Project Managers barricading practice and shall respect the provisions thereof.

12.1. Guarding of Floor Openings and Floor Holes.

12.1.1 Every temporary floor opening shall have railings, or shall be constantly attended by someone. Every floor hole into which persons can accidentally fall shall be guarded by either:

   a) A railing with toe board on all exposed sides, or
   b) A floor hole cover of adequate strength and it should be hinged in place. When the cover is not in place, the floor hole shall be constantly attended by some one or shall be protected by a removable railing.

12.2. Every stairway floor opening shall be guarded by a railing on all exposed sides, except at entrance to stairway. Every ladder way floor opening or platform shall be guarded by a guard railing with toe board on all exposed sides (except at entrance to opening), with the passage through the railing either provided with a swinging gate or so offset that a person can not walk directly into the opening.

12.3. Guarding of Open-Side Floors and Platform.

Every open-sided floor or platform 120 cm or more above adjacent floor or ground level shall be guarded by a railing (or the equivalent) or all open sides, except where there is entrance to ramp, stair-way, or fixed ladder. The railing shall be provided with a toe board beneath the open sides wherever.

   a) Persons may pass;
   b) There is moving machinery ; or
   c) There is equipment with which falling materials could create a hazard.

**CHAPTER 13.0**

## 13.0 HANDLING & STORAGE OF MATERIALS

### 13 .1 Paints Varnishes and Thinners.

a) Storage and Stacking - Paints, varnishes, lacquers, thinners and other flammable materials shall be kept in properly sealed or closed containers. The containers shall be kept in a well ventilated location, free from excessive heat, smoke, sparks or flame. The floor of the paint stores shall be made up of 10 cm thick loose sand.

Paint materials in quantities other than required for daily use shall be kept stocked under regular storage place.

Where the paint is likely to deteriorate with age, the manner of storage shall facilitate removal and use of lots in the same order in which they are received.

Temporary electrical wiring / fittings shall not be installed in the paint store. When electric lights, switches or electrical equipment are necessary, they shall be of explosion proof design.

b) Handling - Ventilation shall be adequate to prevent the accumulation of flammable vapours to hazardous levels of concentration shall be provided in all areas where painting is done.

When painting is done in confined spaces where flammable or explosive vapours may develop, any necessary heat shall be provided through duct work remote from the source of flame.

Sources of ignition, such as open flame and exposed heating elements, shall not be permitted in area or rooms where spray painting is done nor shall smoking be allowed there.

Care should be taken not to use any naked flame inside the paint store. Buckets containing sand shall be kept ready for use in case of fire. Fire extinguishers when required shall be of foam type conforming to accepted standards.

Each workman handling lead based paints shall be issued 1/2 litre milk per day for his personal consumption.

**CHAPTER 14.0**

## 14.0 HEALTH STANDARDS

### 14.1 DRINKING WATER

a) In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.
b) Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.
c) Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or any other source of pollution.

### 14.2 WASHING FACILITIES

a) In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of contract labour employed therein.
b) Separate and adequate cleaning facilities shall be provided for the use of male and female workers.
c) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

### 14.3 LATRINES AND URINALS

a) Latrines shall be provided in every work place on the following scale namely:-
   i) Where female are employed there shall be at least one latrine for every 25 females.
   ii) Where males are employed, there shall be at least one latrine for every 25 males.

   Provided that where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be upto first 100, and one for every 50 thereafter.

b) Every latrine shall be under cover and so partitioned off as to secure privacy and shall have proper door and fastenings.

c) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting non-absorbent materials and shall be cement washed inside and outside at least once a year , latrines shall not be of standard lower than borehole system.

d) i) Where workers of both sexes are employed, there shall be displayed out side each block of latrine and urinal, a notice in the language understood by the majority of the workers '' For Men only '' or '' For Women only '' as the case may be.

   ii) The notice shall also bear the figure of man or woman, as the case may be.

e) There shall be at least one urinal for male workers upto 50 and for female workers upto 50 employed at a time, provided that where the number of male or female workers, as the case may be exceeds 500 , it shall be sufficient if there is one urinal for every 50 males or females upto the first 500 and one for every 100 or part thereafter.

f) i) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
   ii) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of Public Health Authorities.
g) Water shall be provided by means of tap or otherwise so as to conveniently accessible in or near the latrines and urinals.

h) Disposal of excreta: Unless otherwise arranged by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the work place shall be made by means of a suitable incinerator. Alternately excreta may be disposed off by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose and covering it with 15 cm layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn to manure).

i) The contractor shall at his own expense , carry out all instructions issued to him by the Engineer-in-charge to effect proper disposal of night soil and other conservancy work in respect of the contractor's workmen or employees of the site. The contractor shall be responsible for payment of any charges which may be levied by the municipal or cantonment authority for execution of such on behalf.

## 14.4 PROVISION OF SHELTER DURING REST

At every place there shall be provided , free of cost , four suitable sheds , two for meals and other two for rest separately for the use of men and women labour . The height of each shelter shall not be less than 3m from the floor level to the lowest part of the shed roof. These shall be kept clean and the space provided shall be on the basis of 0.6sq.m per head.

Provided that the Engineer-in-charge may permit subject to his satisfaction , a portion of building under construction or other alternative accommodation to be used for the purpose.

## 14.5 CRÈCHES

I) At every work place , at which 20 or more women workers are ordinarily employed , there shall be provided two rooms of reasonable dimensions for the use of their children under at the age of six years . One room shall be used as a play room for the children and the other as their bedroom.

ii) The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.

iii) The contractor shall supply adequate number of toys and games in playroom and sufficient number of cots and bedding in the bed room.

iv) The contractor shall provide one aya to look after the children in the crèche when the number of women workers does not exceed 50 and two when the number of women workers exceeds 50.

v) The use of the rooms earmarked as crèches shall be restricted to children, their attendants and mothers of the children.

## 14.6 CANTEENS

I) In every work place where the work regarding the employment of contract labour is likely to continue for six months and where in contract labour numbering 100 or more are ordinarily employed , an adequate canteen shall be provided by the contractor for the use of such labour .

ii) The canteen shall be maintained by the contractor in an efficient manner.

iii) The canteen shall consist of at least a dining hall, kitchen, storeroom, pantry and washing places separately for workers and utensils.

iv) The canteen shall be sufficiently at all times when any person has access to it.

v) The floor shall be made of smooth and impervious materials and inside walls shall be lime washed or colour washed at least once a year .The inside walls of the kitchen shall be lime washed every four months.

vi) The premises of the canteen shall be maintained in a clean and sanitary condition.

vii) Suitable arrangements shall be made for the collection of disposal of garbage.

viii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause nuisance.

ix) The dining hall shall accommodate at a time 30 percent of the contract labour working at a time.

x) The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one sq.m per diner to be accommodated as prescribed in sub-rule (ix).

xi) a) 1. There shall be provided and maintained sufficient utensils crockery, furniture and any other equipment necessary for efficient running of canteen.
2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.

b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.
2. A service counter, if provided, shall have top of smooth and impervious material.
3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.

xii) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number.

xiii) Sufficient tables stools or benches shall be available for the number of diners to be accommodated as prescribed in sub rule (ix).

xiv) The food stuff and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour .

xv) The charges for food stuffs, beverages and other items served in the canteen shall be based on ''No profit No loss'' and shall be conspicuously displayed in the canteen.

xvi) In arriving at the price of foodstuffs, and other article served in the canteen , the following items shall not be taken into consideration as expenditure namely :-

a) The rent of land and building.

b) The depreciation and maintenance charges for the building and equipment provided for the canteen.

c) The purchase, repairs and replacement of equipment including furniture , crockery, cutlery and utensils.

d) The water charges and other charges incurred for lighting and ventilation.

e) The interest and amounts spent on the provision and maintenance of equipment provided for the canteen.

xvii) The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors.

## 14.7 ANTI-MALARIAL PRECAUTIONS

The contractor shall at his own expense, conform to all anti-malarial instructions given to him by Engineer-in-charge including the filling up of any borrow pits which may have been dug by him.

**CHAPTER 15.0**

## 15.0 RECORD OF FIRST AID TREATMENT.

**Project Data:** _____

Project:

Location:

**Injured Data:**

Name:

Employer:

Employer's Supervisor:

**Injury Data:**

Date:

Time:

Description of Injury:

**First Aid Treatment:**

Treatment administered by:

Type of treatment administered:

Referred for Medical Treatment:

_____No

_____Yes.

Doctor_____

Hospital _____

_____

Report Prepared By: Date:

Treatment Received By: Date:

**CHAPTER 16.0**

## 16.0 DAMAGE REPORT FORM

Contract_____

Plant and equipment affected._____

Serial numbers or identifying marks _____

Owner of plant or equipment _____

Place, date and time of incident _____

Circumstances of incident _____
_____
_____
_____

Details of damage _____
_____

Names of operators involved (if not Company employers, also give details of such contractors concerned)_____
_____

Were normal working methods used ? _____

Contributory causes of incident _____

_____

Names of witness _____

(attach statements)_____
_____

**Preventative action proposed or taken** _____

**Signature of Site Agent or Manager** _____

Date _____.

**CHAPTER 17.0**

## 17.0 PERSONNEL ACCIDENT REPORT FORM.

Division / Dept (if applicable) _____

Contractor _____

Full name and address of injured person (IP) _____

_____

Occupation of IP _____Age of IP _____

Employed (state if self - employed or under training) _____

Trade of sub contractor (where applicable) _____

Particulars of accident:

Date and time of accident _____

Exact place where accident happened. _____

What was IP doing at time of accident? _____

Did IP cease work? _____

First air or hospital treatment. _____

Time lost (state of IP is still off work) _____

Brief description of accident, giving dimensions where applicable _____

_____

_____

_____

_____

Details of tools, equipment plant or machinery. _____

_____

What protective clothing / equipment was being worn / used by IP? _____

Nature of injury and part of the body injured. e.g. punctured foot, hand, broken leg._____

_____

_____

Contributory factors:

Unsafe system of work YES/NO _____

Lack of training, supervision etc. YES/NO _____

Environmental Conditions (wind, rain, ice, etc.) YES/NO _____

State of equipment (faulty brakes, damaged lifting gear, etc.) YES/NO _____

Housekeeping (untidy access, nails in timber. etc) YES/NO_____

Other _____

Delete as appropriate and give details.

_____

Names and address of witness _____

_____

_____

If reportable:

Date and time Safety Officer informed by Telephone _____

Preventative action taken or proposed_____

Signature of Site Agent or Manager _____

Date _____

# SECTION 4:
# FORMS OF SECURITIES

**Forms of Securities**

Acceptable forms of securities are annexed. Bidders should not complete the Performance and Advance Payment Security forms at this time. Only the successful Bidder will be required to provide Performance and Advance Payment Securities in accordance with one of the forms, or in a similar form acceptable to the Employer.

**Annex A:** Performance Bank Guarantee

**Annex B:** Bank Guarantee for Advance Payment

## ANNEXURE –A

## PERFORMANCE GUARANTEE

This Guarantee of guarantee (hereinafter referred to as "**Guarantee**") made this date ..... by Bank (Bank Name)....., a scheduled bank with its head office at (address)..... (hereinafter referred to as the "**Bank**") of the first part in favour of M/s. Mahindra World City (Jaipur) Limited, a company incorporated under Companies Act, 1956 and having its office at 411, Neelkanth Tower#1, Bhawani Singh Marg, C-Scheme, Jaipur -302001 (hereinafter referred to as "**Employer**" which expression shall, unless repugnant to the meaning and context here to, include its affiliates, successors and assigns) of the other part.

**WHEREAS:**

A. M/s. Mahindra World City (Jaipur) Limited is developing a special economic zone at Jaipur called "Mahindra World City, Jaipur" (hereinafter referred to as "**SEZ**");

B. On the assurance of M/s ----------having its office at ------ (hereinafter referred to "**Contractor**") that they are having the necessary infrastructure and capacity to undertake construction of ---------- package at the SEZ to the quality, specifications and time frame as per the terms and conditions stipulated by MWCJ, MWCJ and Contractor have entered into a contract ref: **MWCJL/MTP/B-1/T-09** dated ____ **day** ____ **Month** _____ **Year** (hereinafter referred to as "**Contract**" which expression shall include any agreed amendments or modifications thereto) to execute the work within the SEZ in accordance with the terms and conditions of such Contract;

C. Contractor has, by its acceptance to enter into the Contract with MWCJ has agreed to furnish a bank guarantee to MWCJ to ensure timely and satisfactory performance and completion of the work as per terms of the Contract;

D. The Bank has, at the request of the Contractor, agreed to grant in favour of MWCJ, a guarantee to secure performance by Contractor of its obligations under the said works contract.

**NOW THIS GUARANTEE WITNESSES AS FOLLOWS:**

1. The Bank hereby unconditionally, unequivocally and irrevocably guarantee to MWCJ and agrees and undertakes that if in the sole and unfettered opinion of MWCJ, Contractor has failed to perform its obligations under the said Contract and any amendments or modifications thereto, the Bank shall upon demand of MWCJ forthwith pay to MWCJ, without demur, contestation or dispute, without reference to Contractor, the amount set forth in certificate by MWCJ as the amount of loss / claim / damage / cost / expense arising or likely to arise out of breach or non fulfilment of the said Contract. Any such certificate or demand by MWCJ on the Bank, shall be conclusive as regards the amount due and payable by the Bank to MWCJ under this Guarantee, notwithstanding any dispute between Contractor and MWCJ as to the liability for or quantum of loss / damage / claim / costs / expenses and notwithstanding any notice by Contractor to the Bank withhold or not to pay any amount to MWCJ against this Guarantee either before or after invoking of this Guarantee by MWCJ Provided always the total liability of the Bank hereunder shall be limited to Rs. (.....) (Rupees.....).

2. This Guarantee of the Bank shall be effective immediately from the date hereof and shall be in force for till a certificate is issued by MWCJ to the Bank in accordance with Clause 4 of this Guarantee or the claim expiary date of this guarantee whichever is earlier. If a demand isso served , before the claim expiary date , this Guarantee shall continue in full force and effect (notwithstanding the validity date) in respect of the amount so demanded until the obligation of the Bank in respect hereof is finally determined and the payment made to MWCJ.

3. The Bank agrees that MWCJ has the fullest liberty, without affecting in any manner the Bank's obligations hereunder, to vary any of the terms and conditions of the said Contract, to extend the time of performance by the Contractor from time to time and to forbear from enforcing any of the terms of the said Contract without any notice to or the consent of the Bank and the Bank shall not be released from its liability under this Guarantee by reason of any such variation or extension or forbearance being granted to Contractor. The Bank agrees that MWCJ has no obligation whatsoever to exercise its rights against collateral, if any, of Contractor but may immediately call on this Guarantee.

4. This Guarantee herein contained shall remain in valid and effect till MWCJ certify that the terms and conditions of the said Contract have been fully and properly carried out and that the Contractor has fulfilled all its obligations under the Contract and that MWCJ has no claim against the Contractor on any account against the said Contract or the expiry date whichever is earlier.

5. Only neglect or forbearance, on the part of MWCJ, in the enforcement of the payment of any money, the payment whereof is intended to be hereby secured or the giving of the time for the payment hereto shall in no way relieve the Bank of their liability under this Guarantee.

6. The Bank shall not revoke this Guarantee during its currency except with the previous consent in writing of MWCJ.

7. Any notice or communication under this Guarantee shall be in writing and shall be served on the Bank at its address first hereinbefore mentioned and to MWCJ at its address first hereinbefore mentioned. Either party may notify to the other in writing any change in such address for service of notice upon it. The notices shall be served personally against acknowledgement or by Registered Post

8. This Guarantee shall not be affected by any change in the constitution of the Bank or of Contractor or of MWCJ.

9. This Guarantee shall be governed by the applicable laws of India.

10. The expression "The Bank" and the Contractor hereinbefore used shall include their respective successors and permitted assigns.

Notwithstanding anything contained herein above in the Bank Guarantee.

1- Our liability under this Bank Guarantee shall not exceed Rs. _____/-
2- This Bank Guarantee shall be valid up to _____
3- We shall be liable to pay any amount under this Bank Guarantee or part thereof only if we received (if your serve upon us) a written claim or demand under this Guarantee up to _____ at _____ Bank Ltd., _____(Address)

**ANNEXURE –XXXX**

**DRAFT FOR ADVANCE BANK GUARANTEE**

**Bank Guarantee Bond (RE : Mobilization Advance)**

This Bond (hereinafter referred to as "**Guarantee**") made this (date)..... by Bank (Bank Name)....., a scheduled bank with its head office at (address)..... (hereinafter referred to as the "**Guarantor**") of the first part in favour of M/s. Mahindra World City (Jaipur) Limited, a company incorporated under Companies Act, 1956 and having its office at 411, Neelkanth Tower#1, Bhawani Singh Marg, C-Scheme, Jaipur -302001 (hereinafter referred to as "**Employer**" which expression shall, unless repugnant to the meaning and context here to, include its affiliates, successors and assigns) of the other part.

**WHEREAS:**

A. M/s. Mahindra World City (Jaipur) Limited is developing a special economic zone at Jaipur called "Mahindra World City, Jaipur" (hereinafter referred to as "**SEZ**");

B. On the assurance of M/s ----------having its registered office at ------ (hereinafter referred to "**Contractor**") that they are having the necessary infrastructure and capacity to undertake construction of ---------- package at the SEZ to the quality, specifications and time frame as per the terms and conditions stipulated by EMPLOYER, EMPLOYER and Contractor have entered into a contract Ref. No. _____ dated _____ (hereinafter referred to as "**Contract**" which expression shall include any agreed amendments or modifications thereto) to execute the work_____ (work specification) within the SEZ in accordance with the terms and conditions of such Contract;

C. And whereas Employer has agreed to pay the said Contractor a sum of Rs._____ (Rupees _____) as Mobilisation Advance as per terms and conditions of the above said Contract,that the said Contractor shall submit in favour of your company and an unconditional and irrevocable Bank Guarantee for an equal amount valid till completion period i.e _____ .(Date)

D. The said Contractor has agreed to refund to the Company the balance un-recovered sum in the event of the said Contract Agreement being terminated or coming to as end for whatsoever reason,

E. We the Guarantor, at the request of the Contractor, agreed to Guarantee in favour of EMPLOYER, a guarantee to advance payment made by EMPLOYER to the Contractor.

**NOW THIS GUARANTEE WITNESSES AS FOLLOWS:**

1. The Bank hereby unconditionally, unequivocally and irrevocably guarantee to EMPLOYER and agrees and undertakes that if in the sole and unfettered opinion of EMPLOYER, Contractor has failed to pay the amount equivalent to Rs. ----------given as advance by EMPLOYER to the Contractor (hereinafter referred to as "**Advance**")with in the time stipulated in the Contract, the Bank shall upon demand of EMPLOYER forthwith pay to EMPLOYER, without demur, contestation or dispute, without reference to Contractor, amount equivalent to Advance. Any such certificate or demand by EMPLOYER on the Bank, shall be conclusive as regards the amount due and payable by the Bank to EMPLOYER under this Guarantee, notwithstanding any dispute between Contractor and EMPLOYER as to the liability for or quantum of loss / damage / claim / costs / expenses and notwithstanding any notice by Contractor to the Bank withhold or not to pay any amount to EMPLOYER against this Guarantee

either before or after invoking of this Guarantee by EMPLOYER Provided always the total liability of the Bank hereunder shall be limited to Rs. (.....) (Rupees.....).

2. This Guarantee of the Bank shall be effective immediately from the date hereof and shall be in force for till a certificate is issued by EMPLOYER to the Bank in accordance with Clause 5 of this Guarantee unless a claim or demand in writing is served upon the Bank by EMPLOYER. If a demand is so served, this Guarantee shall continue in full force and effect (notwithstanding the expiration date) in respect of the amount so demanded until the obligation of the Bank in respect hereof is finally determined and the payment made to EMPLOYER.

3. The Bank agrees that EMPLOYER has the fullest liberty, without affecting in any manner the Bank's obligations hereunder, to vary any of the terms and conditions of the said Contract, to extend the time of performance by the Contractor from time to time and to forbear from enforcing any of the terms of the said Contract without any notice to or the consent of the Bank and the Bank shall not be released from its liability under this Guarantee by reason of any such variation or extension or forbearance being granted to Contractor. The Bank agrees that EMPLOYER has no obligation whatsoever to exercise its rights against collateral, if any, of Contractor but may immediately call on this Guarantee.

4. The Bank agrees that EMPLOYER has the fullest liberty, without affecting in any manner the Bank's obligation hereunder, to assign this guarantee in favour of any EMPLOYER affiliate company in India without the consent of but with prior intimation to, the Bank, and the Bank shall not be released from its liability under this Guarantee by reason of any such assignment. The Bank shall forthwith, on receipt of such intimation; undertake necessary endorsements or amendments hereto to incorporate the assignment in favour of such EMPLOYER affiliate assignee.

5. This Guarantee herein contained shall remain in force and effect till EMPLOYER certify that the Contractor has dully paid the Advance back to EMPLOYER. The Bank shall be released of its liabilities and obligations under this Guarantee only after such a certificate as aforesaid is issued by EMPLOYER to the Bank.

    i) The Bank shall not revoke this Guarantee during its currency except with the previous consent in writing of EMPLOYER.

    ii) Only neglect or forbearance, on the part of EMPLOYER, in the enforcement of the payment of any money, the payment whereof is intended to be hereby secured or the giving of the time for the payment hereto shall in no way relieve the Bank of their liability under this Guarantee.

6. Any notice or communication under this Guarantee shall be in writing and shall be served on the Bank at its address first hereinbefore mentioned and to EMPLOYER at its address first hereinbefore mentioned. Either party may notify to the other in writing any change in such address for service of notice upon it. The notices shall be served personally against acknowledgement or by Registered Post / Fax / Telex.

7. The Bank hereby agrees that their liability hereunder shall not be discharged or released or altered or impaired in any manner by ay change in the constitution structure or our Bank or by merger or amalgamation by our Bank with any other Bank, Company, Corporation or Body.

8. The Bank hereby agrees that their liability hereunder shall not be discharged or released or altered or impaired in any manner by ay change in the constitution structure or powers of the said, Contractor or of the Employer.

9. This Guarantee shall be governed by the applicable laws of India.

10. The expression “The Bank” and the Contractor hereinbefore used shall include their respective successors and permitted assigns.

    **Notwithstanding anything contained herein**

    We the Bank _____ (Name) _____ (Address) _____ hereby irrevocably and unconditionally undertake to pay your company, by Banker’s Cheque / Demand Draft favouring **Mahindra World City (Jaipur) Ltd., payable at Jaipur** on First Demand without protest or demur or proof or condition any and all amount demanded by your Company in writing, with reference to the guarantee and that the liability of the _____ (Bank Name), under this guarantee is restricted to Rs. _____ (amount in figures) _____ (Amount in words). Our guarantee shall remain in force until _____ (date) Unless a claim in writing is presented to us during the validity period of this Guarantee and / or during a further grace period of _____ (extended period) thereafter upon expiry of the said validity,

11. IN WITNESS WHEREOF..... FOR AND ON BEHALF OF THE BANK HAS SIGNED THIS GUARANTEE ON THE DAY AND THE YEAR FIRST ABOVE WRITTEN.

12. (  )

13. WITNESSES :

1-  2-

# SPECIAL CONDITIONS OF CONTRACT

# TECHNICAL SPECIFICATIONS

# BILL OF QUANTITIES

**MAHINDRA WORLD CITY, JAIPUR**

**TENDER FOR DG SET WORKS**

**SPECIAL CONDITIONS OF CONTRACT**

## 1. WORK TO BE EXECUTED AS PER TENDER AND STATUTORY REGULATIONS ETC.

### 1.1 Tender Document

This tender document, comprising of Notice Inviting Tender, Special Conditions of Contract, Technical Specifications, Schedule of Quantities and Tender Drawings, shall form part of the contract Agreement after award of contract . Work under this contract shall be executed at contract rates as per conditions and specifications stipulated in this tender document excepting in respect of deviations specifically agreed to before the award of the contract and incorporated in the contract Agreement. In addition, components/materials, which may not be specifically stipulated in the tender document, but which are necessary for satisfactory installation and/or operation of any portion of the work, shall also be provided within the contract rates without any extra cost. Contractor shall carry out and complete the work in all respects to the satisfaction of Owners as per the contract Agreement and as directed by Owners/Architects and as required.

### 1.2 Tender Drawings

Tender drawings are for guidance of the Contractor. Work shall be executed as per approved shop drawings. Exact locations, levels and distances etc. shall be governed by dimensional parameters actually available at site.

### 1.3 Tender Conditions, Specifications and Schedule

- For any discrepancy between Technical Specifications and Schedule of Quantities, provision of Schedule of Quantities shall prevail.
- Any item shown in Schedule of Quantities and not called for in the Specifications or vice versa, shall be provided as if called for in both.
- Wherever it is mentioned that the Contractor shall perform certain work or provide certain facilities, it is understood that the Contractor shall do so at his cost.
- Where the Technical Specifications stipulate requirements in addition to those contained in the applicable Indian Standard Specifications/Codes, these additional requirements shall also be satisfied.

### 1.4 Departures

Should any tenderer wish to depart from any Specification and/or condition stipulated in this tender document, such departure shall be clearly brought out in his tender with full particulars and reasons. No departure from any stipulation in this tender document shall be accepted after tenders have been opened.

### 1.5 Authorities

The work shall conform to all the provisions of the relevant Government Legislation, Regulations and Bye-laws of the Central/Local Authorities and of the concerned Electricity Supply Authority. The Contractor shall also be responsible for giving all notices required under the said Acts/Regulations/Bye-laws.

### 1.6 Electrical License

The tenderers shall be a licensed Electrical Contractor possessing a valid Contractor's license of appropriate class in the state, employing licensed supervisors and skilled workers having valid permits as per the regulations of Indian Electricity Rules and local Electrical Inspectors requirements. Copy of Contractor's Electrical License shall be furnished along with the tender.

## 2. INTENT OF SPECIFICATIONS

It is not the intent of Technical Specifications to completely specify **all** aspects of design/construction features of equipments and **all** details of work to be carried out Nevertheless the intent of the Technical Specification is to ensure that the equipments and the work shall fully comply with and conform to the relevant Bureau of Indian Standard Specifications, Codes of Practice, Indian Electricity Act, Indian Electricity Rules and other Statutory Regulations as may be applicable and to the best available standards of engineering, design and workmanship. The equipment and work shall perform in manner acceptable to Owners who shall interpret meaning of the applicable Specifications/Codes and shall have the right to reject any equipment or work, which, in their assessment, is not complete to meet the Standard/Code.

## 3. SITE OF WORK

### 3.1 Brief description of site

Works covered in this contract is required for Mahindra World City at Jaipur. Tenderers are advised to visit the site after taking prior permission from Owners/Architects for familiarizing themselves with working conditions available at site as also with the statutory levies and their prevailing quantum payable at site. Contractors shall not be entitled to claim any extra payment on account of lack of such knowledge after award of contract.

### 3.2 Power Supply System

Entire work shall be suitable for use on 11,000 volt 3 phase and/or 415 volt 3 phase 4 wire supply system with transformer neutral grounded. The rated frequency of the supply system shall be 50 cycles per second. The System fault levels shall be 350 MVA at 11,000 volts and/or 31 MVA at 415 volts unless otherwise stated.

### 3.3 Ambient Conditions

All equipments components and materials used in the work shall be suitable for continuous operation/use at rated output with permissible overload at following extremes of ambient conditions likely to be encountered at site.

Temperature from minimum $0^{o}$ C to maximum $50^{o}$ C
Related humidity from minimum 10% RH to maximum 100% RH

## 4. OWNER TO PROVIDE

Owner’s scope of contract shall be restricted to providing the following items free of cost to the Contractor.

- Items of civil works like foundations for major equipments, masonry trenches with trench covers (excluding support structure for cables/pipes) etc.
- All light fixtures with lamps shall be procured by Owners and issued to the contractor for fixing
- Space for Contractor’s site office/stores for the duration of the contract at location and of size considered suitable and sparable by Owners. Owners reserve the right to provide alternative space for the purpose, if so necessary, during the tenure of the contract.

## 5. SCOPE OF CONTRACT

Contractor's scope of the contract shall comprise of providing equipments, components, materials, labour, supervisory staff with infrastructure, T&P, scaffolding, consumables, testing equipment, required for completion of the work as per the contract Agreement. **Contract Rates shall be deemed to be inclusive of all direct and indirect expenses required to be incurred as per this scope including but not restricted to the costs of the following.**

### 5.1. Contractual Responsibility

The Contractor shall be fully responsible for ensuring that the design, manufacture, make, type, quantity and size of equipments/components/ materials brought to site for use in work shall be suitable for the work and shall be compatible with spaces available at site particularly with regard to heights and the widths of approaches to places of installation of equipments. **Approval of shop drawings, makes, samples etc. given by or on behalf of Owners/Architects shall not absolve the Contractor of this basic contractual responsibility.**

### 5.2. Items of Work

Supply, installation, testing and commissioning of all items detailed on Schedule of Quantities including extra/substituted items in quantities actually executed, as per broad Sub-heads.

### 5.3. Statutory Levies

Statutory levies as applicable as below.

- Sales tax without issue of C-form by Owners.
- Excise duty/custom duty.
- Work contract tax.
- Octroi
- Any other levies.

### 5.4 Testing

- Testing of equipments at manufacturers work prior to despatch.
- Testing at site as required

### 5.5 Transportation, Storage, insurance etc.

- Loading, transportation and unloading.
- Protection of stored materials/installed work against damage due to dirt, sun and rain including providing tarpaulin/ PVC sheet covers as required.
- Providing security arrangements/watch and ward for stored materials and installed works to guard against pilferage including providing temporary covers on conduit outlets after drawing of wires before fixing switches/fittings etc.
- Comprehensive insurance with Owners as beneficiaries against pilferage during transportation/storage/installation valid till handing over.

### 5.6 Name plates etc.

5.6.1 Caution boards
Affixing/pointing caution boards/danger plates as statutorily required for electrical safety.

5.6.2 Name plates
Providing engraved anodized aluminium or approved equivalent name plates of suitable sizes on switchboards/panels/equipments etc.

5.6.3 Circuit identification

All incoming and outgoing cables and wires shall be properly labeled as per the layout/schematic drawings for easy identification. Details of circuits being fed from DBs shall be affixed at the back of the door of each DB.

**5.7 Civil works, cleaning and painting**

5.7.1 Civil Works

All civil work items required for the work including but not restricted to making chases in walls/ceilings, making holes and openings, providing inserts, grouting etc including making good the same with wire mesh covering first and then cement mortar/ concrete/ water proofing of appropriate mix and strength as directed by the Architect/Owners. Matching paint shall applied on portions so made good. While making good, holes, openings, chases etc and during touch-up, the original specifications must be adhered to for the material choose.

5.7.2 Housekeeping

Housekeeping and clearing of work area during the tenure of contract.

5.7.3 Final Painting

Providing final paint coat to all exposed fabricated steel work and providing matching paint in approved manner over portions of factory painted equipment if damaged during transportation/storage/installation before handing over.

5.7.4 Site Clearance

Demobilization and clearing of all temporary works/ facilities after completion of work at site and cleaning work are before handing over.

**5.8 Water and electricity**

Contractor shall make his own arrangement for water and electricity.

**5.9 Statutory approval**

The Contractor shall deposit applications as prescribed with the appropriate Authorities on behalf of Owners for obtaining sanctions/approvals/permissions/ clearances as detailed below, and shall arrange for timely obtaining of the sanctions/permission/approving/clearance as required. All expenses required to be incurred for obtaining the statutory approvals including liasoning charges shall be borne by the Contractor. Statutory fees shall however be paid by the Owners directly as required.

- Obtaining clearance from Central Pollution Control Board (CPCB) and State Pollution Control Authority in respect of noise levels and emission level being within the permissible limits.
- Obtaining clearance for bulk oil storage and transmission facility including
  - Approval of layout drawings and proposal from Department of Explosive before commencement of the work.
  - NOC from District Magistrate which shall include approvals from local police, local administration and other local bodies as may be required before commencement of the work.
  - Obtaining license from Department of Explosive for operating the facility after completion of the work.
- Obtaining Electric Inspector's clearance after completion of work.
- Obtaining permission from Supply Company Authority for operating the DG set.

**5.10 Compliance of statutory observation**.

- Complying with observations, if any, of Electrical Inspector and/or any other Statutory Authority after completion of work in order to obtain a categorical clearance to start beneficial use.

**5.11 Manuals, drawings etc.**

5.11.1 **Shop drawings on award of work before commencement**

The Contractor shall furnish manufacturer's test certificates in respect of materials/equipments/ components used on work as required and shall submit shop drawings as below to Architects/Owners for approval before commencement of work at site/fabrication/ manufacture.

- Fully dimensioned layout drawings of DG sets and associated accessories in the plant room, based on actual dimensions.
- Detailed G.A drawings of, Fuel piping, pumps etc including manufacturing details, makes of equipments etc.
- Fully dimensioned drawings of foundations for D.G sets and other civil works like floor trenches for pipes and cables, cutout for exhaust pipes, fuel piping etc.

5.11.2 **Completion drawing on work completion.**

After completion of works the Contractor shall submit completion drawings in the form of one complete set of originals on sepia cloth with two sets of blue prints as also in the form of computer floppies and CD -ROM and three sets of documents as listed below:

- As built completion drawings of the installation at site.
- Technical Literature and Operation and Maintenance Manuals for D.G Sets and auxiliaries.
- Detailed description of mode of operation of control and protection circuits complete with copies of all schematic and circuit drawings

**6 COMPLETION TIME & TIME DELAY PENALTY**

**6.1 Completion Time**

- The entire work shall be completed within 5 months or matching with the completion of the interior whichever is later. The Contractor shall submit a detailed time schedule of completing salient activities of the contract to achieve overall completion for approval of Project Manager/Architects/Owners. If the completion of work is delayed beyond the period stipulated in the original contract agreement due to reasons considered by Owners to be beyond the control of Contractor, extension of time for the completion of the work shall be granted by the Owners without the levy of the time delay penalty. The extension of time shall however not entitled the Contractor to claim any extra payment and/or compensation on this account.

- Completion of work shall include supply, installation, testing, commissioning and obtaining the required statutory approvals of the system. The work shall not be demand to be completed till all these items are completed by the Contractor to the satisfaction of the Owners.

**6.2 Time delay penalty**

If the completion of the work is delayed beyond the completion period (as defined in para 6.1 above) stipulated in the contract Agreement (including duly extended completion) due to reasons considered by Owners to be **within** the Contractor's control Owners reserve the right to impose Time Delay Penalty on the contractor @ 0.5% of the **total** contract value per week of delay subject to a maximum of 10% of the **total** contract value.

## 7. PERFORMANCE GUARANTEE

The entire work executed under this contract shall be guaranteed against manufacturing defects and/or bad workmanship for a period of **one year** after the date of contractual completion as defined in para 6.1 above. Any defect arising out of reasons attributable to manufacturing defect and/or bad workmanship, in the assessment of Owners, shall be rectified/replaced to the satisfaction of the Owners free of cost to the Owners during this Performance Guarantee period. An amount of 10% of the contract value, in the form of bank guarantee, shall be retained by the Owners as Security Deposit for implementing the Performance Guarantee if and when required

## 8. TERMS OF PAYMENT

Following terms of payment shall apply :

10% of contract value as mobilizing advance against bank guarantee on award of work
60% of contract value on delivery of equipment at site.
20% of contract value on completion of installation, testing and commissioning and after submission of statutory approvals (permission from supply company authority, clearance from electrical inspector and clearance from pollution control authority) and submission of operating manuals etc.
10% of contract value shall be retained and released as per clause 6 above.

## 9. EQUIPMENT, COMPONENTS AND MATERIALS

### 9.1 Quality

All materials and equipment used in work shall be new and of best available quality conforming to the relevant Indian Standard Specifications and to these specifications. Owners reserve the right to reject any item which in their assessment is second hand

### 9.2 Samples

All materials and equipment used on work shall be got approved by Owners/Architects prior to use on work Samples / literature of items, as directed, shall be got approved from Owners/Architects prior to use on work.

### 9.3 List of approved make

A list of approved makes in respect of important items is enclosed which shall form part of this contract. Only makes approved as per this list shall be used in the work.

### 9.4 Manufacturers Instruction

Where manufacturers have furnished specific instructions, relating to the materials used in this job, covering points not specifically mentioned in these documents, manufacturers instructions shall be brought to the notice of the Owners/Architects for further instructions in the matter.

### 9.5 Interchangeability

All similar parts and/or equipment shall be interchangeable with one another.

### 9.6 Material testing

The owners/architects shall have full powers to require any material used in work to be tested by an independent agency at the Contractor's expense in order to prove its soundness and adequacy.

### 9.7 Inspection at manufacturer's works

Prior to shipment of equipment, the Owners/Architects reserves the right to inspect the equipment at Manufacturer's Works. Contractor shall provide and secure every reasonable access and facility at Manufacturer's Works for this inspection for the Owner/Architect/ Authorized representative.

## 10. SAFETY REGULATIONS

The Contractors shall, at their own expense, arrange for safety provisions as per safety codes of Indian Standards Institution, Indian Electricity Act and such other Rules, Regulations and Laws as may be applicable, as indicated below, in respect of all labour, directly or indirectly employed in the work for performance of the Contractors' part of this agreement.

- No inflammable materials shall be stored in places other than the rooms specially constructed for this purposes in accordance with the provisions of Indian Explosives Act. If such storage is unavoidable, it should be allowed only for a short period and in addition, special precautions, such as cutting off the supply to such places at normal items, storing materials away from wring and switch boards, giving electric supply for a temporary period with due permission of Engineer-in-charge shall be taken.

- Protective and safety equipment such as rubber gauntlets or gloves, earthing rods, line men's belt, portable artificial respiration apparatus etc. should be provided in easily identifiable locations. Where electric welding or such other nature of work is undertaken, goggles shall also be provided.

- Necessary number of caution board such as "Man on Line, Don't switch on" should be readily available in easily identifiable locations.

- Standard first aid boxes containing materials as prescribed by the St. John Ambulance Brigade or Indian Red Cross should be provided in easily identifiable locations and should be readily available. Periodical examination of the first aid facilities and protective and safety equipment provided shall be undertaken and proper records shall be maintained for their adequacy and effectiveness.

- Charts (one in English and one in regional language ) displaying methods of living artificial respiration to a recipient of electrical shock shall be prominently displayed at appropriate places.

- A chart containing the names, addresses and telephone numbers of nearest authorized medical practitioners, hospitals, Fire Brigade and also of the officers in charge shall be displayed prominently alongwith the First Aid Box.

- Steps to train supervisory and authorized persons of the Engineering staff in the First Aid Practices, including various methods of artificial respiration with the help of local authorities such as Fire Brigade, St. John's Ambulance Brigade, Indian Red Cross or other recognized institutions equipped to impart such training shall be taken, as prompt rendering of artificial respiration can save life at time of electric shock.

- No work shall be undertaken on live installations, or on installations which could be energized unless one another person is present to immediately isolate the electric supply in case of any accident and to render first aid, if necessary.

- No work on live L.T. busbar or pedestal switchboards should be handled by a person below the rank of a Wireman and such a work should preferably be done in the presence of the Engineer-in -charge of the work. When working on or near live installations, suitably insulated tools should be used, and special care should be taken to see that those tools accidentally do not drop on live terminals causing shock or dead short.

- Before starting any work on the existing installation, it should be ensured that the electric supply to that portion in which the work is undertaken is preferably cut off. Precautions like displaying “Men at Work” cautions boards on the controlling switches, removing fuse carrier from theses switches and these fuse carriers being kept with the person working on the installation, etc. should be taken against accidental energization. “Permit to Work” should, be obtained form the Engineer-in-charge. No work on H.T. main should be undertaken unless it is made dead and discharged to earth with an earthing lead of appropriate size. The discharge operation shall be repeated several times and the installation connected to earth positively before any work is started.

- Before energizing on an installation after the work is completed, it should be ensured that all tools have been removed and accounted, not person is present inside any enclosure of the switch board etc. any earthing connection made for doing the work has been removed, “Permit to Work” is received back duly signed by the person to whom it was issued in token of having completed the work and the installation being ready for re-energizing and “Men at Work” caution boards removed.

- In case of electrical accidents and shock, the electrical installation on which the accident occurred should be switched off immediately and the affected person should be immediately removed from the live installation by pulling him with the help of him coat, shirt, wooden rode, broom handle or with any other dry cloth or paper. He should be removed from the place of accident to a nearby safe place and artificial respiration continuously given as contained in BIS. Code and Standard prescribed by St. John Ambulance Brigade or Fire Brigade.

**11. INDEMNITY**

The Contractor shall be solely responsible for claims arising out of any accident at site of work during the tenure of contract and shall cover such risks with suitable insurance. The Owner shall not be responsible for any direct or indirect consequence of such accidents.

**12. COMPLETION CERTIFICATE**

On completion of the electrical installation a certificate shall be furnished by the Contractor countersigned by the Licensed Supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local supply authority.

**13. TRAINING OF OPERATING STAFF**

The Contractor shall arrange for train of Owner's operating staff in the correct operation of all important equipments in this contract as directed by Owners/Architects.. The Contractor shall also familiarise the operating staff during the erection period with the design, construction and all maintenance aspects of the equipment.

**14. WORKMANSHIP**

Good workmanship is an essential prerequisite to be complied for this work. Entire work shall be carried out in the most workmanlike manner by skilled workers under competent supervision.

**MAHINDRA WORLD CITY, JAIPUR**

**TENDER FOR DG SET WORKS**

**TECHNICAL SPECIFICATIONS**

**DIESEL GENERATOR SETS**

## 1. GENERAL

Work covered by this contract shall include design, manufacture, supply, transportation, delivery, installation, testing and commissioning of automatic start direct coupled Diesel Generator Sets and shall include but not limited to the following.

- Diesel engine with alternator mounted on a rigid fabricated steel base frame with resilient antivibration mountings
- Water cooling system including cooling towers, pumps, piping and controls.
- Exhaust piping with Residential type Silencer.
- Electric starting equipment including batteries and battery chargers.
- Fuel supply system including bulk oil storage and automatically operated fuel transmission system.
- Statutory approvals including permission from Electric Supply Authority for operation of DG sets, approval from RSEB, clearance from Electrical Inspector, approval from Pollution Control Board and necessary approvals from Department of Explosive for bulk oil storage.

## 2. STANDARDS

The equipment offered shall conform to the latest revision of relevant Indian or British Standard (BSS.) and Codes together with the requirements of the Local Supply Authority and Department of Explosive etc.

Tenderers shall clearly state the standards to which the equipment they are offering conform.

## 3. ENGINE AND ACCESSORIES

### 3.1 Engine

The engine shall have the following characteristics:

| | | |
|---|---|---|
| Type | - | Suitable for generating set application, turbo charged, multi-cylinder, solid injection, cold starting. |
| Cycle | - | Four stroke. |
| Speed | - | 1,500 r.p.m. |
| Speed Variation | - | Within 2% for operation between 10% and 100% |
| Method of Starting | - | Battery |
| Net site output | - | This shall be the continuous rating under the ambient conditions given in Clause 3.3 of SCC and as per schedule of quantities. |

The engine rating shall be stated in the tender in accordance with the latest revision of relevant I.S. or B.S. Adequate precautions shall be taken to safeguard the sets against low lubricating oil pressure, high water temperature, overspeed and overcurrent.

### 3.2 Fuel Consumption

The engine shall be suitable for satisfactory operation on H.S.D. as locally available. The tenderers shall declare the guaranteed fuel consumption in liters per BHP/hr, in accordance with relevant I.S. or B.S. at 1/2, 3/4 and full load under the maximum output after de-rating to ambient conditions.

Such guaranteed fuel consumption is also to be expressed in liters per gross / nett kWh output from the alternator (after supplying the requirements of auxiliaries) at 1/2, 3/4 and full load and at 0.8 and unity power factors.

If guaranteed fuel consumption is exceeded, the Contractor shall make such amendments or alterations as are necessary to bring the consumption to within the guaranteed figures.

Tolerance of + 5% as defined in BSS-649-1958 shall be allowed.

**3.3 Lubricating Oil Consumption**

The tenderers shall state the guaranteed lubricating oil consumption in liters per hour.

**3.4 Governing**

The governor shall be of electronic type with governing class A direct.

**3.5 Mounting And Foundations**

The engine and direct coupled alternator shall be rigidly secured to a common rigid base frame fabricated from MS sections.

The DG set shall be placed on the RCC Floor with GERB make antivibration mountings. A lifting hook of required capacity shall be provided above the finalized location of the DG set to facilitate installation and subsequent maintenance of the DG sets.

The design of mounting arrangements with antivibration mountings shall be as recommended by the DG manufacturers and shall be such that a maximum of 2% vibrations are transmitted to the structure.

The tenderer shall confirm the type and design of mountings provided and the vibration isolation efficiency in the tender.

**3.6 Exhaust Piping**

The engine shall be provided with an exhaust pipe and fitted with a residential type silencer to reduce the noise level as per CPCB norms

Exhaust piping shall be fabricated from class 'C' MS pipes upto 150 mm dia as per IS and above as per IS 3589 of 5.20 mm thickness of size suitable to limit back pressure to within permissible limit. All exhaust piping inside the DG canopy shall be insulated with 50 mm mineral wool lagging covered with 26 SWG aluminium sheet cladding. Flanged joints in the exhaust piping shall be covered with removable insulation at suitable intervals for permitting access to the joint if and when required.

Exhaust piping shall be connected to the engine by means of flexible section or an expansion joint and shall also be graded to a drain pocket inside the building. The pocket shall be fitted with a drain cock.

The exhaust piping should be such that back pressure should not be more than 2.5 inches of mercury (Hg)

**3.7 Air Filters**

The engine air intake shall be fitted with a substantial air cleaner of oil bath/ paper element type. The filter shall be suitable for operation under dusty conditions.

**3.8 Crank Case Breather**

The crankcase breather outlet of the engine shall be fitted with a filter cap capable of preventing entry of dust.

**3.9 Fuel And Lubricating Oil Filters**

Filter for fuel and lubricating oil systems shall be of simplex type. Lubricating oil filters shall be of an efficient full flow type of ample capacity and suitable for use with detergent oils. They shall be capable of removing all foreign matter above a particle size of 5 microns.

**3.10 Tools**

Two sets of standard tools kit for maintenance shall be provided by Contractor. Tenderer shall submit a list of the tools alongwith the tender.

**3.11 Lubricating Oil System**

The engine shall be of the totally enclosed type and fitted with a positive pressure system of lubrication to all working parts. Lubricating oil shall be circulated in the engine by an engine driven pump. There shall be no moving part requiring lubrication by hand prior to the starting of the engine or while in operation.

**3.12 Safety Controls**

**Low Lubricating Oil Pressure**

Pressure sensors shall be fitted such that in the event of a fall in the lub oil pressure, an alarm and indication shall be actuated. In addition, the engine shall be automatically shut down in the event of lub oil pressure dropping to a predetermined low value.

**High Water Temperature**

An alarm shall be given if the close loop engine jacket cooling water temperature exceeds safe limits stipulated by the engine manufacturer due to any reason (including low level of water in secondary cooling system cooling tower). The engine shall be shut down when a pre-determined set water temperature is reached.

**Over Speed**

Speed control shall be so arranged that a 12-1/2% increase over normal rated speed shall cut off fuel supply, thus stopping the engine.

**Overload Protection**

The engine shall be adequately protected against operating under overload conditions. The requirements shall be met by the provision of a fixed overload limit stop on the fuel pump rack control rod to prevent the set being subject o to a load exceeding the site rating plus 10%.

**Excess Starting Time**

The starting circuit for the automatic mains failure diesel generator sets shall be arranged to attempt upto three starting cycles, each not exceeding 10 seconds duration with a similar OFF period between each cycle. If the set fails to start upon completion of the third attempt the starting circuit shall be locked out until it is restored manually. An alarm shall be given and "Set failed to start" indication given on the panel.

Provision shall also be made to avoid re-engagement of the starter pinion until after the engine has come to rest. Failure of the starter motor to disengage shall close down or lock out the engine.

**Fuel Level Protection**

A level sensor shall be provided in the day fuel tanks to give visual and audible alarms if the level in the tank falls to below 1/4 full.

**3.13 General**

The DG sets shall be complete with all equipments, visual and audible alarms, indications and controls required for fully reliable and safe operation of the DG sets whether specifically stated in these specifications or not. It is essential that the operation of all protection equipments be completely reliable in all respects.

Whenever the engine is shut down due to overspeed, low lubricating oil pressure, high water temperature or excess starting time, the circuit breaker shall also be tripped and the starting systems of the engine shall be locked out until the respective protective relay is reset.

**3.14 Accessories, Instruments and Safety Controls for Engine**

Accessories, instruments and safety controls to be provided with the engine shall be (but not limited to) as below. All accessories shall be of design compatible with the design and /or operation of the engine.

a. Accessories:
Flywheel to suit flexible coupling.
Flexible coupling with guard.
Air cleaner oil bath/paper element type.
Corrosion resistor.
Heat exchanger.
Governor - electronic.
Fuel filter
Lub. oil filter.
Heavy duty batteries with leads and battery charger with battery stands.
Stainless Steel Bellows
Flexible coupling
Exhaust silencer residential type
Interconnection wiring, cabling and piping as required
Set of standard tools
Anti-vibration mounting pads.

b. Instruments and Gauges:
Lub. oil pressure gauge.
Water temperature gauge.
Battery charging ammeter.
Hour meter (mechanical) to show total engine hours run 10,000 hr capacity
R.P.M. indicator of the tachometer type.
Starting switch with key
Lamp indicator for charging alternator
Push button for starting
Safety control indication lamp

c. Safety controls for
Low lub oil pressure
High water temperature
Over speed
Low fuel level in buffer tank
Low water level sensor in cooling towers

**3.15 Alternator**

The Alternator shall have the following characteristics

| | | |
|---|---|---|
| Type | - | Drip Proof Screen protected for power generation |
| Speed | - | 1500 R.P.M. |
| Net Site Output | - | Rated continuous at ambient conditions and as per schedule of quantities. |
| Voltage Regulation | - | Within 0.5% of the rated voltage |
| Overload | - | More than 10% of the nominal for 1 hour every 12 hours without exceeding permissible temperature rise. |
| Harmonics | - | Maximum 1% between phase and neutral and total maximum 3% |

**Construction**

A screen protected drip proof type, alternator directly coupled to the Diesel Engine by a flexible coupling shall be provided. The combined engine alternator unit shall be mounted on a common rigid fabricated base frame. The alternator shall have its windings star connected with the neutral connection brought out to a separate terminal. The alternator shall fully comply with the latest Standard BS 2613 and BS 269 in respect of winding insulation and fast response to maintain steady voltage.

**Temperature Rise**
The maximum temperature rises of the various components of the alternator shall not exceed those permitted under I.S. with full output and under the ambient temperature conditions specified in Clause 3 above.

**Rating And Regulation**
The alternator shall be continuously rated to deliver the rated output at 0.8 P.F. lagging, on a 3 phase 4 wire 415 volts 50 cycle system. The alternator shall be of the self regulated and self excited type brushless. The alternator shall be provided with a static excitation system and the voltage regulation from no load to rated load shall be within 0.5% of rated voltage.

**Alternator Insulation**
The alternator should have class H insulation suitable to withstand tropical conditions.

## 4. DG CONTROL AND OPERATION

Operation of DG sets shall be monitored and controlled by a Programmable Logic Controller (PLC) based Logic Panel provided by Owners on the Main LT Panel of the system. DG contractor shall coordinate this aspects with the electrical contractor appointed by the Owners.

## 5. PIPING

**Piping Materials**

Unless otherwise specified, pipes shall be medium class MS (black steel) as per IS 1239 (Class C) suitable for welded joints.. Wherever so specified, class C GI pipes with screwed joints could be used for pipes upto 50 mm dia.. MS/GI pipes shall be of makes as per approved list. Pipes shall be given one primary coat of rust inhibiting paint before being installed.

Fittings shall be new and from approved manufacturers, Fittings shall be of pressure ratings suitable for the piping system. Flanges shall confirm to ISS. Supply of flanges shall include bolts, nuts, washers, gaskets etc., as required. All equipment and valve connections shall be through welded flanges.

Gate valves and check valves shall conform to IS:780/1969. Gate valves shall have non-rising spindles unless otherwise specified. Valves upto 40 mm dia.. shall have gun metal body and valves of more than 40 mm dia.. cast iron body unless otherwise specified. Valves shall be suitable for test pressures as per piping system requirements and as per ISS.

Butterfly valves shall conform to BS:5155, MSS SP 67 & API 609. The valves shall be suitable for flow in either direction and seal in both directions. The valve shall be of integral moulded design.

Strainers shall be Y type or Pot type as per schedule of quantities and /or as required with CI or fabricated steel bodies. Strainers shall have removable bronze screen with 3mm perforations. All strainers shall be provided with equal size isolating valves so that the strainer may be cleaned without draining the system.

Pressure gauge shall be not less than 100 mm dia dial and of appropriate range and be complete with shut off gauge cocks etc.. and shall be duly calibrated before installation.

Pressure gauges shall be provided at the following locations:

a) Suction and discharge of pumps.
b) Inlet and outlet of heat exchangers.

Care shall be taken to protect pressure gauges during pressure testing.

Thermometers shall be either 100 mm dia dial or direct reading industrial type of appropriate range duly calibrated before installation.

Thermometers shall be installed in separable wells.
Thermometers shall be provided at the following locations:
Dial type thermometers on supply and return of heat exchangers.

**Piping Installation**
The Contractor, on award of work, shall prepare detailed working drawings showing the piping route, typical sections, location and detail of fittings, valves, strainers and instruments. The planing of piping system shall take existing wall and ceiling openings, if any, into consideration. Piping layout shall take due care for expansion and contraction in pipes.

Piping shall be installed only after through cleaning. Pipes shall be cut square. Proper edge preparation with 'V' grooves shall be done and edges grinded before welding. Sufficient gap shall be maintained. Electrodes of approved makes only shall be used for welding and tacking.

Pipes shall be supported from floor /wall mounted or ceiling suspended supports at an intervel of maximum 2 mtrs unless otherwise states/approved. Supports shall be designed to withstand the weight of pipes, fittings and fluid in motion. Pipe supports shall be of steel, adjustable for height and primer coated with rust preventive paint and finish coated with 2coats of enamel paint of approved colour. Where pipes and clamps are of dissimilar material, a gasket shall be provided in between. Pipe hangers shall be fixed on walls and ceilings by means of dash fastners. Vertical risers shall be parallel to walls and column lines and shall be straight and plumb. Risers passing from floor to floor shall be supported at each floor by clamps or collars attached to pipe and with a 12mm thick ribbed rubber pad or any other approved resilient material. Where pipes pass through the terrace floor, suitable curbing shall be provided to prevent water leakage. Risers shall also have a suitable concrete pipe support at the lowest point.

Pipe sleeves of 50mm or larger diameter shall be provided wherever pipes pass through wall and the annular space filled with felt and finished with retaining rings.

Insulated piping shall be supported in such a manner as not to put undue pressure on the insulation.

Piping shall be pitched towards drain points. Drain outlets shall be provided at all low points in the piping system with 25 mm dia pipe (for upto 300 mm dia water pipe) with gate valves of equal size with rising spindels . Drain outlets shall be connected through equal size GI pipe to the nearest drain or floor waste.

All piping buried directly in ground shall be provided with a coat of primer paint after surface preparation over which rust preventing tape (Pipekote 4 mm) shall be wrapped.

**Testing**
Entire piping system after installation shall be flushed with clean water to ensure thorough inside cleaning of the system. All piping shall be tested to hydrostatic test pressure of at least one and a half times the maximum operating pressure, but not less than 7 Kg/Sq cm for a period of not less than 24 hours. All leaks and defects in joints revealed during the testing shall be rectified to the satisfaction of the Project Manager .

Piping required subsequent to the above pressure test shall be retested in the same manner.

Systems may be tested in sections and such sections shall be securely capped.

The Project Manager shall be notified well in advance by the contractor of his intention to test a section of piping and all testing shall be witnessed by the Project Manager or his authorised representative.

The Contractor shall make sure that proper noiseless circulation of fluid is achieved through all coils and other heat exchange equipment in the system concerned. 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 carrying out the above rectifications including the tarring-up and re-finishing of floors, walls etc. as required.

No insulation shall be applied to piping until the completion of the pressure testing to the satisfaction of the Project Manager .

The Contractor shall provide all materials, tools, equipment, instruments, services and labour required to perform the test, and shall ensure that the plant room and other areas are cleaned up and spill over water is removed. And also ensure that there is no flooding of water.

After the piping has been installed, tested and run for at least ten days of eight hours each, the piping shall be given two finish coats, 3 mils each of approved color and shade.

## 6. ENGINE AUXILIARIES AND WIRING

All engine auxiliaries shall be checked and tested for proper operation. Wiring between the engine auxiliaries and the DG control logic panel shall be provided with copper conductor PVC insulated 1100 V grade armoured cables. Loop earthing as required shall be provided.

## 7. STARTING BATTERY AND BATTERY CHARGER

### 7.1 24 Volt DC Batteries

24 volt batteries for each set shall comprise of standard lead acid stationary batteries consisting of required cell of each 2 volts to have 180 AH/360 AH capacity a one hour rate of discharge to attain voltage of 1.85 volt per cell to 2 volts supplied complete with inter cell connectors and acid level indicating floats. Battery cells shall conform to IS 1651 with up to date amendments. The battery bank shall be provided with the following accessories.

a) Battery stand
b) Set of connectors with ends take off suitable for connections.
c) Cell insulator and stand insulators
d) Spring type hydrometer
e) Thermometer with specific gravity correction scale
f) Cell testing voltmeter
g) Set of tools consisting of spanners, rubber syringe, acid resisting funnel and acid resisting tube of 2 litres capacity – one set

The batteries shall be supplied duly filled, charged and acidic filled.

### 7.2 Battery Charging Equipment (Trickle and Boost Charging)

Battery trickle and boos charge of suitable capacity intended to operate on single phase 230 volts, so cycles supply system and suitable for charging current. The battery boost charger shall be provided with the following accessories.

a) AC and DC “ON” and “OFF” switches with HRC fuses
b) Indicating lamps for indicating mains “ON” and battery charging
c) Ballast to give charging
d) Single phase double wound (copper conductor ) impregnated natural air cooled mains transformer for rectifier stack.
e) Rotary switch to give step control.
f) Single phase full wave bridge connected silicon rectifier stack
g) Moving coil ammeter to indicated charging current
h) Moving coil voltmeter with a selector switch to measure the battery/charger voltage.
i) Silicon blocking diodes connected to a suitable tap to maintain continuity of DC supply.
j) AC and DC contactors of suitable rating as required.

All the components for battery charger shall be adequately rated and housed in a well ventilated sheet steel cubicle with input and output terminals. Proper cable glands shall be provided for incoming and outgoing cables. Battery charger shall form part of DG Protection and PLC panel.

## 8. RADIO INTERFERENCE

All equipment provided under this specification shall be so designed that it will not cause interference with radio equipment. In the event of the inherent characteristics of the equipment being such that radio interference is possible, efficient devices to nullify the same shall be provided. Suppressers shall be as per the relevant I.S./B.S. Standards.

## 9. PRE-COMMISSIONING CHECKS

All standards checks including the ones elaborated in the specifications to ensure that the installation of the DG sets and associated systems has been carried out satisfactorily shall be done on completion of installation. These shall include.

- DG sets
  - Checking of piping interconnections
  - Checking electrical interconnections
  - Checking of insulation resistance
  - Checking of earthing
  - Checking of instruments and controls.
  - Checking of alignment
  - Checking of vibration transmission to building a structure.
  - Checking of expansion joints.

- Exhaust system
  - Checking of silencer operation
  - Checking of surface temperature of exhaust piping

- Fuel system
  - Checking of automatic operation of fuel transfer pumps.

## 10. PERFORMANCE TESTING AND TYPE TESTS

### 10.1 Performance Testing

DG sets shall be tested at varying loads at manufacturers works prior to dispatch of the sets to site. The performance tests at the works shall be carried out in presence of authorized representative from the Owners. Due notice for the programme of performance testing at works shall be given to the Owners to enable them to arrange for their representatives for this inspection to be at manufacturers works for this inspection and testing. The costs for the arrangement shall be borne by the Contractor.

The performance test on each DG sets shall be of minimum 8 hours duration.

All instruments, materials, consumables (fuel oil, lube oil etc.) load and labour required for carrying out of the test shall be provided by the Contractor .

Following test acceptance criteria shall be applicable.

| | | |
|---|---|---|
| 1. | Fuel consumption at 50%, 75%, 100% and 110% load. | $\pm$ 5% of guaranteed performance. Actual alternator efficiencies as determined in the manufacturers works tests shall be used as the basis of calculation of specific fuel consumption ratio. |
| 2. | Voltage regulation from no load to full load | $\pm$ 1% |

| | | |
|---|---|---|
| 3. | Frequency regulation from no load to full load | ± 0.5% |
| 4. | Maximum water temperature | ± 5% of guaranteed performance |
| 5. | Maximum luboil temperature | ± 5% of guaranteed performance |
| 6. | Minimum luboil pressure | ± 5% of guaranteed performance |
| 7. | Lub Oil consumption | ± 5% of guaranteed performance |

**10.2 Type test**

Copies of manufacturers type test for the engine and the alternator of all ratings shall be enclosed alongwith the dispatch of the DG sets.

**11. GUARANTEED TECHNICAL PARTICULARS**

Guaranteed technical particulars in format enclosed as Annexure-I, I.1 and I.2 of these specifications shall be filled in by the tenderer and enclosed **alongwith** the tender. Tenders not complying with this requirements are liable to be rejected. Guarantee

**Annexure - I**

**MAHINDRA WORLD CITY, JAIPUR**

**TENDER FOR DG SET WORKS**

**TECHNICAL PARTICULARS**
**(Technical particulars to be filled in by tenderers and enclosed alongwith the tender)**

**DG SETS TECHNICAL PARTICULARS**

| **ITEM** | **Confirmations or Comments or data shall be furnished by tenderer against each item** |
|---|---|
| | |
| **Diesel Generating Set** | |
| | |
| Packager of DG Set | |
| Prime rating of the DG set based on continuous operation for 365 days in a year at varying loads.<br><br>The prime rating as above shall be suitable for continuous operation over an ambient of $50^{o}$ C. Tenderer to categorically confirm this operation and to furnish design calculation in support of this confirmation. | |
| DG set to be suitable for 10% overload capacity for 1 hour on 12 hours – over and above the governor capacity being suitable. | |
| | |
| **Diesel Engines** | |
| | |
| Manufacturer of Diesel Engine | |
| Manufacturers Model No | |
| Type of Cooling | |
| Aspiration | |
| Air cleaner type. | |
| Fuel / Lub Oil Filter Type | |
| Governor type and class | |
| Flywheel to suit flexible coupling. | |
| Flexible coupling with guard. | |
| Fuel pump. | |
| Shaft motor water pump with thermostatic control to maintain the water temperature in the engine jacket at 40 deg C. | |
| Interconnection wiring, cabling and piping as required | |
| Cooling water quality | |
| Max. engine water temperature | |
| Lub oil pressure | |
| Max. Lub oil temperature | |
| | |
| **Fuel Consumption** | |
| | |
| Typical fuel consumption litres/BHP/hr | |
| 50% load | |
| 75% load | |
| 100% load | |
| 110% load | |

| | |
|---|---|
| | |
| Fuel consumption figures vis-a-vis Alternator electrical output - kWH/litre | |
| 50% load | |
| 75% load | |
| 100% load | |
| 110% load | |
| | |
| Fuel air compression ratio | |
| | |
| Suitability for locally available HSD | |
| Suitability of operation of DG set on cheaper fuel like LDO etc. | |
| | |
| **Lub oil consumption** | |
| Lub oil consumption at 100% load | |
| | |
| **Heat Balance** | |
| Typical heat balance | |
| Heat rejected to cooling water | |
| Heat rejected to after cooler | |
| Heat rejected to exhaust | |
| Heat rejected to Ambient | |
| | |
| **Alternator** | |
| | |
| Manufacturer | |
| Enclosure | |
| Insulation class | |
| Temperature Rise under continuous operation | |
| Excitation unit | |
| Voltage Regulation no load to full load | |
| Wave form distortion on full load | |
| Radio Interference | |
| Telephone Interference | |
| Stator winding thermistor with trip | |
| Space heater | |
| Single step load acceptance | |
| Peak Motor starting kva | |
| Sustained short circuit % of rated current for 10 seconds | |
| Overload rating for | |
| 15 seconds | |
| 60 seconds | |
| 10 minutes | |
| 30 minutes | |
| | |
| **Instrument and Controls** | |
| **Instruments :** | |
| Oil temperature gauge | |
| Oil pressure gauge | |
| Water temperature gauge | |
| Battery charging ammeter. | |
| Hour meter to show total engine hours run - 10,000 hr capacity | |

| | |
|---|---|
| R.P.M. indicator . | |
| | |
| **Indication lamps** | |
| | |
| Battery charging indication | |
| System ready | |
| | |
| **Safety controls** | |
| | |
| Safety control – low lub. oil pressure | |
| Safety control - high water temperature. | |
| Safety Control – Overspeed | |
| | |
| **Antivibration mounting** | |
| | |
| Make | |
| Vibration Isolation Efficiency | |
| | |
| **Exhaust system** | |
| | |
| Exhaust silencer type | |
| Number of Silencers provided | |
| Noise level dB at 1 m from silencer | |
| Noise level 1 m outside DG room | |
| Exhaust pipe diameter, material and thickness | |
| Guaranteed Temperature on external face of exhaust pipe insulation | |
| Details of insulation provided for exhaust pipe | |
| Temperature of flue gases at exhaust manifold | |
| Expansion joints in exhaust piping | |
| Exhaust stack height - alongwith back pressure calculation | |
| | |
| **Approvals from following shall be obtained by Contractor prior to commencement of work and after completion as required** | |
| | |
| Chief Electrical Inspector to the Local State Government | |
| State Electricity Authorities/HERC | |
| Pollution Control Board for air and noise pollution | |
| Department of Explosives | |
| | |
| **Noise Limit (Pollution Norms)** | |
| Confirmation of compliance to noise limits stipulated in Central Government Notification dated May 17, 2002 to comply with Environmental Protection Second Amendment Rule 2002 or latest amendment in Pollution norms laid by Statutory authority | |

**Signature of tenderer.**

**Annexure-I.1**

**DG SETS – COST OF GENERATION**

| **ITEM** | **Unit** | **Data shall be furnished by tenderer against each item** |
|---|---|---|
| Make of Engine | | |
| Make of DG set | | |
| Engine Model | | |
| DG set rating | KVA | |
| DG set rating | Kw | |
| Average Load factor | % | 75% |
| Units generated per hour | kwh / hour | |
| Number of hours per year | hours / annum | 2400 hours |
| Number of units generated per year | kwh / annum | |
| | | |
| **Fuel Cost** | | |
| Fuel rate | Rs per litre | |
| Fuel consumption | Litres/ hour | |
| Number of units per litre of Diesel | Kwh / litre | |
| | | |
| **Fuel cost** | **Rs per kwh** | |
| | | |
| **Lub Oil Consumption Cost** | | |
| Lub oil consumption | litres / hour | |
| Cost of Lub oil | Rs per litre | |
| Lub Oil consumption cost | Rs per hour | |
| | | |
| **Lub Oil consumption cost** | **Rs per kwh** | |
| | | |
| **Lub Oil Replacement Cost** | Rs per litre | |
| Lub Oil replacement period | hours | |
| Lub Oil replacement quantity | litres | |
| Lub oil replacement | litres / hour | |
| Lub oil replacement cost | Rs / hour | |
| | | |
| **Lub Oil replacement cost** | **Rs per kwh** | |
| | | |
| **Maintenance Cost** | | |
| "B Check" maintenance period | hours | |
| "B check" maintenance kit cost | Rs | |
| | | |
| **"B Check" maintenance cost** | **Rs per kwh** | |
| | | |
| “C Check:” maintenance period | Hours | |
| “C Check:” maintenance kit cost | Rs. | |
| **"C Check" maintenance cost** | **Rs per kwh** | |
| | | |
| “D Check:” maintenance period | Hours | |
| “D Check:” maintenance kit cost | Rs. | |
| **"D Check" maintenance cost** | **Rs per kwh** | |
| | | |

| | | |
|---|---|---|
| Air Cleaner element change period | hours | |
| Air Cleaner Element cost | Rs | |
| | | |
| **Air Cleaner Element replacement cost** | **Rs per kwh** | |
| | | |
| **Total Cost per kwh generated** | | |

**Signature of Tenderer**

**Annexure – 1.2**

**DG SETS – EMISSION LEVELS – at 100% load**

| **ITEM** | **Emission level as per Pollution Control Board Norms** | **Guaranteed emission level of the engine offered to be filled in by the tenderer** |
|---|---|---|
| | | |
| $NO_x$ | 9.2 g/kW-Hr | |
| | | |
| $SO_x$ | | |
| | | |
| CO | 5 g/kW-Hr | |
| | | |
| HC | 1.3 g/kW-Hr | |
| | | |
| Dust (particulate matter) | 0.5 g/kW-Hr | |
| | | |

**Signature of tenderer**

**MAHINDRA WORLD CITY, JAIPUR**

**TENDER FOR DG SET WORKS**

**LIST OF APPROVED MAKES OF MATERIAL**

| **Details of equipment/material** | **Makes of Material** |
|---|---|
| Diesel Engine | Cummins, Caterpillar, MTU, Mitsubishi |
| Alternator | Stamford, Marathon, Kohler |
| DG Set Packagers | Jakson Engineering, TIL, Sterling Generators |
| Anti-vibration mountings | Gerb |
| Batteries | Exide, Standard Furukawa |
| Battery Charger | Statcon |
| Pump sets | Kirloskar, Crompton |
| MS pipes for exhaust system | Jindal, GST, Tata |
| MS pipes for fuel system/GI pipes | Jindal, GST, Tata |
| Butterfly valves | Audco, Advance |
| Gate/NRV/Check valves | Leader, Sant, Audco(above 50mm) |
| Strainers | Emrald, Sant |
| Pressure/Temperature gauges | Fiebig, Guru |
| Insulation | UP Twiga, Lloyd, Kimco, Owens Corning |
| MV Switchboards (Powder coated)<br>Modulded Case Circuit Breaker | Jakson, Sterling<br>L&T, Siemens, ABB |
| Current transformer | Gilbert Maxwell, Kappa |
| Meters | L&T Rishab, AE |
| Selector Switches | L&T Salzer, AE, Kaycee |
| MV Contactors | L&T, Siemens, ABB |
| Rubber flexible coupling for water piping (Vibration eliminator) | Resistoflex, Kanwal |
| Rotary Gear Pump | Rotodel |
| Bulk Oil Tank<br>(Tenderer to submit Profile of the proposed party) | Avenue Engineers<br>42 DDA Market, Community center<br>C-block, Janakpuri<br>New Delhi – 58<br>Tel : 5521794<br><br>Indo Asiatic Engineers Pvt. Ltd.<br>C-102, Mayapur Industrial Area Ph-I,<br>New Delhi |
| Flame proof motors | Crompton, KEC |
| Tank Mastic coating for UG tank external surface. | Shalimar Tar Products |
| Rust preventing polymeric tape for MS pipes directly buried in ground | Pypekote 4 mm |
| Flow meter for oil piping | Aqua metro, Kent |
| Y strainers for oil piping | Omega, Zoloto |

| | |
|---|---|
| Adapter for oil piping | Kayess |
| Valves for oil piping | Zoloto, Sant |
| Air preventor for oil piping | Aqua metro |
| 1100 Volts grade cables/control cables | Universal, Fort Gloster |
| Cable Lugs | Dowells |
| Cable compression glands | Peeco, Comet |
| Cable trays / Cable ladders | MM Enterprises, Slotco |

We have noted the above and confirm that our tender is based on the approved makes indicated above

**Signature of Tenderer**

## SPECIAL INSTRUCTIONS TO TENDERERS

### 1. Compatibility & coordination Synchronizing with PLC

A microprocessor based PLC panel for Automatic Mains Failure, Auto Changeover/ Interlocking and Auto Load Searching & Auto Load Management Functions of the DG sets is incorporated in the Main LT Panel of the system being provided through the electrical contractor to be appointed by the Owners. Control cabling between the DG sets and the PLC is to be done under this contract. All parts of the DG set installation covered by this contract shall be compatible for being integrated with the PLC operation. The DG Contractor shall coordinate his work with that of electrical Contractor for achieving a fully coordinated and trouble free operation of the DG sets and their sub-systems through the PLC panel.

### 2. Completeness of contract

The Contractors shall undertake the complete installation and shall be responsible for the overall satisfactory operation of the DG sets with the associated accessories. The tenderer shall confirm as part of the tender that the associated equipments are suitable for the DG sets and the total system shall be compatible in all respects.

### 3. Quoted rates

Quoted rates shall be deemed to be inclusive of the cost (but not limited to) of the following.

- All equipments described hereafter shall be in accordance with the specifications.
- All equipment shall be selected and installed for the lowest operating noise level.
- Supply of various equipments shall include cost of correspondence with manufacturers, submission of shop drawings and documents and their approval by the Consulting Engineer, procurement of equipment, transportation, shipping, payment of all taxes and levies, storage, supply of equipment at site of installation, furnishing all technical literature required, replacement of defective components and warranty obligations for the individual equipment.
- Statutory approvals from all concerned authorities (State Electricity Authority, HERC, Pollution Control Board, Department of Explosives etc.)
- Installation of various equipments shall include all material and labour associated with hoisting and lowering of equipment in position, insulation of the components where ever required, vibration isolation as required, grouting and anchoring or suspension arrangements and all incidentals associated with the installation as per the specifications and manufacturer's recommendation.
- Vibration isolators shall be installed with components as required. Performance ratings, power consumption and sound power data for each component shall be verified at the time of testing and commissioning of the installation, against the data submitted with the tenders.
- Shop coats of paint that have become marred during shipment or erection shall be cleaned off with mineral spirit, wire brushed and spot primed over the affected areas, then coated with enamel paint to match the finish over the adjoining shop painted surfaces.
- Testing and commissioning shall include furnishing all labour, materials, equipment, instruments, fuel oil and incidentals necessary for complete testing of each component as per the specifications and manufacturer's recommendations, submission of test results to the Project Manager and obtaining their approval and submission of necessary documents and completion drawings.
- All piping shall be installed conforming to the relevant Indian standards, approved shop drawings and shall be tested as per Standards.

- Fuel piping and installation shall be as per the requirement of Department of Explosive. Quoted rate shall include cost of radiographic tests of welded joints randomly selected by Project Manager in addition to hydrostatic pressure testing.

- Piping installation shall include all costs towards supplying and fixing pipes and fittings (elbows, tees, reducers) cutting, threading, joining, welding, soldering and effecting connections as required; providing non hardening sealing material as well as neoprene rubber gaskets for screwed flanges, providing and installing adequate number of clamps, hangers, saddles, brackets, rawl plugs and other accessories for pipe supports, providing minor dressing of walls and floor, providing and installing pipe sleeves etc. as required.

- Exposed steel pipes shall be given two coats of approved paint as per the relevant Indian standards for colour coding of pipes and direction of flow of fluid in the pipes shall be visibly marked with identifying arrows.

- All buried pipes shall be wrapped with Pipekote 4 mm thick wrapping as per manufacturers standards.

- Valves, unions, strainers, drain and air valves, expansion joints, pressure gauges and thermometers shall be provided in the various pipe lines as per the approved shop drawings and specifications.

- After completion of the installation, the entire piping system shall be tested for leakage as required.

- Payment for piping shall be made on the basis of linear measurement of piping system measured from flange face to flange face (in case of flanged joints) and shall include the length of all pipe fittings like bends, elbows, tees, couplers etc. but excluding the lengths of valves and strainers which shall be paid separately on unit rate basis. Quoted rates for piping shall be deemed to be inclusive of the cost of gaskets, nuts & bolts, pipe supports/hangers, vibration isolators / flexible connections and any other item required to complete the piping installation. In case of insulated piping, the quoted rates shall also be deemed to be inclusive of the cost of insulation with cladding. Measurement of insulated piping shall be done before providing the insulation.

- Proper co-ordination shall be done with architects and project managers for civil works such as Fuel lorry platform, bulk fuel area fencing etc. as required.

**Signature of Tenderer**

**MAHINDRA WORLD CITY, JAIPUR**

**TENDER FOR DG SET WORKS**

**SCHEDULE OF QUANTITIES**

**SUMMARY OF COST**

| Sub Head | Description | Value Rs |
|---|---|---|
| I | Diesel Generator Sets | Rs. |
| II | Exhaust System | Rs. |
| III | Fuel System | Rs. |
| IV | DG Cooling Water System | Rs. |
| V | Electrical System& Cabling | Rs. |
| VI | Earthing | Rs. |
| | Annual Maintenance Contract | Rs. |
| | **TOTAL VALUE** | **Rs** |

**Rupees (in words)**

**Signature of Tenderer**

**MAHINDRA WORLD CITY, JAIPUR**

**TENDER FOR DG SET WORKS**

**SCHEDULE OF QUANTITIES**

**Note:**
1. Please fill up rate both in figures and words in the Rate column by putting the rate figure first.
2. Please total up Sub Head wise and carry forward to Summary of Costs

| Sl No. | Description | Qty | Unit | Rate Rs. P. | Amount Rs. P. |
|---|---|---|---|---|---|
| | **SUB HEAD I : DIESEL GENERATOR SETS** | | | | |
| 1. | Supply and transportation at site of 3 phase 415 volts 50 cycle per second 1500 RPM Heat Exchanger cooled Diesel Generator Sets of rating as below. Without acoustic enclosure. The engine shall include flywheel to suit flexible coupling with guard, air cleaner, blower fan, fuel pump, variable speed electronic governor, fuel filter, lub oil filter & pump, primary water circulating pump, static battery charger, 24 volt batteries of compatible capacity with battery stand and instrument panel comprising of switch with key etc. as required. The alternator shall be self excited (PMG), self regulated and continuously rated as below suitable for 3 phase 415 volts 50 cycles, 4 wire system and shall be provided with static excitation unit, Alternator insulation shall be class 'H' suitable to withstand tropical conditions and shall generally comply with BS 5000 and IS 4722. The overload capacity shall be not be less than 110% of rated capacity for 1 hour in every 12 hours The DG set shall be mounted on a fabricated rigid common base frame with GERB make resilient anti-vibration mountings to provide 99% vibration isolation. The DG set shall include all accessories, fittings, instruments & standard tool kit complete as per specifications and as required including control cabling. The cost shall include providing adopter box for Bus-duct termination as required. | | | | |
| a) | 2000 kVA | 1 set | per set | | |
| 2. | Receiving at site including unloading, storage, erection, testing and commissioning of following rating 3 phase 415 volts 50 cycle per second 1500 RPM heat exchanger cooled Diesel Generator Set comprising of Engine with all fittings, accessories, instruments, protection and safety controls coupled to separately excited (PMG) Alternator through flexible coupling with engine and alternator factory aligned and mounted on a truly rigid base plate fabricated from MS sections, provided with Gerb make resilient antivibration mountings to provide 95% vibration isolation including the cost of providing adopter box for Bus-duct termination and | | | | |

| | | | |
|---|---|---|---|
| | including the cost of rechecking the alignments of the set after installation etc. complete as required. | | |
| a) | 2000 kVA | 1 set | per set |
| | **TOTAL SUB HEAD I carried over to Summary** | **Rs.** | |

**SUB HEAD II : EXHAUST SYSTEM**

| | | | |
|---|---|---|---|
| 1. | Supply, erection, testing and commissioning of exhaust piping with MS pipe as per IS 3589 (5.20mm thick) including the cost of pipe supports, bends, flexible joints etc. complete as per specifications as required. and including the cost of insulation with layers of required thickness (minimum 50 mm) of LRB rock wool (120 kg/m3 density) clad with 24 SWG aluminium sheet cladding complete as per specification, as required and as below. The pipes shall be sandblasted for outside surface and given anticorrosive Aluminum paint two coat. The piping shall include low level drain 1" dia point with isolation valve and the drain pipe to be routed to nearest drain point. | | |
| a) | 350 NB (Suitable for 2000 kVA DG Set) | 200 m | per m |
| 2. | Supply, erection testing and commissioning of 1000 mm long Residential type Silencer (as per approved design by the manufacturer) including baffle plates and lagging complete as required. | 2 nos | each |

| | | |
|---|---|---|
| | **TOTAL SUB HEAD II carried over to Summary** | **Rs.** |

**SUB HEAD III : FUEL SYSTEM**

| | | | |
|---|---|---|---|
| 1. | Supply, installation, testing and commissioning of 990 liters capacity Day Fuel Tanks, fabricated from 2 mm thick M.S. sheets including the cost of removable cover with locking arrangement and including the cost of painting and including the cost of providing all the required appurtenances like inlet and outlet connections, float valves, drain connection, overflow connection to oil sump, mechanical oil level indicator and low level / high level alarms and including the cost of support arrangement etc. complete as required. | 1 nos | each |
| 2. | Supply, erection testing and commissioning of a semi rotary hand pump for filling fuel in daily Fuel Tank including the cost of suitable fuel piping and connections complete as required. | 1 nos | each |
| 3. | Supply, installation testing and commissioning of fuel oil piping system fabricated from Class B following size MS pipes cut to required lengths and installed with all welded joints including providing and fixing in position the necessary fittings like elbows, tees, reducers, duly coated with one coat of primer and two coasts of approved enamel paint complete as per specifications and as required | | |
| a) | 25 dia | 250 m | per m |
| 4. | Supply, installation testing and commissioning of following oil piping accessories complete as required | | |
| a) | 25 NB ball valve | 11 nos | each |
| b) | 25 NB CS check valve | 1 nos | each |
| c) | 25 NB CS/SS Y strainer | 1 nos | each |

| | |
|---|---|
| **TOTAL SUB HEAD III carried over to Summary** | **Rs.** |

**SUB HEAD IV : DG COOLING WATER SYSTEM**

| | | | |
|---|---|---|---|
| 1. | Supply, installation, testing and commissioning of FRP type Cooling Towers of nominal capacity as below including sump, steel ladder, TEFC Squirrel cage induction motor suitable for outdoor installation including the cost of providing the required concrete foundations etc. complete as per specifications and as required. Model No. to be specified by supplier. | | |
| a) | 200 TR (Suitable for 2000 kVA DG set) | 1 no | each |
| 2. | Supply, installation, testing and commissioning of mono block centrifugal Pump sets (including standby) factory assembled and tested for rated efficiency complete with TEFC motor and common base frame for circulation of water at flow rate as below against 24 m head including the cost of providing concrete foundation as required for the DG set cooling system suitably interlocked with DG set. The pump sets shall be suitable for operation on 415 +10% volts, 50 Hz, 3-phase power supply. (Independent pumps circulatory system for each DG set and cooling tower) | | |
| a) | 1760 lpm for 2000 kVA DG set | 2 nos | each |
| 3. | Supply, installation testing and commissioning of water piping system fabricated from Class B MS pipes cut to required lengths and installed with all welded joints complete as per specifications, as required and as below | | |
| 3.1 | Piping laid on surface including providing and fixing in position the necessary fittings like elbows, tees, reducers, duly coated with one coat of primer and two coasts of approved enamel paint | | |
| a) | 125 NB | 150 m | per m |
| b) | 25 NB | 40 m | per m |
| 3.2 | Piping laid directly in ground including excavation of trench, laying of pipe covered with 4 mm thick pypkote coating, backfilling, compaction etc. | | |
| a) | 125 NB | 15 m | per m |
| 3.3 | Piping accessories | | |
| a) | 125 NB Butterfly valves | 8 nos | each |
| b) | 125 NB Check valves | 2 nos | each |
| c) | 125 mm NB Y Strainers | 2 nos | each |
| d) | Temperature gauges (Industrial type) | 2 nos | each |
| e) | Pressure gauges | 4 nos | each |

| | | | |
|---|---|---|---|
| 4. | Supply, installation, testing and commissioning of 32 amp TP Isolators in whether proof housing (IP 65) mounted on wall (lockable) at cooling tower location. The cost shall include mounting arrangements and all accessories as required complete. | 1 nos | each |

| | | |
|---|---|---|
| | **TOTAL SUB HEAD IV carried over to Summary** | **Rs.** |

**SUB HEAD V : ELECTRICAL & CABLING**

| | | | |
|---|---|---|---|
| 1. | Supplying and laying of control cabling with copper conductor PVC insulated and PVC sheathed armoured cables in cable Tray/clamped to wall with suitable clamps saddles and fixing bolts/ in ground including the cost of digging and back filling with sand and brick protection as required including the cost of making connections, complete as required as below | | |
| a) | 4 core 2.5 sq mm | 60 m | per m |
| b) | 8 core 2.5 sq mm | 100 m | per m |
| c) | 12 core 2.5 sq mm | 50 m | per m |
| d) | 24 core 2.5 sq mm | 50 m | per m |
| 2 | Supply and fixing of 14 SWG sheet steel slotted cable trays as per approved design and MS painted angle supports spaced 1000 mm apart throughout the length as specified, including the cost of 1 meter MS threaded rod hangers, hooks, dash fasteners etc. for suspension from ceiling and including making cutouts and finishing them as required | | |
| a) | 150 mm x 40 mm x 40 mm (with 40 x 40 x 6 mm MS angle supports and 8 mm dia MS rod hangers) | 150 m | per m |
| 3 | Supply and fixing of additional length of MS rod hangers duly painted with 2 coats of spray paint for supporting the Cable Trays, complete for extension of the supports as in 4 above. The rate shall be proportionately applicable to the length of rod actually required. | Rate only | Kg |
| 4. | Supplying and laying 200 mm dia Hume pipe in ground including the cost of trench excavation, refilling and compaction. | 50 m | per m |
| 5. | Supplying and laying 150 mm dia Hume pipe in ground including the cost of trench excavation, refilling and compaction. | Rate only | per m |

| | |
|---|---|
| **TOTAL SUB HEAD V carried over to Summary** | **Rs.** |

**SUB HEAD VI : EARTHING**

| | | | |
|---|---|---|---|
| 1. | Providing and making earthpits including the cost of 600 mm x 600 mm x 5 mm thick copper plate electrodes, 25 mm dia pipe, CI funnel with wiremesh, earth test link, charcoal, salt, all earth work, 300 mm x 300 mm x 300 mm deep masonry enclosure with MS heavy duty load bearing cover plate having locking arrangement hinged to CI / MS angle frame duly anchored in brick work on top complete as per IS 3043:1987 | 2 nos | each |
| 2. | Providing and making earthpits including the cost of 600 mm x 600 mm x 8 mm GI plate electrode 25 mm dia GI pipe, CI funnel with wiremesh charcoal, earth test link, salt, all earth work, 300 mm x 300 mm x 300 mm deep masonry enclosure with MS / GI heavy duty load bearing cover plate having locking arrangement hinged to CI / MS angle frame duly anchored in brick work on top complete as per IS 3043:1987 (DG set and Feeder Pillars and Auxiliary Panel) | 2 nos | each |
| 3. | Supplying and laying of the following earthing clamped to wall with suitable clamps saddles and fixing bolts/ in ground including the cost of digging and back filling with sand and brick protection as required and complete as required to comply with IS 3043:1987 | | |
| a) | 50 mm x 6 mm GI strip | 20 m | per m |
| b) | 50 mm x 6 mm GI strip with heat shrinkable sleeve | 80 m | per m |
| c) | 50 mm x 6 mm copper strip | 20 m | per m |
| d) | 50 mm x 6 mm copper strip with heat shrinkable sleeve | 40 m | per m |
| e) | 25 mm x 3 mm copper strip | Rate only | per m |
| f) | 25 mm x 3 mm copper strip with heat shrinkable sleeve | Rate only | per m |

**TOTAL SUB HEAD VI carried over to Summary** **Rs.**

**ANNUAL MAINTENANCE CONTRACT**

1. Projected charges for Annual Maintenance Contact (AMC) detailed as per Annexure-A enclosed excluding the cost of spare components etc. required and the cost of fuel oil and lube oil which shall be supplied by Owners in quantities required for maintenance check for 5 years after the date of handing over the work to Owners for regular operation.

| | **Year** | **2000 kVA** | **Committed** |
|---|---|---|---|
| | | Per DG | **Uptime** |
| | First Year | | |
| | | | |
| | Second Year | | |
| | | | |
| | Third Year | | |
| | | | |
| | Fourth Year | | |
| | | | |
| | Fifth Year | | |

3. Response Time for complaint_____ Hrs.

4. Maximum Down-time_____Hrs.

**TOTAL Rs.**

**Annexure-A**

## ANNUAL MAINTENANCE CONTRACT

### 1.0 SCOPE OF WORK FOR AMC FOR DG SETS

The following inspections, maintenance and rectifications for the equipment as defined in the manufacturers manual but not limited to the same shall be undertaken by Contractor.

### 1.1 Fort nightly

i. Checking the engine for its smooth running, unusual noise sound and colour of the smoke from the exhaust.
ii. Checking the leakage of fuel lube oil and coolant
iii. Checking and adjusting fan belts and water pump belts tension
iv. Checking of air filter to increase their life as well as proper in flow of air.
v. Checking of proper functioning of various instrument panel
vi. Checking and changing wiring systems for its loose and dry connection
vii. Checking battery, terminals for sulphation and checking its state.
viii. Check for hunting and rectify if required.

### 1.2 Half Yearly

i. Cleaning and greasing of alternator
ii. Cleaning and tightening of all electrical connections
iii. Insulation, testing of alternator
iv. Perform lube oil and fuel consumption test, exhaust temp. test and below bye test.

### 1.3 Yearly

i. Descaling of heat exchanger
ii. Check alignment of engine and do alignment if required
iii. Check generator brushed and commentators

### 1.4 Other Checks and Maintenance "As and when Required Basis"

i. Periodic checks 1.1, 1.2, 1.3
ii. Valve tappet setting
iii. End play checking of crank shaft, accessory drive and turbo charge
iv. Diagnosis of various faults and its rectifications
v. Checking and fault finding in the whole system
vi. Maintenance of instrument relays and connector fitted in generator control panel
vii. Changing of brushes and rectifier
viii. Diagnosis of all electrical faults and its rectifications
ix. Inspection of build up voltage and RPM adjustment.

Task After doing all checks not limiting to the above set the system right whenever required confirming to the recommended parameters given in the manufacturer manual.

### 2.0 SPARES AND CONSUMABLES

Spares and consumable will be at extra cost at prices agreed with the Contract (The Contractor shall the furnish a current price list for spares). The Owners reserve the right to purchase the spares and consumable from any other agency. In case any spares and consumable are supplied by the Contractor an additional services charges will be applicable. Only genuine and approved spares will be used.

## 3.0 LABOUR

All maintenance and repair work shall normally be performed during the regular working hours 0900 to 1800 hrs, Mondays to Sundays. However, there may be occasions to perform work out side regular hours, for which no additional overtime cost shall be payable. The Contractors workers shall be covered with insurance and statutory requirements of ESI and PF and the Owner shall be indemnified against any claims/expenses etc in this regard.

## 4.0 CONTRACTORS RESPONSIBILITY

4.1 Minimum number of visits for preventive maintenance will be twenty four per year. Break down visits will be separate. Breakdown visits shall not be paid for and are deemed to be included in the AMC charges

4.2 Services reports on prescribed formats for each visit giving details of preventive maintenance, diagnosis or break down repairs, as the case may be will be rendered to the Owner.

4.3 An approximate budget for expenditure towards the maintenance servicing and envisaged repairs, replacements during the year.

4.4 Testers and measuring equipment will be provided by Contractor. These should have valid test and calibration certificate

4.5 Associate technicians of the Owner in the maintenance /repair work.