

**TENDER**

***FOR***

**CONSTRUCTION OF STEM CELL & BMT UNITS AT  
MALABAR CANCER CENTRE ON DESIGN AND BUILD  
BASIS - THALASERRY IN KANNUR DISTRICT**

**PART-II  
GENERAL CONDITIONS OF CONTRACT**

**TENDER NO. HLL/ID /13/ 50**

**JUNE 2013**

**HLL LIFECARE LIMITED  
INFRASTRUCTURE DEVELOPMENT DIVISION**

**GENERAL CONDITIONS OF CONTRACT****INDEX**

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**HLL LIFECARE LIMITED**  
(A GOVERNMENT OF INDIA ENTERPRISE)

**HLL Lifecare Limited**  
**“Adarsh” TC – 6/1717(1)**  
**Vettamukku, Thirumala P.O.**  
**Thiruvananthapuram – 695 006.**

**Item Rate Tender & Contract for Works**

Tender for the work of Construction of Stem Cell & BMT units at Malabar Cancer center, Thalasseri on design and build basis.

- (i) To be submitted by 2 PM on 31.07.2013 to **Deputy Vice President (Technical), HLL Lifecare Ltd., Trivandrum – 695 006**
- (ii) To be opened in presence of tenderer who may be present at 03.30 pm on 31.07.2013 in the office of

**Deputy Vice President (Technical), HLL Lifecare Ltd., Trivandrum – 695 006**

Issued to: \_\_\_\_\_

(Contractor)

Signature of officer issuing the documents \_\_\_\_\_

Designation \_\_\_\_\_

Date of Issue \_\_\_\_\_.

**T E N D E R**

I/We have read and examined notice inviting tender, schedule, A, B, C, D, E & F. specifications applicable, Drawings & Design, General Rules and Directions, Conditions of Contract, Clauses of Contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the Conditions of Contract and all other contents in the tender document for the work (Tender documents comprising of Part I, II and III.

I/We hereby tender for the execution of the work specified for the HLL Lifecare Limited within the time specified in schedule 'F', viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of the contract and with such materials as are provided for, by and in respect in accordance with, such conditions so far as applicable.

We agree to keep the tender open for **120** days from the due date of submission thereof and not to make any modifications in its terms and conditions. If any tenderer withdraws his tender before the said period or issue of letter of acceptance/intent, whichever is earlier, or, makes any modifications in the terms and conditions of the tender which are

not acceptable to the HLL, then the HLL shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid.

Earnest Money of Rs.3,91,020/-has been deposited along with the technical bid as follows .Either the full amount Rs.3,91,020/-shall be submitted in the form of a Demand Draft/ Fixed Deposit Receipt (FDR)/ Banker's cheque of a scheduled bank issued in favour of HLL Lifecare Limited, Thiruvananthapuram.or 50% of amount shall be submitted in the form of a Demand Draft/ Fixed Deposit Receipt (FDR)/ Banker's cheque of a scheduled bank issued in favour of HLL Lifecare Limited, Thiruvananthapuram. Remaining 50% shall be submitted in the form of an irrevocable guarantee bond of any scheduled bank of state bank of India. If I/We fail to commence the work specified I/We agree that the said HLL Lifecare Limited shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely otherwise the said earnest money shall be retained by competent authority on behalf of the HLL Lifecare Limited towards Security Deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and carry out such deviations as may be ordered, upto maximum of the percentage mentioned in Schedule 'F' and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

I/We agree that, in case of works of estimated cost exceeding Rs.6,00,000/-, to deposit an amount equal to 5% of Tendered value of the work as performance guarantee in the form of bond of any Scheduled Bank of India in accordance with the proforma prescribed or in the form of Fixed Deposit Receipt etc., within 30 days of the issue of letter of acceptance of Tender by the HLL. I/We am/are aware that in the event of failure on my/our part to furnish the Bank Guarantee the earnest money will be forfeited and tender cancelled.

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

I/We agree that should I/We fail to commence the work specified in the above memorandum, an amount equal to the amount of the earnest money mentioned in the form of invitation of tender shall be absolutely forfeited to the HLL Lifecare Limited and the same may at the option of the competent authority on behalf of the HLL Lifecare Limited be recovered without prejudice to any right or remedy available in law out of the deposit in so far as the same may extend in terms of the said bond and in the event of deficiency out of any other money due to me/us under this contract or otherwise.

The information in respect of works in hand is as per proforma enclosed.

Dated.....

Witness:  
Address:  
Occupation:

( )  
Signature of Contractor  
Postal Address: -

\*\*\*\*\*

**ACCEPTANCE**

The above tender (as modified by you (Contractor) and as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the HLL Lifecare Limited for a sum of

Rs. \_\_\_\_\_

(Rupees \_\_\_\_\_)

The letters referred to below shall form part of this Contract Agreement:-

(a)

(b)

**For & on behalf of the HLL Lifecare Limited.**

**Signature** \_\_\_\_\_

**Designation** \_\_\_\_\_

**Dated**.....

**HLL LIFECARE LIMITED**  
(A GOVERNMENT OF INDIA ENTERPRISE)  
**“Adarsh” TC – 6/1717(1)**  
**Vettamukku, Thirumala P.O.**  
**Thiruvananthapuram – 695 006.**

To

Sub: NIT No ... HLL/ID/ 13/**13/ 50** dt:17.06.2013 for the work

Construction of Stem Cell & BMT units at Malabar Cancer center, Thalasseri on design and build basis.

Dear Sir,

It is here by declared that HLL Lifecare Ltd is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily reflected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the HLL Lifecare Limited.

Yours faithfully

DGM (Technical)  
ID

To

DGM (Technical)  
ID

Sub: Submission of Tender for the work of Construction of Stem Cell & BMT units at Malabar Cancer center, Thalasseri on design and build basis.

Dear sir,

I/We acknowledge that HLL Lifecare Limited is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of the condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender bid is finally accepted by HLL Lifecare Limited. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid. HLL Lifecare Limited shall have unqualified, absolute and unfettered right to disqualify the tenderer/ bidder and reject the tender/bid in accordance with terms and conditions of the tender/bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

**To be signed by the bidder and same signatory competent/ authorized to sign the relevant contract of behalf of HLL Lifecare Limited**

### **PRE-CONTRACT INTEGRITY PACT**

This Pre-Contract Integrity Pact (herein after called the Integrity Pact) is made on \_\_\_\_\_ day of the month of \_\_\_\_\_ 2013,

#### **Between**

HLL Life Care Limited, a Government of India Enterprise with registered office at HLL Bhavan, Poojappura, Thiruvananthapuram 695 012, Kerala, India. (Hereinafter called "HLL", which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Party.

#### **And**

M/s \_\_\_\_\_ with office at \_\_\_\_\_ represented by Shri \_\_\_\_\_, Chief Executive Officer (hereinafter called the "BIDDER/Seller"/Contractor which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Party.

#### **Preamble**

[Both HLL and BIDDER referred above are jointly referred to as the Parties]

HLL intends to award, under laid down organizational procedures, Purchase orders / contract/s against Tender /Work Order /Purchase Order No. .... HLL desires full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s and Contractor/s.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

1. Enable HLL to obtain the desired materials/ stores/equipment/ work/ project done at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement; and
2. Enable the BIDDER to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and HLL will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:



**Clause.1. Commitments of HLL**

- 1.1 HLL undertakes that HLL and/or its Associates (i.e. employees, agents, consultants, advisors, etc.) will not demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
- 1.2 HLL will, during the tender process / pre-contract stage, treat all BIDDERS with equity and reason, and will provide to all BIDDERS the same information and will not provide any such information or additional information, which is confidential in any manner, to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS in relation to tendering process or during the contract execution.
- 1.3 All the officials of HLL will report to Chief Vigilance Officer of HLL (CVO), any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
- 1.4 HLL will exclude from the process all known prejudiced persons and persons who would be known to have a connection or nexus with the prospective bidder.
- 1.5 If the BIDDER reports to HLL with full and verifiable facts any misconduct on the part of HLL's Associates (i.e. employees, agents, consultants, advisors, etc.) and the same is prima facie found to be correct by HLL, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by HLL. Further, such an Associate may be debarred from further dealings related to the contract process. In such a case, while an enquiry is being conducted by HLL the proceedings under the contract would not be stalled.

**Clause 2. Commitments of BIDDERS/ CONTRACTORS**

2. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-
  - 2.1 The BIDDER will not offer, directly or indirectly (i.e. employees, agents, consultants, advisors, etc.) any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of HLL, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

- 2.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of HLL or otherwise in procuring the contract or forbearing to do or having done any act in relation to obtaining or execution of the contract or any other contract with the HLL for showing or forbearing to show favour or disfavor to any person in relation to the contract or any other contract with HLL.
- 2.3 The BIDDER will not engage in collusion, price fixing, cartelization, etc. with other counterparty(s).
- 2.4 The counterparty will not pass to any third party any confidential information entrusted to it, unless duly authorized by HLL.
- 2.5 The counterparty will promote and observe ethical practices within its Organization and its affiliates.
- 2.6 BIDDER shall disclose the name and address of agents and representatives and Indian BIDDERS shall disclose their foreign principals or associates.
- 2.7 The counterparty will not make any false or misleading allegations against HLL or its Associates.
- 2.8 BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
- 2.9 The BIDDER further confirms and declares to HLL that the BIDDER is the original manufacture/integrator/authorized government sponsored export entity of the defense stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to HLL or any of its functionaries, whether officially or unofficially to award the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
- 2.10 The BIDDER while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of HLL or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
- 2.11 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 2.12 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

- 2.13 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of HLL, or alternatively, if any relative of an officer of HLL has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

- 2.14 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of HLL.
- 2.15 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract, and will not enter into any undisclosed agreement or understanding with other Bidders, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.16 The BIDDER will not commit any offence under the relevant Indian Penal Code, 1860 or Prevention of Corruption Act, 1988; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the HLL as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.
- 2.17 The BIDDER will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.18 The Bidder(s)/ Contractors(s) of foreign origin shall disclose the name and address of the Agents/ representatives in India, if any. Similarly the Bidder(s)/ Contractors(s) of Indian Nationality shall furnish the name and address of the foreign Principal(s), if any.

**Clause.3. Previous contravention and Disqualification from tender process and exclusion from future contracts**

- 3.1 The BIDDER declares that no previous contravention occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process

- 3.2** The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

If BIDDER before award or during execution has committed a contravention through a violation of Clause 2, above or in any other form such as to put his reliability or credibility in question, HLL is entitled to disqualify the BIDDER from the tender process.

**Clause .4. Equal treatment of all Bidders / Contractors / Subcontractors**

- 4.1 The Bidder(s)/ Contractor(s) undertake(s) to demand from his Subcontractors a commitment in conformity with this Integrity Pact.
- 4.2 HLL will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 4.3 HLL will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

**Clause 5 - Consequences of Violation / Breach**

- 5.1 Any breach of the aforesaid provision by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle HLL to take all or any one of the following action, wherever required:-
- i. To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.
  - ii. If BIDDER commits violation of Integrity Pact Policy during bidding process, he shall be liable to compensate HLL by way of liquidated damages amounting to a sum equivalent to 5% to the value of the offer or the amount equivalent to Earnest Money Deposit/Bid Security, whichever is higher.
  - iii. In case of violation of the Integrity Pact after award of the contract, HLL will be entitled to terminate the contract. HLL shall also be entitled to recover from the contractor liquidated damages equivalent to 10% of the contract value or the amount equivalent to security deposit/ performance guarantee, whichever is higher.
  - iv. To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.
  - v. To recover all sums already paid by HLL, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding

payment is due to the BIDDER from HLL in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid amount.

- vi. To encash the advance bank guarantee and performance guarantee /warranty bond, if furnished by the BIDDER, in order to recover the payments already made by HLL, along with interest.
- vii. To cancel all or any other contract with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to HLL resulting from such cancellation/recession and HLL shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.
- viii. To debar the BIDDER from participating in future bidding processes of HLL for a minimum period of five (5) years, which may be further extended at the discretion of HLL or until Independent External Monitors is satisfied that the Counterparty will not commit any future violation.
- ix. To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.
- x. In cases where irrevocable Letters of credit have been received in respect of any contract signed by HLL with the BIDDER, the same shall not be opened.
- xi. Forfeiture of performance guarantee in case of a decision by HLL to forfeit the same without assigning any reason for imposing sanction for violation of the pact.

5.2 HLL will be entitled to all or any of the actions mentioned in para 5.1(i) to (x) of this pact also on the commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

5.3 The decision of HLL to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent External Monitor(s) appointed for the purposes of this Pact.

#### **Clause 6      Fall Clause**

The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems OR providing similar services at a price / charge lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found any stage that similar product/systems or sub systems was supplied by the BIDDER to any to the Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to HLL, if the contract has already been concluded.

**Clause 7. Independent External Monitor(s)**

- 7.1 HLL has appointed Independent External Monitor(s) (hereinafter referred to as Monitor(s)) for this Pact in consultation with the Central Vigilance Commission (Name and addresses of the Monitor(s) to be given).
- 7.2 The responsibility of the Monitor(s) shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.
- 7.3 The Monitor(s) shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 7.4 Both the parties accept that the Monitor(s) have the right to access all the documents relating to the project/ procurement, including minutes of meetings.
- 7.5 As soon as the Monitor(s) notices, or has reason to believe, a violation of this pact, he will so inform the CVO.
- 7.6 The BIDDER(S) accepts that the Monitor(s) have the right to access without restriction to all project documentation of HLL including that provided by the BIDDER. The BIDDER will also grant the Monitor(s), upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to subcontractors engaged by the BIDDER. The Monitor(s) shall be under contractual obligation to treat the information and documents of the BIDDER/ Subcontractor(s) with confidentiality.
- 7.7 HLL will provide to the Monitor(s) sufficient information about all meetings among the parties related to the Project provided such meeting could have an impact on the contractual relation between the parties. The parties will offer to the Monitor(s) option to participate in such meetings.
- 7.8 The Monitor(s) will submit a written report to the CVO of HLL within 8 to 10 weeks from the date of reference or intimation to him by HLL/BIDDER and, should consent arise, submit proposals for correcting problematic situations.

**Clause 8. Criminal charges against violating Bidder(s)/Contractor(s)/ Subcontractor(s)**

If HLL obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if HLL has substantive suspicion in this regard, HLL will inform the same to the Chief Vigilance Officer.

**Clause 9. Facilitation of Investigation**

In case of any allegation of violation of any provisions of this Pact or payment of commission, HLL or its agencies shall be entitled to examine all the documents, including

the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

**Clause.10. Law and Place of Jurisdiction**

Both the Parties agree that this Pact is subject to Indian Law. The place of performance and hence this Pact shall be subject to Thiruvananthapuram Jurisdiction.

**Clause.11. Other legal Actions**

The actions stipulated in the Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

**Clause.12. Validity and Duration of the Agreement**

This Pact begins when both parties have legally signed it. It expires for the Contractor/Successful bidder 12 months after the last payment under the contract or the complete execution of the contract to the satisfaction of the both HLL and the BIDDER /Seller, including warranty period, whichever is later, and for all other Bidders/unsuccessful bidders 6 months after the contract has been awarded.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged / determined by Chairman and Managing Director of HLL.

**Clause. 13. Other provisions**

- 13.1 Changes and supplements as well as termination notices need to be made in writing. Both the Parties declare that no side agreements have been made to this Integrity Pact.
- 13.1 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 13.1 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions

INWITNESS THEREOF the parties have signed and executed this pact at the place and date first above mentioned in the presents of following witnesses:

**HLL**

**BIDDER**

DEPUTY VICE PRESIDENT (TECHNICAL)

HLL Lifecare Limited,

Infrastructure Development Division, Thiruvananthapuram

Witness

1.....

2.....

**ADDITIONAL CONDITIONS**

- I. The intending tenderers has to satisfy the provisions of EPF & Misc. Provisions Act 1952 & Employees' Provident Fund Scheme 1952, by the contractors in respect of labourers/Employees engaged by them for performing the works of HLL.
  - (a) Each claim bill of contractors must accompany the (I) list showing the details of labourers/employees engaged. (II) duration of their engagement (III) the amount of wages paid to such labourers/employees for the duration in question, (IV) amount of EPF contributions (both employer's & employees' contribution) for the duration of engagement in question, paid to the EPF authorities, (V) copies of authenticated documents of payments of such contribution to EPF authorities and (VI) a declaration from the contractors regarding compliance of the conditions of EPF Act, 1952.
  - (b) The contractors claim will be passed by the bill passing authority only if the contractor complies with the terms and conditions of EPF Act, 1952.
- II. "Cess under Building and Other Construction Workers' Welfare Cess Act, 1996 and Building and Other Construction Workers Cess Rules 1998 if applicable will be received from the gross amount of the bill/bills payable under this Contract".
- III. Work Contract Tax, Service Tax and Income Tax at the rate applicable shall be recovered from the gross amount of the bill/bills payable under the contract.
- IV. The quoted price shall be inclusive of all taxes and duties whether payable by the contractor or to be deducted at source. This shall include those applicable among VAT, Sales Tax, Income Tax, Customs Duty, Excise Duty, Turnover Tax, Service



Tax, Work Contract Tax, Octroi, Labour Welfare Cess or any Other Taxes and Duties prevailing in respect of this contract. **ANY BID STATING THAT TAXES ARE EXTRA WILL BE SUMMARILY REJECTED.**

**CONTRACTOR**

**Deputy Vice President (Tech),  
HLL Lifecare Ltd.,  
Trivandrum – 695 006.**

**PROFORMA OF SCHEDULES****SCHEDULE "A"**

Schedule of Quantities (as per Part - III)

**SCHEDULE "B"**

Schedule of Materials to be issued to the contractor

S. No.	Description of Item	Quantity	Rates in figures & words at which the materials will be charged from the contractor	Place of issue
1	2	3	4	5
NIL				

**SCHEDULE "C"**

Tools and Plants to be hired to the contractor

S. No.	Description of Item	Hire charges per day	Place of issue
1	2	3	4
NIL			

**SCHEDULE "D"**

Extra schedule for specific requirements/ documents for the work. If any.

**SCHEDULE "E"**

Reference to General Conditions of Contract

Name of Work: of\_Construction of Stem Cell & BMT units at Malabar Cancer center, Thalasseri on design and build basis

Estimated cost of Work: Rs. 1,95,51,000/-

Earnest Money: Rs. 3,91,020/-

Performance Guarantee

(5 % of the tendered value in the form of Bank Guarantee from Scheduled Bank)

Security Deposit

(5 % of the tendered value in the form of Bank Guarantee from Scheduled Bank)

**SCHEDULE "F"****GENERAL RULES AND DIRECTIONS**

Officer inviting tender

**Dy. Vice President (Tech), ID,  
HLL Lifecare Limited  
Trivandrum – 695 006.**

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clause 12.2 & 12.3

Superstructure 50 %  
Foundation 50 %

**Definitions**

See below

2(v) Engineer-in charge

**Project Manager or any  
officer nominated by HLL  
DVP (Technical)  
HLL Lifecare Limited  
Trivandrum – 695 006.**

2(viii) Accepting Authority

2(x) Percentage on cost of  
materials and labour to cover ...  
all overheads and profit

15 %

2 (xi) Standard schedule of rates ...

CPWD Schedule of Rates  
for Delhi 2012 For Civil &  
Electrical works.

9(ii) Standard HLL Contract Form

...HLL W - 8 form as  
modified and  
corrected upto date.

**Clause 1**

(i) Time allowed for submission of Performance Guarantee  
From the date of issue of letter of acceptance

30 days

(ii) Maximum allowable extension beyond the period  
Provided in (i) above

Nil

**Clause 2**

Authority for fixing compensation under Clause 2

**Chief Engineer(Projects)  
HLL Lifecare Ltd.,  
Trivandrum – 695 006.**

**Clause 2 A**

Whether Clause 2 A shall be applicable:

*Not applicable***Clause 5**

i) Number of days from the date of issue of letter of  
acceptance for reckoning date of start

Date of start shall be date  
of letter of acceptance or

date of handing over of site  
whichever is later.

ii) Mile stone(s) as per table given below

S. No	Description of Milestone (Physical)	Time allowed in days (from date of start)	Amount to be with-held in cases of non achievement of milestone
	<b>Milestone has to be jointly prepared by the HLL Engineer in charge and Contractor within 20 days from the date of receipt of LOA.</b>		

**Time allowed for execution of work**

**12 Months**

**Clause 6, 6A**

**Clause applicable (6 or 6A)**

**6A**

**Clause 7**

Payment shall be made for the work done on monthly basis

**Clause 10A - List of Testing Equipment to be provided by the contractor at site lab**

- |                                |                     |                                  |
|--------------------------------|---------------------|----------------------------------|
| 1. Cube Moulds                 | 2. Set of Sieves    | 8. Compression Testing Machine   |
| 3. Slump Cones                 | 4. Spring Balance   | 9. Rebound Hammer                |
| 5. Bulkage Jars                | 6. Weighing Machine | 10. Moisture Testing Apparatus   |
| 7. Any other testing equipment |                     | 11. Electrical testing apparatus |

**Clause 10 B(i)**

Not *applicable*

**Clause 10 B(ii)**

Whether Clause 10 B (ii) shall be applicable

*Applicable*

**Clause 10 B(iii) - Escalation**

Not *applicable*

**Clause 11**

Specification to be followed for execution of work.

CPWD Specifications for Works 2009 (for Civil)  
CPWD Specifications for Heating, Ventilation & Air Conditioning, CPWD Specifications for Electrical Works

12.2 & 12.3 Limit for value of any item of any individual Superstructure 50 %

trade beyond which sub clauses (i) to (v) shall not apply and clauses 12.2.& 12.3 shall apply Foundation 50 %

**Clause 16**

Authority for deciding reduced rates.

*Competent authority of  
HLL Lifecare Limited*

**Clause 25**

<b>Constitution of Dispute Redressal Committee (DRC)</b>	<b>Competent Authority to appoint DRC</b>
DRC shall constitute one Chairman and two members	Director (Finance)

**Clause 36(i)**

Requirement of Technical Representative(s) and recovery Rate

Sl. No	Minimum Qualification of Technical Representative	Discipline	Designation Principal Technical (Technical representative)	Minimum Experience	Number	Rate at which recovery shall be made by the contractor in the event of variation in the provision of clause 36(i)	
						Figures	Words
1	Graduate in HVAC /Electrical Engineering	HVAC /Electrical	Principal technical Rep (Project Manager)	5 yrs	1	15000.00	
2	Diploma in Electrical / Mechanical Engineering	Electrical / Mechanical	Technical Rep (Supervisor)	5 yrs	2	10000.00	

**NOTE:**

1. Technical personnel to be employed as per above requirement and shall be subject to the approval of their CVs by the Engineer-in-Charge.
2. Any change in the personnel already employed shall be done only with the prior approval of the Engineer-in-Charge.
3. Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers
4. The contractor shall ensure that each of the specialized agencies employed him for the various components of this work engage at least one graduate engineer as Senior Technical representative and adequate number of supervisors.

**Clause 42**

(a) Schedule statement for determining theoretical quantity of Printed by C.P.W.D

- (i) cement men on the basis of Delhi Schedule of Rates
  - (ii) Variations permissible on theoretical quantities
- 
- (a) Cement 2% plus/minus
  - (b) Steel Reinforcement and structural steel sections for each diameter, section and category 2% plus/minus

**PROFORMA FOR AGREEMENT  
(ON NON-JUDICIAL STAMP PAPER OF APPROPRIATE VALUE)**

CONTRACT AGREEMENT FOR THE WORK OF ----- DATED -----  
Between M/s----- (refer note) in the town of -----  
hereinafter called the contractor (which term shall unless excluded by or repugnant to be subject or  
context include its successors and permitted assigns) of the one part and the HLL Lifecare Limited  
hereinafter called the HLL (which term shall unless excluded by or repugnant to the subject or  
context include its successes and assigns) of the other part.

**WHEREAS**

- a. The HLL is desirous that the Construction of -----  
at ----- should be executed as mentioned, enumerated or referred to in the  
tender including Press Notice Inviting Tender, General Conditions of the Contract,  
Special Conditions of the Contract, Specifications, Drawings, Plans, Time Schedule  
of completion of jobs, Schedule of Quantities and Rates, Agreed Variations, other  
documents, has called for Tender.
- b. The contractor has inspected the site and surroundings of the work specified in the  
tender documents and has satisfied himself by carefully examination before  
submitting his tender as to the nature of the surface and grounds, the form and  
nature of the site and local conditions the quantities, nature and magnitude of the  
work the availability of labour and materials necessary for the execution of work,  
the means of access to site, the supply of power and water thereto and the  
accommodation he may require and has made local and independent enquiries  
and obtained complete information as to the matters and things referred to or  
implied in the tender documents or having any connection therewith, and has  
considered the nature and extent of all the probable and possible situations,  
delays, hindrances or interferences to or with the execution and completion of the  
work to be carried out under the contract, and has examined and considered all  
other matters, conditions and things and probable and possible contingencies, and  
generally all matters incidental thereto and ancillary thereof affecting the execution  
and completion of the work and which might have influenced him in making his  
tender.
- c. The tender documents including the HLL's Press Notice Inviting Tender, General  
conditions of contract, Special Conditions of Contract, Schedule of Quantities and  
rates, General obligations, Specifications, Drawings, plan, time schedule for  
completion of work. Letter of Acceptance of tender and any statement of agreed  
variations with its enclosures copies of which are hereto annexed form part of this  
contract though separately set out herein and are included in the expression  
Contract wherever herein used.

**AND WHEREAS**

The HLL accepted the tender of M/s ----- (refer note below)  
(Contractor) for the Construction of ----- at -----and  
conveyed vide letter No.-----dated ----- at the rates stated in the Schedule of  
quantities for the work and accepted by the HLL (hereinafter called the Schedule of Rates) upon  
the terms and subject to the conditions of the contract.

NOW THIS AGREEMENT WITNESSTH & IT IS HEREBY AGREED AND DECLARED AS FOLLOWS.

1. In consideration of the payment to be made to the contract for the work to be executed by him, the contractor hereby covenant with the HLL that the contractor shall and will duly provide, execute, complete and maintain the said work and shall do and perform all other acts and things in the contract mentioned or described or which are to be implied and there-from or may be reasonably necessary for the completion of the said works and at the said times and in the manner and subject to the terms and conditions or stipulations mentioned in the contract, AND
2. In consideration of the due provisions execution, completion and maintenance of the said work, the HLL does hereby agree with the contractor that the HLL will pay to contractor the respective amounts for the work actually done by him and approved by the HLL at the Schedule or Rates and such other sum payable to the contractor under provision of the contract, such payment to be made at such time in such manner as prescribed for in the contract.

It is specifically and distinctly understood and agreed between the HLL and the contractor that the contractor shall have no right, title or interest in the site made available by the HLL for execution of the works or in the building, structures or works executed on the said site by the contractor or in the goods, articles, materials, etc. brought on the said site (unless the same specifically belongs to the contractor) and the contractor shall not have or deemed to have any lien whatsoever charge for unpaid bills will not be entitled to assume or retain possession or control of the site or structures and the HLL shall have an absolute and unfettered right to take full possession of site and to remove the contractor, their servants, agents and materials belonging to the contractor and lying on the site.

In Witness whereof the parties hereto have here-into set their respective hands and seals in the day and the year first above written.

Signed and delivered for and on behalf of HLL      Signature and delivered for and on behalf of the contractor

(HLL LIFECARE LIMITED)  
OFFICIAL ADDRESS

(Contractor)

Date  
Place

Date  
Place

IN PRESENCE OF TWO WITNESSES

SIGNATURE  
NAME  
SIGNATURE  
NAME

SIGNATURE  
NAME  
SIGNATURE  
NAME



**NOTE****For Proprietary Concern**

Shri.....s/o.....r/o.....carrying on business under the name and style of.....at..... (hereinafter called the said Contractor which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives).

**For Partnership Concern**

M/s .....a partnership firm having its registered office at .....(hereinafter called the said Contractor which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives). The partners of the firms are:

- i) Shri .....s/o..... , And
- ii) Shri .....s/o.....etc..

**For Companies**

M/s .....a company duly incorporated under the Indian Companies Act, 1956 and having its registered office at .....in the state of .....(hereinafter called the said Contractor which expression shall unless the context requires otherwise include its successors and assign).

**FORM OF PERFORMANCE SECURITY  
BANK GUARANTEE BOND**

1. In consideration of the HLL Lifecare Limited (hereinafter called "HLL") having agreed under the terms and conditions of agreement NO..... dated..... made between ..... and ..... (herein after called "the said contractor(s)") for the ..... work (herein after called "the said agreement") for compliance of his obligation in accordance with the terms and conditions in the said agreement.

We ..... (indicate the name of the Bank) (herein after referred to as "as Bank") hereby undertake to pay to the HLL an amount not exceeding Rs..... (Rupees ..... only) on demand by the HLL.

2. We ..... (Indicate the name of the Bank) do hereby undertake to pay the amount due and payable under this Guarantee without any demure, merely on a demand from the HLL stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs..... (Rupees..... only).

3. We undertake to pay to the HLL any money so demanded notwithstanding any dispute or disputes raised by the contractor (s) in any suit or proceeding pending before any court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment made by us under this bond shall be valid discharge of our liability for payment to there-under and the contractor(s) shall have no claim against us making such payment.

4. We ..... (Indicate the name of Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the HLL under or by virtue of the said agreement have been fully paid and it is claims satisfied or discharged or till Engineer-in-charge on behalf of the HLL. Certified that the terms and conditions of the said Agreement have been fully and properly carried out by the said contractor(s) accordingly discharges this guarantee.

5. We..... (Indicate the name of Bank) further agree with the HLL that he HLL shall have the fullest liberty without our consent and without affecting any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any of the powers exercisable by the HLL against the said contractor(s) and to forebear or enforce any of the terms and conditions relating to the said agreement we shall not be relieved from our liability by reasons of any such variation or extension being granted to the said contractor(s) or for any forbearance act of omission on that part of the HLL or any indulgence by HLL to the said contract(s) or by any such matter or thing

whatsoever which under the law relating to sureties would, but for this provision, have effected or so relieving us.

6. The guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).

7. We..... (indicate the name of Bank) lastly undertake not to revoke this guarantee except with the previous consent of the HLL in writing.

8. This guarantee shall be valid upto ..... unless extended on demand by HLL. Notwithstanding any thing mentioned above our liability against this Guarantee is restricted to RS..... (Rupees.....only) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee, all our liabilities under the Guarantee shall stand discharged.

Dated the ..... day of 20....

For .....  
(Indicate the name of Bank)

**AFFIDAVIT**

I/We have submitted a bank guarantee for the work .....  
..... (Name of Work), Agreement No..... ..  
Dated:..... from..... (Name of  
the bank with full address) TO THE DEPUTY VICE PRESIDENT (Tech)  
..... with a view to seek exemption from payment of  
performance guarantee in cash. This Bank guarantee expired on  
.....

I /We undertake to keep the validity of the bank guarantee intact by getting it extended  
from time to time at my/our own initiative upto a period of ..... months  
after the recorded date of completion of the work or as directed by the Engineer in  
charge.

I / WE also indemnify the HLL Lifecare Limited against any losses arising out of non-  
encashment of the bank guarantee if any.

(Deponent)  
signature of Contractor

note : The affidavit is to be given by the Executants before a first class Magistrate.

## FORM OF BANK GUARANTEE FOR EARNEST MONEY DEPOSIT

1. KNOW ALL MEN by these presents that we .....  
(Name of Bank) having our registered office at ..... (Name of country) (hereinafter called "the Bank") are bound unto HLL Lifecare Limited (hereinafter called "HLL") in the sum of **Rs.** \_\_\_\_\_ for which payment will and truly to be made to the said HLL, the Bank binds itself, its successors and assigns by these presents.
2. WHEREAS.....(Name of Tenderer) (hereinafter called "the Tenderer") has submitted its tender dated\_\_\_\_\_ for (Name of the work as mentioned under Clause 1 of NIT) hereinafter called the tender.  
AND WHEREAS the Tenderer is required to furnish a Bank Guarantee for the sum of **Rs** \_\_\_\_\_ (\_\_\_\_\_) as Tender Security against the Tenderer's offer as aforesaid.  
AND WHEREAS \_\_\_\_\_(Name of Bank) have, at the request of the Tenderer, agreed to give this guarantee as hereinafter contained.
3. We further agree as follows:
  - a. That HLL may without affecting this guarantee grant time or other indulgence to or negotiate further with the Tenderer in regard to the conditions contained in the said tender and thereby modify these conditions or add thereto any further conditions as may be mutually agreed upon between HLL and the Tenderer.
  - b. That the guarantee hereinbefore contained shall not be affected by any change in the constitution of our Bank or in the constitution of the Tenderer.
  - c. That any account settled between HLL and the Tenderer shall be conclusive evidence against us of the amount due hereunder and shall not be questioned by us.
  - d. That this Guarantee commences from the date hereof and shall remain in force till \_\_\_\_\_ (date to be filled up) (up to 150 days from the last date of submission of tender).
  - e. That the expression 'the Tenderer' and 'the Bank' herein used shall, unless such an interpretation is repugnant to the subject or context, include their respective successors and assigns.
4. THE CONDITIONS OF THIS OBLIGATION ARE:
  - a. if the Tenderer withdraws his Tender during the period of Tender validity specified in Clause 17 of Notice Inviting Tender, or
  - b. if the Tenderer having been notified of the acceptance of his tender by HLL during the period of tender validity :

- i. fails or refuses to furnish the Performance Security in accordance with Clause 10 of Notice Inviting Tender and/or
- ii. fails or refuses to enter into a Contract within the time limit specified in Clause 18 of Notice Inviting Tender.

We undertake to pay to HLL upto the above amount upon receipt of his first written demand, without HLL having to substantiate his demand provided that in his demand HLL will note that the amount claimed by him is due to him owing to the occurrence of any one or more of the conditions (a) & (b), mentioned above, specifying the occurred condition or conditions.

	Signature of .....
	Authorized Official of the Bank
Signature of the witness	Name of Official .....
.....	Designation .....
Name of the Witness	Stamp/Seal
.....	of the Bank .....
Address of the Witness	
.....	

**GUARANTEE TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF  
DEFECTS AFTER COMPLETION IN RESPECT OF WATER SUPPLY AND SANITARY  
INSTALLATIONS**

The agreement made this..... Day of ..... Two thousand and ..... between ..... S/O..... (hereinafter called the GUARANTOR of the one part) and the HLL Lifecare Ltd (herein after called HLL of the other part). WHERE AS THIS agreement is supplementary to the contract. (Herein after called the Contract) dated.....and made between the GUARANTOR OF THE ONE PART AND HLL of the other part, whereby the contractor interalia, undertook to render the work in the said contract recited structurally stable workmanship and use of sound materials.

AND WHERE AS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable and guarantee against faulty workmanship, finishing, manufacturing defects of materials and leakages etc.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable, after the expiry of maintenance period prescribed in the contract for the minimum life of ten years, to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer in charge with regard to nature and cause of defects shall be final.

During the period of guarantee the guarantor shall make good all defects to the satisfaction of the Engineer in charge calling upon him to rectify the defects, failing which the work shall be got done by HLL by some other contractor at the guarantor's cost and risk. The decision of the Engineer in charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects, commits breach there-under then the guarantor will indemnify the Principal and his successor against all loss, damage cost expense or otherwise which may be incurred by him by reason of any default on the part of THE GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and/or cost incurred by HLL the decision of the Engineer in charge will be final and binding on the parties.

IN WITNESS WHERE OF those presents have been executed by the obligator ..... And ..... by for and on behalf of HLL on the day, month and year first above written.

Signed sealed and delivery by OBLIGATOR in Presence of:

- 1.
- 2.

SIGNED FOR AND ON BEHALF OF THE HLL Lifecare Ltd by..... in the presence of:

- 1.
- 2.

**GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR WATER  
PROOFING TREATMENT FOR BASEMENT/ TERRACE/ TOILETS**

The agreement made this \_\_\_\_\_ day of \_\_\_\_\_ two thousand and \_\_\_\_\_ between \_\_\_\_\_ S/o \_\_\_\_\_ (hereinafter called the GUARANTOR of the one part) and the HLL Lifecare Ltd (hereinafter called the HLL of the other part).

WHERE AS this agreement is supplementary to a contract. (Herein after called the Contract) Dated \_\_\_\_\_ and made between the GUARANTOR OF THE ONE PART AND HLL of the other part, whereby the contractor interalia, undertook to render the structures in the said contractor of the work in the said contract recited completely water and leak proof.

THE GUARANTOR hereby guarantee that the water proofing treatment given by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date after the expiry of maintenance period prescribed in the contract. Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects.

The decision of the Engineer in charge with regard to cause of leakage shall be *final*. During the period of guarantee the guarantor shall make good all defects and in case of any defects being found render the structure water proof to the satisfaction of the Engineer in charge at his cost and shall commence the work for such rectification within seven days from the date of issue of notice from the Engineer in charge calling upon him to rectify the defects, failing which the work shall be got done by HLL through some other contractor at the guarantor's cost and risk. The decision of the *Engineer in charge* as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to execute the water proofing, or commits breach there-under then the guarantor will indemnify the Principal and his successor against all loss, damage, cost of expenses or otherwise which may be incurred by him by reason of any of any default on the part of the GUARANTOR in performance *and observance* of this supplementary agreement.

As to the amount of loss and/or cost incurred by HLL on the decision of the Engineer in charge will be final and binding on the parties.

IN WITNESS WHERE OF those presents have been executed by the obligator \_\_\_\_\_ and by \_\_\_\_\_ for and on behalf of the HLL Lifecare Ltd on the day, month and year first above written.

Signed sealed and delivered by OBLIGATOR

in presence of:

- 1.
- 2.

SIGNED FOR AND ON BEHALF OF THE HLL Lifecare Ltd by \_\_\_\_\_ In presence of:

- 1.
- 2.



**HLL LIFE CARE LIMITED****General Rules and Directions**

1. All work proposed for execution by contract will be notified in a form of invitation to tender pasted in public places and signed by the officer inviting tender or by publication in News papers as the case may be.

This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the tender, and the amount of the security deposit and Performance guarantee to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office of officer inviting tender during office hours.

2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act, 1952.
3. Receipts for payment made on account of work, when executed by a firm, must also be signed by all them partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.
4. Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates, will be summarily rejected. Tender shall have the name of the works to which they refer, written on the envelopes. The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paise and considering more than fifty paise as rupee one.
5. The officer inviting tender or his duly authorized assistant will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule-I. In the event of a tender being rejected, the earnest money shall thereupon be returned to the contractor remitting the same, without any interest.
6. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.

7. The tenderers shall sign a declaration under the official Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.

a. Use of correcting fluid, anywhere in tender document is not permitted. Such tender is liable for rejection.

8. In the case of Item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below/above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount. In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this/these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.

9. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.

10. All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs.' should be written before the figure of rupees and word 'P' after the decimal figures, e.g. 'Rs. 2.15 P' and in case of words, the word, 'Rupees' should precede and the word 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word 'only' it should invariably be upto two decimal places. While quoting the rate in schedule of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.

11. (i) The Contractor whose tender is accepted, will be required to furnish performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10,000/-) or Deposit at call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form.

(ii) The contractor whose tender is accepted will also be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 5% of the tendered value of the work. The Security deposit will be collected by deductions from the running bills of the contractor

at the rates mentioned above and the earnest money deposited at the time of tenders, will be treated as a part of the Security Deposit. The Security amount will also be accepted in cash or in the shape of Government Securities. Fixed Deposit Receipt of a Scheduled Bank or State Bank of India will also be accepted for this purpose provided confirmatory advice is enclosed.

12. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.
13. Sales-tax/VAT (except service tax), purchase tax, turnover tax or any other tax applicable in respect of this contract shall be payable by the Contractor and HLL Life care Ltd. will not entertain any claim whatsoever in respect of the same. However, in respect of service tax, same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to him by the Engineer-in-Charge after satisfying that it has been actually and genuinely paid by the contractor.'
14. The contractor shall give a list of both Executive/Non Executive HLL Life Care Ltd. employees related to him.
15. The tender for the work shall not be witnessed by a contractor or contractors who himself/ themselves has/have tendered or who may and has/have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.
16. The tender for composite work includes, in addition to building work, all other works such as sanitary and water supply installations drainage installation, electrical work, horticulture work, roads and paths etc. The tenderer must associate himself with agencies of appropriate class which are eligible to tender for sanitary and water supply drainage, electrical and horticulture works in the composite tender.
17. The contractor shall submit list of works which are in hand (progress) in the following form:-

Name of Work	Name and Particulars Divn. Where work is being executed	Value of Work	Position of works in Progress	Remarks

18. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the HLL Life Care Ltd. may in their discretion, without prejudice to any other right or remedy available in law, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

## CONDITIONS OF CONTRACT

**Definitions**

1. The Contract means the documents forming the tender and acceptance thereof and the formal the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.
2. In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:-
  - i. The expression works or work shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
  - ii. The Site shall mean the land/or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
  - iii. The Contractor shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
  - iv. HLL means HLL Life Care Ltd.
  - v. The Engineer-in-charge means the Engineer Officer who shall supervise and be in- charge of the work as mentioned in Schedule 'F' hereunder.
  - vi. Accepting Authority shall mean the authority mentioned in Schedule 'F'.
  - vii. Excepted Risk are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by Government of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to Government's faulty design of works.
  - viii. Market Rate shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'F' to cover, all overheads and profits.
  - ix. Schedule(s) referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the government mentioned in Schedule 'F' hereunder, with the amendments thereto issued upto the date of receipt of the tender.
  - x. Tendered value means the value of the entire work as stipulated in the letter of award.

- xi. Date of commencement of work: The date of commencement of work shall be the date of start as specified in schedule 'F' or the first date of handing over of the site, whichever is later, in accordance with the phasing if any, as indicated in the tender document.

### Scope and Performance

3. Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
4. Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
5. The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications, Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract.
6. The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities (Schedule-A) shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.
7. The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.
8. The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General Conditions.
- 8.1 In the case of discrepancy between the schedule of Quantities, the Specifications and/ or the Drawings, the following order of preference shall be observed:-
- i) Description of Schedule of Quantities.
  - ii) Particular Specification and Special Condition, if any.
  - iii) Drawings.
  - iv) CPWD Specifications.
  - v) Indian Standard Specifications of B.I.S
- 8.2 If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.
- 8.3 Any error in description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the Contract or release the Contractor from the execution of the

whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

9. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority, shall, within 30 days from the date of issue of LOA, sign the contract consisting of:-
  - i) The notice inviting tender, all the documents including drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
  - ii) Standard HLL Form as mentioned in Schedule 'F' consisting of:
    - a) Various standard clauses with corrections up to the date stipulated in Schedule 'F' along with annexures thereto.
    - b) Safety Code.
    - c) Model Rules for the protection of health, sanitary arrangements for workers employed by HLL or its contractors.
    - d) Contractor's Labour Regulations.
    - e) List of Acts and omissions for which fines can be imposed.
  - iii) No payment for the work done will be made unless contract is signed by the contractor

**CLAUSES OF CONTRACT****CLAUSE 1**

- i) The contractor shall submit an irrevocable Performance Guarantee of 5% (Five percent) of the tendered amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule F from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge upto a maximum period as specified in Schedule F on written request of the contractor stating the reason for delays in procuring the Bank Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of a Bank Guarantee of a Scheduled Bank or State Bank of India.
- ii) The Performance Guarantee shall be initially valid upto the stipulated date of completion plus 60 days beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of the Performance Guarantee extended to cover such enlarged time for completion of work. After recording the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor, without any interest.
- iii) The Engineer-in- Charge shall not make a claim under the performance guarantee except for amounts to which HLL is entitled under the contract (not withstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:
  - a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee.
  - f) Failure by the contractor to pay HLL any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by the Engineer-in-Charge.
- iv) In the event of the contract being determined or rescinded under provision of any of the Clause/Condition of the Agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the President of India.

**CLAUSE 1 A****Recovery  
of Security  
Deposit**

The person/persons whose tender(s) may be accepted (Hereinafter called the contractor) shall permit HLL at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of gross amount of each running bill till the sum along-with the sum already deposited as earnest money, will amount to security deposit of 5% of the tendered value of the work. Such deductions will be made and held by HLL by way of Security Deposit unless he/they has/have deposited the amount of Security at the rate mentioned above in cash or in the form of Government Securities or

fixed deposit receipts or Guarantee Bonds of any Scheduled Bank or the State Bank Of India in accordance with the form annexed hereto. In case a fixed deposit receipt of any bank is furnished by the contractor to the HLL as part of the security Deposit and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the HLL to make good the deficit.

All compensations or the other sums of the money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due to or may become due to the contractor by HLL on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or Guarantee Bond in favour of the Chairman & Managing Director, HLL Lifecare Ltd. or fixed deposit receipt tendered by the State Bank of India or by Scheduled Banks (in case of guarantee offered by Scheduled Banks, the amount shall be within the financial limit prescribed by the Reserve Bank of India); or Government Securities (if deposited for more than 12 month) endorsed in favour of the Engineer-in Charge, any sum or sums which may have been deducted from, or raised by the sale of his security deposit or any part thereof. The Security deposit shall be collected from the running bills of the contractor at the rates mentioned above and the Earnest Money, if deposited in cash at the time of tenders, will be treated a part of the Security Deposit.

The security deposit as deducted above can be released against bank guarantee issued by a scheduled bank, on its accumulations to a minimum of Rs. 5 lakh subject to the condition that amount of such bank guarantee except last one shall not be less than Rs. 5 lakh. Provided further that the validity of Bank Guarantee including the one given against the earnest money shall be in conformity with provisions contained in clause 17 which shall be extended from time to time depending upon extension of contract granted under provisions of clause 2 and clause 5.

**Note-1:** Government papers tendered as security will be taken at 5 % (Five per cent) below its market price or at its face value, whichever is less. The market price of Government paper would be ascertained by the Divisional Officer at the time of collection of interest and the amount of interest to the extent of deficiency in value of the HLL paper will be withheld if necessary.

**Note-2:** Government securities will include all forms of securities mentioned in Rule No.274 of the G.F. Rules except fidelity bond. This will be subject to the observance of the condition mentioned under the rule against each form of security.

**Note-3:** Note 1 & 2 above shall be applicable for both clause 1 and 1A



## CLAUSE 2

**Compensation  
for Delay**

If the contractor fails to maintain the required proportionate progress of the work at the stages specified in Clause 5 or to complete the work and fails to clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to HLL on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below or such smaller amount as the authority specified in Schedule 'F' may decide on the amount of tendered value of work for every completed day/week (as applicable) in which the progress remains below than the specified in Clause 5 or that the work remains incomplete. The decision of the aforesaid authority in writing shall be final and binding on the contractor.

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

(i) Compensation For delay of work

@1.5% per month of delay  
to be computed on per day basis

The table of milestones has to be jointly prepared by the Engineer in Charge and the contractor within 20 days of issue of LOA and this table showing milestones will form part of agreement. Wherever physical milestones are not specified, the financial milestone table shown below will be in force.

TABLE SHOWING

**PHYSICAL MILE STONES**

S. No.	Description of Milestone (Physical)	Time allowed in days (from date of start)	Amount to be with-held in case of non achievement of milestone
1.			In the event of not achieving a milestone in time, 1.25% of the tendered value of work will be withheld for failure of achieving each mile stone.
2.			
Etc..			

**OR** (In cases where physical milestones are not specified)

TABLE SHOWING

**FINANCIAL MILE STONES**

S. No.	Financial Progress	Time Allowed (From date of Start)	Amount to be with-held in case of non achievement of milestone
1	1/8th (of the whole work)	1/4th (of the completion period)	In the event of not achieving the necessary progress as assessed from the running payments, 1.25% of the tendered value of work will be withheld for failure of each mile stone.
2	3/8th (-do-)	1/2 (-do-)	
3	3/4th (-do-)	3/4th (-do-)	
4	full	full	

Provided always that the total amount of compensation for delay to be paid under this condition including the penalty based on milestones shall not exceed 10 % of the tendered value of work on or of the Tendered Value of the item or group of items of work for which a separate period of completion is originally given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the HLL. In case, the contractor does not achieve a particular milestone mentioned in schedule F, or the re-scheduled milestone(s) in terms of Clause 5.4 the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest whatsoever, shall be payable on such withheld amount.

### CLAUSE 3

**When  
Contract can  
be  
determined**

Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudices to his any other rights or remedy against the contractor in respect of any delay, interior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

- (i) If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkman like manner shall omit to comply with the requirement of such note for a period of seven days thereafter.
- (iii) If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.
- (iii) If the contractor fails to complete the work, within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-charge.

- (iv) If the contractor persistently neglects to carry out his obligations under the contract and or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.
- (v) If the contractor shall offer or give or agree to give to any person in HLL or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for HLL.
- (vi) If the contractor shall enter into a contract with HLL in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in -Charge.
- (vii) If the contractor shall obtain a contract with HLL as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of integrity pact.
- (viii) If the contractor being an individual or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.
- (ix) If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.
- (x) If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.
- (xi) If the contractor assigns, transfers sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire

works or any portion thereof without the prior written approval of the Engineer-in-Charge.

- (xii) If the work is not started by the contractor within 1/8<sup>th</sup> of the stipulated time.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-charge on behalf of the President of India shall have powers:

- (a) To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of HLL.
- (b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him due to reasons of his having purchased or procured any materials on entered into any engagements or made any advances on account or with a view to the execution of the work on the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

#### CLAUSE 3A

In case, the work cannot be started due to reasons not within the control of the contractor within 1/8<sup>th</sup> of the stipulated time for completion of work, either party may close the contract in such eventually, the earnest Money Deposit and the Performance Guarantee of the contractor shall be refunded, but no payment on account of interest, loss of profit or damages etc shall be payable at all.

#### CLAUSE 4

In any case in which any of the powers conferred upon the Engineer-in-Charge by clause-3 thereof, shall have become exercisable and the same are

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**Contractor  
liable to pay  
compensation  
even if action  
not taken  
under clause 3**

not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the engineer-in-charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the Engineer-in-Charge which shall be final and binding on the contractor use as on hire (the amount of the hire money being also in the final determination of the site thereof belonging to the contractor, or procured by the contractor and intended to be used to the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates, or in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge whose certificate thereof shall be final, and binding on the contractor clerk of the works, foreman or other authorized agent to remove such notice) in the event of the contractor failing to comply with any such falling to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate for the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

#### CLAUSE 5

##### Time and Extension for Delay

The time allowed for execution of the Works as specified in the Schedule 'F' or the Extended time in accordance with these conditions shall be the essence of the contract. The execution of the works shall commence from such time period as mentioned in schedule 'F' or from the date of handing over of the site whichever is later. If the contractor commits default in commencing the execution of the work as aforesaid, HLL shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money & performance guarantee absolutely.

- 5.1 As soon as possible after the Contract is concluded, the Contractor shall submit a Time and progress chart for each milestone and get it approved by HLL Engineer in charge. The Chart shall be prepared in direct relating to the time stated in the Contract documents for completion for items of the works. It shall indicate the forecast of the dates of commencement and completion of various traders of sections of the work and may be amended as necessary by agreement between the Engineer-in-charge and the Contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the month (save for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given in Schedule 1'F'.

- 5.2 If the work(s) be delayed by:-
- (i) Force majeure, or
  - (ii) Abnormally bad weather, or
  - (iii) Serious loss or damage by fire, or
  - (iv) Civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
  - (v) Delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the contract, or
  - (vi) Non-availability of stores, which are the responsibility of HLL to supply or
  - (vii) Non-availability or break down of tools and Plant to be supplied or supplied by HLL or
  - (viii) Any other cause which, in the absolute discretion of the Engineer-in-Charge is beyond the Contractor's control.

then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-charge to proceed with the works.

- 5.3 Request for rescheduling of Milestones and extension of time, to be eligible for consideration shall be made by the contractor in writing within fourteen days of the happening of the event causing delay on the prescribed form. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.
- 5.4 In any such case the engineer-in-Charge may give a fair and reasonable extension of time and reschedule the milestones for completion of work. Such extension shall be communicated to the Contractor by the Engineer-in-charge in writing, with 3 months of the date of receipt of such request. Non application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the Engineer-in-Charge and this shall be binding on the contractor.

## CLAUSE 6

### Measurements of Work Done

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurements the value of work done in accordance with the contract. The measurements of all items (having financial value) shall be entered in Measurement Book and/or level field book so that a complete record is maintained of all works performed under the contract.

All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorised representative and by the contractor or his authorised representative from time to time during the progress of the work and such measurement shall be signed and dated by the Engineer-in-Charge and the

contractor(s) or his/their representative in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reasons and signed by both the parties.

If for any reason the contractor or his authorised representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and HLL shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorised representative does not remain present at the time of such measurements after the contractor or his authorised representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.

The contractor shall, without extra charge, provide all the assistance with every appliance, labour and other things necessary for measurements and recording levels. Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of the measurement or any general or local custom. In the case of items, which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed. The contractor shall give not less than seven day's notice to the Engineer-in-Charge or his authorised representative in-charge of the work before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurements and shall not cover-up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorised representative in-charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of the measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the Contractor's expense, or in default thereof, no payment or allowance shall be made for extra work or the materials with which the same was executed.

Engineer-in-Charge or his authorised representative may cause, either themselves or through another Officer of HLL, to check the measurements recorded, jointly or otherwise, as aforesaid, and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill, shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from

liabilities from any over measurement or defects noticed till completion of the defects liability period.

#### CLAUSE 6A

**Computerized  
Measurement  
book**

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.

All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per the format of the department so that a complete record is obtained of all the items of works performed under the contract.

All such measurements and levels recorded by the contractor or his authorized representative from time to time. During the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per the interval or program fixed in consultation with Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the engineer-in-Charge for the dated signatures by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance.

Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked/test checked from the Engineer-in-charge and /or his authorized representative. The contractor will, thereafter, incorporate such charges as may be done during these checks/test checks in his draft computerized measurements, and submit to the department a computerized measurement book, duly bound, and with its pages machine numbered. The engineer-in-Charge and /or his authorized representative would thereafter check this MB, and record the necessary certificates for their checks/test checks.

The final fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct, and no cutting or over-writing in the measurements would thereafter be allowed, if at all any error is noticed, the contractor shall have to submit a fresh computerizes pages duly MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the department. Thereafter, the MB shall be taken in the Divisional Office records, and allotted a number as per the Register of MBs. This should be done before the corresponding bill is submitted to the Division Office for payment. The contractor shall submit two spare copies of such computerized MB\s for the purpose of reference and record by the various officers of the department.

The contractor shall also submit to the department separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages machine numbered alongwith two spare copies of the "bill. Thereafter this bill will be processed by the Division Office and allotted a number as per



the computerized record in the same way as done for the measurement book meant for measurements.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement issued by the Bureau of Indian Standards and if for any item no such standards is available then a mutually agreed method shall be followed.

The contractor shall give not less than seven days' notice to the Engineer-in-charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and /or test checking the measurement of any work in order that the same may be checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and /or test checking measurement and shall not cover up and place beyond reach of measurements any work without consent in writing of the Engineer -in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice been given or the Engineer-in-charge's consent being obtained in writing the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurement recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that checking and /or test checking the measurements of any item of work in the measurement of book and /or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

#### CLAUSE 7

**Payment on  
Intermediate  
Certificate  
to be  
regarded as  
Advances**

Interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of HLL in triplicate on or before the date of every month fixed for the same by the Engineer-in-Charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment/adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Schedule "F", in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is

achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in-Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge. The amount admissible will as far as possible be paid by 10<sup>th</sup> working day after the day of presentation of the bill by the Contractor to the Engineer-in-Charge or his Asst. Engineer together with the account of the material issued by HLL, or dismantled materials, if any. In the case of works outside the headquarter of the Engineer-in-Charge, the period of ten working days will be extended to fifteen working days.

All such interim payments shall be regarded as payment by way of advances against final payment only, and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate(s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

Pending consideration of extension of date of completion interim payments shall continue to be made as herein provided, without prejudice to the right of HLL to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.

The Engineer-in-Charge in his sole discretion, on the basis of a certificate from the Site Engineer to the effect, that the work has been completed upto the level in question may make interim advance payments without detailed measurements for work done (other than foundations, items to be covered under finishing items) upto lintel level (including sunshade etc.) and slab level, for each floor working out at 75% of the assessed value. The advance payments so allowed shall be adjusted in the subsequent interim bill by taking detailed measurements thereof.

**In composite tenders, in case the main contractor fails to make payment to the specialist agency employed by him for a minor component of work within 15 days of receipt of each corresponding running account payment, then on the written complaint of the affected agency the Engineer in Charge shall serve show cause notice to the main contractor and if the reply is either not received**

or found unsatisfactory, he may make payment directly to the agency employed for the minor component as per the terms and conditions of the contract drawn between the main contractor and the agency employed by him. Such payment made to the associate agency shall be recovered by the Engineer in Charge from the next RA Bill or Final Bill of the main contractor.

#### CLAUSE 8

##### **Completion Certificate & Completion Plans**

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, wall, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession, for the purpose of the execution thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this clause, as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim whatsoever in this regard except for any sum actually realized by the sale thereof.

#### CLAUSE 8 A

##### **Contractor to Keep Site Clean**

When the annual repairs and maintenance of works are carried out, the splashes and dropping from white washing, colour-washing, painting etc, on walls, floor, windows, etc. shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc where the work is done without waiting for the actual completion of all the other items of work in the contract. In case the contractor fails to comply with the requirement of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either by HLL or through any other agency. Before taking such action, the Engineer-in-Charge shall give 10 days notice in writing to the contractor.

#### CLAUSE 8 B

**Completion Plans to be Submitted by the Contractor**

The Contractor shall within one month of the date of completion of the work submit completion plan as required vide General Specification for Electrical works (Part I Internal) 2005 and (Part-II External) 1994, as applicable, completion plans of internal and external sanitary, water supply and drainage installations by marking on a set of drawings, the route, position and details of the pipes, fixtures, fittings in the manner specified by the Engineer-in-Charge.

The Contractor shall also arrange statutory inspection and certification of the aforesaid installation by local authorities in conformity with the bylaws, if any.

If the contractor fails to submit the completion plans and obtain necessary statutory certificates from the local authority as aforesaid he shall be liable to indemnify by a sum equivalent to, spent by HLL for preparation of the completion plans and in obtaining necessary statutory certificates as aforesaid.

**CLAUSE 9****Payment of Final Bill**

The contractor shall submit the final bill in the same manner as specified in interim bills within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by the Engineer-in-Charge, will, as far as possible, be made within six months, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge, complete with account of materials issued by HLL and dismantled materials.

**CLAUSE 9A****Payment of Contractor's Bill to Banks**

Payments due to the contractor may, if so desired by him, be made to his bank instead of direct to him provided that the contractor furnishes to the Engineer-in-Charge

- (1) an authorisation in the form of a legally valid document such as a power of attorney conferring authority on the bank to receive payments, and,
- (2) His own acceptance of the correctness of the amount made out as being due to him by HLL or his signature on the bill or other claim preferred against HLL before settlement by the Engineer-in-Charge of the account or claim by payment to the bank. While the receipt given by such banks shall constitute a full and sufficient discharge for the payment, the contractor shall wherever possible present bills duly receipted and discharged through his bankers.

Nothing herein contained shall operate to create in favour of the bank any rights or equities vis-à-vis the HLL Lifecare Limited.

**CLAUSE 10 A**

**Materials to  
be provided  
by the  
Contractor**

The contractor shall, at his own expense, provide all materials, required for the works.

The contractor shall, at his own expense and without delay, supply to the Engineer-in-Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-Charge, furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in-Charge shall within thirty days of supply of samples or within such further period as he may require, intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with the specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.

The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in-Charge or his authorized representative shall, at all time, have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal, from the premises, of all materials which in his opinion are not in accordance with the specifications and in case of default the Engineer-in-Charge shall be at liberty to employ at the expenses of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default the Engineer-in-Charge may cause the same to be supplied and all costs, which may attend such removal, and substitution shall be borne by the Contractor

**CLAUSE 10 B:****Secured  
Advance on  
Non-perishable  
Materials  
provided by the  
Contractor**

- (i) The contractor on signing an indenture in the form to be specified by the Engineer-In-Charge, shall entitled to be paid during the progress of the execution of the work up to 90% of the assessed value of any materials which are in the opinion of the Engineers-in-Charge non-perishable, non-fragile and non-combustible and are in accordance with the contract and which have been brought on the site in connection therewith and are adequately stored and /or protected against damage by weather on other causes but which have not at the time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered /deducted from the next payment made under any of the clause or clause of the contract.

Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-Charge provided the contractor provides a comprehensive insurance cover for the full cost of such the contractor in this matter. No secured advance shall however, be paid on high -risk materials such as ordinary glass, sand, petrol, diesel etc.

**Mobilization  
Advance**

- ii) Mobilization advance not exceeding 10% of the tendered value may be given, if requested by the contractor in writing within one month of the order to commence the work subject to the approval/ concurrence from client. In such a case, the contractor shall execute a Bank Guarantee bond from a Scheduled Bank as specified by the Engineer-in-charge for the full amount of mobilization advance before such advance is release. Such advance shall be in two or more installments to be determined by the Engineer-in-Charge at his sole discretion. The first installment of such advance shall be released by the Engineer in-Charge to the contractor on a request made by contractor to the Engineer-in- Charge in this behalf. The second and subsequent installment shall be released by the Engineer-in-Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier satisfaction of the Engineer-in-Charge.

Provided always that provision of Clause 10B (ii) shall be applicable only when so provided in Schedule F.

**Plant  
Machinery  
Shuttering  
Material  
Advance**

- (iii) An advance for plant, machinery & shuttering material required for the work and brought to the site by the contractor may be given if requested by the contractor in writing within one month of bringing such plant and machinery to site. Such advance shall be given on such plant and machinery, which in the opinion of the Engineer-in-Charges will add to the expeditious execution of work and improve the quality of work. The amount of advance shall be restricted to 5% percent of the tender value. In the case of new plant and equipment to be purchased for the work, the advance shall be restricted to

90% of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence satisfactory to the Engineer-in-Charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50%, if the depreciated value of plant and equipment as may be decided by the Engineer-in-Charge. The contractor shall, if so required by the Engineer-in-Charge, submit the statement of value of such old plant and equipment duly approved by a Registered Valuer recognized by the Central Board of Direct Taxes under the Income -Tax Act.1961. No such advance shall be paid on any plant and equipment of perishable nature and on any plant and equipment of a value less than Rs.50,000/-. Seventy five per cent of such amount of advance shall be paid after the plant & equipment is brought to site and balance twenty five percent on successfully commissioning the same.

Leasing of equipment shall be considered at par with purchase of equipment and shall be covered by tripartite agreement with the following;

1. Leasing company which given certificate of agreeing to lease equipment to the contractor.
2. Engineer in Charge, and
3. The contractor

The advance shall further be subject to the condition that such plant and equipment (a) are considered by the Engineer-in-charge to be necessary for the works, (b) and are in working order and are maintained in working order; (c) hypothecated to HLL as specified by the Engineer-in-Charge before the payment of advance is released. The contractor shall not be permitted to remove from the site such hypothecated plant and equipment without the prior written permission of the Engineer-in-Charge. The contractor shall be responsible for maintaining such plant and equipment in good working order during the entire period of hypothecation failing which such advance shall be entirely recovered in lump sum. For this purpose, steel scaffolding and from work shall be treated as plant and equipment.

The contractor shall insure the Plant and Machinery for which mobilization advance is sought and given, for a sum sufficient to provide for their replacement at site. Any amounts not recovered from the insurer will be borne by the contractor.

**Interest &  
Recovery**

- (iv) The mobilization advance and plant and machinery advance in (ii) & (iii) above bear simple interest at the rate of 10 per cent per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by the deduction from the contractors bills commencing after first ten per cent of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time

eighty per cent of the gross value of the contract is executed and paid, on pro-rata percentage basis to the gross value work billed beyond 10% in such a way that the entire advance is recovered by the time eighty percent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

- (v) If the circumstances are considered reasonable by the Engineer-in-Charge, the period mentioned in (ii) and (iii) for request by the contractor in writing for grant of Mobilization advance and plant and equipment advance may be extended in the discretion of the Engineer-in-Charge.
- (vi) The said bank guarantee for advances shall initially be made for the full amount and valid for the contract period, and be kept renewed from time to time to cover the balance amount and likely period of complete recovery together with interest.

#### CLAUSE 10 D

**Dismantled  
Materials Govt.  
Property**

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc as HLL's property and such materials shall be disposed off to the best advantage of HLL according to the instructions in writing issued by the Engineer-in-Charge.

#### CLAUSE 11

**Work to be  
executed in  
Accordance  
with  
Specifications,  
Drawings,  
Orders, etc.**

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department specified in Schedule 'F' or in any Bureau of Indian Standard or any other, published standard or code or , Schedule of Rates or any other printed publications referred to elsewhere in the contract.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

#### CLAUSE 12



**Deviations,  
Variations  
Extent and  
Pricing**

The Engineer-in-Charge shall have power to make alteration in, omission from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and contractor shall be bound to carry out the work in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and alterations/omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

**12.1.** The time for completion of the work shall, in the event of any deviations resulting In additional cost over the tendered value, be extended if requested by the contractor, as follows:

- i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value(+) plus
- ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

**Deviations,  
Extra items  
and Pricing**

**12.2** In the case of extra item(s) the contractor may within fifteen days of receipt of order or occurrence of the items(s) claim rates, supported by proper analysis, for the work the engineer-in-charge shall within one month of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determines the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

**Deviations,  
Substituted  
Items, Pricing**

In the case of substituted items, the rate for the agreement item (to be substituted item shall also be determined in the manner as mentioned in the aforesaid para.

- a) If the market rate for the substitute item so determined is more than the market rate for the substituted item shall be the rate for the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted)
- b) In the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement. Item (to be substituted)

**Deviations,  
Deviated  
Quantities,  
Pricing**

In the case of contract items, substituted items, contract cum substituted items, which exceed the limits laid down in schedule F, the contractor may within fifteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis for the work in excess, of the above mention limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities, the Engineer-in-Charge shall within one month of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

**12.3** The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Schedule F and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

**12.4** The contractor shall send to the Engineer-in-Charge once every three months, an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Superintending Engineer may authorize consideration of such claims on merits.

**12.5** For the purpose of operation of Schedule F the following works shall be treated as works relating to foundation.

- (i) For buildings, compound walls, plinth level or 1.2 meters (4 feet) above ground level, whichever is lower excluding items of flooring and D.P.C but including base concrete below the floors.
- (ii) For abutments, piers, retaining walls of culverts and bridges, walls of water reservoirs, the bed of floor level.
- (iii) For retaining walls where floor level is not determinate, 1.2 meters above the average ground level or bed level.
- (iv) For Roads, all items of excavation and filling including treatment of Sub-base.

**12.6** Any operation incidental to or necessarily has to be in contemplation of tenderer which filing tender, or necessary for proper execution of the item included in the Schedule of quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item in the and the relevant specification, shall be deemed to be included in the rates quoted by the tenderer or the

rate given in the said schedule of rates, as the case may be Nothing extra shall be admissible for such operations.

12.7 Under no circumstances the contractor shall suspend the work on the plea of non-Settlement of rates of or disputes in the rates fixed by the Engineer-in-Charge of the items falling under the above clauses.

### CLAUSE 13

#### **Foreclosure of Contract due to Abandonment or Reduction in Scope of Work**

If at any time after acceptance of the tender HLL shall decide to abandon or reduce the scope of the work for any reason whatsoever, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work. Further, the contractor shall not have any claim for compensation by reasons of an alteration having been made in the original specifications, drawings, designs and instructions which shall involve any curtailment of the work as originally contemplated.

The contractor shall be paid at contract rates full amount for works executed at site and, in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilised on the work to full extent due to curtailment in the scope of the work or foreclosure of the contract.

- i) Proportionate expenditure, incurred on preliminary site work (e.g. temporary access roads, temporary labour huts, staff quarters and site offices, storage accommodation and water storage tanks) and tool and plants.
- ii) The Engineer-in-Charge shall have the option to take over contractor's materials or any part thereof brought to site. For materials taken over or to be taken over by the Engineer-in-Charge, the cost of such materials shall however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.
- iii) For contractor's materials not retained by the Engineer-in-Charge, reasonable cost of transporting such materials and tools and plants from site to contractor's permanent stores or to his other works, whichever is less, shall be payable.
- iv) If any materials supplied by HLL are rendered surplus, the same except normal wastage shall be returned by the contractor to HLL. at rates not exceeding those at which these were originally issued less allowances for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of

transporting such materials from site to HLL stores, if so required by HLL, shall be paid.

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

The reasonable amount of items on (i), (iv) and (v) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor's materials at site taken over by the HLL as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Engineer-in-charge shall be entitled to recover or be credited with any outstanding balances due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the HLL from the contractor under the terms of the contract.

#### CLAUSE 14

If contractor:

**Carrying out  
part works at  
risk and cost  
of contractor**

- (i) At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing or 7 days in this respect from the Engineer-in-charge or
- (ii) Commits default in complying with any of the terms and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-charge.. or

Fails to complete the work(s) or items of work with individual dates of completions, on or before the date(s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in- Charge.

The engineer-in-charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to HLL by a notice in writing to take the part work/part incomplete work of any item(s) out of his hands and shall have powers to:

- (a) Take possession of the site and any materials, constructional plant, implements, stores, etc... thereon ; and/or
- (b) Carry out the part work/part incomplete work of any item(s) by any means at the risk and cost of the contractor.

The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work / part incomplete work of any6 item(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by HLL because of action under the clause shall not exceed 10% of the tendered value of the work.

In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by HLL in completing the part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by HLL as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to HLL in law or per as agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc., and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding. It shall be recovered in accordance with the provisions of the contract.

In the event of above course being adopted by the Engineer-in-Charge the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

#### CLAUSE 15

##### **Suspension of work**

- i) The contractor shall, on receipt of the order in writing of the Engineer-in-Charge (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary so as not

to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons:

- a) On account of any default on the part of the contractor or ;
- b) For proper execution of the works or part thereof for reasons other than the default of the contractor; or
- c) For safety of works or part thereof.

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

(ii) If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:

- a) The contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and;
- b) If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor, provided the contractor submits his claim supported by details to the Engineer-in-Charge within 15 days of the expiry of the period of 30 days,

(xiii) If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within 15 days from receipt by the Engineer-in-Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the work as an omission or such part by HLL or where it affects whole of the works, as an abandonment of the works by HLL, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge. In the event of the contractor treating the suspension as an abandonment of the contract by HLL, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider

reasonable, in respect of salaries and /or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of three months.

Provided, further, that the contractor shall not be entitled to claim any compensation from HLL for the loss suffered by him on account of delay by HLL in the supply of materials in schedule 'B' where such delay is covered by difficulties relating to the supply of wagons, force majeure including non allotment of such materials by controlling authorities, acts of God, acts of enemies of the State/Country or any reasonable cause beyond the control of HLL.

#### CLAUSE 16

##### **Inspection and supervision of work**

All works under or in course of execution or executed in pursuance of the contract shall at all times be opened and accessible to the inspection and supervision of Engineer-in-Charge, his authorised subordinates in charge of the work and all the superior officers, Officer of the Quality Control Organisation of HLL, and contractor shall at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

#### CLAUSE 16 A

##### **Rectification of defects**

If it shall appear to the Engineer-in-Charge or his authorised subordinates in-charge of the work, that any work has been executed with unsound, imperfect, or unskillful workmanship or with materials or articles provided by him for the execution of work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within six months of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so, within a period specified by the Engineer-in-Charge in his demand aforesaid, the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

In such case, the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the competent authority may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work out right without any payment and/or get it and other connected and incidental items rectified or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

#### CLAUSE 17

**Contractor  
liable for  
damages,  
defects during  
maintenance  
period**

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post which the work or any part is being executed, or if any damage shall happen to the work while in progress from any cause whatever or if any defect, shrinkage or other faults appear in the work within twelve months after a certificate final or otherwise of its completion shall have been given by the Engineer-in-Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later. Provided that in the case of road work if in the opinion of the Engineer-in-Charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later.

#### CLAUSE 18

**Contractor  
to supply  
Tools and  
Plants etc.**

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), plant, tools, appliances, implements, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specification or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the



requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting weighing and assisting the measurement for examination at any time and from time to time of the work or materials. On his failing to do so, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or a sufficient portions thereof.

#### CLAUSE 18 A

**Recovery of  
compensation  
paid to  
workman**

In every case in which by virtue of the provisions sub-section (1) of Section 12, of the Workmen's Compensation Act, 1923, HLL is obliged to pay compensation to a workman employed by the contractor, in execution of the works, HLL will recover from the contractor the amount of the compensation so paid; and, without prejudice to the rights of the HLL under sub-section (2) of Section 12, of the said Act, HLL shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by HLL to the contractor whether under this contract or otherwise. HLL shall not be bound to contest any claim made against it under sub-section (1) Section 12, of the said Act, except on the written request of the contractor and upon his giving to HLL full security for all costs for which HLL might become liable in consequence of contesting such claim.

#### CLAUSE 18 B

**Ensuring  
Payment &  
Amenities to  
Workers, if  
Contractor  
Fails**

In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and of the Contract Labour (Regulation and Abolition) Central Rules, 1971, HLL is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19H or under the Contractor's Labour Regulations, or under the Rules framed by HLL/ HLL from time to time for the protection of health and sanitary arrangements for workers employed by the Contractor, HLL will recover from the contractor the amount of wages so paid or the amount of expenditure so incurred ; and without prejudice to the rights of HLL under Sub-Section (2) of Section 20, and sub-section (4) of Section 21, of the Contract Labour (Regulation and Abolition) Act, 1970, HLL shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by HLL to the contractor whether under this contract or otherwise HLL shall not be bound to contest any claim made against it under sub-section (1) of Section 20, sub-section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to HLL full security for all costs for which HLL might become liable in contesting such claim.

#### CLAUSE 19

**Labour  
Laws to be  
Complied  
by the  
Contractor**

The contractor shall obtain a valid Licence under the Contract Labour (R&A) Act 1970, and the Contract Labour (Regulation and Abolition) Central Rules 1971, before the commencement of the work and continue to have a valid license until the completion of the work.

Any failure to fulfill this requirement shall attract the penal provisions of this contract arising out of the resultant non-execution of the work.

**CLAUSE 19 A**

No labour below the age of eighteen years shall be employed on the work.

**CLAUSE 19 B**

Payment of wages:

**Payment  
of wages**

- i) The contractor shall pay to labour employed by him either directly or through sub-contractors, wages not less than fair wages as defined in the contractor's Labour Regulation or as per the provisions of the contract labour (Regulation and Abolition) Act 1970, and the contract labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.
- ii) The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.
- iii) In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the contractor's Labour Regulations made by the HLL / HLL from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorisedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the contract labour(Regulation & Abolition) Act, 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.
- iv) a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are

not justified by their terms of the contract or non-observance of the Regulations.

- b) Under the provisions of Minimum Wages (Central) Rules, 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for six days continuous work and pay wages at the same rate as for duty. In the event of default the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-Charge concerned.

In the case of Union Territory of Delhi, however, as the all inclusive minimum daily wages fixed under Notification of the Delhi Administration No.F.12 (162) MWO/DAB/43884-91, dated 31.12.1979 as amended from time to time are inclusive of wages for the weekly day of rest, the question of extra payment for weekly holiday would not arise.

- v) The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act 1938, workmen's compensation Act, 1923, industrial disputes Act, 1947, Maternity benefits act, 1961, and the contractor's labour (Regulation and Abolition) Act, 1970, or the modifications their of or any other laws relating their to and the rules made their under from time to time.
- vii) The contractor shall indemnify and keep indemnified HLL against payments to be made under and for the observance of the Laws aforesaid and the contractor's Labour Regulations without prejudice to his right to claim indemnity from his sub-contractors.
- viii) The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
- ix) Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such wage shall be paid by the contractor to the Workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise.
- x) The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

#### CLAUSE 19 C

In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall, at his own expense, arrange for the safety provisions as per Safety Code framed from time to time and shall, at his own expense, provide for all facilities in connection therewith. In case the contractor fails to make arrangements and provide necessary facilities as aforesaid he shall be liable to pay a penalty of Rs.200/- for each default and in addition the Engineer-in-Charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

**CLAUSE 19 D**

The contractor shall submit by the 4th and 19th of every month, to the Engineer-in-Charge a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively:-

- (1) the number of labourers employed by him on the work,
- (2) their working hours,
- (3) the wages paid to them,
- (4) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of the damages and injury caused by them, and,
- (5) the number of female workers who have been allowed maternity benefit according to Clause 19 F and the amount paid to them.

Failing which the contractor shall be liable to pay to HLL a sum not exceeding Rs.200/- for each default or materially incorrect statement. The decision of the Engineer-in-Charge shall be final in deducting from any bill due to the contractor the amount levied as fine and be binding on the Contractor.

**CLAUSE 19 E**

In respect of all labour directly or indirectly employed in the works for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by HLL from time to time for the protection of health and sanitary arrangements for workers employed by the Deptt. of Telecommunications and its contractors.

**CLAUSE 19 F**

Leave and pay during leave shall be regulated as follows:-

1. Leave:
  - (i) in the case of delivery-maternity leave not exceeding 8 weeks, 4 weeks, upto and including the day of delivery and 4 weeks following that day,
  - (ii) in case of miscarriage-upto 3 weeks from the date of miscarriage.
2. Pay:

- (i) in case of delivery- leave pay during maternity leave will be at the rate of the women's average daily earnings, calculated on total wages earned on the days when full time work was done during the period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater.
  - (ii) in the case of miscarriage – leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of three months immediately preceding the date of such miscarriage.
- 3. Conditions for the grant of Maternity Leave:  
No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than six months immediately preceding the date on which she proceeds on leave,
- 4. The contractor shall maintain a register of Maternity (Benefit) in the prescribed form as shown in Appendix-I and II, and the same shall be kept at the place of work.

#### CLAUSE 19 G

In the event of the contractor(s) committing a default or breach of any of the provisions of the Contractor's Labour Regulation and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filing any statement under the provisions of the above Regulation and Rules which is materially incorrect, he/they shall, without prejudice to any other liability, pay to the HLL a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting, filing such materially incorrect statements and in the event of the contractor (s) defaulting continuously in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of 5 percent of the estimated cost of the work put to tender. The decision of the Engineer-in-Charge shall be final and binding on the parties.

Should it appear to the Engineer-in-Charge that the contractor(s) is/ are not properly observing and complying with the provisions of the Contractor's Labour Regulations and Model Rules and the provisions of the Contract labour (Regulation and Abolition) Act, 1970, and the Contract Labour (R&A) Central Rules 1971, for the protection of health and sanitary arrangements for the work-people employed by the contractor(s)(hereinafter referred as "the said Rules") the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules to be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/or observe the said Rules and to provide the amenities to the workpeople as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities herein

before mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/their own expense and to approved standards all necessary huts and sanitary arrangements required for his/their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved Standards, the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be re-modeled and/ or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

#### CLAUSE 19 H

(i) The contractor(s) shall at his/their own cost provide his /their labour with a sufficient number of huts (hereinafter referred to as the camp) of the following specifications on a suitable plot of land to be approved by the Engineer-in-Charge.

- a) The minimum height of each hut at the eaves level shall be 2.10m (7 ft.) and floor area to be provided will be at the rate of 2.7 Sq.ms. (30 Sq.Ft.) for each member of the workers family staying with the labourers.
- b) The contractor(s) shall in addition construct suitable cooking places having a minimum area of 1.80m X 1.50m(6'X5') adjacent to the hut for each family.
- c) The contractor(s) shall also construct temporary latrines and urinals for the use of the labourers each on the scale of not less than four per each one hundred of the total strength, separate latrines and urinals being provided for women.
- d) The contractor(s) shall construct sufficient number of bathing and washing places, one unit for every 25 persons residing in the camp. These bathing and washing places shall be suitably screened.

ii)

- b) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobi on both sides. The floor may be kutchra but plastered with mud gobi and shall be atleast 15 cm (6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-Charge and the

contractor shall ensure that through out the period of their occupation the roofs remain watertight.

- c) The contractor(s) shall provide each hut with proper ventilation.
- d) All doors, windows, and ventilators shall be provided with suitable leaves for security purposes.
- e) There shall be kept an open space of at least 7.2m(8yds.) between the rows of huts which may be reduced to 6m(20ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back to back construction will be allowed.

iii) **Water Supply-** The contractor(s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purpose. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks, which may be of metal or masonry, shall be provided. The contractor(s) shall also at his/their own cost make arrangements for laying pipe lines for water supply to his/their labour camp from the existing mains wherever available, and shall pay all fees and charges therefor.

iv) The site selected for the camp shall be high ground, removed from jungle.

v) **Disposal of Excreta-** The contractor(s) shall make necessary arrangements for the disposal of excreta from the latrines by trenching or incineration, which shall be according to the requirements laid down by the Local Health Authorities. If trenching or incineration is not allowed the contractor(s) shall make arrangements for the removal of the excreta through the Municipal Committee/Authority and inform it about the number of labourers employed so that arrangements may be made by such Committee/authority for removal of the excreta. All charges on this account shall be borne by the contractor and paid direct by him to the Municipality/authority. The contractor shall provide one sweeper for every eight seats in case of dry system.

vi) **Drainage:-** The contractor(s) shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy.

vii) The Contractor(s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.

viii) **Sanitation:-** The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.

#### CLAUSE 19 I

The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractor's employment upon the work who may be incompetent or misconducts himself and the contractor shall forthwith comply with such requirements.

#### CLAUSE 19 J

It shall be the responsibility of the contractor to see that the building under construction is not occupied by any body unauthorisedly during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay a levy upto 5% of the tendered value of work may be imposed by the Competent authority of HLL whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, the Competent authority of HLL, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

#### CLAUSE 19K

The contractor shall at all stages of work deploy skilled semi skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute Industrial Training Institute / national Institute of construction Management and Research (NICMAR) National Academy of Construction. CIDC or any similar reputed and recognized institute managed/certified by State/Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled / semi skilled workers required in each trade at any stage of work. The-contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen alongwith requisite certificate from recognized Institute to Engineer in charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs.100 per such tradesman per day. Decision of Engineer-in-Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding.

Provided always, that the provisions of this clause shall not be applicable for works with estimated cost put to tender being less than Rs. 5 crores.



## CLAUSE 20

**Minimum wages Act to be compiled with**

The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labour (Regulation and Abolition) Act, 1970, amended from time to time and rules framed there under and other labour laws affecting contract labour that may be brought into force from time to time.

## CLAUSE 21

**Work not to be sublet, Action in case of Insolvency**

The contract as a whole or part thereof shall not be assigned or sublet or transferred either directly or indirectly whether by creating agent on the basis of General Power of Attorney or in any other manner or given on general power of attorney without the written approval of the Engineer-in-Charge. If the contractor shall assign or sublet or give on general power of attorney or transferred either directly or indirectly whether by creating agent on the basis of General Power of Attorney or in any other manner, his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employment of HLL in any way relating to his office or employment or if any such officer or person shall become in any way directly or indirectly interested in the contractor, or if the contractor shall obtain a contract with the HLL as a result of wrong tendering or by non bonafide methods, the Engineer-in-Charge on behalf of the HLL Lifecare Limited shall have powers to adopt any or all of the courses specified in Clause 3 hereof as he may deem best suited to the interest of HLL and in the event of any or all of these courses being adopted the consequences specified in the said Clause 3 shall ensue.

## CLAUSE 22

All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to use of HLL without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

## CLAUSE 23

**Changes in Firm's Constitution to be intimated**

Where the contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern such approval as aforesaid shall likewise be obtained before the contractor enters into any partnership agreement where-under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.

**CLAUSE 24**

All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

**CLAUSE 25****Settlement  
of disputes  
and  
arbitration**

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:-

- (i) If the contractor considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Engineer-in-Charge on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days request the Chief Engineer/ Principal Chief Engineer in writing for written instruction or decision. Thereupon, the Chief Engineer/ Principal Chief Engineer shall give his written instructions or decision within a period of one month from the receipt of the contractor's letter.

If the Chief Engineer/ Principal Chief Engineer fails to give his instructions or decision in writing within the aforesaid period or if the contractor is dissatisfied with the instructions or decision of the CE/ Principal CE, the contractor may, within 30 days of the receipt of CE/ Principal CE's decision, appeal before the Dispute Redressal Committee (DRC) along with a list of disputes with amounts claimed in respect of each such dispute and giving reference to the rejection of his disputes by the CE/ Principal CE. The Dispute Redressal Committee (DRC) shall give his decision within a period of 90 days from the receipt of Contractor's appeal. The constitution of Dispute Redressal Committee (DRC) shall be as indicated in Schedule 'F'.

If the Dispute Redressal Committee (DRC) fails to give his decision within the aforesaid period or any party is dissatisfied with the decision of Dispute Redressal Committee (DRC), then

either party may within a period of 30 days from the receipt of the decision of Dispute Redressal Committee (DRC), give notice to the Chairman & Managing Director, HLL for appointment of arbitrator on prescribed proforma as per Appendix XV, failing which, the said decision shall be final binding and conclusive and not referable to adjudication by the arbitrator.

Except where the decision has become final, binding and conclusive in terms of Sub Para (i) above, disputes or difference shall be referred for adjudication through arbitration by a sole arbitrator appointed by the Chairman & Managing Director, HLL. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever, another sole arbitrator shall be appointed in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the rejection by the Chief Engineer/ PCE of the appeal.

It is also a term of this contract that no person, other than a person appointed by C & MD, HLL, as aforesaid, should act as arbitrator and if for any reason that is not possible, the matter shall not be referred to arbitration at all.

It is also a term of this contract that if the contractor does not make any demand for appointment of arbitrator in respect of any claims in writing as aforesaid within 120 days of receiving the intimation from the Engineer-in-charge that the final bill is ready for payment, the claim of the contractor shall be deemed to have been waived and absolutely barred and HLL shall be discharged and released of all liabilities under the contract in respect of these claims.

The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 (26 of 1996) or any statutory modifications or re-enactment thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceeding under this clause.

It is also a term of this contract that the arbitrator shall adjudicate on only such disputes as are referred to him by the appointing authority and give separate award against each dispute and claim referred to him and in all cases where the total amount of the claims by any party exceeds Rs. 1,00,000/-, the arbitrator shall

give reasons for the award.

It is also a term of the contract that if any fees are payable to the arbitrator, these shall be paid equally by both the parties.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any, of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid.

#### CLAUSE 26

**Contractor to  
Indemnify HLL  
against Patent  
Rights**

The contractor shall fully indemnify and keep indemnified the HLL Lifecare Limited against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against HLL in respect of any such matters as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the HLL Lifecare Limited if the infringement of the patent or design or any alleged patents or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

#### CLAUSE 27

**Lumpsum  
Provisions  
in Tender**

When the estimate on which a tender is made includes lumpsum in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-Charge, payable by measurement, the Engineer-in-Charge may at his discretion pay the lumpsum amount entered in the estimate, and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of this clause.

#### CLAUSE 28

**Action where  
no  
Specifications  
are stipulated**

**15**

In case of any class of work for which there are no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards specifications. In case there is no such specification in Bureau of Indian Standards, the work shall be carried out as per manufacturer's specifications. In case no such manufacturer's specifications is available then as per District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

**CLAUSE 29****Withholding  
and lien in  
respect of  
sum due  
from the  
Contractor**

- i) Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-Charge or the HLL shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any, deposited by the contractor and for the purposes aforesaid, the Engineer-in-Charge or HLL shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Engineer-in-Charge or the HLL shall be entitled to withhold and have a lien to retain such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Engineer-in-Charge or the HLL or any contracting person through the Engineer-in-Charge pending finalization of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or HLL will be kept withheld or retained as such, by the Engineer-in-Charge, till the claim arising out of or under the contract is determined by the arbitrator (if the contract is governed by the arbitration clause) or by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-charge or the HLL shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/limited company as the case may be, whether in his individual capacity or otherwise.

- ii) HLL shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have

been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for HLL to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by the HLL to the contractor, without any interest thereon whatsoever.

Provided that the HLL shall not be entitled to recover any sum overpaid, nor the contractor shall be entitled to payment of any sum paid short where such payment has been agreed upon between the Engineer-in-charge on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by the Engineer-in-charge.

#### CLAUSE 29 A

**Lien in  
respect of  
claims in  
other  
contracts**

Any sum of money due and payable to the contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or the HLL or any other contracting person or persons or through Engineer-in-Charge against any claim of the Engineer-in-Charge of HLL or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge or of the HLL or with such other person or persons.

It is an agreed term of the contract that the sum of money so withheld or retained under this clause by the Engineer-in-Charge or the HLL will be kept withheld or retained as such by the Engineer-in-Charge or the HLL or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the arbitration clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this clause and duly notified as such to the contractor.

#### CLAUSE 30

**Water Supply  
and Power  
Supply**

The Contractor (s) shall make his/their own arrangements for water and power supply required for the work and nothing extra will be paid for the same. This will be subject to the following conditions:

- i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.
- ii) The Engineer-in-charge shall make alternative arrangements for water supply at the risk and cost of the contractor (s) if the arrangements made by the contractor (s) for procurement of water are in the opinion of the Engineer-in-Charge, unsatisfactory.

- iii) The contractor shall make his own arrangement for temporary electric connection and shall make necessary payment for it direct to the concerned authority. On completion of the work he shall furnish a no dues certificate from the concerned authority failing which the claims/dues of the concerned authority shall be settled by the Engineer-in-Charge at the contractor's risk and cost.

#### CLAUSE 31

**Departmental  
power & water  
supply, if  
available**

Water and power supply if available may be supplied to the contractor by the HLL subject to the following conditions:

- i) The water charges @ actual shall be recovered on gross amount of the work done.
- ii) The contractor (s) shall make his/their own arrangement of water connection and laying of pipelines from existing main source of supply
- iii) The contractor shall make his own arrangement to extend the power supply from the tapping point and install a sub meter for recording consumption of power in the work. The consumption charges thereof shall be recovered from the contractor by deduction from his bills or from any other dues.
- iv) The HLL do not guarantee to maintain uninterrupted supply of water and power and it will be incumbent on the contractor (s) to make alternative arrangements for water and power at his/their own cost in the event of any break down in the supply so that the progress of his/their work is not held up. No claim of damage or refund of water and power charges will be entertained on account of such break down.

#### CLAUSE 32

**Alternate water  
arrangements**

- i) Where there is no piped water supply arrangement and the water is taken by the contractor from the wells or hand pump constructed by the HLL no charge shall be recovered from the contractor on that account. The contractor shall, however, draw water at such hours of the day that it does not interfere with the normal use for which the hand pumps and wells are intended. He will also be responsible for all damage and abnormal repairs arising out of his use, the cost of which shall be recoverable from him. The Engineer-in-Charge shall be the final authority to determine the cost recoverable from the contractor on this account and his decision shall be binding on the contractor.
- ii) The contractor shall be allowed to construct temporary wells in HLL land for taking water for construction purposes only after he has got the permission of the Engineer-in-Charge in writing. No charges shall be recovered from the contractor on this account, but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to construction and subsequent maintenance of the wells and shall restore the ground to its

original condition after the wells are dismantled on completion of the work.

### CLAUSE 33

#### **Return of Surplus Materials**

Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of HLL either by issue from HLL stocks or purchase made under orders or permits or license issued by HLL, the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose off them without the written permission of the HLL and return, if required by the Engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the amount charged to him excluding the element of storage charges. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition the contractor shall in addition to throwing himself open to action for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to HLL for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.

### CLAUSE 34

#### **Hire of Plant & Machinery**

- i) The contractor shall arrange at his own expense all tools, plant, machinery and equipment (hereinafter referred to as T & P) required for execution of the work except for the plant & Machinery listed in Schedule 'C' and stipulated for issue to the Contractor. If the contractor requires any item of T & P on hire from the T & P available with the HLL over and above the T&P stipulated for issue, the HLL will, if such item is available, hire it to the contractor at rates to be agreed upon between him and the Engineer-in-Charge. In such a case all the conditions hereunder for issue of T&P, shall also be applicable to such T&P as is agreed to be issued.
- ii) Plant and Machinery when supplied on hire charges shown in Schedule 'C' shall be made over and taken back at the HLL equipment yard/shed shown in Schedule 'C' and the contractor shall bear the cost of carriage from the place of issue to the site of work and back. The contractor shall be responsible to return the plant and machinery with the same condition in which it was handed over to him, and he shall be responsible for all damage caused to the said plant & machinery at the site of work or elsewhere in operation and otherwise during transit including damage to or loss of plant and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Engineer-in-Charge shall be the sole judge to determine



- the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.
- iii) The plant and machinery as stipulated above will be issued as and when available and if required by the contractor. The contractor shall arrange his programme of work according to the availability of the plant and machinery and no claim, whatsoever, will be entertained from him for any delay in supply by the HLL.
  - iv) The hire charges shall be recovered at the prescribed rates from and inclusive of the date the plant and machinery made over upto and inclusive of the date of the return in good order even though the same may not have been working for any cause except major breakdown due to no fault of the contractor or faulty use requiring more than three working days continuously (excluding intervening holidays and Sundays) for bringing the plant in order. The contractor shall immediately intimate in writing to the Engineer-in-Charge when any plant or machinery gets out of order requiring major repairs as aforesaid. The Engineer-in-Charge shall record the date and time of receipt of such intimation in the log sheet of the plant or machinery. Based on this if the breakdown before lunch period or major breakdown will be computed considering half a day's breakdown on the day of complaint. If the breakdown occurs in the post lunch period of major break down will be computed starting from the next working day. In case of any dispute under this clause the decision of the Superintending Engineer shall be final and binding on the contractor.
  - v) The hire charges shown above are for each day of 8 hours (inclusive of the one-hour lunch break) or part thereof.
  - vi) Hire charges will include service of operating staff as required and also supply of lubricating oil and stores for cleaning purposes. Power fuel of approved type, firewood, kerosene oil etc. for running the plant and machinery and also the full time chowkidar for guarding the plant and machinery against any loss or damage shall be arranged by the contractor who shall be fully responsible for the safeguard and security of plant and machinery. The contractor shall on or before the supply of plant and machinery sign an agreement indemnifying the HLL against any loss or damage caused to the plant and machinery either during transit or at site of work.
  - vii) Ordinarily, no plant and machinery shall work for more than 8 hours a day inclusive of one-hour lunch break. In case of an urgent work however, the Engineer-in-Charge may, at his discretion, allow the plant and machinery to be worked for more than normal period of 8 hours a day. In that case the hourly hire charges for overtime to be borne by the contractor shall be 50 % more than the normal proportionate hourly charge (1/8<sup>th</sup> of the daily charges) subject to a minimum of half day's normal charges on any particular day. For working out hire charges for

over time a period of half an hour and above will be charged as one hour and a period of less than half an hour will be ignored.

- viii) The contractor shall release the plant and machinery every seventh day for periodical servicing and/or wash out which may take about three to four hours or more. Hire charges for full day shall be recovered from the contractor for the day of servicing/wash out irrespective of the period employed in servicing.
- ix) The plant and machinery once issued to the contractor shall not be returned by him on account of lack of arrangements of labour and materials, etc. on his part, the same will be returned only when they are required for major repairs or when in the opinion of the Engineer-in-Charge the work or a portion of work for which the same was issued is completed.
- x) Logbook for recording the hours of daily work for each of the plant and machinery supplied to the contractor will be maintained by the HLL and will be countersigned by the contractor or his authorized agent daily. In case the contractor contests the correctness of the entries and/or fails to sign the Log Book the decision of the Engineer-in-Charge shall be final and binding on him. Hire charges will be calculated according to the entries in the Log Book and will be binding on the contractor. Recovery on account of hire charges for road rollers shall be made for the minimum number of days worked out on the assumption that a roller can consolidate per day and maximum quantity of materials or area surfacing as noted against each in the annexed statement (see attached annexure)
- xi) In the case of concrete mixers, the contractors shall arrange to get the hopper cleaned and the drum washed at the close of the work each day or occasion.
- xii) In case rollers for consolidation are employed by the contractor himself, log book for such rollers shall be maintained in the same manner as is done in case of HLL rollers, maximum quantity of any items to be consolidated for each roller-day shall also be same as in Annexure to Clause 34(x). For less use of roller recovery for the less roller days shall be made at the stipulated issue rate.
- xiii) The contractor shall be responsible to return the plant and machinery in the condition in which it was handed over to him and he shall be responsible for all damage caused to the said plant and machinery at the site of work or elsewhere in operation or otherwise or during transit including damage to or loss of parts, and for all losses due to his failure to return the same soon after the completion of the work for which it was issued. The Engineer-in-Charge shall be the sole judge to determine

the liability of the contractor and its extent in this regard and his decision shall be final and binding on the contractor.

- xiv) The contractor will be exempted from levy of any hire charges for the number of days he is called upon in writing by the Engineer-in-Charge to suspend execution of the work, provided HLL plant and machinery in question have, in fact, remained idle with the contractor because of the suspension.
- xv) In the event of the contractor not requiring any item of plant and machinery issued by HLL though not stipulated for issue in Schedule 'C' any time after taking delivery at the place of issue, he may return it after two days written notice or at any time without notice if he agrees to pay hire charges for two additional days without, in any way, affecting the right of the Engineer-in-Charge to use the said plant and machinery during the said period of two days as he likes including hiring out to a third party.

#### CLAUSE 35

**Conditions  
relating to  
use of  
Asphaltic  
Materials**

- i) The contractor undertakes to make arrangement for the supervision of the work by the firm supplying the tar or bitumen used.
- ii) The contractor shall collect the total quantity of tar or bitumen required for the work as per standard formula, before using the same, and shall hypothecate it to the Engineer-in-Charge. If any bitumen or tar remains unused on completion of the work on account of lesser use of materials in actual execution for reasons other than authorised changes of specification and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-Charge shall be made and the material returned to the contractor. Although the materials are hypothecated to HLL, the contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of work without the consent of the Engineer-in-Charge in writing.
- iii) The contractor shall be responsible for rectifying defects noticed within a year from the date of completion of the work and the portion of security deposit relating to asphaltic work shall be refunded after the expiry of this period

#### CLAUSE 36

**Employment  
of Technical  
Staff and  
employees**

- Contractors Superintendence, Supervision, Technical Staff & Employees
- i) The contractor shall provide all necessary superintendence during execution of the work and as long thereafter as may be necessary for proper fulfilling of the obligations under the contract.

The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge the name, qualifications, experience, age, address and other particulars along with certificates, of the principal technical representative to be in charge of the work. Such qualifications and experience shall not be lower than specified in Schedule 'F'. The Engineer-in-Charge shall within 15 days of receipt of such communication intimate in writing his approval or otherwise of such representative to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the contractor shall appoint another such representative according to the provisions of this clause. Decision of the Engineer-in-Charge shall be final and binding on the contractor in this respect. Such a principal technical representative shall be appointed by the contractor soon after receipt of the approval from the Engineer-in-Charge and shall be available at site within fifteen days of start of the work.

If the contractor (or any partner in case of firm/company) who himself has such qualifications, it will not be necessary for the said contractor to appoint such a principal technical representative but the contractor shall designate and appoint a responsible agent to represent him and to be present at the work whenever the contractor is not in a position to be so present. All the provisions applicable to the principal technical representative under the Clause will also be applicable in such a case to contractor or his responsible agent. The principal technical representative and/or the contractor shall on receiving reasonable notice from the Engineer-in-Charge or his designated representative(s) in charge of the work in writing or in person or otherwise, present himself to the Engineer-in-Charge and/or at the site of work, as required, to take instructions. Instructions given to the Principal technical representative or the responsible agent shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and/or the contractor or his responsible authorized agent shall be actually available at site at least two working days every week, these days shall be determined in consultation with the Engineer-in-Charge as well as fully during important stages of execution of work, during recording measurement of works and whenever so required by the Engineer-in-Charge by a notice as aforesaid and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative in the site order book and shall affix his signature in token of noting down the instructions and in token of acceptance of measurements. There shall be no objection if the representative/agent looks after more than one work and not more than three works in the same station provided these details are disclosed to the Engineer-in-Charge and he shall be satisfied that the provisions and purpose of this clause are fulfilled satisfactorily.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative or agent is effectively appointed or is effectively attending or fulfilling the provisions of this clause, a recovery shall be effected from the contractor as specified in Schedule 'F' and the decision of the Engineer-in-Charge as recorded in the site order book and measurement recorded in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint a suitable technical representative or responsible agent and if such appointed persons are not effectively present or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as a suitable agent is appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative/ responsible agent along-with every on account bill/ final bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

- ii) The contractor shall also provide and employ on the site the required complement of technical assistants and foreman who are skilled and experienced in their respective fields for proper supervision of the work.

The contractor shall provide and employ skilled, semi skilled and unskilled labour as is necessary for proper and timely execution of the work.

The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconducts himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the written permission of the Engineer-in-Charge and the person so removed shall be replaced as soon as possible by competent substitutes.

#### CLAUSE 37

##### **Levy/ Taxes Payable by Contractor**

- i) Sales Tax or any other tax on materials in respect of this contract shall be payable by the contractor and HLL shall not entertain any claim whatsoever in this respect.
- ii) The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, stone, kankar, etc. from local authorities.
- iii) If pursuant to or under any law, notification or order any royalty, Cess or the like becomes payable by the HLL and does not anytime become payable by the contractor to the State HLL, Local authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the HLL and it will have the right and be entitled to recover the amount paid in circumstances as aforesaid from dues of the contractor.

## CLAUSE 38

**Conditions for reimbursement of Levy/ Taxes, if levied after receipt of tenders**

- i) All tendered rates shall be inclusive of all taxes and levies payable under respective statutes. However, pursuant to the constitution (46<sup>th</sup> Amendment) Act, 1982, if any further tax or levy is imposed by statute, the last stipulated date for the receipt of tender including extensions, if any, and the contractor thereupon necessarily and properly pays such taxes/levies the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Engineer in Charge ( whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.
- ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the HLL and/or the Engineer-in-Charge and further shall furnish such other information/document as the Engineer-in-Charge may require from time to time.
- iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy, pursuant to the Constitution (Forty Sixth Amendment) Act 1982, give a written notice thereof to the Engineer-in-Charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

## CLAUSE 39

**Termination of Contract on death of Contractor**

Without prejudice to any of the rights or remedies under this contract if the contractor dies, the Engineer-in-Charge on behalf of the HLL Lifecare Limited shall have the option of terminating the contract without compensation to the contractor.

## CLAUSE 40

**If relation working in HLL, then Contractor not allowed to tender**

The company or firm or any other person shall not be permitted to tender for works in HLL Civil Zone in which his near relative (s) (directly recruited or on deputation in HLL) is/are posted in any capacity either non-executive or executive employee.

The contractor shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relative to any executive employee/ gazetted officer in the HLL or Ministry of Health and Family Welfare.

Any breach of these conditions by the Company or Firm or any other person, the tender/work will be cancelled and Earnest Money/ Security Deposit will be forfeited at any stage, whenever it is so noticed. The department will not pay any damages to the company or Firm or the concerned person. The

Company or Firm or the person will also be debarred for further participation in the tender in the concerned HLL Civil Zone. Further, any breach of this condition by the tenderer would also render him liable to be removed from the approved list of contractors or this Department. If however the contractor is registered in any other Department he shall also be debarred from tendering in HLL for any breach of this condition.

NOTE: - Near relative (s) for this purpose is/are defined as :-

- (i) Member of Hindu Undivided family (UHF).
- (ii) They are Husband and Wife.
- (iii) The one is related to other in the manner as father, mother, son(s) & Son's wife (daughter-in-law), Daughter(s), Daughter's husband (son-in-law), brother(s), brother's wife, sister(s), sister's husband (brother-in-law).

#### CLAUSE 41

**No Gazetted Officer/ Engineer to work as Contractor within one year of Retirement**

No engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in an engineering department of the Government of India shall work as a contractor or employee of a contractor for a period of one years after his retirement from Government service without the previous permission of Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Government of India as aforesaid, before submission of the tender or engagement in the contractor's service, as the case may be.

#### CLAUSE 42

**Compensation during warlike situations**

The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected there-with, shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall, when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provisions of the agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation upto the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Engineer-in-Charge upto Rs.5000/- and by the DGM(T) for a

higher amount. The contractor shall be paid for the damages/destruction suffered and for the restoring the material at the rate based on analysis of rates tendered for in accordance with the provisions of the contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and purpose for which they were collected shall be final and binding on all parties to this contract.

Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operation (a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the A.R.P. Officers or the Engineer-in-Charge (b) for any materials etc. not on the site of the work or for any tools, plant, machinery, scaffolding, temporary building and other things not intended for the work.

In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Engineer-in-Charge.

#### CLAUSE 43

**Apprentices  
Act  
provisions to  
be complied  
with**

The contractor shall comply with the provisions of the Apprentices Act, 1961 and the rules and orders issued thereunder from time to time. If he fails to do so, his failure will be a breach of the contract and the Engineer-in-charge may, in his discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

#### CLAUSE 44

**Release of  
Security  
Deposit  
after labour  
clearance**

Security Deposit of the work shall not be refunded till the contractor produces a clearance certificate from the Labour Officer. As soon as the work is virtually complete the contractor shall apply for the clearance certificate to the Labour Officer under intimation to the Engineer-in-Charge. The Engineer-in-Charge, on receipt of the said communication, shall write to the Labour Officer to intimate if any complaint is pending against the contractor in respect of the work. If no complaint is pending, on record till after 3 months after the completion of the work and/or no communication is received from the Labour Officer to this effect till six months after the date of completion, it will be deemed to have received the clearance certificate and the Security Deposit will be released if otherwise due.

#### CLAUSE 46

**Insurance**

Without limiting the Contractor's obligations and responsibilities stated elsewhere in the Contract, the Contractor shall at his own cost arrange, secure and maintain insurance in the joint names of the HLL and the contractor with any of the subsidiary of the General Insurance Corporation of India in such a manner that the HLL and the contractor are covered for all time during the



period of contract i.e. the time period allowed for completion of work, extended period and the defect liability period. The insurance shall be effected in accordance with terms approved by the HLL and the contractor shall submit the insurance policies to the Engineer-In-Charge within one week of signing of the agreement along with the receipt of premium. The contractor shall timely pay and submit the receipts of payment of premiums for extensions of policies, if any. The insurance shall cover the following:-

A. Contractor's All Risks Insurance

The contractor shall insure the work for a sum equivalent to the Contract value or such additional sums as specified and the interests of the HLL against ALL RISKS claims, proceedings, loss or damages, costs, charges and expenses from whatsoever cause arising out of or in consequence of the execution and maintenance of the work for which the contractor is responsible under the contract

B. Workman Compensation & Employers Liability Insurance.

This insurance shall be effected for all the contractor's employees engaged in the performance of the contract. The HLL shall not be liable in respect of any damages or compensation payable at law in respect of or in consequence of any accident or injury to any workman or any other person in the employment of the contractor and the contractor shall indemnify and keep indemnified the HLL against all such damages and compensation and against all claims, demands, proceedings, costs, charges and expenses, whatsoever in respect or in relation thereof.

C. Third Party Insurance.

The contractor shall be responsible for making good to the satisfaction of the Engineer-in-Charge any loss or any damage to all structures and properties belonging to the HLL or being executed or procured or being procured by the HLL or of the other agencies within the premises of all work of the HLL. If such loss or damage is due to fault and or the negligence or willful acts or omissions of the contractor, his employees, agents, representatives.

The contractor shall take sufficient care in moving his plants, equipments and materials from one place to another so that they do not cause any damage to any person or to the property of the HLL or any third party including overhead and underground cables and in the event of any damage resulting to the property of the HLL or to a third party during the movement of the aforesaid plant, equipment or materials, the cost of such damages including eventual loss of production, operation or services in any plant or establishment as estimated by the HLL or ascertained or demanded by the third party, shall be borne by the contractor.

Before commencing the execution of the work, the contractor, shall insure and indemnify and keep the HLL harmless of all claims, against the contractor's liability for any materials or physical damage, loss or injury which may occur to any property, including that of the HLL or to any person including any

employee of HLL, or arising out of the execution of the work or in the carrying out of the contract, otherwise than due to the matters referred to in the provision to (a) above. Such insurance shall be effected for an amount sufficient to cover such risks. The terms shall include a provision whereby, in the event of any claim in respect of which the contractor, would be entitled to receive indemnify under the policy being brought or made against the HLL, the insurer willfully indemnify HLL against such claims and any costs, charges and expenses in respect thereof.

- D. The contractor shall also at times indemnify the HLL against all claims, damages or compensation under the provisions of Payment or Wages Act, 1936, Minimum Wages Act, 1948, Employer's Liability Act, 1938, the Workman's Compensation Act, 1947, Industrial Disputes Act, 1947 and Maternity Benefit Act, 1961, or any modification thereof or any other law relating thereof and rules made there under from time to time.
- E. Contractor shall also at his own cost carry and maintain any and all other insurance(s) which he may be required to take out under any law or regulation from time to time. He shall also carry and maintain any other insurance, which may be required by the Engineer-in-Charge.
- 46.2 The Contractor shall prove to the Engineer-in-charge from time to time he has taken out all the insurance policies referred to above and has paid the necessary premiums for keeping the policies alive till expiry of the Defects Liability Period.
- 46.3 The aforesaid insurance policies shall provide that they shall not be cancelled till the Engineer-in-charge has agreed for cancellation.
- 46.4 Remedy on the contractor's failure to insure

If the contractor shall fail to effect and keep in force the insurance referred to above or any other insurance which he/they may be required to effect under the terms of the contract then and in any such case Engineer-in-charge may without being bound to, effect and keep in force any such insurance and pay such premium or premiums, as may be necessary for that purpose and from time to time deduct the amount so paid by the Engineer-in-charge from any moneys due or which may become due to the contractor or recover the same as a debt due from the contractor.

#### Clause 47

Office  
accommodation for  
Contractor,  
Employer/Employe  
r's representative  
and visiting  
officials

The Contractor shall provide and maintain all necessary office/s, workshops, stores, shelters, sanitary facilities, canteens and other temporary buildings for themselves and their staff at site to the approval of the Employer's Representative

Within 30 days of the date of the work order/handing over of site the Contractor shall also provide without any extra cost office accommodation of approx. 60 Sqm. in the existing building which will be air-conditioned for the Employer's Representative, visiting and inspecting officials, Meeting Room with attached Toilets. The office spaces shall be well lighted and cooled and shall be provided with adequate number of electric lights, plug points, ceiling fans, water cooler and Air-conditioners and all required furniture and fittings including cabinets and drawing stands. The layout and detail plan of all temporary office accommodations to be built at the site shall be to the approval of the Employer/ Employer's Representative.

All expenses for maintenance of the above facilities as well as running expenses shall be borne by the Contractor at no extra cost.

## SAFETY CODE

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than  $\frac{1}{4}$  to 1 ( $\frac{1}{4}$  horizontal and 1 vertical).
2. Scaffolding of staging more than 3.6 m (12 ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured atleast 90 cm (3 ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working Platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 ms (12 ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.
4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm (3 ft.).
5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m (30 ft) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (11  $\frac{1}{2}$ "") for ladder upto and including 3 metre (10 ft.) in length. For longer ladders this width should be increased atleast  $\frac{1}{4}$ " for each additional 30 cm.(1 foot) of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which maybe awarded in any such suit, action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.
6. Excavation and trenching- All trenches 1.2 m (4 ft.) or more in depth, shall at all times be supplied with atleast one ladder for each 30 metre (100 ft) in length or fraction thereof. Ladder shall extend from bottom of the trench to atleast 90 cm. (3 ft) above the surface of the ground. The sides of the trenches, which are 1.5 m (5 ft) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated material shall not be placed within 1.5 m (5 ft) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.
7. Demolition. - Before any demolition work is commenced and also during the progress of the work,
  - i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
  - ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

- iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.
8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned. The following safety equipment shall invariably be provided.
- i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
  - ii) Those engaged in whitewashing and mixing or stacking of cement bags or any material, which is injurious to the eyes, shall be provided with protective goggles.
  - iii) Those engaged in welding works shall be provided with welder's protective eye shields.
  - iv) Stonebreakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
  - v) When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated atleast for an hour before the workers are allowed to get into manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measures are adhered to:-
    - a) Entry for workers into the line shall not be allowed except under supervision of the Engineer in Charge or any other higher officer.
    - b) Atleast 5 to 6 manholes upstream and downstream should be kept open for atleast 2 to 3 hours before any man is allowed to enter into the manhole for working inside.
    - c) Before entry presence of toxic gases should be tested by inserting wet lead acetate paper, which changes colour in the presence of such gases and gives indication of their presence.
    - d) Presence of oxygen should be verified by lowering a detector lamp into the manhole. In case, no oxygen is found inside the sewer line, worker should be send only with oxygen kit.
    - e) Safety belt with rope should be provided to the workers. While working inside the manhole such rope should be handled by two men standing outside to enable him to be pulled out during emergency.
    - f) The area should be barricaded or cordoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever for the cleaning works are undertaken during night or day.
    - g) No smoking or open flames shall be allowed near the blocked manhole being cleaned.
    - h) The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.
    - i) Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge may decide the time upto which worker may be allowed to work continuously inside the manhole.
    - j) Gas masks with Oxygen cylinder should be kept at site for use in emergency.
    - k) Air blowers should be used for flow of fresh air through the manholes. Whenever called for, portable air blowers are recommended for ventilating the manholes. The motors for these, shall be vapour proof and of totally enclosed type. Non-sparking gas engines

also could be used but they should be placed at least 2 metres away from the opening and on the leeward side, protected from wind so that they will not be the source of friction on any inflammable gas that might be present.

- l) The workers engaged for cleaning the manholes/sewers should be properly trained before allowing working in the manhole.
  - m) The worker shall be provided with Gumboots or non-sparking shoes bump helmets and gloves non-sparking tools and safety lights and gas masks and portable air-blowers (when necessary). They must be supplied with barrier cream for anointing the limits before working inside the sewer lines.
  - n) Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.
  - o) If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.
  - p) The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.
  - vi) The contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Whenever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken: -
    - a) No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
    - b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scrapped.
    - c) Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.
9. The Contractor shall not employ women and men below the age of 18 years on the work of painting with product containing lead in any form. Whenever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use:
- (i) White lead, sulphate of lead or product containing these pigments, shall not be used in painting operation except in the form of pastes or paint ready for use.
  - (ii) Measures shall be taken, wherever required in order to prevent danger arising from the application of paint in the form of spray.
  - (iii) Measures shall be taken, wherever practicable to prevent danger arising out of from dust caused by dry rubbing down and scrapping.
  - (iv) Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
  - (v) Overall shall be worn by working painters during the whole of working period.
  - (vi) Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.

- (vii) Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man appointed by the competent authority of HLL
  - (viii) HLL may require, when necessary, medical examination of workers.
  - (ix) Instructions with regard to special hygienic precautions, to be taken in the painting trade, shall be distributed to working painters.
10. When the work is done near any place where there is risk of drowning, all necessary equipment should be provided & kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.
11. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions: -
- i) (a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.
  - (b) Every rope used in hoisting or lowering materials or as means of suspension shall be of durable quality and adequate strength, and free from patent defects.
  - (ii) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.
  - (iii) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley blocks used in hoisting or as means of suspension the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear, referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
  - (iv) In case of HLL machines, the safe working load shall be notified by the Electrical Engineer-in-Charge. As regard contractor's machines the contractors shall notify the safe working load of the machines to the Engineer-in-Charge whenever he brings any machinery to the site of work and get it verified by the Electrical Engineer concerned.
12. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energised, insulating mats, wearing apparel, such as gloves, sleeves and boots, as may be necessary, should be provided. The worker should not wear any rings, watches and carry keys or other materials, which are good conductors of electricity.
13. All scaffolds ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.
14. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.
15. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by Labour Officer or the Engineer-in-Charge or their representatives.
16. Notwithstanding the above clauses from (1) to (15) there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

## MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY HLL LIFECARE LIMITED OR ITS CONTRACTORS

### 1. APPLICATION

These rules shall apply to all buildings and construction works in charge of the HLL Lifecare Ltd in which twenty or more workers are ordinarily employed or are proposed to be employed in any day during the period during which the contract work is in progress.

### 2. DEFINITION

**Work place** means a place where twenty or more workers are ordinarily employed in connection with construction work, on any day during the period, during which the contract work is in progress.

### 3. FIRST-AID FACILITIES

- i) At every work place there shall be provided and maintained, so as to be easily accessible during working hours, first aid boxes at the rate of not less than one box for 150-contract labour or part thereof ordinarily employed.
- ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment: -
  - a) For work places in which the number of contract labour employed does not exceed 50- Each first-aid box shall contain the following equipment: -
    1. 6 small sterilised dressings.
    2. 3 medium size sterilised dressings.
    3. 3 large size sterilised dressings.
    4. 3 large sterilised burn dressings.
    5. 1 (30 ml.) bottle containing a two percent alcoholic solution of iodine
    6. 1 (30ml) bottle containing salvolatile having the dose and mode of administration indicated on the label.
    7. 1 snakebite lancet.
    8. 1 (30gms.) bottle of potassium permanganate crystals.
    9. 1 pair scissors.
    10. 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institute, Government of India.
    11. 1 Bottle containing 100 tablets (each of 5 gms.) of aspirin.
    12. Ointment for burns.
    13. A bottle of suitable surgical antiseptic solution
  - b) For workplaces in which the number of contract labour exceeds 50- Each first-aid- box shall contain the following equipment.
    1. 12 small sterilised dressing.
    2. 6 medium size sterilised dressings.
    3. 6 large size sterilised dressings.
    4. 6 large size sterilised burn dressings.
    5. 6 (15-gms.) packets sterilised cotton wool.
    6. 1 (60 ml.) bottle containing two percent alcoholic solution iodine.



7. 1 (60-ml.) bottle containing salvolite latile having the dose and mode of administration indicated on the label.
  8. 1 roll of adhesive plaster.
  9. 1 snake bite lancet.
  10. 1 (30 gms.) bottle of potassium permanganate crystals.
  11. 1 pair of scissors.
  12. 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labour Institute/ Government of India.
  13. A bottle containing 100 tablets (each of 5 gms.) of aspirin.
  14. Ointment for burns.
  15. A bottle of suitable surgical antiseptic solution.
- iii) Adequate arrangements shall be made for immediate recoupment of the equipment when necessary.
  - iv) Nothing except the prescribed contents shall be kept in the First-aid box.
  - v) The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours at the work place.
  - vi) A person in charge of the first-aid box shall be a person trained in First-Aid treatment, at the work places where the number of contract labour employed is 150 or more.
  - vii) In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from the works, First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.
  - viii) Where work places are situated in places, which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

#### 4. DRINKING WATER

- i) 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.
- ii) 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.
- iii) Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of pollution. Where water has to be drawn from an existing well, which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it or for drinking. All such wells shall be entirely closed in and be provided with a trap door, which shall be dust and waterproof.
- iv) A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

**5. WASHING FACILITIES**

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

**6. LATRINES AND URINALS**

- i) Latrines shall be provided in every work place on the following scale namely:-
  - a) Where female are employed there shall be at least one latrine for every 25 females.
  - b) 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 the first 100, and one for every 50 thereafter.

- ii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
- iii) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside at least once a year. Latrines shall not be of a standard lower than bore-hole system.
- iv)
  - a) Where workers of both sexes are employed, there shall be displayed outside 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.
  - b) The notice shall also bear the figure of a man or a woman, as the case may be.
- v) There shall be at least one urinal for upto 50 number of male workers and one for upto 50 number of female workers 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.
- vi)
  - a) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
  - b) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.
- vii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.
- viii) Disposal of excreta: - Unless otherwise arranged for 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 a 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).
- ix) 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 on the site. The contractor shall be responsible for payment of any charges, which may be levied by Municipal or Cantonment Authority for execution of such on his behalf.

**7. PROVISION OF SHELTER DURING REST**

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 metres (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq. m. (6 sq. ft.) per head.

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

**8. CRECHES**

- i) At every work place, at which 20 or more women worker are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under the age of six years. One room shall be used as a playroom for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause 19 H (ii) a, b & c.
- 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 the playroom and sufficient number of cots and beddings in the bedroom.
- iv) The contractor shall provide one ayah 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.

**9. 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 one hundred or more are ordinarily employed, an adequate canteen shall be provided by the contractor for the use of such contract labour.
- ii) The contractor shall maintain the canteen in an efficient manner.
- iii) The canteen shall consist of atleast a dining hall, kitchen, storeroom, pantry and washing places, separately for workers and utensils.
- iv) The canteen shall be sufficiently lighted 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 atleast once in each year. Provided that the inside walls of the kitchen shall be lime-washed every 4 months.
- vi) The premises of the canteen shall be maintained in a clean and sanitary condition.
- vii) Wastewater shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.
- viii) Suitable arrangements shall be made for the collection and disposal of garbage.
- 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 square metre (10 sft.) per diner to be accommodated as prescribed in sub-Rule 9.
- xi)
  - a) A portion of the dining hall and service counter shall be partitioned off and reserved for women workers in proportion to their number.
  - b) Washing places for women shall be separate and screened to secure privacy.
- xii) Sufficient tables' stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule 9.
- xiii)
  - a)
    - 1. There shall be provided and maintained, sufficient utensils, crockery, furniture and any other equipment's, necessary for the efficient running of the canteen.
    - 2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.
  - b)
    - 1. Suitable clean cloths 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's.
- xiv) The foodstuffs 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 foodstuffs, beverages and any 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 food stuffs, and other articles 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 charge for the building and equipment's provided for the canteen.
  - c) The cost of purchase, repairs and replacement of equipment's 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's provided for the canteen.
- xvii) Registered accountants and auditors shall audit the accounts pertaining to the canteen once every 12 months.

#### **10. ANTI-MALARIAL PRECAUTIONS**

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

- 11.** The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts.

#### **12. AMENDMENTS**

HLL may, from time to time, add to or amend these rules and issue directions it may consider necessary for the purpose of removing any difficulty, which may arise in the administration thereof.

### **CONTRACTOR'S LABOUR REGULATIONS**

## 1. SHORT TITLE

These regulations may be called the Contractors Labour Regulations.

## 2. DEFINITIONS

- i) **Workman** means, any person employed by HLL or its contractor directly or indirectly, through a subcontractor, with or without the knowledge of the HLL, to do any skilled, semiskilled or unskilled, manual, supervisory, technical or clerical work, for hire or reward, whether the terms of employment are expressed or implied, but does not include any person: -
  - a) Who is employed mainly in a managerial or administrative capacity; or,
  - b) Who, being employed in a supervisory capacity draws wages exceeding five hundred rupees per mensem or exercises either by the nature of the duties attached to the office or by reason of powers vested in him, functions mainly of managerial nature; or,
  - c) Who is an out worker, that is to say, person to whom any article or materials are given out by or on behalf of the principal employers to be made up cleaned, washed, altered, ornamental finished, repaired adopted or otherwise processed for sale for the purpose of the trade or business of the principal employers and the process is to be carried out either in the home of the out worker or in same other premises, not being premises under the control and management of the principal employer.
- ii) **Fair Wages** means wages whether for time or piecework fixed and notified under the provision of the Minimum Wages Act from time to time.
- iii) **Contractors** shall include every person who undertakes to produce a given result other than a mere supply of goods or articles of manufacture through contract labour or who supplies contract labour for any work and includes a subcontractor.
- iv) **Wages** shall have the same meaning as defined in the Payment of Wages Act.

## 3.

- i) Normally working hours of an adult employee should not exceed 9 hours a day and in case of child 4 ½ hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.
- ii) When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week he shall be paid over time for the extra hours put in by him at double the ordinary rate of wages. Children shall not be made to work extra hours.
- iii)
  - a) Every worker shall be given a weekly holiday normally on a Sunday, in accordance with the provisions of Minimum Wages (Central) Rules 1960, as amended from time to time, irrespective of whether such worker is governed by the Minimum Wages Act or not.
  - b) Where the minimum wages prescribed by the HLL, under the Minimum Wages Act, are not inclusive of the wages for the weekly day of rest, the worker shall be entitled to rest day wages, at the rate applicable to the next preceding day, provided he has worked under the same contractor for a continuous period of not less than 6 days.
  - c) Where a contractor is permitted by the Engineer-in-Charge to allow a worker to work on a normal weekly holiday, he shall grant a substituted holiday to him for the whole day, on one of the five days, immediately before or after the normal weekly holiday, and pay wages to such worker for the work performed on the normal weekly holiday at the overtime rate.

## 4. DISPLAY OF NOTICE REGARDING WAGES ETC.

The contractor shall, before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain, in a clear and legible condition in conspicuous places on the work, notices in English and in local Indian languages spoken

by the majority of the workers, giving the minimum rates of the wages fixed under Minimum Wages Act, the actual wages being paid, the hours of work for which such wage are earned, wages periods, dates of payments of wages and other relevant information as per Appendix 'III'.

## **5. PAYMENT OF WAGES.**

- i) The contractor shall fix wage periods in respect of which wages shall be payable.
- ii) No wage period shall exceed one month.
- iii) The wages of every person employed as contract labour in an establishment or by a contractor, where less than one thousand such persons are employed, shall be paid before the expiry of seventh day and in other cases before the expiry of tenth day after the last day of the wage period in respect of which the wages are payable.
- iv) Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.
- v) All payment of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.
- vi) Wages due to every worker shall be paid to him direct or to other person authorised by him in this behalf.
- vii) All wages shall be paid in current coin or currency or in both.
- viii) Wages shall be paid without any deductions of any kind except those specified by the Central HLL by general or special order in this behalf or permissible under the Payment of Wages Act 1956.
- ix) A notice showing the wages period and the place and time of disbursement of wages shall be displayed at the place of work and a copy sent by the contractor to the Engineer-in-Charge under acknowledgement.
- x) It shall be the duty of the contractor to ensure the disbursement of wages in presence of authorised representative of the Engineer-in-Charge who will be required to be present at the place and time of the disbursement of wages by the contractor to workmen.
- xi) The contractor shall obtain from the or any other authorised representative of the Engineer-in-Charge, as the case may be, a certificate under his signature at the end of the entries in the "Register of Wages" or the "Wage-cum-Muster Roll", as the case may be, in the following form: -

"Certified that the amount shown in the column No.....has been paid to the workman concerned in my presence on.....at....."

## **6. FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES**

- (i) The wages of a worker shall be paid to him without any deduction of any kind except the following: -
  - (a) Fines
  - (b) Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.

- (c) Deductions for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money or any other deductions which he is required to account, where such damage or loss is directly attributable to his neglect or default.
  - (d) Deduction for recovery of advances or for adjustment of overpayment of wages, advances granted shall be entered in a register.
  - (e) Any other deduction, which the Central Government may from time to time, allows.
  - (ii) No fines should be imposed on any worker save in respect of such acts and omissions on his part as have been approved of by the Chief Labour Commissioner.
- Note:-** An approved list of Acts and Omission for which fines can be imposed is enclosed at Appendix-X.
- (iii) No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.
  - (iv) The total amount of fine, which may be imposed, in any one-wage period, on a worker, shall not exceed an amount equal to three paise in a rupee of the total wages, payable to him in respect of that wage period.
  - (v) No fine imposed on any worker shall be recovered from him by instalment, or after the expiry of sixty days from the date on which it was imposed.
  - (vi) Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

## 7. LABOUR RECORDS

- (i) The contractor shall maintain a **Register of Persons employed** on work on contract in Form XIII of the CL (R&A) Central Rules 1971 (Appendix IV)
- (ii) The contractor shall maintain a **Muster Roll** register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix V)
- (iii) The contractor shall maintain a **Wage Register** in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VI)
- (iv) **Register of accident** – The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:
  - a) Full Particulars of the labourers who met with accident.
  - b) Rate of wages.
  - c) sex
  - d) Age
  - e) Nature of accident and cause of accident
  - f) Time and date of accident
  - g) Date and time when admitted in hospital
  - h) Date of discharge from the hospital
  - i) Period of treatment and result of treatment
  - j) Percentage of loss of earning capacity and disability as assessed by Medical Officer.

- k) Claim required to be paid under Workmen's Compensation Act.
  - l) Date of payment of compensation
  - m) Amount paid with details of the person to whom the same was paid
  - n) Authority by whom the compensation was assessed
  - o) Remarks.
- v) The contractor shall maintain a **Register of Fines** in the Form XII of the CL (R&A) Rules 1971 (Appendix XI) The contractor shall display in a good condition and in a conspicuous place of work the approved list of acts and omission for which fines can be imposed (Appendix X)
  - v) The contractor shall maintain a **Register of deductions for damage or loss** in Form XX of the CL (R&A) Rules 1971 (Appendix XII).
  - vii) The contractor shall maintain a **Register of Advances** in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIII).
  - vii) The contractor shall maintain a **Register of Overtime** in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIV).

#### 8. ATTENDANCE CARD-CUM WAGE SLIP

- i) The contractor shall issue an **Attendance card cum wage slip** to each workman employed by him in the specimen form at (Appendix-VII).
- ii) The card shall be valid for each wage period.
- iii) The contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.
- iv) The card shall remain in possession of the worker during the wage period under reference.
- v) The contractor shall complete the wage slip portion on the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.
- vi) The contractor shall obtain the signature or thumb impression of the worker on the wage slip at the time of disbursement of wages and retain the card with him.

#### 9. EMPLOYMENT CARD

The contractor shall issue an **Employment Card** in the Form XIV of CL (R&A) Central Rules 1971 to each worker within three days of the employment of the worker (Appendix-VIII).

#### 10. SERVICE CERTIFICATE

On termination of employment for any reason whatsoever the contractor shall issue to the workman whose services have been terminated, a Service Certificate in the Form XV of the CL (R&A) Central Rules 1971 (Appendix-IX).

#### 11. PRESERVATION OF LABOUR RECORDS

All records required to be maintained under Regulations Nos. 6 & 7 shall be preserved in original for a period of three years from the date of last entries made in them and shall be made available for inspection by the Engineer-in-Charge or Labour Officer or any other officers authorised by the Ministry of Communication in this behalf.

#### 12. POWER OF LABOUR OFFICER TO MAKE INVESTIGATIONS OR ENQUIRY



The labour officer or any person authorised by the Central HLL on their behalf shall have power to make enquiries with a view to ascertaining and enforcing due and proper observance of Fair Wage Clauses and provisions of these Regulations. He shall investigate into any complaint regarding the default made by the contractor or subcontractor in regard to such provision.

**13. REPORT OF LABOUR OFFICER**

The Labour Officer or other persons authorised as aforesaid shall submit a report of result of his investigation or enquiry to the Engineer in charge concerned indicating the extent, if any, to which the default has been committed with a note that necessary deductions from the contractor's bill be made and the wages and other dues be paid to the labourers concerned. In case an appeal is made by the contractor under Clause 13 of these regulations, actual payment to labourers will be made by the Engineer in charge after a decision has been made on such appeal.

- i) Engineer in charge shall arrange payments to the labour concerned within 45 days from the receipt of the report from the Labour Officer

**14. APPEAL AGAINST THE DECISION OF LABOUR OFFICER**

Any person aggrieved by the decision and recommendations of the Labour Officer or other person so authorised may appeal against such decision to the Superintending Engineer concerned within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the Executive Engineer concerned but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

**15. PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER**

- i) A workman shall be entitled to be represented in any investigation or inquiry under these regulations by: -
  - a) An officer of a registered trade union of which he is a member.
  - b) An officer of a federation of trade unions to which the trade union referred to in Clause (a) is affiliated.
  - c) Where the employer is not a member of any registered trade union, by an officer of a registered trade union, connected with the industry in which the worker is employed or by any other workman employed in the industry in which the worker is employed.
- ii) An employer shall be entitled to be represented in any investigation or inquiry under these regulations by:-
  - a) An officer of an association of employers of which he is a member.
  - b) An officer of a federation of associations of employers to which association referred to in Clause (a) is affiliated.
  - c) Where the employer is not a member of any association of employers, by an officer of association of employer connected with the industry, in which the employer is engaged or by any other employer, engaged in the industry in which the employer is engaged.
- iii) No party shall be entitled to be represented by a legal practitioner in any investigation inquiry under these regulations.

**16. INSPECTION OF BOOKS AND SLIPS**

The contractor shall allow inspection of all the prescribed labour records to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labour Officer or any other person, authorised by the Central Government on his behalf.

**17. SUBMISSION OF RETURNS**

The contractor shall submit periodical returns as may be specified from time to time.

**18. AMENDMENTS**

The HLL may from time to time add to or amend the regulations and on any question as to the application/interpretation or effect of those regulations the decision of the Superintending Engineer concerned shall be final.

**Appendix 'I'**

**REGISTER OF MATERNITY BENEFITS (Clause 19F)**

Name and address of the contractor\_\_\_\_\_

Name and Location of the work\_\_\_\_\_

Name of the Employee	Father's/ husband's name	Nature of Employment	Period of actual confinement	Date on which notice of given
1	2	3	4	5

Date on which maternity leave commenced and ended				
Date of Delivery/ Miscarriage	In case of delivery		In case of miscarriage	
	Commenced	Ended	Commenced	Ended
6	7	8	9	10

Leave pay paid to the employee				Remarks
In case of delivery		In case of miscarriage		
Rate of leave pay	Amount paid	Rate of leave pay	Amount paid	
11	12	13	14	15

**SPECIMEN FORM OF THE REGISTER, REGARDING  
MATERNITY BENEFIT ADMISSIBLE TO THE CONTRACTOR'S  
LABOUR IN HLL LIFECARE LIMITED.**

Name and address of the contractor \_\_\_\_\_

Name and location of the work \_\_\_\_\_

1. Name of the woman and her husband's name.
2. Designation
3. Date of appointment.
4. Date with months and years in which she is employed.
5. Date of discharge / dismissal, if any.
6. Date of production of certificates in respect of pregnancy.
7. Date on which the woman informs about the expected delivery.
8. Date of delivery / miscarriage / death.
9. Date of production of certificates in respect of delivery / miscarriage.
10. Date with the amount of maternity/ death benefit paid in advance of expected delivery.
11. Date with amount of subsequent payment of maternity benefit.
12. Name of the person nominated by the woman to receive the payment of the maternity benefit after her death.
13. If the woman dies, the date of death, the name of the person to whom maternity benefit amount was paid, the month thereof and the date of payment.
14. Signature of the contractor for authenticating entries in the register.
15. Remarks column for the use of inspecting officer.

**LABOUR BOARD**

Name of work: \_\_\_\_\_

Name of Contractor: \_\_\_\_\_

Address of Contractor: \_\_\_\_\_

Name and address of HLL Cenet: \_\_\_\_\_

Name of HLL Labour Officer : \_\_\_\_\_

Address of HLL Labour Officer: \_\_\_\_\_

Name of Labour Enforcement Officer: \_\_\_\_\_

Address of Labour Enforcement Officer: \_\_\_\_\_

Sl.No	Category	Minimum wage Fixed	Actual wage paid	Number Present	Remarks

Weekly holiday \_\_\_\_\_

Wage period \_\_\_\_\_

Date of payment of Wages \_\_\_\_\_

Working hours \_\_\_\_\_

Rest interval \_\_\_\_\_

Form-XIII (See Rule 75)  
**Register of Workmen Employed by Contractor**

Name and address of contractor \_\_\_\_\_

Name and address of establishment under which contract is carried  
on \_\_\_\_\_

Nature and location of Work \_\_\_\_\_

Name and address of Principal Employer \_\_\_\_\_

Sl. No.	Name and surname of Workman	Age and Sex	Father's/ Husband's Name	Nature of employment / designation	Permanent home address of the workman (Village and Tehsil, Taluka and District)	Local Address	Date of commencement of employment	Signature or thumb impression of the workman	Date Termination of employment.	Reasons For termination.	Remarks
1	2	3	4	5	6	7	8	9	10	11	12

## Form-XVI (See Rule 78(2)(a))

**Muster Roll**

Name and address of the contractor\_\_\_\_\_

Name and address of establishment under which contract is carried  
on \_\_\_\_\_

Nature and location of work\_\_\_\_\_

Name and address of Principal Employer\_\_\_\_\_

For the month of fortnight\_\_\_\_\_

Sl. No.	Name of workman	Sex	Father's/ Husband's name	Dates					Remarks
1	2	3	4	5					6
				1	2	3	4	5	

## Form -XVII (See Rule 78(2)(a))

## Register of Wages

Name and address of the contractor\_\_\_\_\_

Name and address of establishment under which  
contract is carried on\_\_\_\_\_

Nature and location of work\_\_\_\_\_

Name and address of Principal Employer\_\_\_\_\_

Wages period\_\_\_\_\_ Monthly/fortnightly

Sl. No.	Name of workman	Serial No.in the register of workman	Designation Nature of work done	No. of days worked	Units of work done	Daily rate of wages/piece rate	Basic Wages
1	2	3	4	5	6	7	8

Dearness allowances	Overtime	Other cash payments(Indicate nature)	Total	Deductions if any, (indicate nature)	Net amount paid	Signature or thumb impression of the workman	Initial of contractor or his representative
9	10	11	12	13	14	15	16



**Appendix 'VII'**  
**(Observe)**

Wage Card No. \_\_\_\_\_

**Wage Card**

Name and address of the contractor \_\_\_\_\_ Date of issue \_\_\_\_\_

Name and location of work \_\_\_\_\_ Designation \_\_\_\_\_

Name of Workman \_\_\_\_\_ Month/fortnight \_\_\_\_\_

Rate of Wages \_\_\_\_\_

	DATE																															
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Morning																																
Evening																																
Initial																																

Rate \_\_\_\_\_

Amount \_\_\_\_\_

Received from \_\_\_\_\_ the sum of Rs. \_\_\_\_\_ on account of my wages.

Signature

Form-XIX  
(See rule 78(2)(b))

**Wages Slip**

Name and address of the contractor\_\_\_\_\_

Name and Father's/Husband's name of workman\_\_\_\_\_

Nature and location of work\_\_\_\_\_

For the Week/Fortnight/Month ending\_\_\_\_\_

1. No. of days worked \_\_\_\_\_

2. No. of units worked in case of piece rate workers\_\_\_\_\_

3. Rate of daily wages/piece rate\_\_\_\_\_

4. Amount of overtime wages\_\_\_\_\_

5. Gross wages payable\_\_\_\_\_

6. Deduction, if any\_\_\_\_\_

7. Net amount of wages paid\_\_\_\_\_

Initials of the Contractors or his representative

Form-XIV  
(See rule 76)

**Employment Card**

Name and address of the contractor\_\_\_\_\_

Name and address of establishment under which contract is carried  
on\_\_\_\_\_

Nature of work and location of work\_\_\_\_\_

Name and address of Principal Employer\_\_\_\_\_

1. Name of Workman\_\_\_\_\_

2. SI No. in the register of workman employed\_\_\_\_\_

3. Nature of employment/designation\_\_\_\_\_

4. Wage rate (with particulars of unit in case of piece work)\_\_\_\_\_

5. Wages period\_\_\_\_\_

6. Tenure of employment\_\_\_\_\_

7. Remarks\_\_\_\_\_

Signature of contractor

**Form-XV (See Rule 77)**  
**Service Certificate**

Name and address of the contractor\_\_\_\_\_

Nature and location of work\_\_\_\_\_

Name and Address of workman\_\_\_\_\_

Age or date of birth\_\_\_\_\_

Identification marks\_\_\_\_\_

Father's/Husband's name\_\_\_\_\_

Name and address of establishment in/under which contract is carried  
on\_\_\_\_\_

Name and address of Principal Employer\_\_\_\_\_

Sl.No.	Total period for which employed		Nature of work done	Rate of Wages (with particulars of unit in case of piece work)	Remarks
	From	To			
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>

Signature

**LIST OF ACTS AND OMISSIONS FOR WHICH FINES CAN BE IMPOSED**

In accordance with rule 7 (v) of the HLL Contractors Labour Regulations to be displayed prominently at the site of work both in English and local Language.

1. Wilful insubordination or disobedience, whether along or in combination with other.
2. Theft fraud or dishonestly in connection with the contractors beside a business or property of HLL.
3. Taking or giving bribes or any illegal gratifications.
4. Habitual late attendance.
5. Drunkenness fighting ,riotous or disorderly or indifferent behavior.
6. Habitual negligence.
7. Smoking near or around the area where combustible or other materials are locked.
8. Habitual indiscipline.
9. Causing damage to work in the progress or to property of the HLL or of the contractor.
10. Sleeping on duty.
11. Malingering or showing down work.
12. Giving of false information regarding name and father's name etc.
13. Habitual loss of wage cards supplied by the employers.
14. Unauthorized use of employer's property of manufacturing or making of unauthorized articles at the work place.
15. Bad workmanship in construction and maintenance by skilled workers which is not approved by the HLL and for which the contractors are compelled to undertake rectification.
16. Making false complaints and/or misleading statements.
17. Engaging on trade within the premises of the establishment.
18. Any unauthorized divulgence of business affairs of the employees.
19. Collection or canvassing for the collection of any money within the premises of an establishment unless authorized by the employer.
20. Holding meeting inside the premises without previous sanction of the employers.
21. Threatening or intimidating any workman or employer during the working hours within the premises.

**Form-XII (See Rule 78(2)(d))**

**Register of Fines**

Name and address of the contractors\_\_\_\_\_

Name and address of establishment under which contract is carried  
on \_\_\_\_\_

Nature and location of work\_\_\_\_\_

Name and address of Principal Employer\_\_\_\_\_

Sl.No.	Name of workman	Father's/Husband's name	Designation/nature of employment	Act/Omission For which fine imposed	Date of Offence
1	2	3	4	5	6

Whether workman Showed cause against fine	Name of person in whose presence employees explanation was heard	Wage period and wages payable	Amount of fine imposed	Date on which fine realized	Remarks.
7	8	9	10	11	12

Form-XX(See Rule 78(2)(d))

**Register of Deduction for Damage or Loss**

Name and address of the contractors\_\_\_\_\_

Name and address of establishment under which contract is carried  
on\_\_\_\_\_

Nature and location of work\_\_\_\_\_

Name and address of Principal Employer\_\_\_\_\_

Sl.No.	Name of workman	Father's/Husband's name	Designation/nature of employment	Particulars of damage or loss	Date of damage or loss
1	2	3	4	5	6

Whether workman showed cause against fine	Name of person in whose presence employees explanation was heard	Amount of deduction imposed	No. of installments	Date of recovery		Remarks
				First installment	Last installment	
7	8	9	10	11	12	13

## Form-XXII (See Rule 78(2)(d))

**Register of Advances**

Name and address of the contractors \_\_\_\_\_

Name and address of establishment under which contract is carried  
on \_\_\_\_\_

Nature and location of work \_\_\_\_\_

Name and address of Principal Employer \_\_\_\_\_

Sl. No.	Name of workman	Father's/Husband's name	Designation nature of employment	Wage period and wages payable	Date and Amount of Advance given	Purpose(s) for which Advance made	Number of Installments by which advance to be repaid	Date and amount of each installments repaid	Date on which last Installments was repaid	Remarks
1	2	3	4	5	6	7	8	9	10	11



Form-XXIII (See Rule 78(2)(e))  
**Register of Overtime**

Name and address of the contractors \_\_\_\_\_

Name and address of establishment under which contract is carried on  
 \_\_\_\_\_

Nature and location of work \_\_\_\_\_

Name and address of Principal Employer \_\_\_\_\_

Sl.No.	Name of workman	Father's/husband's name	Sex	Designation /nature of employment	Date on which Overtime worked	Total overtime worked or production incase	Normal rate of wages	Overtime rate of wages	Overtime earnings	Rate on which overtime wages paid	Remarks
1	2	3	4	5	6	7	8	9	10	11	12

To

Chairman & Managing Director

HLL Lifecare Limited

Dear Sir,

In terms of clause 25 of the agreement, particulars of which are given below, I/we hereby give notice to you to appoint an arbitrator for settlement of disputes mentioned below:

1. Name of applicant
2. Whether applicant is Individual/Prop. Firm/Partnership Firm/Ltd. Co.
3. Full address of the applicant
4. Name of the work and contract number in which arbitration sought
5. Name of the Division which entered into contract
6. Contract amount in the work
7. Date of contract
8. Date of contract Date of initiation of work
9. Stipulated date of completion of work
10. Actual date of completion of work (if completed)
11. Total number of claims made
12. Total amount claimed
13. Date of intimation of final bill (if work is completed)
14. Date of payment of final bill (if work is completed)
15. Amount of final bill (if work is completed)
16. Date of request made to CE/ PCE for decision
17. Date of receipt of CE/ PCE's decision
18. Date of appeal to DRC
19. Date of receipt of DRC'S decision.

Specimen signatures of the applicant (only the person/authority who signed the contract should sign)

I/We certify that the information given above is true to the best of my/our knowledge.

I/We enclose following documents.

1. Statement of claims with amount of claims.
- 2.

Yours faithfully,  
(Signatures)

Copy in duplicate to:

1. CE/ PCE

## **TECHNICAL SPECIFICATIONS - HVAC SYSTEM**

### **4.1 SCOPE OF WORK**

The complete scope of work shall cover design, preparation of drawings, supply, fabrication, erection, testing and commissioning of all items for Air Conditioning Works.

#### **4.1.1 Basis of Design**

The entire system has been designed based on climatological data available as given under the section basis of Design. The technical requirements given under here is only indicative and not descriptive and the contractor shall ensure that the whole system supplied is complete in all respects for the smooth operation of the plant and should be suitable for the rated performance.

#### **4.1.2 Terms and Definitions**

The following terms have been used in the tender specifications, drawings, etc.

BIS	Bureau of Indian Standards
ASHRAE	American society of Heating, Refrigeration and Air-conditioning Engineers, USA.
ASME	American Society of Mechanical Engineers.
ASA	American Standard Association.
B.S	British Standards
CMH	Cubic Meter per Hour
CFM	Cubic Feet per Minute
US GPM	US Gallons per Minute
IGPM	Imperial Gallons per Minute.
RPM	Revolutions per Minute
BTU/Hr.	British Thermal Unit per Hour
KCal/Hr.	Kilo Calories per Hour
HZ	Hertz
H.P.	Horse Power
Kg/CM <sup>2</sup>	Kilo Gram per Square Centimeter
SG	Supply Air Grilles
SD	Supply Air Diffuser
SAF	Supply Air Filters
FD	Fire Damper
VCD	Volume Control Damper
RG	Return Air Grilles
RD	Return air diffuser
FAD	Fresh Air Damper
RH	Relative Humidity
DB	Dry Bulb Temperature
WB	Wet Bulb Temperature
MV	Mechanical Ventilation
DP	Drain Point.
RO	Rate Only

The design, manufacture, identification of material and testing of the equipment covered in this specification shall comply with the latest edition of the appropriate standard of the following:

- 1) Duct Work  
IS:655 (latest edition)
- 2) Pipes

IS: 1239 Mild steel, black ERW pipes, with fittings.

- IS: 3589 For MS Class '2', black ERW pipes 200 mm dia, and  
above, with fittings.
- 3) Steel Pipes for Water  
IS:3589
  - 4) Refrigeration and Air-conditioning  
As per ASHRAE/ISI air-conditioning and refrigeration institute standards.
  - 5) Sluice Valves for Water Lines  
IS:778-1980
  - 6) Copper alloy Gate/ Globe / Check Valve for water lines  
IS:778
  - 7) Steel pipe flanges  
IS:6392
  - 8) Non return valve for water lines  
IS:5312 (Part I) 1984
  - 9) Colour code for the identification of pipe lines  
IS:2379-1963
  - 17) Horizontal centrifugal pumps  
IS:1520
  - 18) Wrought aluminum and aluminum alloy sheet and strip for general engineering purposes  
IS:737
  - 19) Mild steel tubes, tubular and other wrought steel fittings  
IS:1239
  - 20) Bourdan tube pressure & vacuum gauges  
IS:3624
  - 15) Galvanized steel sheets  
IS:277-1977
  - 21) Glossary of terms used in refrigeration and air-conditioning  
IS:3615
  - 22) Code for practice for standard for selection of standard worm and helical gears  
IS:7403
  - 23) Gun metal gate, globe and check valves for general purposes  
IS:778
  - 24) Wrought aluminum and aluminum alloy sheet and strip for general engineering purposes  
IS:737
  - 25) Expanded Polystyrene (EPS) : IS 4671.
  - 26) Bonded mineral wool : IS 8183.
  - 10) Specific requirements for the direct switching of the individual motors  
IS:4064 (Part-II)-1978
  - 11) PVC insulated (HD) Electric Cables for working voltage up including 1100 Volts  
IS:1554 (Part I)
  - 12) Starters IS:8554 (Part-I) 1979
  - 13) HRC Cartridge fuse links upto 650 Volts  
IS:2208
  - 14) Inspection and testing of installation  
IS:732 (Part-III) 1979
  - 16) Three phase induction motors  
IS:325
  - 27) PVC insulated (heavy duty) electric cables for working voltage upto and including 1100 watts:  
IS:1554 (Part-I)

#### 4.1.3 Safety Codes

The following IS codes shall be followed:

Safety code for mechanical refrigeration  
IS:660  
Safety code for air-conditioning  
IS:659  
Safety code for scaffolds & ladders  
IS:3696  
Code of practice for fire precautions in welding & cutting operations  
IS:3016  
Code for safety procedures and practices in electrical works  
IS:5216

Indian Electricity Act 1910  
Electricity Supply Act and Indian Electricity Rules.

#### **4.2 CHILLER**

The scope of work under this heading shall cover design, supply, erection, testing, commissioning of air cooled scroll chiller units as per specification enumerated below and as per parameters laid down in the equipment schedule.

The standard constructional features of manufacturer are acceptable for chiller consisting of compressor, condenser, evaporator etc. However salient Features are listed here for reference. Imported chillers with ARI certificate is acceptable.

For imported chillers ARI certification has to be produced and test certificates of routine tests shall be submitted. Pre dispatch factory inspection shall be carried out by CLIENT/CONSULTANT for chiller. Sufficient advance notice shall be given to CLIENT/CONSULTANT for inspection.

##### **4.2.1 Compressor**

The compressor shall be scroll type, single stage, open/semi hermetic/hermetic type using refrigerant R134a.

##### **4.2.2 Bearing**

The compressor must incorporate the necessary design features which eliminate both the axial and radial thrusts. The bearings shall be pressure lubricated during operation and shall be completely sequenced and interlocked with the start up of the machine in such a way that the oil pump should start earlier than the machine and the machine should automatically start after some time provided the oil temperature and pressure is maintained during the start-up period.

##### **4.2.3 Lubrication System**

The lubrication system should form one integral part of the compressor assembly and must enforce complete force feed lubrication (at a pressure and controlled temperature) to all bearing surfaces under any speed conditions at start-up, at shut down and during operation at various loads, suitable arrangement shall also be provided to take care of lubrication during failure of power. Then full lubrication must be available to the machine during acceleration and deceleration periods through a suitable mechanism. The lubricating system shall be as per manufacture's standard for meeting the site requirements. The required protection shall be incorporated in the lubricating system. Suitable means shall be provided to prevent the leakage of refrigerant along with the shaft during shut down periods.

##### **4.2.4 Capacity Controls/ Compressor control panels**

The compressor must be equipped with an in built automatic capacity control mechanism for regulating its capacity. It should be possible to go down to 20% of full load as per latest ARI standards.

The various controls/ gauges shall be mounted on compressor control panel of compressor.

Micro processor based control panel is preferred. Following controls required for the system shall be incorporated. The motor should stop automatically if the safety device operates and with simultaneous audio visual indication shall be incorporated.

- Low oil pressure cut-out
- Low evaporating pressure/temperature cut-out
- High condensing pressure cut-out
- High oil/discharge temperature
- Chilled water flow switch
- Condenser water flow switch
- Motor overload
- One set of time delay relay.
- Antifreeze thermostat
- Flow switches/differential switches

#### **4.2.5 Electric motor**

The electric motor driving the compressor shall be as per manufacturer's standard for this compressor and motor shall be suitable for operation on 400 V, 50 Hz, 3 phase or other conventional A.C. supply. The motor shall be continuous duty rated for the application. The motor shall be selected such a way that the motor rating is for actual requirement.

The motor shall be provided with suitable bearing to take care of any axial thrust. Necessary lubricators shall be provided to enable the bearings to be correctly greased as required.

The tenderer shall also calculate IKW/TR for part load conditions of 40%, 50%, 60%, 70%, 80% and 90%. The manufacturer's computer print out for performance of the chiller at NPLV shall be submitted which will be sent to ARI for verification.

#### **4.2.6 Evaporator and condenser**

The evaporator and condenser shall be as per manufacturer's standard to meet the operational requirement.

##### **Evaporator (Chiller)**

Chiller shall be provided with eliminator to prevent liquid carry over to the compressor. The chiller shall be provided with liquid level sight glass and a relief device (of the bursting type) to prevent excess pressure in the heat exchanger. The cooler shall be horizontal, flooded, shell and tube type. The chiller shall be selected for a fouling factors of 0.0001 Hr.Sqft.Deg.F/BTU or any other value if required depending on special circumstances as per latest ARI-550-92.

The chiller shall be provided with the following connections and accessories:

- a) Refrigerant inlet and outlet connections.
- b) Water inlet and outlet connections with industrial type thermometers.
- c) Drain and vent connections with stop valves.
- d) Pressure gauges on inlet and outlet connections.

Water chiller shall be insulated as per manufacturer's standards and as approved by the Engineer-in-Charge.

##### **Condenser**

Condenser shall have a refrigerant side design working pressure of 15 psi and shall be pneumatically pressure tested at 30 psi for R134a.

The condenser shall be complete with the following accessories.

- a) Refrigerant inlet and outlet connections and necessary shut off valve.
- b) air vent, test cocks.
- c) Any other standard accessories with the equipment if required.

#### **4.2.7 Thermometers/Pressure gauges.**

Thermometers shall be provided to show lube oil temperature, entering & leaving condenser water temperature and entering & leaving chilled water temperatures. Pressure gauges shall be provided for inlet & outlet of chillers and condensers.

#### **4.2.8 Installation**

The chiller shall be installed over suitable foundation and shall be adequately isolated against transmission of vibrations to the building structure special attention shall be paid to the alignment of the driver and driven shafts. Final alignment shall be checked at site in presence of the Engineer-in-Charge using a dial indicator.

#### **4.2.9 Testing**

The chiller unit whether imported or indigenous, as selected by the firm shall have ARI certificate. Before the performance tests are made at site, the contractor shall carry out such preliminary tests as necessary to satisfy himself that each machine meets the contract requirements. Unit capacity shall be computed from the temperature readings and water flow measurements. Flow measurement shall be through flow meter duly calibrated. Chilled water lines computed results shall tally with the specified capacities and power consumption shall tally with the figures furnished with the tender. All instruments and services needed for the testing shall be furnished by the contractor at no extra cost. Test measurements shall be acceptable only if steady conditions of water flow rates, water temperatures and motor load prevail for atleast fifteen minutes prior to taking each set of measurements.

#### 4.4

#### **CHILLED WATER , WATER PUMPS**

**4.4.1** Capacity and Construction:- Pumps required for chilled water and condenser water circulation shall be of capacities indicated in the schedule of equipment. Pumps shall be of horizontal, enclosed impeller centrifugal type. The construction of the pumps shall be as follows:

Sl.No.	Description	Material/Type of Construction
1.	Pump	Horizontal, Split casing, Centrifugal
2.	Casing	Cast iron
3.	Impeller	Bronze
4.	Shaft	High tensile steel
5.	Bearings	Heavy duty ball/Roller bearings as per manufacturer's standard
6.	Base plate	Cast Iron/Fabricated M.S.
7.	Flanges	As per IS
8.	Type of seal	Mechanical
9.	Drive	Totally enclosed fan cooled squirrel cage induction motor suitable for operation on 415 Volts +/-10%, 3 Phase, 50 HZ AC supply
10.	Starter	As per the schedule of equipment

The pumps shall be directly coupled through flexible coupling to the drive motor. The pump and drive motor shall be mounted on a common based plate. The capacity of the drive motor shall atleast be 15% in excess of BHP of the pump. The drive motors shall conform to IS:325 (Latest Edition) in all respects. Motor shall be provided with heavy-duty bearings with an easily accessible grease nipple.

Starter rating shall be as per BOQ. The starters shall incorporate, thermal overload and under-voltage protection. Starters shall also have in built single phasing preventers. Wherever starters are mounted near the motor, they shall be of totally enclosed metal clad and dust proof construction.

The secondary VFD type pump shall be inter connected with primary pumps. The VFD type shall be in operation in case of part load requirement of chiller.

#### 4.4.2

#### **Accessories and fixtures**

The following fixtures and accessories shall be provided with each pump along with other standard accessories:-

Coupling guard, One air vent, Lubrication fixtures and seals, Suction and delivery pressure gauges of 100 mm dia and appropriate rating with gauge cocks.

25 mm GI gland drain/drain nipple.

The pump casing shall be designed to withstand discharge pressure plus static head on the system plus at least 50% of the total. However, the minimum design pressure shall not be less than 10kg/Sq. cm. The bearing of the pump shall be effectively sealed to prevent loss of oil and entrance of dirt or water.

#### 4.4.3

#### **Installations**

Pumps shall be installed as per the manufacturer's instructions. Vibration isolation arrangement preferably with serrated rubber pads & pre-cast concrete foundation block is desirable. The pump-motor set shall preferably be factory aligned. The alignment and base plate level shall be checked at site and the results submitted.

Wherever necessary, site alignment shall be done by competent persons. Chilled water pumps shall be insulated with foam polystyrene or equivalent material. The pump shall be



insulated in such a manner that maintenance could be done without causing damage to the Insulation. The price shall include cost of insulation, tools, labour etc.

#### **4.4.4 Testing**

The contractor shall submit performance curves for pumps supplied by him. The capacity of each pump shall be checked with respect of the Contractor's piping and equipment layout. Indirect tests shall be conducted on each pump-set, after completion of the installation with reference to delivery head, flow and BHP. The test results shall correspond to the performance curves subject to a tolerance of 3%. The equipment, instruments and labour required for testing shall be furnished by the Contractor at no extra cost.

#### **4.4.5 Painting**

The pump sets along with all accessories and fixtures shall be painted with two coats of enamel paint of approved colour after the completion of installation and testing.

#### **4.4.6 Lubrication**

After the completion of the installation and before testing, all the pumps shall be lubricated in conformity with manufacturer's recommendations. Manufacturer's instruction manual shall be furnished along with a recommended list of spare parts.

### **4.5 AIR HANDLING UNITS**

#### **4.5.1 Scope**

The scope of work under this heading shall cover design, supply, erection, testing, commissioning of all air handling units as per specification enumerated below and as per parameters laid down in the equipment schedule.

#### **4.5.2 Type**

Air handling unit of latest type i.e. Double skin, Horizontal factory manufactured, sectionalized construction.

#### **4.5.3 Components**

AHU shall be provided with the following :

- a) Fan Section
- b) Coil Section
- c) Filter Section
- d) Drain Pan

#### **4.5.4 Sectionalized air handling units**

##### **Construction Features**

Construction features/specifications of sectionalized AHUs shall generally be as per the standard of the manufacturer. The tenderer shall submit detailed Technical Specifications and leaflets of AHU offered by them. The minimum requirements for such AHUs shall be as given below :

- a) AHU casing shall be made of galvanized sheet steel reinforced with hat-section of standard size sheet channels welded in place. AHU frame work shall be of extruded aluminium channels. Outer skin :- 0.6mm PVC laminated/ pre painted G.S.S. or plasticised /powder coated. Inner skin :- 0.6mm plain GSS.

- b) Fan & Coil section shall be minimum 25 mm thick insulated from inside with P.U. Foam with Density of 38 Kg / Cum.
- c) Fan section shall have forward-curved DIDW centrifugal blowers statically and dynamically balanced with suitable static pressure required for supply of air through heap filter.
- d) Cooling coils shall be of plate and fin or tube and fin type with copper coils and aluminium fins. The coil face area and number of rows deep shall be as per equipment schedule and computerized selection shall be furnished along with the tender.
- e) Filter section shall have washable HDPE/synthetic media filters of 6mm thickness (10 micron filtering capacity) with 90% efficiency.
- f) Drive package shall comprise TEFC sq. cage motor of suitable size with design calculation, V-belts and Pulley, motor mounting arrangement, drive guard, etc.
- g) Drain pan shall be insulated and shall be provided with threaded pipe connections at both ends. Drain pan shall be constructed of 18G Aluminium.

#### **4.5.5 Accessories**

Air handling units shall be provided with the following accessories :

- Industrial type thermometers with metal guard and thermowell screwed to thermometer pockets at inlet/outlet of the cooling coil.
- Pressure gauge with U tube and gauge cock at inlet and out let of the cooling coil.
- Anti vibration isolation arrangement.
- Provision for installing 3 way mixing/magnetic valve in chilled water connection.
- Air tight access door for coil/fan inspection or openable side panels with powder coated die cast aluminium sheet.
- Differential pressure type Airstats shall be provided with AHUs with alarm indication.

#### **4.5.6 Cooling units**

Tube thickness of Cooling coil shall be as per manufacture's standard but not less than 0.41 mm. and the no of fins shall be 4 nos per cm. The thickness of Aluminium fins shall not be less than 0.2 mm. The fins shall be of aluminium and shall have integral spacing collars. The tubes shall be mechanically / hydraulically expanded to provide uniform and permanent fin-tube bonding. The return bends shall be die-formed and brazed to the tubes. A 6mm (1/4 ") FPT plugged vent/drain shall be provided on each nozzle connection. Coil shall be circuited to provide on each nozzle connection. Coil shall be circuited to provide for design water velocity in tubes without exceeding the total water pressure drop as per standards. All coils shall have same end connections regardless of no. of rows deep. Complete coil, including headers, connections & return bends shall be pressure tested.

#### **4.5.7 Fan drive motor, etc.**

Fan blowers shall be DIDW centrifugal forward curved designed for discharging the required quantity of air at the specified external static pressure. The blower shall be supported on steel shaft of suitable design. The fan shaft shall be corrosion resistant. Fan wheels / blowers and shafts shall be designed for continuous operation at max. rated speed and motor horse power. The design details and selection of components shall be attached with the offer.

Fan bearings shall be ball-type, self-aligning rubber/steel pillow block or flange type, mounted & located conveniently for re-lubrication.

Drive motor shall be TEFC sq. cage induction motor. The motor shall have class "B" insulation. The drive package shall comprise V-belts, pulleys, adjustable mountings plate for motor, drive guard, etc. The drive motor rating shall be 110% of total BHP of fans.

The AHU panel shall have fully automatic star delta starter with suitable interlocking with Heater / Fire damper etc. The panel shall be complete as per BOQ.

#### **4.5.8 Installation**

All civil works including foundation block and anti-vibration mounting etc shall be inclusive in the item rate quoted. AHUs shall be installed in weather maker rooms as shown in the drawings. The unit shall be installed on vibration isolation pads of adequate size and at 6 no of minimum footing. The operation of AHUs shall be smooth and shall not transmit undue vibration to the structure. As per site requirements the AHUs may have to be brought in dismantled condition and assembled in the site.

#### **4.5.9 Testing**

Air handling units shall be inspected at the factory for their design performance with respect to Air quantity, Pressure drop across filter and coil as per manufacturer's design.

AHUs shall also be tested for visual examination, free run and motor rating.

#### **4.5.10 Pan type humidifier**

The body shall be made out of 2 mm thick stainless steel sheet SS-304, having connections of quick fill, make up, over flow and drain. A round sight glass of 12 mm thick shall be provided to check water level. The top cover shall be openable for access to the inside of humidifier. A flood light shall also be provided inside the tank for better visibility of water level. The body of humidifier shall be air tight and leak proof.

It shall be insulated with 50 mm thick fibre glass 32 kg/cum and then cladded with 0.8 mm thick Al. sheet. The humidifier shall be divided in two chambers. One bank of heaters shall always kept on to maintain temperature of water between 60 deg C to 70 deg C.

Electrical panel shall be made out of 16 G CRC sheet and painted glossy white from inside and powder coated out side light smoke grey colour. Panel with contactors, MCBs, low level cutout,

heating thermostat for individual bank, fault indicating lamp and high temperature cutout heaters internally wired shall also be provided.

#### **4.6 CONTROL SYSTEM**

This section deals with supply, installation and testing, commissioning of necessary controls (automatic) and instruments conforming to these specifications and shall be in accordance with schedule of quantities.

The various controls listed below shall be electrically operated and in case of low voltage controls the necessary step down transformer shall be provided with each centre. All automatic controls shall be of approved makes.

##### **4.6.1 Flow Switches**

The flow switches shall be provided in chilled water outlets of evaporator of each chiller. These switches shall prevent the compressor from starting unless the water is flowing in the lines.

##### **4.6.2 Thermostats**

These shall be electrically operated, fixed /differential type with the sensing elements located in the return air passage of AHUs. The exact mounting arrangements, profile, etc. shall be derived as per location requirements.

##### **4.6.3 Instruments**

###### **a) Thermometer:**

The alcohol filled thermometer shall be of approved make having range of 0-100 deg.F and easy to read. These shall be provided at inlet/outlet pipelines of chillers & air handling units

###### **b) Pressure gauges:**

The pressure gauges shall be dial type of 100 mm dia. of approved make to be installed at inlet / outlet pipelines of chillers, air handling units and at suction and discharge of pump sets.

##### **4.6.4 Testing and calibration**

All instruments and controls shall be factory calibrated, completed with installation, calibration literature required at site. These shall be tested at site for ascertaining their accuracy and calibration before installation and commissioning.

#### **4.7 DUCTING SYSTEM**

This section deals with supply, erection, testing and commissioning of all sheet metal ductwork conforming to specifications given below. The ducts shall be of factory fabricated.

##### **4.7.1 Material for Ducting**

All ducts shall be fabricated from galvanized sheet of 120 gm/sq.m (Class VIII) conforming to IS 277-1962 (revised). The fabrication of duct shall strictly conform to ISS 655-1963. The thickness of the sheet shall be as follows:

Maximum size (mm)	Thickness of sheet (mm)	Type of transverse joint connections	Bracing (if any)
Upto 300	0.63 24 G	S-drive, pocket or bar slips, on 2.5m centres	None
301 to 600 601 to 750	0.63 24 G	S-drive, pocket or bar slips, on 2.5m centres S-drive, 25mm pocket or 25mm bar slips on 2.5m centres drive	None 25x25x3mm angle 1.2m from joint

751 to 1000 1001 to 1500	0.80 22 G	40x40mm angle connections, or 40mm pocket or 40mm bar slips, with 35x3mm bar reinforcing on 2.5m centres	40x40x2mm angle 1.2m from joint
1501 to 2250	1.00 20 G	40x40mm angle connections, or 40mm pocket or 40mm bar slips, 1 m maximum centres with 35x3mm bar reinforcing	40x40x3mm angle / 40x40x3mm angle 60mm from joint.
2251 & above	1.25 18 G	50x50mm angle connections, or 40mm pocket or 40mm bar slips, 1 m maximum centres with 35x3mm bar reinforcing	40x40x3mm angle / 40x40x3mm angle 60mm from joint.

The following points shall be also taken into account while fabrication of ducts.

- a) All ducts shall be as per gauges, etc. indicated on the approved drawings.
- b) All ducts of size larger than 450 mm shall be cross broken.
- c) All ducts shall be supported from RCC/truss by means of MS rods, angles, etc.
- d) The ductwork shall not extend outside and beyond height limits as specified on the approved drawings.
- e) All ducts shall be reinforced, if necessary and must be secured in place so as to avoid shifting of the ducts on its supports.
- f) The vanes shall be provided and securely fastened to prevent noise and vibration.
- g) The rubber gasket shall be installed between duct flanges in all connections and joints.
- h) The ductwork can be modified in consultation with CLIENT/CONSULTANT to suit actual conditions in the building.
- i) All flanges and supports should be primer coated on all surfaces before erection and painted with aluminum paint thereafter.
- j) The flexible joints are to be fitted to the suction and delivery of all fans with double heavy canvass. The length of flexible joints should not be less than 150 mm.
- k) All sheet metal gauges and fabrication procedure as given in BIS specification shall be strictly adhered to. The BIS specification shall form part of this contract.

#### **4.7.2 Grilles/Diffusers**

Material of construction - Extruded Aluminum

Supply air and return air grilles shall be continuous type and shall be fixed as given in the approved drawing. The square/rectangular diffusers shall be flush or step down type to match false ceiling pattern. The diffuser blades shall be die formed, flush mounted with single or double direction airflow. Supply of frames for fixing the grilles/diffusers, if required, is also in the scope of the contractor.

Return air grilles shall be with blanks and return air provisions. The size and appearance shall match with supply air grilles. The supply air grilles shall form part of the continuous return air grilles. The fixing of grilles/diffusers should be done in close co-ordination with false ceiling work and as directed by CLIENT/CONSULTANT.

The aluminum grilles/diffusers, etc. shall be powder coated of colours to match the interiors. However, successful bidder shall have to obtain prior approval regarding colour, finish,

shape, etc. of grilles/diffusers and sample should be submitted to CLIENT/CONSULTANT for approval.

#### **4.7.3 Slot diffusers/grilles**

The slot diffusers shall be fabricated out of high grade aluminium alloy extrusions fixed or clipped to cross stays allowing easy removal of internal vanes and pattern control elements. Linear slot diffusers shall be two flow control vanes fixed to a central element on each slot. The air pattern shall be horizontal to vertical without changing the diffusers.

#### **4.7.4 Testing**

The complete duct system shall be tested for air leakage and complete air distribution systems shall be balanced in accordance with the approved drawings for achieving designed values inside the building.

### **4.8 PIPING WORK AND VALVES**

This section deals with supply, installation of pipes, pipe fittings and valves, testing and balancing of chilled water, drain water, etc. as detailed in specifications. All piping, fittings and valves, etc. shall conform to relevant BIS specifications.

#### **4.8.1 Water Piping**

The piping, fittings and valves shall be of approved make and shall conform to BIS standards.

All pipes for chilled water lines shall be M.S. (Black steel) heavy duty class C as per IS 1239-79 Part I.

All pipes for condenser water /drain water /make up water piping shall be of M.S. (Black steel) heavy duty class C as per IS:1239 Part I and II and IS 3589 for pipes of dia. 200 mm and above with minimum thickness 6 mm. IS:4736 for Hot Dip Zinc Coated Steel Tubes. The make of pipes shall only be as per approved vendor list. The pipes shall be sized for individual liquid flow and ensure smooth noiseless balanced circulation of fluid.

All pipings and their steel supports shall be thoroughly cleaned and primer coated before installation. All pipe supports shall be applied with enamel paint of approved colour and make.

#### **4.8.2 Pipe Fittings**

The pipe fittings for welded joints shall be weldable quality. Also the fittings shall be suitable for same pressure ratings as for the piping system.

All bends upto sizes 150 mm dia shall be of heavy duty ready made.

All bends in sizes 200 mm and above shall be fabricated from the same dia and thickness of pipe in atleast four sections and having a centre in radius of at least 1.5 times diameter of pipes. Fittings such as tees, reducers, etc. shall be from the same pipe and at least of length twice the diameter of the pipe. The dead ends are to be blanked with 6mm thick plate.

#### **4.8.3 Butterfly Valves**

These valves shall be wafer type flangeless design suitable for holding between flanges with hand lever as per IS 4854. ( pressure rating PN 1.0) It shall be hand operated upto 250mm and gear operated above 250mm. The constructional features shall be as given below.

Body material	Cast Iron
Disc material	Ductile Iron Gr.450/10 with epoxy coating.
Stem	SS410
Body lining	EPDM integrally moulded

#### **4.8.4 Non-return Valve**

These valves shall be flanged wafer design dual plate type as per IS 5312 ( pressure rating PN 1.0).It shall be suitable for horizontal and vertical run pipes with negligible water hammer in both positions. The sealed design shall provide metal to metal soft seating. The soft seat shall be integrally moulded type.

Valves of sizes upto 65 mm dia. shall be gun metal and 75 mm dia. and above shall have cast iron body, the disc and seat of these valves shall be gun metal and with flanged ends.

#### **4.8.5 Y-Strainer**

Y-Strainer shall have cast iron body . The filter element shall be made out of 3 mm perforated brass sheet. It shall be easily removable when required to be cleaned without disconnecting the main pipe line. A permanent magnet shall be provided with drain plug to attract iron and dust particles from the water.

#### **4.8.9 Balancing Valves**

These valves shall be double regulating control and shut off type with built in pressure drop measuring facility. It shall be able to pre regulate flow conditions with tamper proof positioning by a built in locking device. Valves of sizes upto 80 mm dia. shall be threaded gun metal and 80 mm dia and above shall have cast iron body.

#### **4.8.10 3-way motorised mixing valve**

These valves shall be suitable for diverting or mixing of chilled water for two position. It shall be modulating type with linkage actuator, proportionate thermostat, etc. suitable for automatic control of water flow in AHUs. The valve body shall be Cast Iron and spindle shall be SS.It shall be suitable for horizontal or vertical mounting positions.

#### **4.8.11 Supports for Pipes**

All pipe supports shall be of steel applied with anti-corrosive paint before installation. In plant room pipe may be supported from ceiling and have steel supports of adequate strength. Adequate number of supports shall be located in such a way that no vibration on piping is transmitted to the building or any other structures. The rate for piping include supply, fabrication and erection of steel supports, painting, etc.

#### **4.8.12 Layout and Sizing of Pipe Lines**

The contractor shall prepare and submit detailed drawings after the award of contract for approval. No work at site shall be started before final approval of drawings is given. The drawings shall indicate sizes of pipes, quantity of water flow in each length of pipe. All details of fittings, location of valves, air vents, etc. shall be clearly indicated including pipe supports. Detailed iso-metric drawing shall be submitted.

#### **4.8.13 Laying Over Head (OH) Chilled/Drain/Make-up Water Pipes**

- a) All OH pipes shall be securely supported or suspended with stands, hangers, clamps, etc. as required. The contractor shall design all brackets saddles, and anchors clamps and stands hangers and shall be responsible for structural adequacy.
- b) All pipe supports shall be of steel, coated with two coats of anti-corrosive paint and finally finish with black enamel paint.
- c) The pipe supports spacing shall be as follows:

Dia of pipe

Spacing between supports

Upto 25 mm	1.5 M
30 mm to 50 mm	2.0 M
65 mm to 75 mm	2.5 M
100 mm to 125 mm	3.0 M
150 mm to 200 mm	3.5 M
200 mm and above	4.0 M

The pipe hangers shall be firmly fixed on wall or ceiling.

- d) The vertical risers shall run parallel to walls and shall be straight/parallel to wall duly checked with plumb line.
- d) In case of pipes with/without insulation while passing through the wall/slab shall be provided with sleeve of 50 mm of higher size than the pipe with/without insulation.
- e) Wherever insulated pipes are running, it shall be supported in such a way that no extra pressure is put on the insulated pipe. Suitable metal sheet shall be provided between insulation and the clamp.
- f) The expansion-joints or expansion-loops shall be provided to take care of the expansion and contraction in pipes due to temperature rises.
- g) On RCC roof top, pipes shall be supported on brick pedestals. Necessary clamping should be done on to the pedestals.

#### **4.8.14 Laying of Under Ground (UG) Pipes**

All UG pipes with insulation shall be supported with PCC blocks at a minimum interval of 3.5 m. At bends and joints also, PCC supports shall be provided on both sides.



#### **4.8.15 Expansion Tank**

Expansion tank of HDPE material of approved make with necessary fittings and supports shall be installed at a highest point to take care of expansion of water due to temperature rise. The location of the expansion tank shall be finalised in consultation with CLIENT/CONSULTANT.

#### **4.8.16 Balancing and Testing**

- a) The water quantities as required/specified or directed shall be adjusted to deliver required quantity of water.
- b) Manometer shall be used for balancing and adjusting the system.
- c) The three way diverting valves / automatic control valves shall be balanced and adjusted for maximum flow of water.
- d) The Contractor shall submit balancing report for final approval.

#### **4.8.17 Testing of Pipe System**

- a) All tools, tackles, services labour shall be arranged by the Contractor at no extra cost.
- b) All pipes shall be hydraulic tested 1.5 times the maximum operating pressure for a period of 2 hours. All leaks occurring during testing shall be rectified to the satisfaction of CLIENT/CONSULTANT. After repairs of leak it shall be tested again at the same pressure.
- c) In case piping is tested in parts, these sections shall be securely sealed and capped.
- d) The contractor shall make sure that the water shall flow in pipes, AHU's coil without noise.
- e) In case no proper circulation/heat exchange is achieved due to any reason, etc., it shall be rectified by the Contractor.

#### **4.8.18 Air Vents**

Air valve for purging of air blocked in piping system shall be provided at different points as directed by CLIENT/CONSULTANT and as per requirement.

#### **4.8.19 Pressure Gauges**

Bourdan type pressure gauges of 100 mm dia of suitable range shall be provided at the following locations:

- a) Chiller/Cooling coils - inlets and outlets.
- b) Suction and discharge of all pumps.
- c) Inlet/outlet connection of AHU's
- d) All pressure gauges shall be complete with globe valves and conform to IS:3624.

#### **4.8.20 Thermometer**

Direct reading industrial type alcohol filled thermometer of suitable range / length shall be provided at the following locations

- a) Chiller /Cooling coil - Inlets and outlets., b) AHU's

#### 4.9 **THERMAL / ACOUSTIC INSULATION**

This section deals with supply and fixing of thermal / acoustic insulation of ducts, insulation of pipes, etc. as per the specification.

##### 4.9.1 **Material of Insulation**

###### **a. Chilled Water Pipes**

The insulation material shall be expanded polystyrene (EPS) of required thickness as per BOQ. The density of expanded polystyrene shall not be less than 16 kg per cubic meter and the thermal conductivity shall not exceed 0.35 mW/cm °C at 10 deg.C mean temperature. Only fire retardant (TF quality) expanded polystyrene shall be used and shall conform to IS 4671. For pipe sizes upto 200 mm dia preformed pipe section made out of expanded polystyrene and for sizes above 200 mm, insulation of pipes shall be done with uniformly cut pieces from slabs of expanded polystyrene.

###### **b. Supply/return air ducts**

Insulation material shall be resin bonded glass wool having thermal conductivity of not more than 0.033 W/m.K at 25°C and having a density of atleast 24 Kg/m<sup>3</sup> and faced with aluminium foil of thickness 7 micron and conform to IS 8183.

The thickness of insulation used on ducting shall be as detailed below:-

	Conditioned space	Unconditioned space
a) Supply Air Duct	25mm thick	50mm thick
b) Return Air Duct	Not applicable	25mm thick

The thickness of insulation shall be as specified for the individual application.

Copies of test certificates on thermal conductivity, thickness, density, etc. supplied by the

manufacturers shall be submitted for approval. Adhesive used for fixing the insulation shall be

non-flammable, vapour proof CPRX compound or bitumen as approved by

CLIENT/CONSULTANT.

#### **4.9.2 Method of Insulation**

##### **a. Insulation of pipes with EPS (above ground)**

- i) The pipe to be insulated should be cleaned thoroughly with steel brush for removing dirt, rust and grease with chemical solution, if required.
- ii) Apply a coat of zinc chromate primer and two coats of cold setting adhesive compound or hot bitumen on Pipes.
- iii) Fix insulation of specified thickness tightly and seal all joints with adhesive compound.
- iv) Insulated surface shall be wrapped with two layers of 125 G polythene sheet with over lapping of 50 mm longitude and transverse joints.
- v) Cover this with 24 G, 19 mm width GI chicken wire netting, butting all the joints and tie down with GI wires.
- vi) Finish the surface with two coats of sand cement plaster (1:4, cement 1 and sand 4) and surface shall be finished smoothly and curing of plaster shall be done using wetted jute bags.
- vii) Vapour barrier mastie of 3 mm thickness in two layers reinforced with RP tissues to be applied.

##### **b. Insulation of pipes with EPS (below ground)**

- i) to vi) of above and
- vii) On finished plastered surface of pipe apply one layer of tarfelt with hot bitumen as adhesive and with sufficient overlaps.

##### **c. Valves and Fittings**

All valves, fittings, flanges, strainers, etc. in the piping, operating below normal temperature shall be insulated in the same manner as described above. Care shall be taken to ensure that no damage would be caused to the insulation when valves or strainers are operated or serviced. No extra payments shall be applicable for insulation of valves and fittings.

##### **d. Pumps and Accessories**

All chilled water pumps and accessories shall be provided with (insulation of the same thickness) as that of pipes to which they are connected.

##### **e. Cold Water and Expansion Tank**

All tank such as expansion tank, make-up water tank connected with chilled water shall be insulated to the same thickness as for pipes to which they are connected. The method of application of insulation is as described for outdoor piping.

##### **f. Chillers**

The chiller shells shall be insulated as per manufacturer's recommendations.

##### **g. Insulation of ducting**

- i) Clean the surface with brush.
- ii) Apply two coats of CPRX/bitumen on the surface.
- iii) Fix fibre glass wool of specified thickness faced with aluminium foil with 50 mm overlap on joints.
- iv) Seal the joints with 50mm wide aluminium adhesive tape.
- v) Provide PVC strapping at 0.5m interval

#### **h. Acoustic Lining of the Duct**

The material to be used for acoustic lining shall be resin bonded glass wool fixed upto 6 m from the outlets of all AHUs conform to IS 8183. The lining shall be carried out as given below:

- i) Clean the inside surface of the duct.
- ii) Fix the insulation boards faced with RP tissue inside duct.
- iii) Cover the insulation boards and RP tissue with 0.5 mm thick perforated aluminum sheet.
- iv) Screw down aluminium sheet, RP tissue and insulation to the duct surface using brass screws.

#### **i. Under deck insulation**

The material to be used for under deck insulation shall be of TF Quality Expanded Polystyrene (EPS) having thermal conductivity of not more than 0.35 mW/cm °C at 10 deg.C mean temperature and having a density 24 kg/m<sup>3</sup> and shall conform to IS 4671. The method of fixing is as given below.

- i) Clean the surface
- ii) Apply hot bitumen on the surface with brush and stick the EPS slabs.
- iii) Screw down the EPS on the surface with GI fixtures, supports, etc.

## **4.10 FIRE DAMPERS**

This section deals with supply, erection, testing and commissioning of fire dampers and box type dampers, conforming to general specification and suitable for duty selected, indicated in schedule of equipment/material.

### **4.10.1 Dampers**

- a) The fire dampers of at least two hour rating shall be provided in all return air ducts at AHU room wall crossing.
- b) The fire dampers shall be fabricated out of 1.6 mm galvanised sheet steel and spring actuated type. These dampers shall be multi leaf type. The damper blades shall be provided on both ends using chrome plated spindles in self lubricating bushes. Stop seals shall be provided on top and bottom of the damper housing made of 16G GSS. For preventing smoke leakage side seals shall be provided.
- b) In the normal position the blades of the dampers shall remain open to allow maximum air to flow. The dampers shall be actuated fusible link mechanism. The fire damper shall also close due to temperature rise above 74°C.
- c) All fire dampers shall be mounted on wall with a duct sleeve 400 mm long depending on the wall thickness. The sleeve shall be factory fitted on the fire damper. The joint at the sleeve end shall be slip on type. Minimum thickness of GI sheet used for sleeves shall be 18G.
- d) Control wiring to AHU from fire dampers for automatic AHU motor switch off in case of fire shall also be executed and commissioned.

### **4.10.2 Hinged Access Doors**

In all fire dampers, coil, heaters, plenums or any other equipment requiring regular servicing and inspection shall be provided with hinged access doors or suitable size complete with air tight gaskets. In case of insulated ducts or plenums, the access door shall be insulated. All hinges, tower bolts, etc. shall be of anodized aluminum only.

### **4.10.3 Exhaust Air Blowers**

In line exhaust air flow duct blowers suitable for single phase operations with direct driven class F motor, IP 54 insulation, max 1400rpm, necessary steel frame, and complete with GI box, with an operating sound level not exceeding 60dB at 3m distance.

### **4.10.4 Hepa Filter**

Hepa Filter shall be of efficiency 99.97%. HEPA filters shall be aluminium corrugated and Mini pleat style. All filters shall made up of high quality micro-fine glass fiber media. Filter frames shall made up of Galvanized steel. Hepa filter shall ensure low pressure drop even at high airflows & with Antimicrobial protection.

All filters shall be made in accordance and tested to EN 1822 / ASHRAE 52.2 standards. These filters shall be tested at factory and test certificates from OEM's shall be produced. The Hepa filter shall be fixed in a plenum constructed at the AHU mouth.

## **4.11 PAINTING WORK**

**4.11.1** All equipment shall be painted as specified under respective headings. Grilles/ diffusers shall be powder coated as per approved colour matching with interiors. The contractor has to get approval of the quality and colour of paints for all types of painting work.

All pipes for chilled water shall be painted as per standard code of practice and arrows indicating direction of flow of water shall be marked.

#### **4.11.2 Colour scheme for the plant and equipment**

i)	Compressor	..
	Battle ship grey	
ii)	Condenser	..
	Battle ship grey	
iii) Chiller	.. Light green with white arrows	
iv)	Refrigerant discharge line	
	.. Red	
v)	Refrigerant liquid line	
	.. Yellow	
vi)	Steel supports	..
	Black	
vii)	Pump sets	..
	Battle ship grey	
viii)	Condenser water lines	
	.. Dark blue with white arrows or light blue with white arrows	
ix) Chilled water lines	.. Green with white arrows	
x)	Direction of flow of water	
	.. White arrows	
xi) Electrical panels/sub-panel/remote control console	..	Light grey or any approved colour
xii)	Cable trays	..
	Black	
xiii)	Supports for ducts	.. Black.

Materials and equipment shall be catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be manufacturer's latest standard design that complies with the specification requirements.

The contractor or equipment manufacturer of the Air conditioning Management System shall provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation and Servicing). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.

#### **4.12.1 Execution drawings**

Submit all execution drawings for review before proceeding with procurement or site-specific software development and according to a schedule to be established with client.

Submit execution drawings for all equipment to be provided, including but not limited to.

- Software packages
- DDC

- c) Specification data sheets of each hardware component or software module.
- d) Schematic diagrams showing system configuration and interconnection of management stations and all field panels in accordance with the specified level.
- e) Schematic diagrams for all building systems showing control devices, instrumentation, product interconnection, panel wiring, interlocking and component tag identification as well as written sequence of operation.
- f) Other drawings as appropriate. General advertising type literature is only acceptable as additional support information.

Provide final documentation to serve the diverse needs of personnel concerned with instruction, operation, procurement, installation and maintenance.

Execution drawings and final documentation will be reviewed to ensure that such documents are in keeping with the intent of this specification and fully meet the requirements in terms of content and format. Make all required changes to this documentation at no additional cost.

#### **4.12.2 Reference standards**

Provide electrical material and installation in accordance with the appropriate requirements, and in accordance with applicable sections of the current edition of the applicable local codes for electrical work and signalling systems

Provide a AMS system which allows future support of the ANSI/ASHRAE BACnet Standards.

Provide Terminal Unit Controls that is LonMark compliant.

Modem interfacing provisions shall meet EIA RS232C. Modems shall comply with the local required communication protocol with a minimum transmission rate of 56 kbps.

All equipment and systems installed under this Contract shall meet following specifications on electromagnetic compatibility:

- a) Interference immunity according to EN50082-2
- b) Emitted interference according to EN50081-1.

Provide equipment which functions and meets all detailed performance criteria when operating in the following minimum ambient condition ranges:

- a) Operating Temperature - 0 to 50 deg C
- b) Relative Humidity 10% to 85% non –condensing
- c) Electrical power service of single phase, 230V AC +/- 10%, 50 Hz nominal

The limits above are minimums and shall not take precedence over ranges detailed in this or the manufacturers specification.

#### **4.12.3 Variable Frequency Drive (VFD)**

Variable frequency Drives (VFD's) shall be integrated into the AMS system utilizing a serial communication protocol that enables a full "real & write" seamless interface between the VFD & AMS. The VFD's selected, shall be supplied and installed by the contractor. The Contractor shall bear full responsibility for delivering & maintaining this "interoperability" solution.

The VFD shall provide, via serial communication, access to the following VFD features as a minimum.

Motor Current  
 Motor Kw  
 Total Motor KWH  
 Total Motor Run Hours  
 Manual/Off/Auto position feedback

Full PI control access, set points adjust etc (Where used for Pressure/temp control e.g.: VAV Systems, Cooling Towers, and AHUs etc)

Specific alarm indication (General Alarm not acceptable)  
 Sleep Mode function for Cooling Tower Fan  
 Run & Trip status  
 Airflow status/ alarm (Utilizing VFD CT's)  
 Dirty Filter Status /alarm (Utilizing VFD high frequency alarm)  
 Fault Log history (Minimum last 10 faults/alarms)  
 Remote dial in capability for service diagnosis and remote fault reset.

The VFD shall provide the following selectable physical I/O to the AMS system.

- 8 x DI 0/24 VDC (PNP) Read only/ status points
- 2 x Relay Outputs (1 x 240v, 1 x 50 V) Read/ Status or on/off control points (e.g.: damper /valve open/ close control).
- (1 x AI )-10 V or thermistor Read/.Write Points (e.g.: temperature/Pressure sensors, set points, etc)
- 2 x AO/DO 0/4 –20 Ma or 0-24 Vdc Read/Write points
- 1 x 0-24 v DC pulse Output
- Cascade control for multi staging upto 5 no. fan or pump applications (optional where selected)

The VFD shall included the appropriate communication board & protocol, to enable RS485 serial communication with the AMS system. The contractor shall provide all necessary hardware and software required to interface with the VFD either directly through compatible protocols or gateway interface.

The contractor shall provide the client with a list of physical I/O points that will be utilized within the VFD for each specific project. There shall also be a list of additional pseudo points (e.g.: Lw, KwHr, Amps etc) accessible from the VFD without the need for any additional programming.

The VFD shall be capable of operating via serial bus communication and hard wired digital inputs simultaneously. It shall have the following protective features:

1. Electronic motor overload protection.
2. Protection to motor and FC against input transients, loss of AC line phase, short circuit, under voltage, over voltage, phase imbalance, motor over temperature. The frequency converter must display all faults in plain English text. Codes are not acceptable.
3. The frequency converter must be fully protected from switching at the output e.g. switching at the isolator switches near the ventilation fan motor without any additional switch gear.
4. The frequency converter must be fully protected from phase to phase short circuit or earth fault at the motor terminals.
5. To prevent breakdown of motor winding insulation, the U peak must be below 1000 V.
6. A thermistor input must be available in the frequency converter for monitoring actual motor winding temperature.
7. The local Control Panel (keypad of FC) of FC shall display in 4 line alpha- numeric characters in plain English language, the following operating parameters:



- 1 Energy consumed in kW-Hr.
- 2 Power consumed by motor in kW
- 3 Run time of motor in Hours.
- 4 Current drawn by the motor in Amperes.
- 5 Voltage applied to motor terminals by FC in Volts
- 6 DC link voltage in Volts
- 7 Output frequency in Hz.
- 8 Percentage of maximum out put frequency in %.
- 9 Motor Speed in RPM
- 10 Thermal Load on Motor in %
- 11 Thermal Load in FC in %
- 12 Warning Messages such as over current, Current Limit, Motor over temperature, Inverter-over temperature, under voltage, Over Voltage, Main failure, Out of frequency range, serial communication time out.
- 13 Alarm message such as circuiting, each fault, current limit, over current, motor overheated, inverter overheated, under voltage, over voltage, mains phase fault, motor phase missing, heat sink temperature too high, serial communication time out.

### **TESTING OF AIR-CONDITIONING SYSTEM**

**4.13** Routine and type tests for the various items of equipment of the system shall be performed at the Contractor's own cost and test certificates are to be submitted.

**4.14** The performance tests to determine whether or not the full intent of the specification is met shall be conducted by the contractor. After notification to Purchaser that the installation has been completed and the system has run continuously for a period of at least one week, the contractor shall conduct under the direction and the presence of Purchaser such tests as specified to establish the capacity of various equipment supplied and installed by the contractor.

**4.15** The contractor shall operate, test and adjust the air-conditioning system units, fan, motors, all air handling appliances including adjustment of regulators, dampers, etc. All testing equipments, labour, operating personnel, oil, refrigerant or any other item required for these tests shall be provided by the contractor to enable the plant to be put in a continuous running test.

**4.16 Test procedure**

**4.16.1 Design Conditions:**

The inside and outside conditions shall be recorded on hourly basis. The outside and inside dry bulb and wet bulb temperatures shall be recorded by means of a sling psychrometer with mercury thermometers. The relative humidity shall be computed from the psychometric chart. The inside dry bulb temperature and relative humidity shall fall within the specified limits.

The contractor should conduct performance such tests as indicated in the rated Technical Part and produce sufficient documentary proof that the plant is operating at the rated capacity.

The following readings shall be recorded hourly during the tests and capacity of the plant shall be computed.

- 1. Compressor**
  - a. Suction pressure - Kg/cm<sup>2</sup> (psi)
  - b. Suction temperature - °C (°F)
  - c. Discharge pressure - Kg/cm<sup>2</sup> (psi)
  - d. Condensing Tempr. - °C (°F)
  - e. Oil pressure - Kg/cm<sup>2</sup> (psi)
  - f. Compressor Speed - RPM
- 2. Compressor motor**
  - a. Rated capacity - HP
  - b. Rated volts - Volts
  - c. Rated current - Amps
  - d. Starting current - Amps
- 3 Chiller**
  - a. Rated capacity - HP
  - b. Chilled water flow in temp - degC
  - c. Chilled water flow out temp - degC
  - d. Chilled water flow in - m3hr
  - e. Chilled water flow out - m3hr
- 4. Chilled water pumps**
  - a. Rated capacity - HP
  - b. Rated volts - Volts
  - c. Rated current - Amps
  - d. Starting current - Amps
  - e. Chilled water flow - m3hr
- 5. Inside unit**
  - a. Air velocity - M/Hr. (FPM)
  - b. Face area - M<sup>2</sup> (SFT)
  - c. Air quantity - M<sup>3</sup>/Hr. (CFM)
  - d. Entering air temp. DB - °C (°F)
  - e. Entering air temp. WB - °C (°F)
  - f. Leaving air temp. DB - °C (°F)
  - g. Leaving air temp. WB - °C (°F)
- 6. Air Grilles**
  - a. Area of Grilles - M<sup>2</sup> (Sft)
  - b. Velocity - M/Hr (FPM)
  - c. Air flow rate - M<sup>3</sup> (FPM)
  - d. Temperature DB - °C (°F)
  - e. Temperature WB - °C (°F)
- 7. Air Diffusers**
  - a. Area - M<sup>2</sup> (Sft)
  - b. Velocity - M/Hr (FPM)
  - c. Air flow rate - M<sup>3</sup> (FPM)
  - d. Temperature DB - °C (°F)

8. **Filters**
- |                    |               |
|--------------------|---------------|
| e. Temperature WB  | - °C (°F)     |
| a. Total area      | - $M^2$ (Sft) |
| b. Effective area  | - $M^2$ (Sft) |
| c. Velocity of air | - M/Hr (FPM)  |
| d. Quantity of air | - $M^3$ (CFM) |

## SECTION-V

### **TECHNICAL DATA**

**(To be submitted along with the tender)**

- 5.0** The following data shall be furnished along with the offer: (REFER LIST OF APPROVED MAKES)  
(Attach catalogues, brochures, etc.)

#### **1. Chiller**

Manufacturer  
Model  
Actual capacity TR  
Overall dimensions  
Over all weight  
Operating weight  
Refrigerant

#### **Compressor**

Manufacturer  
Model  
Type  
Capacity at the specified water temp. and flow rates - in TR  
Type of capacity control provided  
Type of lubrication  
KW / TR

#### **Motor**

Model  
Manufacturer  
Number of motors  
Capacity HP  
Whether provided with part winding  
Type  
Class of insulation  
Speed RPM  
Characteristics  
Type of starter  
Rating  
Whether the following protections are provided.

- |     |   |        |
|-----|---|--------|
| i)  | Overload  | Yes/No |
| ii) | Under voltage   | Yes/No |
| i)  | Single phase protection<br>(for three phase motor starters) | Yes/No |

#### **2. Inside units**

Manufacturer

Model  
 Type of fan  
 Fan speed (R.P.M.)  
 No. of fans.  
 Fan wheel diameter (mm)  
 Drive arrangement  
 Material and thickness of fan wheel and blades.  
 Materials and thickness of housing.  
 Fan outlet area  
 Outlet velocity.  
 Total air quantity  
 Static pressure at outlet. (mm. of water)  
 Whether statically and dynamically balanced.  
 B.H.P. Consumed  
 Total weight of all items

### **Cooling Coil**

Material of Tubes  
 Material of fins  
 Tube diameter  
 Tube thickness  
 Fin thickness  
 Method of bonding of fins  
 No. of fins/cm.  
 Total tube surface outside  
 Test pressure  
 Coil face area

### **Filter**

Manufacturer  
 Type of filters  
 Filter medium  
 Material of frame work and its thickness  
 Face area  
 Face velocity across filters  
 Pressure drop across filters (mm of water)

### **Motor**

Manufacturer  
 Model  
 Number of motors  
 Capacity HP  
 Type  
 Class of insulation  
 Speed RPM  
 Characteristics  
 Type of starter  
 Rating  
 Whether the following protections are provided.

- |                   |        |
|-------------------|--------|
| i) Overload       | Yes/No |
| ii) Under voltage | Yes/No |

iii) Single phase protection  
(for three phase motor starters)

Yes/No

**3. Ducting**

Material

Manufacturer

**4. Insulation (for ducting)**

Manufacturer

Material

'k' Value at 10 (°C) mean temperature

Thickness.

Density

Fire Retardant property

Note : Any other data relevant to each equipment shall also be furnished.

### Approved make of items –HVAC

1.	Chiller	-	Blue star/ Kirloskar/ Carrier /Hitachi/ Trane/York/Dhanambush
2.	AC Compressor	-	Danfoss/Koplan/Emerson
3.	AHU	-	Blue star/ Carrier /Hitachi/VTs/Zeco
4.	Ductable/Packaged AC	-	Blue star/ Voltas/ Carrier/ETA/Hitachi
5.	Split AC		Blue star/ Voltas/ Carrier
6.	Pumps	-	Kirloskar, Mather platt, Beacon, Grundfoss
7.	Three phase motors	-	Siemens/Kirloskar/Crompton/Bharath Bijlee /ABB /Alsthom
8.	MS pipes	-	TATA/Gindal
9.	Copper Pipes	-	Totaline/Piyush/Mandev
10	Stabilizer	-	V Guard/VOLTAS
11	GI Sheets	-	SAIL/TATA/JINDAL
12	Resin bonded Glass wool	-	UPTWIGA /Owens Coning/KIMMCO
13	Nitrile Rubber Insulation	-	Armaflex/K Flex
14	Grilles/Diffusers	-	Airmaster/Carryaire/Air Flow/Ravistar
15	Pressure gauges	-	Feibig/H-Guru/Jaspin
16	Industrial type thermometers	-	Feibig/H-Guru/Jaspin
17	Fire Dampers	-	Carryaire/Airmaster/Air Flow/ Ravistar
18	Volume Control Damper	-	Carryaire/Airmaster/Air Flow/ Ravistar
19	Exhaust/ Duct Fans	-	System Air/Kruger/Nicotra
20	Paints	-	ICI/Asian/Berger
21	PVC pipe	-	Any ISI marked
22	Motors		Siemens, Kirloskar, Crompton, Bharath, Bijlee, ABB, Alsthom, NGEF
23	Hepa Filter	-	Aerofoil/Pyramid/AAF
24	Valves	-	Audco, Leader, Kirloskar, Crawley, Divine, Advance, Bankim Sarkar.
25	Motorized Valves	-	Honeywell/Siemens/ Belimo

## **TECHNICAL SPECIFICATIONS FOR FIRE FIGHTING SYSTEM**

### **1.0 TECHNICAL SPECIFICATIONS FOR FIRE FIGHTING SYSTEM**

#### **1.1 General**

Work under this subhead is time-bound and has to be completed within the time limit set in the tender. Work shall be executed in accordance with an agreed schedule which shall be submitted by the tenderers along with offer and agreed to by owners.

#### **1.2 Scope of Work**

The scope of work in this subhead shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely do all work relating to the supply, installation, testing & commissioning of Fire Detection & Fighting System Works for MCC, Thalassery as described herein after and shown on the drawings. The scope of work in general shall include the following.

- i) Fire Fighting Pumps & Accessories and related electrical works
- ii) External & Internal Fire Hydrant System.
- iii) Sprinkler system.
- iv) Fire Detection System.
- v) Hand Held appliances.

Without restricting to the generality of the foregoing, the work shall include the following:

A Hydrant System Covering the entire complex and consisting of the following:

- A. Three number of Pumps - One number Main electric split casing Pump of 2280 LPM at 56 M head, one number Diesel Standby split casing Pump for Hydrant Systems of 2280 LPM at 56 M head, and a Jockey Pump for System pressurization of 180 LPM at 56 M head.
- B. Other piping system ancillaries such as Suction and Delivery Headers, Air Vessel, Pressure Gauges, Pressure Switches, Pump Panel etc. as required.
- C. External Hydrant Ring Main with single headed Yard Hydrants, RRL Hose, Branch Pipes, etc. all housed in a Hose Box.



- D. Internal Hydrant system where required with single headed landing valves accompanied by 1 number swinging type Hose Reel, 2 numbers RRL Hoses, Branch Pipe etc. all housed in the niche. Bidder shall provide front frame with shutter for niche.
- E. Sprinkler system as indicated in the drawing.
- F. Hand appliance as per Bill of Quantities.
- G. To obtain the approval of the relevant drawings before actual installation at site and to get the complete installation inspected and passed by the concerned authorities, as may be necessary as per local bye laws. (Any fee payable to the local bodies for such activities shall be reimbursed by the CLIENT/CONSULTANT on production of receipt).

### **1.3 Contractor's Experience**

- 1.3.1 Contractors shall engaged specialist agency only for this work of Fire Fighting systems.
- 1.3.2 The selected specialist agency must have sufficient experience in the execution of turn-key projects as specified.
- 1.3.3 Contractor must submit with the tender a list of similar jobs carried out by him as required along with the name of works, name and address of clients, year of execution, capacity of plant and value of work.

### **1.4 Technical Information**

- 1.4.1 Contractor shall submit along with the tender copies of detailed specifications, cuts, leaflets, and other technical literature of equipment and accessories offered by him.
- 1.4.2 Contractor's attention is specially invited to the special conditions and other clauses in the agreement which required the contractor to :-
  - a. Submit detailed shop drawings.
  - b. Use material of specific makes and brands.
  - c. Obtain all approvals from Fire Fighting authorities.
  - d. Execute the entire work on a turn-key basis so as to provide a totally operating plant.

### **1.5 Exclusions**

- 1.5.1 Work under this contract does not include the following work:-
- 1.5.2 Electrical cables upto incoming motor control centre.

### **1.6 Site Accessibility**

- 1.6.1 The equipments are to be located in pump house located within the Service block.
- 1.6.2 The equipment must be carried from the goods receiving station to the site in an extremely careful manner to prevent damage to the equipment building or existing services.
- 1.6.3 Contractor must visit the site and familiarize himself with above problems to ensure that the equipment offered by him are of dimensions that they can be carried and placed in position without any difficulty.

## 1.7 Approvals

The contractor shall prepare all submission drawings and obtain all approvals of fire fighting works from fire fighting authorities.

## 1.8 System Description

- 1.8.1 The Hydrant System shall comprise of AC motor driven pump set, standby diesel pump set, jockey pump set for pressurization with all required accessories including valves, special fittings, instrumentation, control panels and any other components required to complete the system in all respects.
- 1.8.2 The Hydrant System shall be semi automatic in action and shall be laid covering the entire area externally and all the floors internally with independent piping system. For the Sprinkler System, a separate piping system shall be installed.
- 1.8.3 The Hydrant System shall be kept pressurized at all times. The proposed Jockey Pump shall take care of the leakages in the system, pipe lines and valve glands.
- 1.8.4 The pressure in the hydrant pipe work shall be kept constant at 7 Kg/cm<sup>2</sup>. In the event of fire when any of the hydrant valve in the network is opened, the resultant fall in header pressure shall start the AC motor driven fire pump through pressure switches automatically. There shall be one Diesel Engine Driven pump as standby for hydrant system. In case of failure of electricity or failure of Electric Pump to start on demand, the standby Diesel Pump shall automatically take over.
- 1.8.5 However, shutting down of the pump set shall be manual except for the Jockey Pump which shall start and stop automatically through pressure switches. In addition to auto start arrangements, the main pump shall also have an over-riding manual starting facility by push button arrangement.
- 1.8.6 The piping for the hydrant system in the yard shall be laid in soil 1 Metre deep or in rectangular Trench. The pipe laid in soil shall be protected as specified in para 1.9.3 below. The scope of work includes necessary excavation of trench and back filling the same. The scope of work also includes necessary watering, ramming, removing the surplus earth from the site and construction of brick pedestal at 3 Mtrs intervals of size as

indicated in the Bill of Quantities. Pipes shall be cleaned before wrapping and coating.

- 1.8.7 The yard hydrants shall be placed at a regular spacing of 30m - 45m centre to centre. The following accessories are proposed near each yard hydrant.

- i) One no. gunmetal single headed hydrant valves.
- ii) Two nos. RRL Hoses of size 63mm dia x 15m long.
- iii) One nos. gunmetal Branch pipe.

Gun metal hydrant valve, RRL hose and gunmetal branch pipe will be accommodated in an aluminium hose box mounted on brick pedestals.

- 1.8.8 The Internal Hydrant System shall be provided at points as indicated on the drawing on each floor.

- 1.8.9 The hydrant point shall be directly tapped from the Riser pipes, and shall be furnished with required accessories such as

- i) One no. gunmetal single headed hydrant valves.
- ii) Two nos. RRL Hoses of size 63mm dia x 15m long.
- iii) One no. first aid Dunlop hose reel full swinging type 20mm dia x 30m long.
- iv) One no. gunmetal Branch pipe.

The hydrant risers shall be terminated with air release valve at the highest points to release the trapped air in the pipe work. At each tapping from the Riser an Orifice Plate shall be located in the lower floors to reduce the pressure at no extra cost.

- 1.8.10 Sprinkler system shall be distributed so as to cover 10–12 sq. m area with one sprinkler.

Sprinkler risers shall be provided with instantaneous control valve with alarm gang. The alarm valve assembly shall be complete with all accessories as required for the performance.

A suitable drainage arrangement with bye pass valves shall be provided to facilitate maintenance of sprinkler pipe work.

- 1.8.11 To compensate for slight losses of pressure in the system and to provide an air cushion for counteracting pressure surges/water hammer in the underground pipe work Air Vessels shall be furnished in the pump room near fire pumps. The air vessel shall be normally partly full of water and the remaining being filled with air which shall be under compression when the system is in normal operation.

## **1.9 GENERAL SPECIFICATIONS**

### **1.9.1 Pipes and Fittings**

Pipes upto 150mm dia shall conform to IS-1239. Pipes with dia 200mm and above (6mm thick) shall confirm to IS-3589. All pipes shall be I.S.I. marked.

Fittings for black steel pipes shall be malleable iron suitable for welding or approved type cast iron fittings with tapered screwed threads.

### 1.9.2 Jointing

Joint for black steel pipes and fittings shall be metal-to-metal tapered thread or welded joints. A small amount of red lead may be used for lubrication and rust prevention in threaded joints.

Joints between C.I. or black steel pipes, valves and other apparatus, pumps etc. shall be made with C.I. or M.S. flanges with appropriate number of bolts. Flanged joints shall be made with 3mm thick insertion rubber gasket.

**Note:** Joints for pipes and fittings upto 50mm diameter shall be threaded joints using Teflon Tape or equivalent bonding tape on the threads. Joints for pipe and fittings above 50mm diameter shall be welded joints.

### 1.9.3 Pipe Protection

- a) All pipes in under ground masonry trenches/service tunnels, above ground and in exposed locations shall be painted with one coat of red oxide primer and two or more coats of synthetic enamel paint of approved shade.
- b) Pipes in wall chases shall be protected from corrosion by 2 coats of bituminous paints.
- c) Protection of Underground Pipes:

The underground steel pipes shall be protected by coating and wrapping. The coating and wrapping shall be done, in general, as per IS:10221-1982.

It specified in Bill of Quantities, the proprietary pipe protection system shall be provided as per the Manufacturers recommendation. The proprietary system shall be of approved make.

### 1.9.4 Installation of Pipes

All pipes shall be adequately supported from ceiling or walls by structural clamps fabricated from M.S. structural e.g. rods, channels, angles and flats. All clamps shall be painted with one coat of primer and two coats of black enamel paint. The contractor shall provide inserts at the time of slab casting or provide suitable anchor fasteners.

The pipe supports or hangers shall be designed to withstand combined weight of pipe, pipes fittings, fluid in pipe and insulation. Pipe supports shall be of steel and coated with rust preventing paint and finished with two coats black enamel paint. The maximum spacing for pipes supports shall be as below:

Pipe (MM)	Spacing (MTR)	Size of support
Up to 25	2.0	6mm
32 to 65	2.4	8mm

75 to 125	2.7	10mm
150 & above	3.0	12mm

Pipes supports shall be spaced at maximum interval of 1.5 mtrs. on either side of heavy fitting and valves. Wherever piping passes through walls, pipes sleeves of diameter larger than that of piping shall be provided. Pipe sleeves shall be of steel or cast iron pipe.

The underground piping shall be supported with cement concrete blocks of suitable size and strength provided at an interval of 2.5 mtrs. The pipes shall be laid at 1 mtr depth (top of the pipe) and trench excavated for sufficient width. The rate for pipe shall include the scope of excavation/refilling the trench. 1:2:4 concrete thrust blocks are also to be provided at turning of pipe. The cost of installation includes concrete pedestals etc. as required and to be included in the item rate.

#### **1.9.5 Orifice Flanges**

Contractor shall provide orifice flanges fabricated from 6mm thick stainless steel plates on the branch lines feeding different zones/floors so as to allow required flow of water at a pressure of 3.5 kg/sq.cm. for each hydrants and 2 bar at installation valve for sprinkler system. The contractor shall design the orifices to ensure the required pressure. No extra cost shall be paid for the orifice plate.

#### **1.9.6 Valves & Other Accessories**

##### **1.9.6.1 General**

Each valve body shall be marked with cast or stamped lettering giving the following information's:

- a) The manufacturer's name or trade mark
- b) The size of the valve
- c) The guaranteed working pressure

Isolating valves on the water supply lines shall be full bore ball valve type for pipe diameters upto 50mm. For 65mm dia and above these shall be butterfly valves.

##### **1.9.7 Full Way Ball Valve**

The valves shall be of full bore type and of quality approved by the Consultant/Owner. The body and ball shall be of copper alloy and stem seat shall be of Teflon.

##### **1.9.8 Sluice Valve (SV)**

##### **1.9.9**

It shall be of IS 780 standards. Construction shall be of inside screw, non-rising stem for water purpose and flanged type. Pressure class shall be of PN 1.0 and tested to 15 kG/Sq.cm pressure. Seat ring shall be of gun metal as per IS 318. Gasket packing shall be of CAF / Graphited asbestos

#### **1.9.9 Non-Return Valves**

Non-return valves are to be IS:778-1984 manufactured from gun-metal or dezincification resistant brass.

#### **1.9.10 Drain Valve**

Drain Valves are to be provided at all low points in the system for draining the water. These shall be 40mm dia full way ball valve fixed on 40mm dia black steel pipe.

#### **1.9.11 Inspection & Testing Assembly**

Inspection and testing of the sprinkler system shall be done by providing an assembly consisting of gunmetal valves, gunmetal sight glass, bye-pass valve.

#### **1.9.12 Flow Switch**

Flow switch shall be provided on sectional mains and branch lines as indicated on drawings, or necessary and required and directed by the Engineer-in-charge.

Flow switch should be suitable to actuate at a minimum of flow and shall be suitable for connection to a central annunciation panel.

#### **1.9.13 Pressure Switches**

Pressure switches shall be differential type for operation of all pumps and for the various duties and settings required. Pressure switches shall be for heavy duty operation and of approved make. All pressure switches shall be factory calibrated.

#### **1.10 External Fire Hydrants**

Yard Hydrant valves shall be single headed as per IS : 5290. The valve shall be complete with hand wheel, quick coupling connection spring loaded type and gun metal blank cap. The Yard Hydrant shall be laid on 125 and 100mm dia pipe as per standards. Hydrant Ring Main, branched off to 80 mm dia and Stand Post of 80mm dia.

#### **1.11 Internal Landing Valves**

The internal landing valves shall be single-headed made of gun metal and conforming to IS:5290. It shall be complete with hand -wheel, quick coupling connection spring loaded type and blank cap.

#### **1.12 Hose pipes, Branch Pipes and Nozzles**

**Hose Pipe:** Hose pipe shall be rubber lined woven jacketed and 63mm in diameter. They shall conform to type-2 (Reinforced rubber lined) of IS:639-1979. The hose shall be sufficiently flexible and capable of being rolled.

Each run of hose pipe shall be complete with necessary coupling at the ends to match with the landing valve or with another run hose pipe or with Branch pipe. The couplings shall be of instantaneous spring lock type.

**Branch Pipe:** Branch pipe shall be of gunmetal 63mm dia and be complete with male instantaneous spring lock type coupling for connection to the hose pipe. The branch pipe shall be externally threaded to receive the nozzle.

**Nozzle :** The nozzle shall be of copper or gunmetal, 20mm in internal diameter. The screw threads at the inlet connection shall match with the threading on the branch pipe, the inlet end shall have a hexagonal head to facilitate screwing of the nozzle on to the branch pipe with nozzle spanner.

End couplings, branch pipes, and nozzles shall conform to IS:903-1985. two hoses of 15 mtr. Lengths with couplings shall be provided with each external (yard) hydrant. One nozzle and one branch pipe with coupling shall be provided with each yard hydrant.

#### 1.13 External Fire Hose Cabinet

The external fire hose cabinet to accommodate the hose pipes, branch pipe nozzle and the hydrant outlets shall be fabricated from 1.5m thick sheet steel. This shall be lockable and provided with center opening glazed doors.

The support for hose cabinet shall be of brick work up to a height of 0.5m above ground level. The depth of footing for this support shall be minimum 50cm below ground level, resting on leveling course of minimum 10cm of PCC (1:5:6). The brickwork shall be plastered in cement mortar (1:6). The hose cabinet shall be painted red and stove enameled.

#### 1.14 Internal Fire Hose Cabinet

Each internal fire hydrant valve shall be housed in a niche of size indicated on drawings. Each internal fire hose Cabinet shall hold single headed hydrant, 2 Hoses, 2 Branch pipes and 1 no. Dunlop hose reel mounted on a drum.

- A) The cabinet shutters & frames shall be fabricated from boxed steel sections and MS plate 2mm thick.
- B) The front glass of shutters shall be 5.0 mm thick clear glass and shall be held by means of rubber. Locking arrangement shall also be made with one number of mortice lock of approved make. A separate Key Box of 2 mm thick MS sheet with glass facing shall be provided.
- C) The Shutter shall be given a powder coat finish in post office red colour.

#### 1.15 Hose Reel

The hose reel shall be directly tapped from the riser through a 25 mm dia pipe, the drum and the reel being firmly held against the wall by use of dash fasteners. The Hose Reel shall be swinging type (180 degrees) and the entire Drum, Reel etc shall be as per IS:884. The rubber tubing shall be of approved quality and the nozzle shall be 6 mm dia shut off type.



### **1.16 Brigade inlet Connections**

Two sets of 4 ways collecting head Fire Brigade connection shall be provided at the location indicated in the drawing.

The inlet to the riser shall be with 150mm dia sluice valve and non-return valve. The scope shall include providing necessary reducers, tees bends and special fittings as required. Necessary enclosure made of 2mm thick sheet metal with support shall be provided, as in the case of hose cabinets.

### **1.16 AUXILIARY PUMPING EQUIPMENT (Jockey Pump)**

#### **1.16.1 Scope**

This section covers the details of requirements of the auxiliary equipment necessary for the operation of the fire pumps and the wet-riser system.

#### **1.16.2 Drive**

The pump shall be directly driven from the electric motor. Flexible coupling and coupling guard shall be provided.

#### **1.16.3 Capacity**

The discharge and head of the jockey pump shall be as mentioned in Bill of Quantities.

Jockey pump shall be Horizontal type. The pump casing shall be of cast iron and parts like impeller, sleeve, wearing ring etc. shall be of non-corrosive metal like bronze, brass or gunmetal. The shaft shall be of stainless steel.

Bearings of the pump shall be effectively sealed to prevent loss of lubricant or entry of the dust or water. The pump casing shall be designed to withstand 1.5 times the working pressure.

#### **1.16.4 Motor**

The motor shall be squirrel cage A.C. induction type suitable for operation on 415 volts 3 phase 50 Hz, system. The motor shall be totally enclosed fan cooled type conforming to protection clause IP 21 of IS 4691. The class of insulation shall be B, synchronous speed shall be 3000 RPM/1500 RPM. The motor shall conform IS 325-1978 and rated for continuous duty.

#### **1.16.5 Motor Starter**

The motor starter shall be automatic star delta type with overload trip, but without under voltage/no volt trip. Starter shall conform to IS 1822-1967.

## **2.0 MAIN ELECTRIC FIRE PUMP**

### **2.1 Scope**

This section covers the details of requirements of the motor, starter and pump for the electrically operated fire pump.

### **2.2 General**

The electric fire pump shall be suitable for automatic operation complete with necessary electric motor and automatic starting gear, suitable for operation on 415 volts, 3 phase, 50 Hz. AC system. Both the motor and the pump shall be assembled on a common base plate of fabricated MS channel type or cast iron type.

### **2.3 Drive**

The pump shall be only direct driven by means of a flexible coupling. Coupling guard shall also be provided.

### **2.4 Fire Pump**

The fire pump shall be horizontal split casing centrifugal type. It shall have a capacity to deliver 2280 LPM as specified, developing adequate head so as to ensure a minimum pressure of 3 Kg per sq.cm at the highest and the farthest outlet. The delivery pressure at pump outlet shall be not less than 7 Kg. Per sq.cm. in any case.

The pump shall be capable of giving a discharge of not less than 150 percent of the rated discharge, at a head of not less than 65 percent of the rated head. The shut off head shall be within 120 percent of rate head.

The pump casing shall be of cast iron to grade FG 200 to IS:210 and parts like impeller, shaft sleeve, wearing ring etc., shall be of non-corrosive metal like bronze/brass/gunmetal. The shaft shall be of stainless steel.

Bearing of the pump shall be effectively sealed to prevent loss of lubricant or entry of dust or water.

The pump shall be provided with a plate indicating the suction lift delivery head, discharge speed and number of stages. The pump casing shall be designed to withstand 1.5 times the working pressure.

### **2.5 Motor**

The motor shall be squirrel cage A/C induction type suitable for operation on 415 volts 3 phase 50 Hz system. The motor shall be totally enclosed fan cooled type conforming to protection clause IP 21 vide I.S. 4691. The class of insulation shall be B. The motor shall be rated for continuous duty as per relevant IS and shall have a horsepower rating necessary to drive the pump at 150 percent of its rated discharge.

### **2.6 Motor Starter**

The motor starter shall be automatic star Delta type conforming to IS:1822-1967. The starter shall not incorporate under voltage or overload trip or single-phase preventor. The starter assembly shall be suitably integrated in the power control panel for the wet riser system.

Each pump shall be provided with vibration isolating pads of appropriate size.

### **3.0 DIESEL FIRE PUMP**

#### **3.1 Scope**

This section covers the details or requirements of the stand by fire pump operated by a diesel engine.

#### **3.2 General**

The diesel pump set shall be suitable for automatic operation complete with necessary automatic starting gear, for starting on wet battery system and shall be complete with all accessories. Both engine and pump shall be assembled on a common bed place, fabricated with mild steel channel.

#### **3.3 Drive**

The pump shall be only direct driven by means of a flexible coupling. Coupling guard shall also be provided.

#### **3.4 Fire Pump**

The fire pump shall be horizontal split casing centrifugal type. It shall have the capacity to deliver 2280 LPM as specified, developing adequate head so as to ensure a minimum pressure of 3 kg. Per sq.cm. at the highest and the farthest outlet. The delivery pressure at the pump outlet shall be not less than 7 kg. Per sq.cm. in any case. The pump shall be capable of giving a discharge of not less than 150% of the rated discharge at a head of not less than 65% of the rated head. The shut off head shall be within 120% of the rated head. The shaft shall be of stainless steel. The pump shall be provided with mechanical seal. The pump casing shall be designed to withstand 1.5 times the working pressure.

Bearings of pump shall be effectively sealed to prevent loss of lubricant or entry of dust or water.

#### **3.5 Diesel Engine**

##### **Engine Rating:-**

The engine shall be cold starting type without the necessity of preliminary heating of the engine cylinders or combustion chamber (for example, by wicks, cartridge, heater plugs etc.). The engine shall be multi cylinder/vertical, 4-stroke cycle, water-cooled, diesel engine, developing suitable HP at the operating speed specified to drive the fire pump. Continuous capacity available for the load shall be exclusive of the power requirement of auxiliaries of the diesel engine, and after correction for altitude, ambient, temperature and humidity for the specified environmental conditions. This shall be at least 20% greater than the maximum

HP required to drive the pump at its duty point. It shall also be capable of driving the pump at 150% of the rated discharge at 65% of the rated head. The engine shall be capable of continuous non-stop operation for 8 hours. The engine shall have 10% overload capacity for one hour in any period of 12 hours continuous run.

The engine shall accept full load within 15 seconds from the receipt of signal to start. The diesel engine shall conform to B.S. 649/IS 1601/IS 10002, all amended up to date.

### **3.6 Cooling System**

The engine cooling system shall be radiator water cooled system. The radiator assembly shall be mounted on the common baseplate. The radiator fan shall be driven by the engine as its auxiliary with a multiple fan belt. When half the belts break remaining belts must be capable of driving the fan. Cooling water shall be circulated by means of an auxiliary pump of suitable capacity driven by the engine in a closed circuit.

### **3.7 Fuel System**

The fuel shall be gravity fed from the engine fuel tank to the engine driven pump. The engine fuel tank shall be mounted either over or adjacent to the engine itself suitably wall mounted on brackets. The fuel filter shall be suitably located to permit easy servicing.

The engine fuel tank shall be welded steel construction (3mm thick) and of capacity sufficient to make the engine to run on full load for at least 8 hours. The tank shall be complete with necessary supports, level indicator (protected against mechanical injury), inlet, outlet, over flow connections drain plug and piping to the engine fuel tank. The outlet should be so located as to avoid entry of any sediment into the fuel line of the engine. A semi rotary hand pump filling the engine fuel tank together with hose pipe 5 mtr. Long with a foot-valve etc. shall also form part of the scope of work.

### **3.8 Lubricating Oil System**

Forced feed Lubricating Oil system shall be employed for positive lubrication. Necessary Lubricating Oil filters shall be provided and located suitably for convenient servicing.

### **3.9 Starting System**

The starting system shall comprise of necessary battery/batteries, starter motor of adequate capacity and axle type gear to match with the toothed ring fly wheel. Suitable metallic relay to protect starting motor from excessively long cranking runs shall be included within the scope of the work. The metallic relay protection shall be integrated with engine protection system.

The capacity of the battery shall be suitable for meeting the needs of the starting system but not less than 180 AH.

The battery capacity shall be adequate for 10 consecutive starts without recharging with cold engine under full compression.

The scope shall cover all cabling, terminals, initial charging etc.

### **3.10 Exhaust System**

The exhaust system shall be complete with silencer suitable for indoor installation, and silencer piping including bends and accessories needed. The exhaust pipe shall protrude outside the pump room. The total backpressure shall not exceed the engine manufacturer's recommendations. The exhaust piping shall be suitably supported and the pipe used shall be of medium class MS pipe.

### **3.11 Engine Shut Down Mechanism**

This shall be manually operated and shall return automatically to the starting position after use.

### **3.12 Governing System**

The engine shall be provided with an adjustable governor to control the engine speed within 5% of its rated speed under all conditions of load up to full load. The governor shall be set to maintain rated pump speed at maximum pump load.

### **3.13 Engine Instrumentation**

Engine instrumentation shall include the following :-

- a. Lubricating Oil Pressure Gauge
- b. Lubricating Oil temperature gauge
- c. Water temperature gauge
- d. Water pressure gauge
- e. Tachometer
- f. Hour meter
- g. Starting key

The instrument panel shall be suitably mounted on the engine.

### **3.14 Pipe Work**

The piping for exhaust outlet as well as fuel piping between fuel tank and the engine shall be with Medium class M.S.

### **3.15 Anti Vibration Mounting**

Suitable vibration mounting duly approved by engineer-in-charge shall be employed for mounting the unit so as to minimize transmission of vibration to the structure. The isolation efficiency achievable shall be clearly indicated in the report, which will be submitted to engineer-in-charge before installation.

### **3.16 Battery Charger**

Necessary float and boost charger shall be incorporated in the control section of the power and control panel to keep the battery under trickle condition. Ammeter to indicate the state of charge of the batteries shall be provided.

## **4.0 POWER AND CONTROL PANEL AND OTHER CONTROL COMPONENTS**

### **4.1 Scope**

This section covers the detailed requirements of the power and the control panel for the wet riser system, and also for the various control components in the system.

### **4.2 Power and Control Panel**

#### **4.2.1 Constructional Requirements**

##### **General Features**

The power and control panel shall be totally enclosed, free standing floor mounted cubicle type, fabricated out of sheet steel not less than 2mm thick. Where ever necessary, additional stiffening shall be provided by angle iron framework. General construction shall be of compartmentalization and sectionalisation such as mains incomes, electric fire pump, diesel fire pump, pressurization pump, and control, so that there is no mix up of power and control wiring and connections in the same sections as far as possible. The panel shall also have the space for cable allays. The space for cable alleys shall be at least 200mm wide to the entire depth of panel. The panel shall be front operated type with all connections accessible from the front. Front doors shall be hinged type. Back doors shall be hinged type or removable type for inspection. The door hinges shall be of concealed type. The doors for busbar chamber shall be of removable type with the help of bolts. The doors shall be provided with quick fixing doors knobs with indication. The general arrangement of the panel shall be got approved before fabrication the cubicle construction shall be to IP 21 as per IS:2147.

#### **4.2.2 Cable entries and gland plates**

All cable entries shall be through gland plates which are removable and sectionalized. Where heavy cables are brought in and terminated, suitable clamps shall be incorporated to relieve the stress on the glands due to the weight of the cable. Cable entries may be from top or bottom depending on the equipment layout and cable scheme as approved.

#### **4.2.3 Busbar and Connections**

The busbars shall be air insulated, and of aluminium of high conductivity electrolytic quality (grade E 91 E to IS: 5082) and of adequate cross section. Current density shall not exceed 1.3 amps. Per sq.cm. All connections to individual circuits from the busbars shall preferably be with solid connections. The busbars and the connections shall be suitable covered with PVC sleeves or in an approved manner. Busbars shall be suitably supported using non-hygroscopic

insulated supports. High tensile bolts and spring washers shall be provided at busbar joints.

#### **4.2.4 Earthing Arrangement**

GI strip 25mm x 5mm shall be run at the rear of the board. 2 nos. earth terminals shall be provided at the ends of the GI strip for connection to earth system.

#### **4.2.5 Terminal Blocks and Small Wiring**

Terminal blocks shall be of heavy duty type and generally not less than 15 amps 250V grade upto 100V, and 600V grade for the rest of the functions. They shall be easily accessible for maintenance. All control wiring inside the panel shall be with PVC insulated copper conductor of 2.5 sq.mm. size and 600V grade conforming to IS:694-1977. Suitable colour-coding may be adopted. Wiring harness shall be neatly formed and run preferably function wise, and as far as possible segregated voltage wise. Identification ferrules shall be used at both ends of the wires.

#### **4.2.6 Instruments and Lamps**

All indication lamps and instruments shall be flush mounted type in front of the panel. The voltmeter and ammeter shall be of size 100mm nominal (dial size) conforming to clause 1.5 of IS 1248 for accuracy.

Current transformers shall be provided with ammeters.

Indicating lamps to indicate the availability of electric supply shall be provided at the incoming section. Necessary indicating lamps for alarm indications and battery charging shall be provided in the respective sections.

All indicating lamps and meter shall be protected with HRC cartridge type fuses.

#### **4.2.7 Labels**

All internal components shall be provided with suitable identification labels. Suitably engraved labels shall be fixed at the panel for all switches, instrument push buttons, indicating lamps etc.

#### **4.2.8 Painting**

The entire panel shall be given a primer coat of red lead after degreasing and phosphating treatment and 2 coat of final paint of approved shade before assembly of various items.

### **4.3 Equipment Requirements**

#### **4.3.1 General**

The power and control panel shall comprise individual section for the various equipments of the system and controls, in a combined cubicle type design. All



switches, MCCBS, MCBS and fuse/fuse switch units shall be conforming to relevant IS.

#### 4.3.2 Incomer Section & outgoing section

- (A) Incomer section:
- 1 no. 630 amps TP MCCB unit complete. One set of 96 mm square digital Ammeter ( 0-400 Amps) complete with selector switch and CTS. One set of 96 mm square digital Voltmeter (0 - 500 V) complete with control fuses and selector switch. One set of phase LED indicating lights with control fuses. One set of 4 strips of 800 Amps aluminium busbars.
- (B) **Outgoing feeder**
- (i) Three numbers of 300 Amps TP MCCB (35 KA, lcs = lcu) unit complete, S P Preventer, ML 4 type Contactor for star delta starting, start and stop push buttons, auto-manual switch, digital Ammeter with CTS, ASS, LED phase indicating lights, Auxillary Contactors for interlocking/sequence of operation, control terminals complete in all respect with interconnections for Hydrant Pump and sprinkler pump.
- (ii) Two numbers of 63 Amps rated TP MCCB (25 KA, lcs = lcu) unit- complete, ML 1.5 type Contactor for D O L starting with overload relay, start and stop button, digital Ammeter, CTS and selector switch, phase indicating lights, Auxillary contacts for interlocking/sequence of operation, control terminals complete in all respect for Jockey Pump.
- C Control Wiring from Pressure Switches of different settings in Hydrant and Jockey Pumps, for sequence of operation shall be included to complete the system.
- D Colour code with ferrule marking shall also be made.
- E The cabling shall be XLPE insulated and aluminium / copper conductor cable of 1100 volts grade conforming to IS as required from Fire Pump Board to motor and cable of suitable size as per BOQ.

#### 4.3.3 Electric Fire Pump Section

This section shall incorporate the following facilities.

- a. Suitable capacity MCCBS
- b. Control system components and equipment such as relays, contractors, timers etc. for automatic operation.
- c. Starter Unit, Current Transformer and digital ammeter.
- d. LED Indication lamps, their fuses, terminal block, push buttons, control and selector switches etc. are as required.
- e. Pump lock out devices due to faults or abnormalities as specified in operating sequence.

- f. Visual/audio alarms, indications and communications facility as specified in operating sequence.
- g. Necessary inter-connection and control wiring etc.

#### **4.3.4 Engine Section**

The engine section shall incorporate the following facilities:

- i. Control system components and equipment such as relays, contractors, timers etc. for automatic operation.
- ii. Instruments, indicator lamps, fuses terminal blocks, push buttons, control and selector switches etc. as are required.
- iii. Engine shut down and block out devices due to faults or abnormalities as specified.
- iv. Visual/audio alarms and indications as specified.
- v. Inter-connection and control wiring etc.

#### **4.3.5 Auxiliary Pump Section**

The auxiliary pump section for jockey pump shall incorporate the following:

- a. TP&N MCBS.
- b. Control system components such as relays, times, contractors, etc. as are necessary for functional requirements.
- c. Starter unit, current transformer and ammeter.
- d. Indication lamps, fuses, terminal blocks, push buttons selector, switch etc. as required.
- e. Inter-connections and control wirings etc.

#### **4.3.6 Control Section**

This section shall incorporate the following:-

- a. Control components integrating the various sections, so as to satisfy the functional requirements.
- b. Battery charger unit with boost/float charge facility with voltmeter, capable of independently charging 2 sets of batteries at a time.
- c. Visual/audio alarms, not covered in individual sections.
- d. Lamps healthy test facility.
- e. Instruments, indicating lamps, push buttons, fuse terminal blocks etc. as are required.
- f. Test facility to simulate operation of hydrants.

#### **4.4 Other Control Components**

##### **4.4.1 Pressure Switches**

Pressure switches shall be provided for switching on and off the pressurization pump at preset pressures and also for switching off the fire pump at preset pressure. Being the main component for initiating the signal for the operation of the pumps, the pressure settings shall be totally reliable, sturdy in construction and of long life. The pressure settings shall be adjustable.

##### **4.4.2 Power Supply for Controls**

In order to ensure that the control systems remains co-operational at all times the control system shall be designed for 24 VDC operation fed from the battery. This shall be independent of the starting battery for the engine i.e. battery shall remain trickle charged at all times from the separate battery charger at the control section.

#### **5.0 Electrical Work and Earthing**

##### **Scope**

This section covers the detailed requirements of electrical works including earthing, for the materials installation.

Electric power supply shall be terminated in the incoming switch gear of the power and control panel by the Department. All further connections to the various components of the system shall be the responsibility of the contractor, for a complete and working system, satisfying all the functional requirements.

The scope shall particularly include the following :

Power and Control Panel(s) as given in relevant section.

All inter-connections with multi-core armoured copper cables of size suitable between various control units and control panel(s).

All power cable connections with multi-core armoured aluminium cables of size as specified in BOQ, between panels, motors etc.

Necessary earthing with 2 Nos. G.I. plate electrodes and loop earthing.

The work shall be carried out conforming to CPWD General Specifications for electrical works part-I (Internal) amended up to date and part-II (External) amended upto date.

#### **6.0 Sprinkler System**

##### **6.1 Sprinkler Heads**

Sprinkler heads shall be of quartzoid bulb type with bulb, valve assembly yoke and the deflector. The sprinklers shall be approved make and type.

## 6.2 Types

### 6.2.1 Conventional Pattern

The sprinklers shall be designed to produce a spherical type of discharge with a portion of water being thrown upwards to the ceiling side of wall extras. The sprinklers shall be suitable for erection in upright position or pendant position.

#### A. Spray Pattern

The spray type sprinkler shall produce a hemispherical discharge below the plane of the deflector.

#### B. Ceiling (flush) Pattern

These shall be designed for use with concealed pipe work, these shall be installed pendant with plate or base flush to the ceiling with spray head below the ceiling.

#### C. Side Wall Sprinklers

These shall be designed for installation along with the walls of room close to the ceiling. The discharge pattern shall be similar to one quarter of sphere with a small proportion discharging on the wall behind the sprinklers.

### 6.2.2 Construction

- i) **Bulb:-** Bulb shall be made of corrosion-free material strong enough to withstand any water pressure likely to occur in the system. The bulb shall shatter when the temperature of the surrounding air reaches a predetermined level.
- ii) **Valve assembly:-** Water passage of the sprinkler shall be controlling assembly of flexible construction. The valve assembly shall be held in position by the quartzoid bulb. The assembly shall be stable and shall withstand pressure surges or external vibration without displacement.
- iii) **Yoke:-** The yoke shall be made of high quality gun metal. The arms of yoke shall be so designed as to avoid interference with discharge of water from the deflector. The sprinkler body shall be coated with an approved anti corrosive treatment if the same is to be used in corrosive conditions.
- iv) **Deflector:-** The deflector shall be suitable for either upright or pendant erection. The deflector shall be designed to give an even distribution of water over the area protected by each sprinkler.

#### D) Colour Code

The following colour code shall be adopted for classification of sprinkler according to nomination temperature ratings.

**Sprinkler Temperature Rating**

68 deg. C

**Colour of the Bulb**

Yellow

**E. Size of Sprinklers Orifices**

The sprinklers shall be of 15mm nominal bore size.

**6.2.3 Pipes and Fittings**

Pipes for sprinkler system shall be of black steel conforming to I.S. 1239 (medium class).

Fittings for black steel pipes shall be malleable iron suitable for welding or approved type cast iron fittings with tapered screwed threads.

**6.2.4 Jointing**

Joint for black steel pipes and fittings shall be metal to metal tapered thread or welded joints. A small amount of red lead may be used for lubrication and rust prevention in threaded joints.

Joints between G.I. or black steel pipes, valves and other apparatus, pumps etc. shall be made with G.I. or M.S. flanges with appropriate number of bolts. Flanged joint shall be made with 3mm thick insertion rubber gasket.

**6.2.5 Pipes Protection**

All pipes above ground and in exposed locations shall be painted with one coat of red oxide primer and two or more coats of synthetic enamel paint of approved shade.

Pipes in chase or buried underground shall be painted with two coats of hot bitumen.

**6.2.6 Pipe Supports**

All pipes shall be adequately supported from ceiling or walls from structural clamps fabricated from M.S. structural e.g. rods, channels, angles and flats. All clamps shall be painted with one coat of primer and two coats of black enamel paint. The contractor shall provide inserts at the time of slab casting or anchor fastener later.

**6.2.7 Valves**

Sluice valves of sizes 80mm and above shall be double flanged cast iron conforming to I.S. 780. Check valve shall be of cast iron double flanged conforming to I.S. 5312.

Valves on pipes 65mm and below shall be heavy pattern gunmetal valves with cast iron wheel seat tested to 20 kg/sqcm. pressure. Valves shall conform to I.S. 778.

1. **Air Valves**

25mm dia screwed inlet cast iron single acting air valves on all high points in the system or as shown on drawings.

2. **Drain Valves**

50mm dia black steel pipe conforming to I.S. 1239 medium class with 50mm gunmetal full way valve for draining and water in the system in low pockets.

6.2.8 **Installation Control Valve**

Installation control valves shall comprise of the followings:

- a) One-man stop valve of full way pattern with gunmetal pointer to indicate where open/shut.
- b) One automatic alarm valve fitted with handle & cover.
- c) One hydraulic alarm motor and gong for sounding a continuous alarm upon out-break of fire. One combined waste and testing valve including 5mtr of tubing and fittings.
- d) Alarm stops valve.
- e) Strainer
- f) Drain plug
- g) Padlock and strap
- h) Wall box for installation of valve.
- i) All other accessories as required.

6.3 **Pressure Gauges**

Burden type pressure gauges conforming to IS/BS specifications shall be provided at the following locations:

- a. Just above alarm valve.
- b. Just below alarm valve, on the installation stop valve.
- c. One pressure gauge on delivery side of each pump.
- d. Required number of pressure gauges on pressure tank.

6.4 **Installation of Piping**

- a. All above ground piping shall be installed on suitable to pipe hangers/supports as required. The hangers shall be made of MS angles, channels etc. and painted to the required finish with suitable synthetic enamel paint. The maximum spacing of piping supports shall be as follows:



- |      |                  |          |
|------|------------------|----------|
| i)   | 20mm to 32mm dia | 2.5 mtr. |
| ii)  | 40mm to 65mm dia | 3.0 mtr. |
| iii) | 65mm & above     | 3.0 mtr. |

Piping shall be so installed that the system can be thoroughly drained. All the pipes shall be arranged to drain to the installation drain valve. In case of basement and other areas where the pipe work is below the installation drain valve/auxiliary valves of the following sizes shall be provided.

20mm dia valve for pipes up to 50mm dia

25mm dia valves for 65mm dia pipe

32mm dia valves for pipes larger than 65mm dia

Piping shall be of screwed type upto 50mm diameter. Welding of joints will be allowed for pipes of above 50mm dia.

The entire piping shall be pressure tested by hydrostatic method upto a pressure of 1.5 times the working pressure. The piping shall be slowly charged with water so that all the air is expelled from the piping by providing a 25mm inlet with a stop cock. The piping shall be allowed to stand full of water for a period of 2 hours and then the piping shall be put under pressure by means of manually operated test pump or by a power driven test pump. The pressure gauges used for testing shall be accurate and shall preferably be calibrated before the testing is carried out. All the leakage's and defects in joints revealed during the testing shall be rectified to the entire satisfaction of the Engineer-in-charge. The system may be tested in sections/parts as the work of erection of piping proceeds. The piping shall stand 1.5 times the working pressure for at least 2 hours.

## 7.0 Operating Sequence for the Fire Fighting System

- 7.1 The operating pressure in the mains is to be maintained at 7.0 kg/cm<sup>2</sup>.
- 7.2 The jockey pump shall start automatically the moment pressure drops to 6.5 kg/cm<sup>2</sup> because any leakage or minor draw-off from the system and stop when the pressure reaches 6.5 kg/cm<sup>2</sup> again.
- 7.3 In case, after the start of jockey pump, the pressure still keeps on falling, the main fire pump shall start at 6.0 kg/cm<sup>2</sup> by triggering of the pressure switch. Jockey pump shall stop when main pump starts.
- 7.4 In the event of electrical or mechanical failure of main fire pump to start, the diesel engine driven pump shall cut in when the pressure in the mains fall down to 5.5 kg/cm<sup>2</sup>. The main electric pump shall then be locked out.
- 7.5 If within a preset period the standby pump fails to start or fails to develop adequate pressure, the control system shall shut down the standby pump and lock it out and given an audiovisual indication to that effect at the control panel.

- 7.6 Jockey pump shall be shut down automatically when the fire pump electric or diesel, is operating. Necessary integration of pipe work and controls shall be provided for the purpose. A timer may be employed where necessary to distinguish between slow fall of pressure due to system leaks and sudden fall of pressure due to fire duty by opening of valves and thus prevent parallel start up of both pressurization and fire pumps.
- 7.7 The control panel shall have status selection for each of the pumps for “automatic” as well as “manual” operation.
- 7.8 Pumps when under “manual” status shall be operated manually through relevant push buttons.
- 7.9 The fire pumps once started shall not be stopped automatically.
- 7.10 The fire pumps shall be locked out for operation both for “manual” and “automatic” operations, once the low water controls operates and furnish an audio and visual alarm on the panel the audio alarm can be silenced by accepting the alarm. The visual alarm shall be individual for each equipment. It shall be flashing type and on acceptance remain steady. A reset button shall be provided for each pump for returning the pump for fire duty.
- 7.11 Over load or under voltage/no volt trip devices for electric fire pump shall not be provided in the starter. LED type indication lamps to indicate the availability of power shall be provided.
- 7.12 Once tripped the electric fire pump shall remain locked out for operation irrespective of the position of its operational status selection switch. Lock out indication shall be available on the panel.
- 7.13 Return to normal operational availability shall be feasible only by manual re-set of locked out units by operation of appropriate push buttons.
- 7.14 When fire pumps are brought into operation an audible tone from turbine type alarm operated by water flow in the mains shall be provided to indicate the healthiness of the system. The healthy running alarm shall not be silenced till the fire pump is shut down, but the tone may be mellowed by the operation, if required.
- 7.15 Alarm for failure and lock out of any pump shall distinct from “healthy” alarm. Failure alarms shall be loud and can be silenced on acceptance.
- 7.16 Repeat indication of various audio and visual indications on a slave remote panel in fire control room in terminal building shall be available. The slave Remote panel shall have indication lamps to show the status of :
  - a) Power healthy in fire pump room.
  - b) Jockey pump ‘ON’
  - c) Main pump ‘ON’

The slave Remote panel shall also have a hooter, which shall sound in case, any pump is 'ON'. The slave Remote panel shall have a provision to reset the hooter with the help of a push button.

## 8.0 Testing

### 8.1 Testing on Completion of Installation

The entire system shall be tested after completion of installation as per the operating sequence specified.

### 8.2 Schedule of Inspection

Testing of fittings/equipments shall be carried out either at site or at works in the presence of a CLIENT/CONSULTANT's representative given below:

- |    |                                       |   |   |
|----|---------------------------------------|---|---|
| 1. | Pumps, motors and engine              | - | Inspection by Client/Consultant at Manufacturers works before dispatch. |
| 2. | Electrical panel                      | - | Inspection by Client/Consultant at Manufacturers works before dispatch. |
| 3. | Pipes                                 | - | Visual inspection at site for ISI mark.                                 |
| 4. | Various valves                        | - | Visual inspection at site for ISI mark.                                 |
| 5. | SFUs, MCBs etc.                       | - | Type test certificates.   |
| 6. | Sprinklers                            | - | Test certificate from independent test laboratories.                    |
| 7. | Fire hose, hydrant, extinguisher etc. | - | Visual inspection at site for ISI mark.                                 |

**Approvals** It shall be the responsibility of the contractor to obtain the approval of drawings and to get the installation inspected and passed by any concerned authorities, as may be necessary as per local by laws, any fee payable to the local bodies for such activities shall be reimburse by the Client/Consultant on production of receipt.

## 9.0 Standards and Codes

- |     |                  |   |
|-----|------------------|---|
| 1.  | IS – 1648 – 1961 | Code of Practice for fire safety of building (general) fire fighting equipment and maintenance. |
| 2.  | IS – 3844 – 1966 | Code of practice for installation of internal fire hydrant.                                     |
| 3.  | IS – 2217 – 1963 | Recommendation for providing first aid and fire fighting arrangement in public buildings.       |
| 4.  | IS – 2190 – 971  | Code of practice for selection, installation and maintenance of portable first fire appliance.  |
| 5.  | IS – 3589        | Electrically Welded Steel pipes (Medium class)  |
| 6.  | IS – 1239        | Mild steel tubes, Tubulers and other wrought steel fittings (Medium class)                      |
| 7.  | IS – 780         | C.I. Double flanges sluice valve.   |
| 8.  | IS – 778         | Gun Metal Valves  |
| 9.  | IS – 909 – 1965  | External fire hydrant (underground)   |
| 10. | IS – 5290 – 1969 | Internal Landing Valve  |
| 11. | IS – 884 – 1969  | First and hose reel   |
| 12. | IS – 934 – 1976  | Specification for portable chemical fire extinguisher soda acid type.                           |
| 13. | IS – 2873 – 1969 | Specification for fire extinguisher for carbon dioxide  |
| 14. | IS – 2189 & 2109 | Automatic fire alarm system or BSS 3116.  |
| 15. |                  | National building code  |

## **15. 10\_ FIRE DETECTION AND ALARM SYSTEM**

### **10.1 STANDARDS**

The manufacture, identification of material and testing of equipment covered in this specification shall comply with the latest editions as on date of opening of tenders of the appropriate standards of the following. Unless otherwise specified, Indian Standards are preferred. All the appliances and accessories shall carry IS or International certification and shall be of approved make.

NFPA 72E Standards on automatic fire detection.

IS:2189 Code of practice for selection, installation and maintenance of automatic fire detection and alarm system.

IS: 823 Welding procedure

IS: 1652 Batteries

IS: 694 PVC insulated cables (light duty) for working voltage upto 1100 volts.

IS: 1554 PVC insulated cables (heavy duty) for voltage upto 1100 volts.

IS: 5959 Specification for polythelene insulated PVC sheathed heavy duty electric cables, voltage not exceeding 1100 V

IS: 5578 Guide for marking of insulated conductors

IS: 3043 Code of practice for earthing.

IS: 5216 Guide for safety procedures and practices in electrical work.

In case where the offer deviates from the specified standards, the tenderer shall indicate clearly in the offer the alternative standards proposed and details thereof.

Unless otherwise mentioned, all applicable codes and standards shall be of the latest editions as published by the Indian Standards and all other such as may be published by them during the tenure of the contract, and shall govern in respect of workmanship, properties of materials, installation and methods of testing. In case where suitable Indian Standards are not available, generally accepted codes and practices as approved by CLIENT/CONSULTANT shall be adopted. Any changes or modifications directed by CLIENT/CONSULTANT shall also be incorporated by the contractor during execution of the work.

Automatic fire detection and alarm system consists of fire control panel, detectors, manual call points, hooters, isolators, response indicators, etc. The equipment and cables of the system shall be independent of any other system in the premises and shall not be shared with any other system. The fire detection and alarm system shall be installed as per NFPA 72E / IS-2189 code.

### **10.2 DETECTORS AND ACCESSORIES**

#### **10.2.1 Detectors**

The fire detectors shall be of analogue addressable type to detect one or more characteristic of fire like smoke, heat or flame. It shall be

sleek, suitable communication technique with noise immunity, built-in functional test switch, microprocessor based technology, mechanically integrated photoelectric and ionization shared volume smoke chamber, etc. All types of detectors shall be of both electronically and manually programmable type using dip-switches or handheld programmer or from fire control panel. Reversed polarity or faulty zone wiring shall not damage the detector. The detector shall have no moving parts or components subject to wear. It shall be possible to test the detector in the field. The response of a detector shall always be clearly visible from outside by a flashing light on the base. The detector shall connect to the control unit via a fully supervised two-wire circuit. A built barrier shall prevent entry of insects into the sensor. The detector shall be designed for fast and simple cleaning.

All electronic circuits must be solid state devices and virtually hermetically sealed to prevent their operation from being impaired by dust dirt or humidity. All circuitry must be protected against usual electrical transients and electromagnetic interference. All radioactive parts of the source, if any, shall be fully gold plated. The detector shall be inserted into or removed from the base by a simple push-twist mechanism to facilitate easy exchange for cleaning and maintenance.

The smoke & heat detectors shall fit into a common type standard base. The standard base shall be supplied with a seal plate, preventing dirt, dust, condensation or water reaching the wire terminals or the detector points. Detectors shall be provided with a MS box for entry and termination of armoured cable and to protect detectors terminals.

At the time of installation and prior to commissioning, every detector shall be allotted an identification number. All detectors shall have LED blink when it is addressed. Detectors shall not be either partially or totally recessed in ceiling or wall. Detectors shall be suitably protected where they are liable to be subjected to mechanical damage. Detectors should not be painted or coated or covered in any manner after installation as this will adversely affect the sensitive of operation.

#### 10.2.2 Beam detectors

It shall be addressable type linear optical beam smoke detector type. It shall be of a combined transmitter/receiver unit. The minimum range of the detector shall be 50 m. The detector shall operate in the infra – red light spectrum. Numerical indicators shall be provided to aid beam alignment. The indicators shall comply to EN 54- 12 standards. The detector shall operate on the principle of light

obstruction utilizing infra-red beam. The detector shall have standby automatic fault and alarm LED indicators visible from the front and bottom. Alignment shall be accomplished via an optical sight and it shall be listed for operation from - 22° F to 131° F. Smooth four square grid reflector shall also be provided reflect the transmitted beam shall also be provided for the satisfactory performance of the system.

#### **10.2.3 Smoke detectors**

It shall be of optical-cum-thermal type. Smoke detectors shall quickly respond to smoke containing small particles normally produced and heat likely to be generated and automatically adjusts sensitivity without needing operator intervention.

#### **10.2.4 Heat detector**

It shall be of fixed-cum-rate of rise temperature type. Heat detectors shall be suitable for use in situation where sufficient heat is likely to be generated and damage caused by heat generated.

#### **10.2.5. Loop Hooters**

The loop hooters shall be so arranged that when any alarm operates all the hooters through out the premises shall be activated. The hooters at the fire alarm shall be electronic type having frequency of suitable frequency range. The hooters shall be capable to produce a sound output of 90 db at 1 m. Hooters shall be of loop powered and no separate power is provided.

‘Fault’ alarm and ‘Fire’ alarm in a panel sounder shall be distinctly different. Fire alarm sounders shall not be used for any purpose other than for fire operations. When installed flush with a false ceiling these shall match the ceiling surface. Necessary provisions such as wooden boxing or frame work, if required, to accommodate the sounders shall be made in the ceiling in advance.

These shall be installed at a height not lower than 2.4 m, except when recessed in a false ceiling of lower height. In such cases the sounders shall be recessed at false ceiling level.

The panel sounders in the respective panels shall be actuated automatically as soon as fire alarm signal is initiated from any trigger device connected to them. These shall also be sounded when there is a fault alarm signal within their areas of control. The sound shall be continuous and of the same characteristics from all fire alarm sounders in a building.

#### 10.2.6. Loop Isolators

Loop isolators shall be designed to protect one area or a number of devices which are consecutively wired in a loop. Its function is to isolate a section of the loop if a problem develops within that section, allowing the remainder of devices connected on the loop to function correctly. Loop isolators shall be provided after every 20-30 devices in each loop.

#### 10.2.7. Manual Call Points (MCPs)

It shall be of 'break glass' type, and 1.5mm thick welded sheet steel or 3 mm thick cast aluminium. The front glass shall be breakable. The MCPs shall be recess mounted suitable to support the intelligent addressable panel. It shall form an integral part of the fire detector system. The housing shall be dust/vermin proof properly sealed with rubber lining. The glass frangible element shall keep a push button pressed inside such that in the event of breaking the glass, the push button is released to actuate an alarm in the control panel. MCPs shall be easily resetable with key.

Where sheet steel is used for, this shall be thoroughly cleaned off dust, dirt, grease and rust if any and two coats of anti rust primer shall be given both inside and outside. This shall be followed by two coats of synthetic enamel paint in fire red colour on the external surface that will be visible on installation. In the case of cast aluminium body for a call box, the surface shall be neatly finished with red colour paint. The following words shall be painted on the front of the call box in contrasting colour with a letter size of not less than 5mm.

**“BREAK GLASS IN CASE OF FIRE”**

**Installation requirements:-**

Manual call points shall be located at exit space and shall be installed at a height of 1.4 m above the floor at an easily accessible position. They shall be installed at easily accessible, well illuminated positions, preferably in a contrasting background so that they are easily noticable from either direction. They may be semi-recessed so as to project by 10mm. They shall be installed free from obstructions.

#### 10.2.8. Fire Control Panel

The fire alarm control panel shall be of micro processor controlled and of modular hardware design of intelligent addressable type. It shall be housed in a steel enclosure. It shall also be finished with hard wear textured epoxy paint/ powder coated. Cable entries shall be provided on the top and bottom of the panel.



**The system capacity shall be based on the number of devices and control modules. Each devices in the system shall be identified by its unique address position on the two wire loop. The panel retains command over the alarm process, LED indicators, automatic test feature and loop hooters. The panel shall be of software programmable. The panel shall be capable of:-**

- (a) programmable at site.
- (b) automatic system test activates
- (c) detector sensitivity adjustments
- (d) alarm verification
- (e) Alpha/numerical display
- (f) Relay control module
- (g) Support for bacnet and modbus protocol.
- (h) maintenance alert facilities
- (i) provision to connect to PCs

The panel shall have facility to shut off individual AHUs in case of fire through relay arrangements. The relay shall be suitable to withstand AHU contactor coil current.

The manufacturer of fire control panel, detectors and other detection devices shall have own or authorized service centre in India with spares for carrying out maintenance service during the guarantee and maintenance periods. The tenderer shall submit a brief write-up of the service centre facilities available in India along with the tender.

#### 10.2.9 Power Supply of panel

**The power supply shall drive the system from either the main electrical supply single phase supply or the standby power supply. The standby power supply shall be derived from exclusive SMF back-up batteries of reputed make. Standby power supply shall be capable of maintaining the system in normal operation having a period of not less than 24 hrs. after the failure of normal main supply.**

#### 10.2.10. Control Cable

The control cable for wiring fire alarm system shall be of 650 Volt grade. Cables shall be laid as per relevant installation standards. The size of these cables are specified in schedule of requirements.

#### 10.2.11 Cable Glands

Cable glands shall be of heavy duty single compression type of brass, chrome plated. These shall have a screwed nipple with conduit electrical

thread and checknut. These shall be suitable for armoured/unarmoured cables, which is being used.

#### 10.2.12 Cable Connectors

Cable connectors, lugs/sockets, shall be of copper/aluminium alloy, suitably tinned, solderless, crimping type. These shall be suitable for the cable being connected and type of function (such as power, control or connection to instruments, etc.)

### 11. INSPECTION AND TESTING

#### 16. (Fire detection and alarm system)

##### 11.1 INSPECTION

All materials shall be offered for inspection in cleaned condition, prior to erection. At no event, site fabricated work /material shall be installed in position without inspection and approval by CLIENT/CONSULTANT. The Contractor shall ensure that each stage of fabrication is carried out in compliance with the procedures specified in the IS standards as applicable and/or specified in this document.

The contractor shall conduct sample tests of all the materials supplied at reputed laboratories/agencies as directed by CLIENT/CONSULTANT at his own cost and test reports are to be submitted. Inspecting officials like CLIENT/CONSULTANT, TAC / Local Authorities shall have the right to access the premises of the work at any time with or without giving prior notice. All the formalities or procedures for conducting the inspections by the authorities as required by them shall be arranged by the contractor free of cost.

All testing shall be carried out in the presence of CLIENT/CONSULTANT/ statutory authorities and test registers shall be maintained by the contractor. The contractor shall provide all material, tools, equipment, instruments, services and personnel required to perform the tests and remove debris resulting from cleaning and after testing free of cost.

The original test certificates of all tests conducted are to be forwarded to CLIENT/CONSULTANT. After conducting the tests, any defects found on materials, equipment, piping, etc. shall be got rectified/repared / replaced by the Contractor without any extra cost.

##### 11.2 TESTING

###### 11.2.1 Fire Detection and Alarm System

**The entire fire detection and alarm system shall be tested for continuity and performance as per IS-2189 code. After installation, the visual inspection of all the detectors shall be made to make sure that they are properly installed. Each detector shall be inspected to ensure that it is properly mounted and connected. Heat detectors**

shall be tested to initiate an alarm by a heat source such as hair drier or a shielded heat lamp. After each heat test, the detectors shall be reset. Smoke detectors shall be tested to initiate an alarm at its installed location with smoke or other aerosol. All detectors found to have the sensibility outside the approved range shall not be used.

Detectors, control and indicating panels, sounders shall be tested at the manufacturer's factory and test certificate be furnished with the supply. Type test certificate to prove conformity to the relevant contract specifications shall be furnished with the supply, from recognised testing institutions or Govt. test bodies in India or abroad.

Following tests shall be conducted in the presence of CLIENT/CONSULTANT and the test certificate shall be furnished with the record of tests.

#### 11.2.2 Continuity test

**Test for insulation resistance of the wiring work and the control and indicating panels.**

#### 11.2.3 Test for system operation.

Tests for detectors shall be conducted using a test fire at normal floor level. The system operation for fault conditions shall be conducted by introducing faults such as open circuit, short circuit, removal of detector, open/short circuit in a sounder circuit etc. Tests relevant to loop isolators shall also be conducted to confirm that it functions as required.

## 12. TECHNICAL DATA

(Fire detection and alarm system)

(To be submitted along with the tender)

**Note: Refer list of preferred makes of items in Section IV. (Please attach catalogue, etc. of items from the original supplier)**

### Beam Detectors

Make

Model No.

Size:

Beam range:

Alignments : Horizontal & Vertical :

Reflector size:

Operating temp range:

Voltage range:

LED display status:

Air velocity:

Protocol used

IP rating

### Smoke Detectors

Make

Model No.

Size:

Operating temp range:

Voltage range:

LED display status:

Air velocity:

Protocol used

IP rating

### Heat Detectors

Make

Model No.

Size:

Operating temp range:

Voltage range:  
LED display status:  
Air velocity:  
Fixed temp. set point:  
Rate of rise temp:  
Sensor:  
Protocol used:  
IP rating

Loop isolators

Make  
Model No.  
Spacing of isolators  
Operating voltage  
Temp. range  
Size:  
IP rating

Loop hooters

Make  
Model No.  
No. of tones  
Sound output  
IP rating  
Size

MCPs

Make  
Model No.  
Size:  
IP rating

Fire control panel

Make  
Model No.  
Maximum No. of programmable loops

Maximum No. of devices per panel  
 Maximum devices per loop  
 Maximum control cable length  
 Maximum resistance per loop  
 Length per loop  
 No. of slots for additional cards  
 Networking facilities  
 No. of auxiliary output for AHU shut off.  
 No. of repeater output  
 No. of hooters per loop  
 No. of isolators per loop  
 Operating voltage  
 Operating current  
 No. of display characters  
 Support for bacnet and modbus protocol.  
 Size  
 Weight

**Makes of following items**

**PVC insulated FRLS**

<b>armoured Cu. Cable</b>	<b>:</b>
<b>PVC insulated armoured Cu. Cable</b>	<b>:</b>
<b>PVC insulated FRLS cu. wire</b>	<b>:</b>
<b>PVC conduits</b>	<b>:</b>
<b>MS conduits</b>	<b>:</b>

## TECHNICAL DATA

(Hydrant System)

(To be submitted along with the tender)

**Note: Refer list of preferred makes of items in Section IV. (Please attach catalogue, etc. of items from the original supplier).**

### **1 Diesel engine driven pump**

#### **1.a Pump details**

**Make**

**Type**

**Model**

**Overall dimensions**

**Weight (Kgs)**

**Material**

**Pump casing**

**Impeller**

**Shaft sleeve**

**Base plate**

**Type and material of steel**

**Operating speed (R.P.M.)**

**Head (Mtr)**

**Efficiency**

**Performance curves (whether enclosed with the tender).**

**Yes/No**

#### **1.b Engine details**

**a) Make**

**b) Model**

**c) HP**

**d) RPM**

**e) SFC**

**Oil consumption**

**Weight**

**Overall dimension**

**Exhaust pipe dia**

### **2 Battery & Battery Charger**

**Make of battery charger**

**Make of batteries**

**Model No. of batteries**

**Voltage**

**AH**

**No. of batteries**

**Model No. of battery charger**

### **3 Electric motor driven pump**

#### **1.a Pump details**

**Make**

- Type
- Model
- Overall dimensions
- Weight (Kgs)
- Material
- Pump casing
- Impeller
- Shaft sleeve
- Base plate
- Type and material of steel
- Operating speed (R.P.M.)
- Head (Mtr)
- Efficiency
- Performance curves (whether enclosed with the tender).
- Yes/No
- 1.b Motor details
  - a) Make
  - b) Model
  - c) HP
  - RPM
  - Weight
  - Overall dimension
  - Class of insulation
- 4 Jockey pump
  - 1.a Pump details
  - Make
  - Type
  - Model
  - Overall dimensions
  - Weight (Kgs)
  - Material
  - Pump casing
  - Impeller
  - Shaft sleeve
  - Base plate
  - Type and material of steel
  - Operating speed (R.P.M.)
  - Head (Mtr)
  - Efficiency
  - Performance curves (whether enclosed with the tender).
  - Yes/No
- 1.b Motor details
  - a) Make
  - b) Model
  - c) HP
  - d) RPM
  - g) Weight



- h) Overall dimension
- i) Class of insulation

**5 Makes and model numbers of following items**

MS Pipe	:
GI & MS fittings	:
Valves	:
Strainer	:
Instrumentation	:
Pressure guage	:
Pressure switch	:
Hardware	:
Paint	:
Polymeric mix	:
Hydrant valve	:
CP hose	:
Branch pipe	:
Hose Reel	:

TECHNICAL DATA  
(Sprinkler system)

(To be submitted along with the tender)

**Note:** Refer list of preferred makes of items in Section IV. (Please attach catalogue, etc. of items from the original supplier).

**Alarm valve**  
Make  
Model No.  
Size

**Sprinklers**  
Make  
Model No.  
Size

**‘Y’ strainer**  
Make  
Model No.  
Size

**MS pipes**  
Make  
Model No.

## APPROVED MAKES OF ITEMS

### HYDRANT/SPRINKLER/DETECTION/SYSTEMS

Motor	: Kirloskar/Siemens/ABB/Crompton Greaves
Pump	: Kirloskar/Mather & Platt/KSB/Beacon
Diesel Engine	: Kirloskar/Cummins/Greaves
MS Pipe	: Tata/Jindal/SAIL/GST/Zenith
GI & MS fittings	: Tube weld/Tube products/Punjab steel/TNT
Valves	: Kirloskar / Kalpana / Updhaya / Leader /
Advance	
Strainer	: Sant/Emerlad/Teleflo/Jaypee/ Grandpix
Pressure guage	: Fiebig/H.Guru
Pressure switch	: Indfoss/Switzer/Schneider
Hydrant valve &	: Newage/Steelage/ Arihant/Shah Bhogilal
Fire brigade point	
Branch pipe	: Newage/ Arihant/Shah Bhogilal
CP hose	: Newage/Shah Bhogilal/Pyroline
Hose Reel	: Newage/Chathariya/Shah Bhogilal
Hose cabinet	: Newage/ Zenith/Shah Bhogilal
Hardware	: TATA/Sundaram fasteners/GKW
Paint	: Asian/ICI/Nerolac/Berger
Polymeric mix	: IWL
Fire extinguisher	: Ceasefire/ Minimax / Safex / Bharat / Safeguard.
Alarm valve	: HD / Tyco (UL listed)
Sprinkler	: HD/ Tyco (UL listed)
Smoke/heat detectors	
(UL approved)	: Edwards/Morely/Essar/Siemens/Notifier
Fire alarm panel	: Edwards/Morely/Essar/Siemens/Notifier
Manual call points	: Edwards/Morely/Essar/Siemens/Notifier etc. (UL approved)

**ADDITIONAL CONDITIONS**

1. Scope of work: The scope of work shall include planning, design, engineering, preparation of drawings, supply, installation, testing, commissioning and validation of the complete system required for the new Stem cell & BMT unit on turnkey basis. The work broadly includes civil, interior, plumbing and sanitation, Air-conditioning, electrical, fire fighting, bio-medical requirements, gas piping, bed head panels, PA system, access control system, CCTV, voice, data system, UPS, Nurse call system etc and necessary services required for the successful operation and performance of the Stem cell & BMT unit.
2. The contractor must obtain all necessary certification and validation for the successful operation of stem cell and BMT unit.
3. The contractor must prepare all the design, detailed engineering and co-ordination drawing required for the interior, AC, electrical, fire alarm and all required services and get vetted by the HLL / MCC technical and bio-medical team. The contractor shall have prior experience in the execution of jobs of the similar nature and should have successfully completed at least one job of this nature ie; BMT, Stem Cell, Clean room etc.
4. All materials used for the construction of stem cell and BMT unit shall be with respect to the latest International / Indian standards.
5. The preferred make of all materials considered for the construction of stem cell & BMT unit shall be submitted with technical bid of tender and got approved by the HLL / MCC technical and bio-medical team.
6. The contractor must inform in advance regarding the facilities to be got from the client (MCC) like water, power requirement, drain etc. The client will provide the same at one point from which all the distribution to the new Stem cell & BMT unit is in the scope of the contractor.
7. The contractor has to do all liasoning works and obtain statutory approval from Electricity Board, Electrical inspectorate, PCB and any another body for the successful energisation of electrical supply to the new Stem cell & BMT unit. No charges will be paid to the contractor in this regard. However, statutory fees if any will be paid by client. All necessary drawings and documents required for the same has to be prepared and submitted by the Contractor with the concurrence and approval of the HLL / MCC technical and bio-medical team.
8. General Arrangement & control drawing of the electrical LT panels shall be approved by the HLL / MCC technical and bio-medical team.
9. The LT panels shall be manufactured from manufacturer having valid CPRI certificate for similar types of panels and shall be as per the guidelines of Kerala state Electrical Inspectorate.
10. All the test certificates of the equipments shall be submitted along with the delivery of the materials at site.