

TENDER

FOR

**Construction of Administrative Office for (KUHS) - SITC of Air
Conditioning Works**

**PART-II
GENERAL CONDITIONS OF CONTRACT**

TENDER NO. HLL/ID /13/ 39(A)

MAY 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 administrative Office for KUHS – SITC of Air Conditioning Works.

- (i) To be submitted by 11.30 am on 21.06.2013 to
Deputy General Manager (Technical), HLL Lifecare Ltd., Trivandrum – 695 006
- (ii) To be opened in presence of tenderer who may be present at 03.30 pm on 21.06.2013 in the office of

Deputy General Manager (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 90 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.4,51,185/- has been deposited along with the technical 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. 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/ 39(A)** dt:24.05.2013 for the work

Construction of administrative Office for KUHS – SITC of Air Conditioning Works.

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 administrative Office for KUHS - SITC of Air Conditioning Works.

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 GENERAL MANAGER (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 recovered 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 General Manager (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: Construction of administrative Office for KUHS - SITC
of Air Conditioning Works

Estimated cost of Work: Rs. 2,25,59,259/-

Earnest Money: Rs. 4,51,185/-

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. General Manager (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 DGM (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
	Milestone has to be jointly prepared by the HLL Engineer in charge and Contractor within 20 days from the date of receipt of LOA.		

Time allowed for execution of work

4 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(ii)

Whether Clause 10 B (ii) shall be applicable

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

Clause 16

Authority for deciding reduced rates.

*Competent authority of
HLL Lifecare Limited*

Clause 25

Constitution of Dispute Redressal Committee (DRC)	Competent Authority to appoint DRC
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 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 cement men on the basis of Delhi Schedule of Rates Printed by C.P.W.D
- (i) 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 SITC of **Air Conditioning Work** 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 buildings ,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 contractor for the work to be executed by him, the contractor hereby covenants 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 therefrom 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 hereinto 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/sa 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) Shris/o..... , And
- ii) Shris/o.....etc..

For Companies

M/sa company duly incorporated under the Indian Companies Act, 1956 and having its registered office atin 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 GENERAL MANAGER (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 the witness

.....

Name of the Witness

.....

Address of the Witness

.....

Signature of
Authorized Official of the Bank

Name of Official

Designation

Stamp/Seal
of the Bank

**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.

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 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

17. 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 1/8th 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 1/8th 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

**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 10th 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

After completion of entire installation as per specification in all respects, the AC contractor shall demonstrate trouble free running of the AC equipments and installations for a period of minimum 120hrs of running. Within 10 days of completion of works, the contractor shall inform the EIC to inspect the works and the EIC on receipt of such notice shall inspect the installation and after rectifying all the defect noted shall proceed to take over the work. Upon commissioning and final handing over the installation the HVAC contractor shall submit (within 4 weeks) to the engineer in charge 3 copies of the following documents in addition to completion drawings.

1. O & M manual
2. Test certificates, consolidated control diagram and technical clarifications
3. Equipment warranties from manufactures
4. Commissioning and test testing reports
5. Rating charts for equipments
6. Log register as per equipments manufactures standard format
7. LOA of recommended spares and consumables

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, CPWD general specification for HVAC works 2004 as applicable, completion plans of internal 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:

- (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 80% 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

**Secured
Advance on
Non-perishable
Materials
provided by the
Contractor**

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.

Interest & Recovery

- (iii) The mobilization advance in (ii) 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.
- (iv) 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 may be extended in the discretion of the Engineer-in-Charge.

- (v) 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 which 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 contact.

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 any 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 gobri on both sides. The floor may be kutcha but plastered with mud gobri 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 installation is not occupied by any body unauthorisedly during construction, and is handed over to the Engineer-in-Charge with possession of complete works.

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 20

Minimum wages Act to be complied 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

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**

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 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 - NOT APPLICABLE

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 - NOT APPLICABLE

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 (1/8th 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 - NOT APPLICABLE

**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**

The No, of qualification & experience of technical staff shall be as per the CPWD norms for HVAC Works of the magnitude in cost .The contractor or his principal technical representative shall be available at site during working hours

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) 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 (46th 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 year 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 therewith, 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 - NOT APPLICABLE

**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

All consignment are to duly insured up to the destination at the cost of the contractor. The insurance cover shall be valid till the equipment is handed over, duly installed, tested, commissioning and handing over.

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. 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.

- C. 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.
 - D. 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/handling 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.

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			
1	2	3	4	5	6

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

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 FOR HVAC SYSTEM

1.00 SYSTEM DESCRIPTION

A central air conditioning system has been proposed for providing year round thermal environmental control for the various occupied areas. The system selected is a chilled water system incorporating chillers, primary and secondary chilled water pumps, Air Handling Units (AHUs), Fan Coil Units (FCUs) and other accessories.

The system shall consist of Three numbers water-cooled screw type water chilling packages having a minimum capacity of 130 TR each at the selected operating conditions, of which two will be operating at peak load conditions and the third will be a standby. The chiller shall deliver chilled water at 6-7deg C.

There shall be three primary chilled water pumps and three secondary chilled water pumps, two of each working and the third as standby.

The secondary chilled water pumps will be provided with Variable Frequency Drives (VFDs), operated by pressure sensors in the chilled water pipelines.

The chillers, the primary and secondary chilled water pumps shall be installed at the plant room. The insulated chilled water header pipes from the AC plant room will be routed to the building in UG trenches and in masonry shafts to the various floors of the building.

AHUs fitted with chilled water cooling coils shall be provided for all the large areas and FCUs shall be provided for small areas that are to be air-conditioned.

Chilled water at 7 degrees Celsius will be circulated from the Chillers by means of the primary and secondary chilled water pumps and insulated chilled water piping through the cooling coils of all the AHUs and FCUs.

The return water from the AHUs and FCUs shall be routed back to the chillers to form a closed loop cooling cycle.

The hot water generated shall be circulated through the hot water pumps to the hot water tank.

All the AHUs and FCUs will be provided with 2-way flow control valves operated by room thermostats, to regulate the flow of the chilled water through the coils as per the requirement.

The AHUs will be floor-mounted or ceiling suspended types, as per their capacity and overall dimensions.

The FCUs shall be ceiling suspended inside the respective rooms.

In the larger areas, cool dehumidified air from the AHUs shall be uniformly distributed by means of sheet metal ducts and grills.

In the smaller areas, conditioned air from the FCUs shall be blown in to the room by means of a short collar/canvas connection and grills.

Return air shall be routed back to the AHUs/FCUs through the void above the false ceiling.

In all the areas catered to by AHUs, fresh air dampers shall be provided.

In the case of the FCUs, fresh air will be drawn in to the room by means of a short length of pipe installed through an external wall.

All the mechanical equipment such as chillers, pumps, AHUs and FCUs shall be provided with energy efficient motors (EFF1). All the sensors and controls shall have a high accuracy in order to control the operation accurately and hence minimize the energy consumption of the respective equipments.

The entire system must be designed and installed to achieve the maximum possible energy savings within the specified design parameters.

The chiller micro processor panel shall be suitable for hooking up with with a Plant Manager Device for hooking up the chillers & pumps. The various controls of the HVAC system like 2-way motorized valves must be BMS compatible.

Underdeck thermal insulation shall be provided for the roof of all the conditioned areas exposed to direct sunlight.

Provision has been made in the AC Plant room for installing one Chiller and water circulation pumps.

SPECIFICATIONS FOR EQUIPMENTS AND SERVICES

2.0 WATER CHILLING PACKAGES

2.1.0 SCOPE

The scope of this section comprises the supply, installation, testing and commissioning of High Efficiency Water cooled Screw type Water Chilling Packages of the specified capacity. They shall be imported units, fully Factory assembled and Tested and ready to be hooked-up and to be operated at site. Each Chilling Package shall comprise the following main components.

2.1.1 SCREW TYPE COMPRESSORS

Each Chilling Package shall have at least two screw compressors, each with it's own independent refrigerant circuit. The various circuits of each Chilling Package shall operate independently or simultaneously to match the prevailing load conditions. Provision shall also be made in the control panel of the Chilling Package to manually switch off a particular circuit if need be.

2.1.2 The screw compressors shall be of mono / twin screw design, and may be of semi sealed/hermetically sealed type. It shall be suitable for operation with R-134a/ R-407c/ R-410a refrigerants.

2.1.3 The screws shall be manufactured from forged steel. The profile of the screws shall permit safe operation up to a speed of 5000 RPM for 50 Hz operation. The compressor shall unload from fully loaded to the minimum capacity by means of hydraulically actuated slide valve, positioned over the screw rotor / pilot operated solenoid valve.

2.1.4 The compressor housing shall be of high grade cast iron, machined with precision, to provide a very close tolerance between the rotor(s) and the housing.

2.1.5 The rotor(s) shall be mounted on anti friction bearings designed to reduce friction and power input. There shall be multiple cylindrical bearings to handle the radial and axial loads.

2.1.6 There shall be built in oil reservoir to ensure full supply of lubricants to all bearings and a check valve to prevent backspin during shut down.

- 2.1.7 There shall be oil pump or other means of differential pressure inside the compressor for forced lubrication of all parts during startup, running and during shut down. An oil sump header shall be provided in the casing.
- 2.1.8 The units shall be complete with automatic capacity control mechanism, to permit modulation from 20% to 100% capacity range.

2.2.0 Interlocking

2.2.1 The compressor motor shall be interlocked with the following:-

- i) Differential pressure switch in the chilled water line.
- ii) Differential pressure switch in the condenser water line.
- iii) Anti-freeze thermostat.
- iv) Condenser water pump.
- v) Chilled water pump.

The interlocks shall be provided with indicating lamps or flags in the control panel in the refrigeration plant room.

2.2.2 The compressor drive motors shall be double squirrel cage type and of hermetic / semi hermetic design, and protected against damage by means of built in protection devices.

2.3 CONDENSER .

2.3.1 General

This section deals with shell and tube type water cooled condensers.

2.3.2 Rating

- i) The condenser(s) capacity shall match the compressor(s) capacity specified in the tender specifications. The selection shall be for 4.2 degree C temperature rise of water through the condenser unless otherwise specified in the tender specifications.
- ii) The condenser shall be designed for a fouling factor of 0.0002 hr. sq. m. degree C difference / K. Cal.
- iii) Unless otherwise specified, the condenser shall be designed for a entering water temperature of 32 degree C.

2.3.3 Material and Construction

- i) The condenser shall be horizontal, shell and tube type, designed, constructed and tested for the refrigerant specified in the tender specifications.

- ii) The shell of the condenser shall be made of MS of thickness not less than 8mm, with electric fusion welded seams. The shell capacity shall be such as to hold 1.25 times the refrigerant charge in the machine of which the condenser is a part, under pumped down conditions.
- iii) The end plates of condenser shall be made of MS of thickness not less than 25mm.
- iv) The condenser shall be designed for a working pressure on the refrigerant side suitable for the refrigerant offered, and on the water side for 10 kg./sq. cm. gauge.
- v) The tubes shall be of seamless hard drawn copper and finned, unless otherwise specified. The minimum wall thickness shall be 1.0mm with root thickness of 0.63 mm below the fins.
- vi) Intermediate tube supports of steel shall be provided at not more than 1250 mm intervals to prevent sagging and vibration of the tubes. The condensers shall have water boxes designed for multi pass flow.
- vii) The tubes may be provided with special tabulating arrangement to improve heat transfer where such an arrangement is a standard design of the manufacturer.
- viii) The condensers shall be provided with removable heads on either side made of cast iron or steel with neatly machined surface for effective jointing with the shell for easy accessibility for cleaning / replacement of the tubes. Suitable baffles shall be incorporated to achieve the required number of passes.
- ix) The condenser shall be provided with baffle arrangement for preventing direct impingement of hot gas over the tubes and to enable even distribution of the gas over the tube bundles.
- x) The condenser shall include necessary provision for sub-cooling of the refrigerant where the refrigerating machine is selected with such sub-cooling requirement. The arrangement shall be such that the cold water entering the condenser first cools the liquid refrigerant in the sub-cooler.
 - i) The condenser shall be sand blasted from both inside & outside before assembly.

2.3.4 Connections and Accessories

The condenser shall be provided with the following connections and accessories and conforming to Section 'Refrigerant Piping' where applicable:-

- i) Hot gas inlet and liquid outlet connection. The liquid line connections shall be provided with isolating valves.
- ii) Water inlet and outlet connections
- iii) Pressure relief device
- iv) Drain connection with valve for water side.
- v) Differential flow switch / pressure switch / flow switch / flow sensor in the water line(s).

2.3.5 Pressure Testing

- i) The condenser shall be tested at the works to 1.5 times the maximum working pressure for the refrigerant specified in the tender specifications or 15 kg./sq. cm. , whichever is higher
- ii) The water side of the condenser shall be tested to a hydraulic pressure of 10 kg./sq. cm.

2.4 CHILLER

2.4.1 General

This section deals with shell and tube type Chillers

2.4.2 Rating

- i) The chiller(s) shall match the compressor(s) capacity specified in the tender specifications. The chiller shall be selected for a water temperature drop between 4.5 to 5.5 degree C through the chiller.
- ii) The fouling factor shall be 0.0001 hr. sq. ft. degree F temperature difference / Btu.

2.4.3 Material and Construction

- i) The water chiller shall be horizontal, shell and tube type, designed, constructed and tested for the specified refrigerant
- ii) The chiller shall be designed for a working pressure on the refrigerant side suitable for the refrigerant offered, and on the water side for 10 kg./sq. cm. gauge.
- iii) The end plates of chiller shall be made of MS of thickness not less than 25mm.
- iv) The shell of the chiller shall be made of MS of thickness not less than 8mm with electric fusion welded seams.

- v) The tubes shall be of seamless, hard drawn copper with a minimum tube wall thickness of 0.71 mm for plain tubes & minimum 0.63mm at the root of fins for finned tubes.
- vi) The tubes shall be plain for DX type chillers.
- vii) The tubes shall be rolled into grooves in the tubes sheets and flared at ends.
- viii) The DX type chillers shall be provided with adequate number of properly spaced baffles to ensure the highest heat transfer efficiency between the water and the refrigerant.
- ix) The chiller shall be smooth finished with one coat of zinc chromate primer before the insulation is applied.
- x) The chiller shall be sand blasted from both inside (before insertion of tubes) & outside.

2.4.4 Connections and Accessories

The chiller shall be provided with the following connections and accessories and conforming to the Section 'Refrigerant Piping' where applicable:-

- i) Refrigerant inlet and outlet connections
- ii) Thermostatic/electronic expansion valve(s) with adjustable superheat control and external equalizer.
- iii) Line solenoid valve, or pilot solenoid valves as required
- iv) Water inlet and water outlet connections
- v) Drain connection with stop valve for water side only
- vi) Vent connection with valve
- vii) Flow switch in water line

2.4.5 Pressure Testing

- i) The chiller shall be tested in the works to 1.5 times the maximum working pressure for the refrigerant specified in the tender specifications, or 21 kg./sq. cm. (Pneumatic), whichever is higher.
- ii) The water side of the chiller shall also be tested to a hydraulic pressure of 10 kg./sq. cm.

- 2.4.6** The equipment shall be packed on metallic skids to permit easy installation and shall be provided with spring vibration isolators.
- 2.4.7** Hydrostatic, volumetric and refrigerant leak tests shall be carried out at the manufacturer's works before the dispatch of the compressor/chiller.
- 2.4.8** The COP of chiller shall not be less than 6.00 at ARI design conditions and not less than 5.70 at standard design condition.
- 2.4.9** ARI test certificate shall be submitted for the chiller.

2.5 REFRIGERANT PIPING

2.5.1 General

This section deals with the refrigerant piping of the chilling package.

2.5.2 Design aspects of Refrigerant Piping

- i) Refrigerant piping shall be designed and installed so as to:
 - a) Ensure circulation of adequate refrigerant at all loads.
 - b) Ensure oil return to crank case of compressor positively and continuously.
 - c) Keep pressure losses within limits, especially in suction lines.
 - d) Prevent liquid refrigerant from entering the compressor when the compressor is working as well as when it has stopped.
 - e) Prevent trapping of oil in evaporator or suction lines, which may return to the compressor in the form of slugs.
- ii) Hot gas lines:
 - a) Oil shall be entrained and carried by hot gas under all load conditions likely to be encountered in normal operation.
- iii) Liquid Lines:
 - a) Liquid lines shall be designed to ensure that flashing of liquid refrigerant does not occur by minimizing the pressure drop suitably and by appropriate sub cooling.
 - b) Each liquid line shall be provided with a permanently installed refrigerant drier of throw away or rechargeable type. The drier shall be installed in a valved line.
 - c) Flow indicator (moisture indicating type) shall be installed on all liquid lines.
- iv) Suction Lines:

- a) Oil shall be entrained and carried by the suction gas under all conditions of load likely to be encountered in normal operation.
- b) Piping shall be designed for a suitable velocity of refrigerant (similar to hot gas line) to ensure that oil will not separate from the gas and drain to the compressor in slugs.
- c) The refrigeration system shall be equipped with controls for pump down system so that the evaporator and suction line are emptied before the compressor shuts off, thus preventing liquid refrigerant from entering the compressor when restarted.
- d) Refrigerant lines shall be sized to limit pressure drop between evaporator and condensing unit to less than 0.2 kg. per sq. cm. (3 psi).
- v) Isolating valve shall be provided to enable isolation of each compressor in case of multiple compressor units (as built in valves), strainer, drier and any other components as may be required for proper operation and maintenance.
- vi) Thermostatic/electronic expansion valve shall be provided in the refrigerant circuit.

2.5.3 Material

- i) Refrigerant piping shall be of copper to manufacturer's standards.
- ii) Valves shall be of the packed, back-seating type and these shall be of forged brass construction.

2.5.4 Pressure Testing

- i) After completion of the piping installation at the factory, the entire chilling unit shall be pressure tested with dry nitrogen or any other inert gas at the following pressures for the particular refrigerant to be used:-

Refrigerant	Test pressure (Kg./Sq. cm. (Gauge))	
	High pressure side	Low pressure side
R - 134a	20	8

This test shall be carried out as follows:

- a) The system shall be charged with nitrogen or inert gas to 1.0 Kg./sq. cm. gauge and all joints shall be checked for leakage with a mixture of four parts water, one part liquid soap and a small amount of glycerin. Leaks shall be marked, pressure released and repairs done. Brazed joints, which leak, shall be opened and redone. These shall not be repaired by addition of brazing alloy to the joints.
- b) The system shall now be charged with nitrogen or the inert gas to the pressure specified in the above table and the process of locating leaks and repairs shall be repeated.
- ii) Final pressure test:
After all the leaks have been repaired, the system shall be retested with the test pressure maintained for a period of not less than 8 hours. No measurable drop in pressure should be detected after the pressure readings are adjusted for temperature changes. Pressure gauges, controls and compressors may be valved off during pressure testing.

2.6 MICROPROCESSOR CONTROLLER

2.6.1 General

This section deals with the microprocessor controls of the chilling package.

- 2.6.2 Each chilling unit shall be complete with a microprocessor based interactive control console in a locked enclosure, factory mounted, directly on the unit, pre-wired with all operating and safety controls and tested.
- 2.6.3 It will provide start, stop, safety, interlock, capacity control and indications for operation of the chiller unit through an alphanumeric / graphical display. It shall also be provided with necessary soft starters to prevent high initial current.
- 2.6.4 Controls shall provide to view and change digital programmable essential set points, cause of shutdown and type of restart required.
 - a) Leaving chilled water temperature,
 - b) Percent current limit.
 - c) Remote reset temperature range.
- 2.6.5 All safety and cycling shutdowns shall be enunciated through the alphanumeric / graphical display and consist of day, time, cause of shutdown and type of restart required.
- 2.6.6 Cycling shutdown shall include low leaving chilled water temperature, chiller / condenser water flow interruption, power fault, internal time clock and anti-recycle.

- 2.6.7 Safety shutdowns shall include low oil pressure, high compressor discharge temperature, low evaporator pressure, motor controller fault and sensor malfunction.
- 2.6.8 The display screen shall indicate the following minimum information
- i) date and time
 - ii) supply and return chilled water temperatures
 - iii) supply and return condenser water temperatures
 - iv) differential oil pressure
 - v) percent motor rated current
 - vi) evaporator & condenser refrigerant saturation temperatures
 - vii) chiller operating hours and number of compressor starts
 - viii) oil sump temperature
 - ix) status message
- 2.6.9 Security access shall be provided to prevent unauthorized change of set points, to allow local or remote control of the chiller and to allow manual operation of the pre rotation vanes and oil pump.
- 2.6.10 The chiller shall be provided with ports compatible with any building management system offered, to output all system operating information, shutdown / cycling message and a record of last four cycling or safety shutdowns to a remote printer (option). The control centre shall be programmable to provide data logs to the printer at a set time interval.
- 2.6.11 Control centre shall be able to interface with an automatic controls system to provide remote chiller start / stop; reset of chilled water temperature, reset of current limit, and status messages indicating chiller is ready to start, chiller is operating, chiller is shut down on a safety requiring reset and chiller is shut down on a recycling safety.
- 2.6.12 The microprocessor control system shall include the interlocking of compressor motor with chilled and condenser water flows and lubricating oil pump pressure.
- 2.6.13 At the time of START, the microprocessor control system shall check all pre-start safeties to verify that all restart safeties are within limits. If any one is not within limits, an indication of the fault will be displayed and the start aborted.

2.7 INSTALLATION

2.7.1 General

This section deals with the installation of the chilling package.

The complete chilling unit shall be installed over a RCC foundation and shall be adequately isolated against transmission of vibrations to the building structure. Necessary foundation bolts, nuts, leveling screws etc wherever required for mounting the unit shall be provided by the contractor.

2.7.2 PAINTING

The equipment shall be supplied as per manufacturer's standard finish painting on zinc chromate primer.

2.7.3 FACTORY INSPECTION

The assembled chilling packages will be inspected, if the need be, by the Users / Consultants before they are dispatched to the site. The Bidders shall include the cost involved for this factory visit and testing by the Users / Consultants in their scope.

3.0 COOLING TOWERS

3.1 SCOPE

The scope of this section comprises the supply, installation, testing and commissioning of mechanical draft type Cooling towers.

3.2 DESIGN

- i) Rating:
The cooling tower shall be rated for the heat rejection capacity specified in the tender specifications.
- ii) Range:
The Cooling tower shall be designed to cool the requisite quantity of water through 4.2 degree C or as specified in the tender specifications, against the prevailing wet bulb temperature.
- iii) Wet Bulb approach:
The cooling tower shall be selected for a wet bulb approach of not more than 4.0 degree C.
- iv) Outlet temperature:
The Cold water temperature from the cooling tower shall match the entering temperature for which the condenser selection is made.
- v) Flow rate:
The flow rate through the cooling tower shall match the flow rate of the condenser(s).

3.3 MATERIAL AND CONSTRUCTION

Fiberglass Reinforced Plastic (FRP) Cooling tower:

- i) The structural framework of the cooling tower including all members shall be designed for the load encountered during the normal operation of the cooling tower and its maintenance. The structure shall be rugged and rigid to prevent distortion and shall include tie arrangements as may be necessary.

- ii) The cooling tower shall be induced draft type, with FRP casing in square/rectangular shape and with a FRP basin to match the shape of the casing. Rotating type sprinklers will not be accepted.
- iii) The air intake shall be from openings all along the sides of the casing near its base. These openings shall be covered with hot dip galvanized expanded metal mesh screens.
- iv) The basin shall have a holding capacity adequate for operation for at least 30 minutes without addition of make-up water to the basin. The construction should be such as to eliminate the danger of drawing air into the pump when operating with minimum water in the basin.
- v) The basin fittings shall include the following:
 - a. Bottom / side outlet.
 - b. Drain connection with valve.
 - c. Float valve type automatic make-up connection with valve.
 - d. Overflow connection.
 - e. Bleed off with valve, from inlet header to overflow pipe.
- vi) The supporting framework for the tower casing and the water basin shall be made of hot dip galvanized steel and it shall be further protected with epoxy painting.
- vii) The filling shall be of PVC. Thickness of PVC fills shall not be less than 0.2 mm. These shall be of such construction as to provide low air resistance, large wetted surface for a high heat transfer efficiency, and easy replaceability.
- viii) The water distribution shall be either through fixed type sprinklers or through balancing, sub balancing and spreader troughs (un pressurized system) “ open gravity type with polypropylene nozzle”, ensuring uniform water loading and distribution of water over the fill. All pipes and fittings shall be of PVC. The sprinklers shall operate from the residual velocity head at the headers. Due care shall be taken with regard to corrosive effects and maintainability in the design of the water distribution system.
- ix) Drift eliminators of PVC shall be provided for maximum removal of entrained water droplets. The spacers and tie rods used shall be of plastic material.
- x) The fan shall be multi-blade axial flow type, made of aluminium alloy or FRP. The fan assembly shall be statically and dynamically balanced.

- xi) The fan drive shall be direct from a three phase induction motor. The entire drive arrangement shall be designed for a minimum noise and it shall be rigidly supported to the tower structure.
- xii) To ensure safety of personnel at the time of working on cooling tower a steel ladder shall be provided in such a manner and location as necessary to give safe and complete access to all the parts of the cooling tower requiring inspection or adjustments. The ladder shall be bolted to the tower at the top and grouted in masonry at the bottom end.
- xiii) A thermostat shall be provided in the sump of the Cooling Tower, to sense the water temperature and to switch off the Fan motor during night times and other favorable weather conditions.

3.4 INSTALLATION

The cooling towers will be located at a well-ventilated place on the terrace of the plant room building. The structural loading of the terrace shall be considered. Cooling towers shall be installed in such a way that their load is transferred directly to the columns for which necessary Mild steel-I sections shall be provided by the air conditioning contractor. The cooling towers shall be rested on Mild steel-I sections and not on terrace slab. Sufficient free space shall be left all around for efficient operation of the cooling tower.

3.5 PAINTING

The cooling towers shall be supplied with the manufacturer's standard finish painting with zinc chromate primer

4.0 WATER CIRCULATING PUMPS

4.1 SCOPE

The scope of this section comprises the supply, installation, testing and commissioning of water circulation pumps. The pumps shall be centrifugal type direct driven with a 3 phase, $415 \pm 10\%$ volts, 50HZ, AC motor. The pumps may be of back pull out type with operating speed not exceeding 3000rpm. These pumps are to be used for circulating condenser water, primary chilled water and secondary chilled water in the respective circuits.

4.2 RATING

The pumps shall be suitable for continuous operation in the system. The head and discharge requirements shall be as specified in the tender documents for the respective circuits. The discharge rating shall not be less than the flow rate requirement of the respective equipments through which the water is to be pumped. The head shall be suitable for the system and shall take into consideration the pressure drops across the various

equipments and components in the water circuit as well as the frictional losses. The pumps offered shall be of high efficiency.

4.3 MATERIAL AND CONSTRUCTION

- i) The centrifugal pumps shall conform to IS 1620 standard. The motor shall be totally enclosed fan cooled type.
- ii) The pump casing shall be of heavy section close grained cast iron. The casing shall be provided with air release cock, drain plug and shaft seal arrangement as well as flanges for suction and delivery pipe connections as required.
- iii) The impeller shall be of bronze or gunmetal. This shall be shrouded type with machined collars. Wear rings, where fitted to the impeller, shall be of the same materials as the impeller. The impeller surface shall be smooth finished for minimum frictional loss. The impeller shall be secured to the shaft by a key.
- iv) The shaft shall be of stainless steel and shall be accurately machined. The shaft shall be balanced to avoid vibrations at any speed within the operating range of the pump.
- v) The shaft sleeve shall be of bronze or gunmetal. This shall extend over the full length of the stuffing box or seal housing. The sleeve shall be machined all over and ground on the outside.
- vi) The bearings shall be ball or roller type suitable for the duty involved. These shall be grease lubricated and shall be provided with grease nipples/cups. The bearings shall be effectively sealed against leakage of lubricant.
- vii) Mechanical shaft seals having carbon or other suitable hard wearing surface and stainless steel compression springs shall be provided. A drip well with drain piping shall be provided beneath the seal.
- viii) The pumps, shall be directly coupled to the motor shaft through, a flexible coupling protected by a coupling guard.
- ix) The pump and motor shall be mounted on common base plate either of cast iron or fabricated from rolled steel section. The base plate shall have rigid, flat and true surfaces to receive the pump and motor mounting feet.

4.4 ACCESSORIES

Each pump shall be provided with the following accessories:

- i) Butterfly valves on suction and discharge sides
- ii) Reducers, if required to match the sizes of the connected pipe work.

- iii) Non return valve on the discharge side.
- iv) 'Y' type strainer on the water inlet side.

4.5 INSULATION

The thermal insulation of the pump casing for chilled water circulating pumps shall be of the same type and thickness as provided for the connected pipe work.

4.6 INSTALLATION

- i) The pump and motor assembly shall be mounted and arranged for ease of maintenance and to prevent transmission of vibration and noise to the building structure or excess vibration to the pipe work.
- ii) The pump and motor assembly shall be installed on a cement concrete block. The mass of the inertia block shall not be less than the combined mass of the pump and motor assembly. The inertia block shall be vibration isolated from the plant room floor by 25 mm thick neoprene rubber pads or any other equivalent vibration isolation fittings. The pump motor sets shall be properly aligned to the satisfaction of the engineer-in-charge.

4.7 PAINTING

The pumps shall be supplied with the manufacturer's standard finish painting with zinc chromate primer.

5.0 VARIABLE SPEED PUMPING SYSTEM

The Variable Speed Pumping system are to be provided for the Secondary Chilled water pumps. This system shall consist of the Variable Frequency Drive, Pressure sensor transmitter, Pump Control Panel and power and control wiring and shall be provided all the secondary chilled water pumps.

5.1 VARIABLE FREQUENCY DRIVE

- i) The Variable frequency drives shall be Pulse Width Modulation (PWM) type, microprocessor controlled design.
- ii) The Variable Frequency Drive (VFD), including all factory installed options, shall be tested to UL standard 508. The VFD shall also meet C-UL and be CE marked and built to ISO 9001 standards.
- iii) The VFD shall be housed in a NEMA 1 enclosure.
- iv) The VFD shall employ an advanced sine wave approximation and voltage vector control to allow operation at rated motor shaft output speed with no de-rating. This voltage vector control shall minimize harmonics to the motor to increase motor efficiency and lift. Power factor shall be near unity regardless of speed or load.
- v) The VFD shall have balanced DC link reactors to minimize power line harmonics.
- vi) Input and output power circuit switching shall be done without interlocks or damage to the VFD.

- vii) The following User friendly adjustments shall be provided:
 - a) Accel time
 - b) Decel time
 - c) Minimum Frequency
 - d) Maximum Frequency
- viii) An automatic energy optimization selection feature shall be provided. This feature shall reduce voltage when lightly loaded and provide a 3% to 10% additional energy savings.
- ix) The VFD shall be capable of displaying the following information in alphanumeric display :
 - a) Frequency
 - b) Voltage
 - c) Current
 - d) Kilowatts per hour
 - e) Fault Identification
 - f) Percent Torque
 - g) Percent Power
 - h) RPM

5.2 AUTOMATIC VFD BYPASS

- a) Variable speed pumping system shall be equipped with an automatic bypass.
- b) Bypass shall consist of a main power disconnect with ground fault protection, a pair of interlocked contactors and a motor overload relay. All are to be mounted in a NEMA 1 enclosure.

5.3 SENSOR / TRANSMITTERS

- a) Differential pressure sensor transmitters are to be supplied and installed at the outlet of each secondary chilled water pump. These sensors shall transmit an isolated 4-20mA DC signal indicative of process variable to the pump logic controller via standard two wire 24V DC system. It shall have a NEMA 1 electrical enclosure capable of withstanding 150 PSI static pressure. Accuracy shall be within 0.5% of full span.

5.4 PUMP LOGIC CONTROLLER

- i) The controller shall meet Part 15 of FCC regulations pertaining to class A computing devices. The controller shall be specifically designed for variable speed pumping applications.
- ii) The controller shall function to a proven program that safeguards against hydraulic conditions including :

- a) Pump flow surges
 - b) Hunting
 - c) End of curve
 - d) System over pressure
 - e) NPSHR above NPSHA
 - f) Motor overload
- iii) The pump logic controller shall be capable of receiving up to two discrete analog inputs from zone sensor / transmitter. It will then select the analog signal that has deviated the greatest amount from its set point. This selected signal shall be used as the command feedback input for a hydraulic stabilization function to minimize hunting. Each input signal shall be capable of maintaining a different set point value. Controller shall be capable of controlling up to four pumps in parallel.
 - iv) The pump logic controller shall have an additional analog input for a flow sensor. This input shall serve as the criteria for the end of curve protection algorithm.
 - v) The hydraulic stabilization program shall utilize a proportional-integral-derivative control function. The proportional, integral and derivative values shall be user adjustable over an infinite range.
 - vi) The operator interface shall have the following features :
 - a) Multi-fault memory and recall last 10 faults and related operational data
 - b) Red fault light, Yellow warning light and Green power on light.
 - c) Soft-touch membrane keypad switches.
 - vii) The display shall have four lines, with 20 characters on three lines and eight large characters on one line. Actual pump information shall be displayed indicating pump status.
 - viii) Controller shall be capable of performing the following pressure booster function:
 - a) Low suction pressure cut-out to protect the pumps against operating with insufficient suction pressure.
 - b) High system pressure cut-out to protect the piping system against high pressure conditions.
 - c) No flow shut down to turn the pumps off automatically when there is no flow.
 - ix) The following communication features shall be provided to the BMS :
 - a) Remote system start / stop non-powered digital input.

- b) Failure of any system component. Output closes to indicate alarm condition.
 - c) One 4-20 mA output with selectable output of :
 - Frequency
 - Process Variable
 - Output Current
 - Output power.
- x) The following communication features shall be provided to the building automation system via an RS-485 port utilizing Johnson Controls Metasys N2 protocol or equivalent.
 - a) Individual Analog Input
 - b) Individual Zone Set Points.
 - c) Individual Pump / AFD on/off status.
 - d) System percent speed.
 - e) System Start / Stop command
 - f) System operation mode.
 - g) Individual KW signals.
 - h) System flow, when optional flow sensor is provided.

5.5 THE COMPLETE VFD SYSTEM

- a. The pump and the VFD must be compatible.
- b. All functions of the variable speed pump control system shall be tested at the factory prior to shipment. This test shall be conducted with motors connected to AFD output and it shall test all inputs, outputs and program execution specific to this application.
- c. The system shall include the programmable logic pump controller, variable frequency drive(s) and remote sensor / transmitters as indicated.
- d. The variable speed pump logic controller, adjustable frequency drives, AFD bypass and pressure sensor / transmitters shall be supplied as individual components and assembled at the job site.
- e. Power and control wiring for this system shall be supplied and installed by the Air-conditioning contractor to ensure a single point responsibility for the performance of the system. Power source with the necessary Switches will be provided by the Owners in the Motor Control Centre in the AC Plant room.

6.0 AIR HANDLING UNIT (AHU)

6.1 SCOPE

The scope of this section comprises the supply, installation, testing and commissioning of Chilled water Air handling Units. The air handling units shall be of double skin construction, draw through type in sectionalized construction consisting of blower section, coil section, filter section and

insulated drain pan. Unless otherwise specified, the unit shall be horizontal type.

6.2 Rating

- i) The capacity of the cooling coil, the air quantity from the blower and static pressure of blower fan shall be as laid down in the tender documents.
- ii) The coil shall be designed for a face velocity of air not exceeding 165 m/min.
- iii) The requisite static pressure demanded by the air circuit shall be developed by the fan at the selected operating speed. The static pressure value shall not in any case be less than 40mm water gauge in normal cases, not less than 65mm water gauge where 5 micron particle size filters are used and not less than 100 mm where 0.3 micron particle size filters are used. The fan motor HP shall be suitable to satisfy these requirements and the drive losses.
- iv) Maximum fan speed
 - a) Fans up to and including 300 mm dia : 1440 RPM
 - b) Fans above 300 mm dia : 900 RPM
- v) The air outlet velocity from the centrifugal blower shall not exceed 650m/min.
- vi) Maximum fan motor speed : 1440 RPM
- vii) Noise level at a distance of 1M from AHU shall not exceed 60 dBA.

6.3 Housing / Casing

- i) The housing / casing of the air handling unit shall be of double skin construction. The housing shall be so made that it can be delivered at site in total / semi knocked down condition, depending upon the requirements. The main framework shall be extruded aluminium hollow structural sections. All the framework shall be assembled using mechanical joints to make a sturdy and strong framework for various sections. For 100% fresh air application framework shall be made of thermal break hollow extruded aluminium profile.
- ii) Double skin panels shall be 25mm thick, made of 0.8mm thick GSS with powder coated finish on the outside and 0.8mm thick GSS inside, with Polyurethane foam insulation of density not less than 38 kg/cum injected in between by injection moulding machine. These panels shall be bolted from inside/screwed from outside on to the framework with soft rubber gasket in between to make the joints airtight. The gaskets shall be inserted within grooves in the extruded aluminium profile of the

framework. For units installed outdoors, the thickness of double skin panels shall be minimum 40mm.

- iii) Frame work for each section shall also be bolted together with soft rubber gasket in between to make the joints airtight. Suitable doors with nylon handles, aluminium die-cast powder coated hinges & latches shall be provided for access to various panels for maintenance. However, AHU in the form of complete single unit shall also be acceptable with access door(s) for maintenance to various sections. The entire housing shall be mounted on galvanized steel channel frame work made out of GI sheet of thickness not less than 2mm. For higher capacity AHUs hot dip galvanized steel channel frame work made of minimum 3mm thick GS sheet shall be used.

6.4 Drain pan

Drain pan shall be made out of minimum 1.25mm thick stainless steel sheet externally insulated with 10mm thick closed cell Polyethylene foam insulation with necessary dual slope to facilitate fast removal of condensate. Necessary supports will be provided to slide the coil in the drain pan.

6.5 Cooling coil

- i) The coil shall be made from seamless solid drawn copper tubes. The minimum thickness of tube shall be 0.5mm and diameter 12.5 mm.
- ii) The depth of the coil shall be such as to suit the requirements, viz. re-circulated air application or 100% fresh air application. The coil shall be 4 or 6 rows deep for normal re-circulated air application and 8 rows deep for all outdoor air application, unless otherwise specified.
- iii) U bends shall be of copper, jointed to the tubes by brazing, soft soldering shall not be used.
- iv) Each section of the coil shall be fitted with flow and return headers to feed all the passes of the coil properly. The headers shall be complete with water in/out connections, vent plug on top and drain at the bottom. The coil shall be designed to provide water velocity between 0.6 to 1.8 m/s in the tubes.
- v) The fins shall be of aluminium. The minimum thickness of the fins shall be 0.15mm. The number of fins shall not be less than 5 per cm length of coil. Fins shall be of plate type. The tubes shall be mechanically expanded to ensure proper thermal contact between fins and tubes. The fins shall be evenly spaced and upright. The fins bent during installation shall be carefully realigned. For coastal areas fins shall be phenolic coated. For 100% F.A. application fins shall be hydrophilic type.

- vi) The coil shall be suitable for chilled water and shall be designed for a working pressure of 10 kg/sq. cm.
- vii) Shut off and regulating valves shall be provided at the water inlet and outlet.

6.6 Supply Air Fan and Drive

- i) The supply air fan shall be AMCA certified centrifugal type with forward / backward curved blades double width type. For static pressure up-to 65mm forward curved blades shall be used and for higher static pressures backward curved blades shall be used.
- ii) The fan housing shall be of Galvanized sheet steel and the impellers shall be fabricated from heavy gauge steel sheet as per approved manufacturers standard. The side plates shall be die formed for efficient, smooth airflow and minimum losses. Fan impeller shall be mounted on solid shaft supported to housing using heavy duty ball bearings. Fan housing and motor shall be mounted on a common base frame mounted inside the fan section on anti-vibration spring mounts or cushy-foot mount. The fan outlet shall be connected to casing with the help of fire retardant fabric.
- iii) The fan impeller assembly shall be statically and dynamically balanced.
- iv) The fan shall be fitted with vee belt drive arrangement consisting of not less than two evenly matched belts. Belts shall be of oil resistant type. Adequate adjustments shall be provided to facilitate belt installation and subsequent belt tensioning by movement of the motor on the slide rails. A readily removable guard shall be provided.
- v) The fan motor shall be totally enclosed fan cooled squirrel cage induction motor with IP-54 protection and selected for quiet running. The motor shall be suitable for operation on $415 \pm 10\%$ V, 3 PHASE, 50 Hz., AC supply. The motor shall conform to IS:325 - 'Three phase induction motors' having class F insulation.

6.7 Air Filters

- i) Metallic viscous type filter made out of aluminium wire mesh or of dry cleanable synthetic fabric type, minimum 50mm thick, shall be provided on the air suction side of the AHU as standard equipment with the unit. These filters shall have an efficiency of 90% down to 20 microns particle size. Face velocity across these filters shall not exceed 155 m/min.
- ii) Each AHU shall be provided with a filter section containing pre-filters made of cleanable metal viscous filters made of corrugated aluminium wire mesh, or dry cleanable synthetic fabric filters. These shall be minimum 50mm thick with a frame work of aluminium.

- iii) The filter area shall be made up of panels of size convenient for handling. The filter panels shall be held snugly within suitable aluminium framework made out of minimum 1.6mm aluminium sheet with sponge neoprene gaskets by sliding the panels between the sliding channels so as to avoid air leakage.
- iv) Fine Filters
Special filters having an efficiency of 99% down to 5 microns particle size shall be provided in the AHUs that will be catering to the critical areas like ICUs, OTs etc. The list of these areas is indicated in Basis of Design 1.06 and also in the Schedule of Quantities. The filters shall be of special media fixed in sheet metal housing made of aluminium sheet and bonded with suitable agents to obtain leak proof joints. The AHUs shall be designed with suitable space for the installation of these filters. Sheet metal framework of aluminium shall be provided for the installation of the filters. Neoprene rubber gaskets shall be used to ensure leak proof installation. Adequately sized inspection doors shall be provided easy access to the filters. This is of importance since some of the AHUs will be ceiling suspended.

6.8 Instruments and Valves

The following instruments shall be provided at the specified locations in the AHUs.

- i) Pressure gauges at the inlet and outlet of the coil with MS couplings welded to the pipe, siphon and gauge cock.
- ii) Stem type thermometers at the inlet & outlet of coil with MS couplings welded on to the chilled water pipeline.
- iii) Butterfly valve at the inlet and outlet of coil.
- iv) Balancing valve at the outlet of coil.
- v) Y-strainer at the inlet of coil.
- v) Motorized 2-way modulating valve along with proportionate thermostat.

6.9 Installation

The air handling unit shall be so installed as to transmit minimum amount of vibration to the building structure. Adequate vibration isolation shall be provided by use of rubber / neoprene pads.

6.10 Testing

Cooling capacity of the various air handling units shall be computed from the measurements of air flow and dry and wet bulb

temperatures of air entering and leaving the coil. Flow measurements shall be by an anemometer and temperature measurements by accurately calibrated mercury-in-glass thermometers. Computed results shall conform to the specified capacities and quoted ratings.

7.0 FAN COIL UNITS (FCU)/CASSETTE UNIT

7.1 SCOPE

The scope of this section comprises the supply, installation, testing and commissioning of fan coil units & Cassette Units 4 way type. The Fan Coil Units & Cassette shall be ceiling suspended blow through type complete with finned chilled water coil, centrifugal blowers and drive motor, insulated drain pan, cleanable air filters and fan speed regulator and other controls as described.

7.2 Casing

The casing shall be fabricated out of GSS sheet having a minimum thickness of 1.25mm.

7.3 Cooling coil

The coil shall be of seamless copper tubes with aluminium fins. The fins shall be uniformly bonded to the tubes by mechanical expansion of the tubes. The coil circuit should be sized for adequate water velocity but not exceeding 1.8 m/s. The air velocity across the coil face shall not exceed 165 m/min.

7.4 Fan

This shall consist of two light weight aluminium impellers of forward curved type, both statically and dynamically balanced, along with properly designed GI sheet casings.

The two impellers shall be directly mounted on to a double extension shaft, single phase multiple winding motor capable of running at three speeds.

7.5 Drain pan

Drain pan shall be fabricated out of minimum 1.00 mm thick stainless steel sheet covering the whole of the coil section and extended on one side for accommodating coil connections, valves etc. and complete with a 25mm drain connection. The drain pan shall be insulated with 10mm thick closed cell polyethylene foam insulation. Self priming drain pump shall be provided for cassette units.

7.6 Air filter

The filter shall be cleanable type 15mm thick with 90% efficiency down to 20micron and to be mounted on the air inlet side.

7.7 Speed control

A sturdy switch shall be provided with the unit complete with wiring, for ON/OFF operation and with minimum three speed control of the fan.

7.8 Automatic controls

Each unit shall have a room thermostat and a 2-way motorized valve. The valve shall be fixed on the water outlet side of the Unit. The thermostat and the three speed fan switch shall be a combination control unit having a aesthetic appearance.

The water valves on inlet line shall be of gun metal ball type with internal water strainers. The valves on return line shall be without the water strainer.

7.9 Water connections

The water lines shall be connected to the cooling coil of the fan coil unit, by at least 300mm long, type 'L' seamless solid drawn copper tubing, with flare fittings and connections.

7.10 Painting

All the sheet metal components of the Fan Coil Unit shall be given a powder coat finish.

8.00 VENTILATING FANS

8.1 Propeller fans

The scope of this section is the supply, installation, testing and commissioning of Wall mounted propeller fans.

In the case of individual toilets the exhaust fans shall be mounted directly in an external wall of the toilet. In the case of toilets with multiple cubicles a ducted exhaust system shall be provided to properly exhaust the air from all the cubicles. In this case the exhaust fan shall be installed in an external wall of the toilet, above the level of the false ceiling that will be provided. Short lengths of GI sheet metal ducts and exhaust grills shall be provided for connection to the exhaust fan. The fans shall be of the Axial flow type of robust design, suitable for continuous duty in industrial applications. The fans shall be complete with mounting frame, cowl and mesh.

The ratings are indicated in the Bill of Quantities.

8.2 Centrifugal fans

The scope of this section is the supply, installation, testing and commissioning of Centrifugal fans for exhaust systems for CSSD.

These Centrifugal exhaust fans shall be of Single Inlet Single Width (SISW) construction, fitted with drive motors of the required capacity. The drive arrangement shall be direct or belt driven.

The ratings are indicated in the Bill of Quantities.

9.0 SHEET METAL DUCTING

9.1 SCOPE

The scope of this section is the supply, installation, testing and commissioning of sheet metal air ducts.

- i) Ducts shall be factory fabricated and shall be generally as per IS: 655 'Specifications for metal air ducts', unless otherwise specified.
- ii) No variation of duct configuration or sizes is permitted except with written permission. Size of the round ducts installed in place of rectangular ducts or vice versa shall be in accordance with ASHRAE table of equivalent rectangular and round ducts.
- iii) Circular ducts, where provided shall be of thickness as specified in IS: 655 and its latest amendments.
- iv) All circular ducts and fittings shall be factory fabricated and shall be as shown on the contract drawings.
- v) Duct design:
 - Maximum flow velocity : 1500 Ft/Min.
 - Maximum friction : 0.1 in.WG/100 Ft. Run

N.B. Whichever of the above two values is lower, shall be selected.

Maximum velocity at supply
air outlet : 400 Ft/Min.

Noise Level Design Criteria

In accordance with Design Standards and Criteria, permissible noise level in various spaces, considered when unoccupied, shall be as follows:

S.No.	Area	Acceptable Noise Levels (NC)
a.	Private Rooms	25 - 30
b.	OT	35 - 40
c.	Corridors	35 - 40
d.	Wards	30 - 40
e.	Public Areas	35 - 40

9.2 DUCT MATERIAL

- i) The thickness of sheets for fabrication of rectangular ductwork shall be as under. The thickness required corresponding to the longest side of the rectangular section shall be applicable for all the four sides of the ductwork.

Longest side (mm)	Minimum sheet thickness
	(mm)
750 mm and below	0.63
751 mm to 1500 mm	0.80
1501 mm to 2250 mm	1.00
2251 mm & above	1.25

FOR ALUMINUM DUCTS MATERIAL SHALL BE ONE COMMERCIAL GAUGE HIGHER WITH 22 G AS MINIMUM

- ii) Flanges for duct joints, stiffening angles (braces) and supporting angles shall be of rolled steel sections, and of the following sizes.

Application	Duct Width	Angle size
Flanges	Upto 1000 mm	35mm x 35mm x 3mm
-do-	1001mm to 2250 mm	40mm x 40mm x 3mm
-do-	More than 2250 mm	50mm x 50mm x 3mm
Bracings	Upto 1000 mm	25mm x 25mm x 3mm
-do-	More than 1000 mm	40mm x 40mm x 3mm
Support angles	Upto 1000 mm	40mm x 40mm x 3mm
-do-	1001mm to 2250 mm	40mm x 40mm x 3mm
-do-	More than 2250 mm	Size and type of RS section shall be decided in individual cases

- iii) All spiral ducts and fittings shall be manufactured from GS Sheets conforming to the standards ASTM A924 and ASTM A653 - galvanized steel sheet, lock-forming quality, having the required zinc coating in conformance with ASTM A90.
- iv) Hangers shall be fully threaded rods of 8mm dia. Galvanized mild steel for duct sizes up to 1500 mm and of 10mm dia for ducts upto 2250mm size, and 12 mm dia for larger sizes.

- v) All nuts, bolts and washers shall be zinc plated steel. All rivets shall be galvanized or shall be made of magnesium - aluminium alloy. Self tapping screws shall not be used.
- vi) Hanger Straps: ASTM A653 galvanized steel with zinc coating as per ASTM A90.
- vii) Structural Steel Members: ASTM A36 steel.

9.3 DUCTWORK FABRICATION

- viii) The interior surfaces of the ducting shall be smooth.
- ix) All the ducts up to 600 mm longest side shall be cross broken between flanges by a single continuous breaking. Ducts of size 600 mm and above shall be cross broken by single continuous breaking between flanges and bracings. Alternatively, beading at 300mm centres for ducts up to 600 mm longest side, and 100 mm centres for ducts above 600 mm size shall be provided for stiffening.
- iii) All sheet metal connections, partitions and plenums required for flow of air through the filters, fans etc. shall be at least 1.25 mm thick galvanized steel sheets and shall be stiffened with 25 mm x 25 mm x 3 mm angle iron braces.
- iv) As far as possible, long radius elbows and gradual changes in shape shall be used to maintain uniform velocity accompanied by decreased turbulence, lower resistance and minimum noise. The ratio of the size of the duct to the radius of the elbow shall be normally not less than 1:1.5.
- v) Flanged joints shall be used at intervals not exceeding 2500 mm. Steel flanges shall be welded at corners first and then riveted to the duct.
- vi) Plenums for filters shall be complete with suitable access door of size 450 mm x 450 mm.
- vii) Provide rectangular 45 degree entry fittings for rectangular ducts and 45 degree wye takeoffs for round ducts.
- viii) Duct sizes indicated are inside clear dimensions.
- viii) Increase duct size gradually, not exceeding 15 degree divergence wherever possible. Do not exceed 30-degree divergence upstream of equipment. Do not exceed 45-degree convergence downstream of equipment.

- x) For circular ducting all accessories viz bends, tees, reducers, flanges, etc shall be pre fabricated at the manufacturing unit as per SMACNA Standards. Construct Tees, bends, and elbows with a centerline radius 1.5 times the duct diameter. Where not possible and where rectangular elbows are used, provide single thickness turning vanes constructed and installed in accordance with SMACNA Standards.
- xi) FOR CIRCULAR DUCTS
 - a) Machine made spiral lock-seam duct with light reinforcing corrugations. Corrugations shall be applicable as per SMACNA Standards.
 - b) Fittings: Welded seam construction, manufactured of at least two gages heavier metal than duct.
 - c) The diameters of the spiral duct shall confirm to EUROVENT / ISO / CEN standards.
 - d) All branch connections shall be made as a separate fitting.
- d) All elbows shall be fabricated with a centerline radius of 1.5 times the diameter. 90° and 45° elbows in diameters 3" round through 5" round shall be stamped or pleated elbows.
- e) All other elbows shall be of the segmented type, fabricated in accordance with the following:

DEGREE OF ELBOW/ NUMBER OF SEGMENTS

DEGREE OF ELBOW	NUMBER OF SEGMENTS
less than 36°	2
37 thru 71°	3
72 thru 90°	4

- f) Circumferential and longitudinal seams of all fittings shall be a continuous weld or spot welded and sealed with mastic. All welds shall be as per the HVAC Specification DW/144 and painted to prevent corrosion.
- g) All field joints for round ducts up to and including 900 mm diameter shall be made with a 50 mm slip-fit or slip coupling.

9.4 INSTALLATION OF DUCTS

- i) The fabrication and installation shall be done in a workmanlike manner. Duct work shall be rigid and straight without kinks.
- ii) All exposed ducts within the conditioned space shall have slip joints. Flanged joints shall not be used.
- iii) All joints shall be airtight.
- iv) Ducts shall be supported independently from the building structure and adequately, to keep the ducts true to shape. The support spacing shall be not more than 2 m. Where ducts cannot be suspended from ceiling, wall brackets or other suitable arrangements, as approved by the Engineer-in-charge shall be adopted. Neoprene or other vibration isolation packing of minimum 6 mm thickness shall be provided between the ducts and the angle iron supports/brackets. Vertical duct work shall be suitably supported at each floor by steel structural members.
- v) Where metal ducts or sleeves terminate in woodwork, tight joints shall be made by means of closely fitting heavy flanged collars. Where ducts pass through brick or masonry openings, wooden frame work shall be provided within the openings and the crossing ducts shall be provided with heavy flanged collars on either side of the wooden frame work, so that duct crossing is made leak-proof.
- vi) Duct connections to the air-handling unit shall be made by inserting a double canvas sleeve 150 mm long. The sleeve shall be securely bonded and bolted to the duct and unit casing.
- vii) Dampers shall be provided in branch duct connections for proper volume control and balancing the air quantities in the system, whether indicated in the drawings or not. Suitable links, levers and quadrants shall be provided for proper operation, control and setting of the dampers. Every damper shall have an indicating device clearly showing the position of the dampers at all times.
- viii) During construction, install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- ix) Use double nuts and lock washers on threaded rod supports.
- x) Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

- xi) Provide flexible connections with minimum 25 mm slack immediately adjacent to equipment in ducts associated with fans and motorized equipment.
- xii) Repair damaged galvanized ductwork surfaces (welds, scratches, etc.) by applying minimum 2 coats of a zinc base paint.
- xiii) Provide duct drops to diffuser same size as diffuser neck size.
- xiv) Install openings in ductwork where required to accommodate thermometers and controllers. Where openings are provided in insulated ductwork, install insulation material inside metal ring.

9.5 BALANCING

The entire air distribution system shall be balanced with the help of an anemometer. The measured air quantities at fan discharge and at the various outlets shall be within ± 5 percent of those specified / quoted. Branch duct adjustments shall be permanently marked after the air balancing is completed so that these can be restored to their correct position if disturbed at any time.

9.6 MEASUREMENT

- i) Duct measurements (for insulated ducts) shall be taken before application of insulation.
- ii) Duct work shall be measured section wise on the basis of external surface area by multiplying the axial length from flange face to flange face for each section by the corresponding duct perimeter in the centre of that section length.
- iii) Uniformly tapering straight sections shall also be measured as in (ii) above. However, for special pieces like tees, bends etc. area computations for surface areas shall be done as per shape of such pieces.
- iv) The quoted unit rate for external surfaces of ducts shall include all wastage allowances, flanges, gaskets for joints, vibration isolators, bracings, hangers and supports, inspection chambers/access panels, splitter dampers with quadrants and levers for position indication, turning vanes, straightening vanes, and all other accessories required to complete the duct installation as per the specifications. These accessories shall not be separately measured.
- v) Grilles and diffusers (except linear diffusers) shall be measured by the cross sectional areas, perpendicular to the airflow, and excluding

the flanges. Volume control dampers, where provided shall not be separately accounted for.

- vi) Linear slot type diffusers shall be measured by linear measurements only, and not by cross-sectional areas, and shall exclude flanges for mounting of the linear diffusers. The supply air plenum for linear diffusers shall be measured as described above for ducting.
- vii) Fire dampers shall be measured by their cross sectional area perpendicular to the direction of the airflow. Quoted rates shall include the necessary collars and flanges for mounting, inspection pieces with access door and fusible link arrangement.

10.0 GRILLES / DIFFUSERS

SCOPE

The scope of this section is the supply, installation, testing and commissioning of air grilles and diffusers.

- i) Grilles/diffusers shall be fabricated of extruded aluminium sections and shall present a neat appearance and shall be rigid with mechanical joints.
- ii) Square and rectangular grilles shall have a flanged frame with the outside edges curved 5 to 7 mm. The outer framework of the grilles shall be made of not less than 1.6 mm thick aluminium sheet. The louvers shall be of aerofoil design of extruded aluminium section with minimum thickness of 0.8mm at front and shall be made of 0.8mm thick aluminium sheet. Louvers may be spaced 18 mm apart.
- iii) Square and rectangular diffusers shall have a flange flush with the ceiling into which it is fitted or shall be of anti smudge type. The outlets shall comprise an outer shell with duct collar and removable diffusing assembly. These shall be suitable for discharge in one or more directions as required. The outer shell shall not be less than 1.6 mm thick extruded section aluminium sheet. The diffuser assembly shall not be less than 0.80 mm thick extruded aluminium section.
- iv) Circular diffusers shall have either flush or anti smudge outer cone. Flush outer cones shall have the lower edge of the cone not more than 5mm below the underside of the finished ceiling into which it is fitted. Anti smudge cones shall have the outer cone profile designed to reduce dirt deposit on the ceiling adjacent to the air outlet. The metal sheet used for construction of these shall be minimum 1.6 mm thick extruded aluminium sheet.
- v) Linear slot type diffusers shall have a flanged frame with the outside edges curved 3.5mm and shall have the required number of slots. The air quantity through each slot shall be adjustable. The metal sheet used for the construction of these shall be minimum 1.6 mm thick extruded aluminium sheet.
- vi) Grilles and diffusers constructed of extruded aluminium sections shall have grille bars set straight, or deflected as required. These shall be assembled by mechanical interlocking of components to prevent distortion.
- vii) All supply air grilles/diffusers shall be fitted with a volume control damper, made of MS sheets. The damper blades shall be pivoted on nylon bushes. These dampers shall be located immediately behind

the grille/diffuser and shall be fully adjustable from within the occupied space without removing the grille/diffuser. The volume control damper for circular outlets shall be opposed blade radial/shutter type dampers. Opposed blade dampers shall be used for square and rectangular grilles/diffusers.

- viii) The locations of the grilles/diffusers are shown in the tender drawings. Necessary openings and wooden framework for fixing the grilles shall be provided by the air conditioning contractor. The location of grilles/diffusers is subject to change; hence the approval of the Engineer-in-Charge shall be obtained before finally fixing the grilles/diffusers in position.
- ix) While installing grills, the fasteners should be fixed in recessed grooves so that they are not visible on the flange or face of the grille/diffuser. Only non-ferrous screws shall be used.
- x) The grilles/diffusers shall be powder coated to the desired colour to match the surroundings wall/ceiling. The paint colour shall be approved by the Engineer-in-Charge.
- xi) All damages to the finish of the structure during the installation work shall be made good by the air-conditioning contractor before handing over the installation.

11.0 FRESH AIR INTAKES

SCOPE

The scope of this section is the supply, installation and commissioning of Fresh air Intakes.

- i) A fresh air intake cowl of GS sheet metal of square/rectangular shape and having a bend of 45 deg. angle to prevent rain water entry, shall be provided on the external wall.
- ii) The above cowl shall be provided with a bird screen made of GI wire mesh of 18 swg thick wire and having 6 mm holes. This screen shall be fixed tight to a flange on the outer edge of the cowl with 6mm GI bolts and nuts.
- iii) An opposed blade Volume Control Damper fabricated out of MS sheet and powder coated shall be fixed on the inner wall of the fresh air opening. The adjustable louvers shall be pivoted on nylon bushes. The damper shall be provided with an easily operable lever with a locking arrangement. The damper and cowl shall be of the same face area.

12.0 FIRE DAMPERS

SCOPE

The scope of this section is the supply and installation of Fire dampers.

- i) Fire dampers shall be provided in all supply air ducts and return air path in the air-handling unit room and at all floor crossings. Access door will be provided in the duct before each set of fire dampers.
- ii) Fire dampers shall be multi blade louvers type. The blade should normally remain in the open position and shall allow maximum free area to reduce pressure drop and noise in the air passage. The blades and frame shall be constructed with minimum 1.6mm thick galvanized steel sheet.
- iii) The louvers of the fire damper shall be held in the open position by means of a fusible link made of two copper metal strips soldered together in an overlapping position, using a certified low-melting point solder. A heavy duty spring would ensure that the louvers are shut tight when the fusible link melts. The louver blades shall be pivoted on gun metal bushes.
- iv) Fire dampers shall have a rating of 90 minutes against collapse and flame penetration as per UL 555-1995.

13.0 WATER PIPING

SCOPE

The scope of this section is the supply, installation, testing and commissioning of the water piping system complete.

13.1 PIPING DESIGN

Pipe sizes shown in the tender documents are for guidance only. The contractor shall be responsible for selection of sizes as per detailed engineering to be done by him. Piping design to be done by the Air-conditioning contractor shall conform to the following:

- i) For water pipe sizing 50mm and below
Maximum friction : 4 Ft/100 Ft. Run
For pipe sizing 50mm and above
Maximum friction : 6 Ft/100 Ft. Run
- ii) Butterfly / Ball valves shall be provided at
 - a) suction and delivery sides of pumps.
 - b) Inlet and outlet of each Condenser, chiller and cooling tower.
 - c) all drain connections from equipments, except condensate drains.
 - d) Inlet & outlet of all the cooling coils of the AHUs and FCUs.

- iii) Non return valve shall be provided at the delivery of each pump. This shall be of swing type.
- iv) Balancing valve shall be provided at the outlet side of chiller, condenser, and the AHU cooling coils to regulate the water flow rate.
- v) Air valves of 25 mm size shall be provided at all high points in the piping system for venting of air.
- vi) Piping drawings showing the sizes of valves, layout and other details shall be prepared and submitted for the approval of the Engineer-in-charge before execution the work.

13.2 PIPE MATERIAL

Pipes shall be of the following materials.

Chilled Water Pipes

- a) Mild steel heavy class (Black steel) tube conforming to IS: 1239 for sizes upto 150mm.
- b) Welded black steel pipe, class 2, conforming to IS: 3589, for sizes greater than 150mm. These pipes shall be factory rolled & fabricated from minimum 6mm thick M.S. sheet for pipes upto 350mm dia & from minimum 8mm thick M.S. sheet for pipes of 400mm dia & above.

13.3 PIPE JOINTS

Joints in steel pipes shall be of any of the following types.

- a) Screwed joints and union joints screwed to pipes or welded joints, up to 25mm size.
- b) Butt welded joints for pipe sizes above 25mm.
- c) Flanges joints with flanges as per IS: 6392 for all sizes. Flanges may be steel welded neck type or slip on type welded to pipe, or alternatively screwed type.

13.4 VALVES

- i) The material of construction of butterfly valves shall be as under:

Body	-	Cast iron
Disc	-	Cast Bronze or Stainless Steel
Seat	-	Nitrile rubber
O-ring	-	Nitrile rubber / Silicon
- ii) Balancing valve shall be of cast iron flanged construction with EPDM / SG iron with epoxy coated disc with built in pressure drop measuring facility (pressure test cocks) to compute flow rate across the valve. The test cocks shall be long enough to protrude out of pipe insulation.

- iii) Non return valves shall be of gun metal construction upto 65mm, the metal conforming to class 2 of IS: 778. For 75mm and above, the valve shall be of bronze or gun metal, body being of cast iron. While screwed or flanged ends may be provided upto 65mm, flanged ends shall be provided for larger sizes.
- iv) Air purge valves shall be of gunmetal body.

13.5 STRAINERS

- i) Strainers shall be of 'Y' type. 'Y' strainers shall be provided on the inlet side of each air-handling unit and pump in chilled water and condenser water circuit. The strainers shall be designed for the test pressure specified for the gate valves. Filtration area of Y-strainer shall be minimum four times the connecting pipe size.
- ii) Strainers shall have a removable bronze / stainless steel minimum 1mm thick screen with 3 mm perforations and permanent magnet. Strainers shall be provided with flanges or threaded sockets as required. They shall be designed so as to enable blowing out accumulated dirt and facilitate removal and replacement of screen without disconnection of the main pipe.

13.6 INSTRUMENTS

- i) Pressure gauge of appropriate range and 100mm. dial size shall be provided at the following locations.
 - a) Supply and return of all heat exchange equipments.

The pressure gauge shall be duly calibrated before installation and shall be complete with shut off cocks.
- ii) Direct reading industrial type thermometer of appropriate range shall be provided at the inlet and outlet of all heat exchange equipments. The thermometers shall be installed in separate wells.

13.7 EXPANSION TANK

- i) Expansion tank for chilled water shall be of closed pressurized type. The tank shall be of 1000 liters capacity and shall be of HDPE construction. It shall be provided with a special membrane of synthetic material to withstand the system pressurization. The tank shall be insulated with 50 mm thick eps slabs and covered with wire netting and cement plastering.
- ii) A pressurization system shall be provided along with the expansion tank. This system shall consist of two make-up water pumps, one working and one standby. The pumps shall be multi stage centrifugal pumps capable of operating at the chilled water operating pressure. The system shall be complete with pressure switch, isolating valves, non-return valves and make-up water piping from the tank located on the roof of the AC plant room. The two pumps shall be mounted on a common MS base frame and mounted on a masonry pedestal.
- iii) An air separator shall be provided at the suction side of the primary chilled water pumps. The capacity of the air separator shall be compatible with the system capacity and the size of the water inlet and outlet flanges shall be as per the size of the main chilled water header pipes. The air separator shall be insulated with 50 mm thick eps slabs and covered with wire netting and cement plastering. The air separator shall be provided with an automatic air vent.

13.8 INSTALLATION

- i) The installation work shall be carried out in accordance with the detailed drawings prepared by the Air-conditioning Contractor and approved by the Engineer-in-charge.
- ii) Air-conditioning contractor shall utilize the structural provisions for Air-conditioning services wherever provided in the building and make his own arrangements for additional changes.
- iii) Expansion loops or joints shall be provided to take care of expansion or contraction of pipes due to temperature changes.
- iv) Tee-off connections shall be through equal or reducing tees, otherwise ferrules welded to the main pipe shall be used. Drilling and tapping of the walls of the main pipe shall not be resorted to.
- iv) Wherever reducers are to be made in horizontal runs, eccentric reducers shall be used if the piping is to drain freely. In other locations, concentric reducers may be used.
- vi) Open ends of piping shall be blocked as soon as the pipe is installed to avoid entry of foreign matter.

- vii) All pipes using screwed fittings shall be accurately cut to the required size and threaded in accordance with IS: 554 and burrs removed before laying.
- viii) Piping installation shall be supported on or suspended from the building structure adequately. The Air-conditioning contractor shall design all brackets, saddles, clamps, hangers etc. and shall be responsible for their structural integrity.
- ix) Pipe supports shall be of steel, adjustable for height and prime-coated with zinc chromate paint and finish-coated gray. Spacing of pipe supports shall not be more than that specified below:-

Nominal Pipe size (mm)	Spacing (Metres)
12 and 15	1.25
20 and 25	2.00
32, 40, 50 and 65	2.50
80, 100 and 125	2.50
150 and above	3.00

Extra supports shall be provided at the bends and at heavy fittings like valves to avoid undue stress on the pipes. Pipe hangers shall be fixed on walls and ceiling by means of metallic or Rawl plugs or approved shear fasteners.

- x) Insulated piping shall be supported in such a manner as not to put undue pressure on the insulation.
- xi) Anti vibration pads, springs or liners of resilient and non-deteriorating, material shall be provided at each support, so as to prevent transmission of vibration through the supports.
- xii) Pipe sleeves of diameter larger than the pipe by at least 50mm shall be provided wherever pipes pass through walls, and the annular spaces shall be filled with felt and finished with retaining rings.
- xiii)
 - a) Vertical risers shall be parallel to walls and column lines and shall be straight and plumb. Risers passing from floor to floor shall be supported at each floor by clamps or collars attached to pipe with a 12mm thick rubber pad or any other resilient material as approved by the Engineer-in-charge.
 - b) The space in the floor cut outs around the pipe work (after insulation work where applicable) shall be closed using cement concrete (1:2:4 mix) or steel sheet, from the fire safety considerations, taking care to see that a small annular

space is left around the pipes to prevent transmission of vibration to the structure.

- c) Risers shall have suitable support at the lowest point.
- xiv) Where pipes are to be buried under ground, the top of the pipes shall be not less than 75 cms. from the ground level. Where this is not practicable, permission of the Engineer-in-charge shall be obtained for burying the pipes at a lesser depth. The pipes shall be surrounded on all sides by sand cushion of not less than 15cms thickness. After the pipes have been laid and top sand cushion provided, the trench shall be refilled with the excavated soil and any extra soil shall be removed from the site of work by the Air conditioning contractor.
- viii) All pipes and their steel supports shall be thoroughly cleaned and given one primer coat of Zinc chromate before being installed.
- xvi) After all the water piping has been installed, pressure tested in accordance with clause 10.10, all exposed piping in the plant room shall be given two finish coats of paint, approved by the Engineer-in-charge. Similar painting work shall be done over insulated pipe work, valves etc. The direction of flow of fluid in the pipes shall be indicated with identification arrows.
- ix) 3 mm gasket shall be used for flanged joints.

13.9 PRESSURE TESTING

- i) All piping shall be tested to hydrostatic test pressure of at least one and a half times the maximum operating pressure, but not less than 10 kg. / sq. cm. for a period of not less than 24 hours. All leaks and defects in joints revealed during the testing shall be rectified to the satisfaction of the Engineer-in-charge.
- ii) Piping repaired subsequent to the above pressure test shall be re-tested in the same manner.
- iii) System may be tested in sections and such sections shall be securely capped.
- v) It shall be made sure that proper noiseless circulation is achieved through all the coils and other heat exchange equipments in the system. If proper circulation is not achieved due to air-bound connections, the contractor shall rectify the defective connections. He shall bear all the expenses for carrying out the above rectification.

- v) Insulation shall be applied to piping only after the completion of the pressure testing to the satisfaction of the Engineer-in-charge.
- vi) Pressure gauges may be capped off during pressure testing of the installation.
- vii) The contractor shall provide all materials, tools, equipments, instruments, services and labour required to perform the tests and to remove water resulting from cleaning after testing.

13.10 BALANCING

- i) After completion of the installation, the entire water system shall be adjusted and balanced to deliver the water quantities as specified, quoted, or as directed.
- ii) Automatic control valves and two way diverting valves shall be set for full flow condition during balancing procedure. Water circuit shall be adjusted by balancing cocks provided for balancing. These shall be permanently marked after the balancing is completed so that they can be restored to their correct positions, if disturbed.

13.11 MEASUREMENT

Measurement of piping work shall be done on the following basis:-

- a) Piping shall be measured along the centre line of installed pipes including all pipe fittings and accessories but excluding valves and other items for which quantities are specifically indicated in the schedule of work. No separate payment shall be made for fittings and accessories.
- b) The rates for piping work shall include all wastage allowances, pipe supports, hangers, nuts and check nuts, vibration isolators, suspension where specified or required, and any other item required to complete the piping installation. These items shall neither be separately measured nor paid for.
- c) Piping measurement shall be taken before application of the insulation in the case of insulated pipe work.

14.0 INSULATION WORK

SCOPE

The scope of this section is the supply and installation of insulation work.

14.1 MATERIAL

The insulation material to be used for various applications shall be as follows:

- i) For insulation of water piping, pumps and tanks:-

- a) Fire retardant quality Expanded Polystyrene moulded pipe sections shall be used for pipes and slabs for other equipments.
 - b) Polyurethane foam (PUF) with GI jacket.
- ii) For thermal Insulation of duct work:-
 - a) Fiber glass mat covered with aluminium foil.
 - b) Nitrile rubber sheet of suitable thickness closed cell type.
- iii) For acoustic lining of ducts
 - a) Fiber glass rigidboard covered with RP tissue and perforated aluminium sheet.
 - b) Nitrile rubber sheet of suitable thickness open cell type.
- iv) For acoustic lining of AHU rooms:-
Fiber glass mat
- v) For suction line and Chiller insulation:-
Polyvinyl nitrile rubber insulation.
- vi) For double skin AHUs:
Polyurethane foam (PUF)

14.2 THERMAL / ACOUSTIC INSULATION

14.2.1 Material

- ◆ Insulation material shall be Closed Cell Elastomeric Nitrile Butadiene Rubber.
- ◆ Insulation material shall have anti-microbial product protection. The antimicrobial product protection shall be an integral part of insulation that is built-in during the manufacturing process and the product protection should not allow the microbes to function, grow and reproduce.
- ◆ Resistance towards microbiological growth on insulation surface should confirm to following standards: Fungi Resistance – ASTM G21 where the fungal growth on the surface is NIL after 28 days of incubation at 28 – 30 deg C and Bacterial resistance – ASTM E 2180 where the reduction of bacterial growth is minimum 99.9% after 24 hours of incubation at 34 – 38 deg C.
- ◆ Thermal conductivity of Elastomeric Nitrile rubber shall not exceed 0.035 W/m°K at an average temperature of 20°C in accordance to EN12667
- ◆ The insulation shall have fire performance such that it passes Class 1 as per BS476 Part 7 for surface spread of flame as per BS 476 and also pass Fire Propagation requirement as per BS476 Part 6 to meet the Class 'O' Fire category as per 1991 Building Regulations (England & Wales) and the Building Standards (Scotland) Regulations 1990.

- ◆ Water vapour permeability shall not exceed 1.74×10^{-14} Kg/m.s.Pa, i.e. Moisture Diffusion Resistance Factor or 'μ' value should be minimum 10,000 according to EN 12086
- ◆ Density of Material shall be between 40 to 60 Kg/m³.

14.2.2 Duct Insulation

External thermal insulation shall be provided as follow:

- ◆ The thickness of Nitrile rubber shall be as shown on drawing or identified in the schedule of quantity. Following procedure shall be adhered to:
- ◆ Duct surfaces shall be cleaned to remove all grease, oil, dirt, etc. prior to carrying out insulation work. Measurement of surface dimensions shall be taken properly to cut closed cell elastomeric rubbers sheets to size with sufficient allowance in dimension.
- ◆ Material shall be fitted under compression and no stretching of material shall be permitted. A thin film of adhesive shall be applied on the back of the insulating material sheet and then on to the metal surface. When adhesive is tack dry, insulating material sheet shall be placed in position and pressed firmly to achieve a good bond. All longitudinal and transverse joints shall be sealed as per manufacturer recommendations. The adhesive shall be strictly as recommended by the manufacturer.
- ◆ The detailed Application specifications are mentioned separately.

14.2.3 Insulation of Ducts Exposed Directly to Sunlight

For installations exposed to sunlight, after giving 36 hours curing time for the adhesive apply manufacturer's recommended UV/Mechanical Protection. Please refer the separate detailed guidelines on UV/Mechanical Protection.

14.2.4 Recommended Adhesive

In all cases, the manufacturer's recommended Adhesive should be used for the specified purpose.

14.2.5 Acoustic Insulation

Material shall be engineered Nitrile Rubber open cell foam. The Random Incidence Sound Absorption Coefficients (RISACs) across the octave band frequencies; tested as per ISO 354, and Noise Reduction Coefficients (NRCs) for the Acoustic Insulation should be minimum as per the below chart:

Freq (Hz)	125	250	500	1000	2000	4000	NRC
10 mm	0.03	0.04	0.14	0.40	0.88	1.00	0.40
15 mm	0.01	0.09	0.29	0.74	1.08	0.83	0.55
20 mm	0.04	0.13	0.40	0.90	1.04	0.90	0.60
25 mm	0.05	0.25	0.86	1.14	0.88	0.99	0.80
30 mm	0.07	0.32	0.99	1.16	0.93	1.08	0.85
50 mm	0.23	0.73	1.29	0.99	1.09	1.11	1.05

- The material should be fibre free.
- The density of the acoustic insulation should be minimum 140 Kg/m³
- The insulation should have Microban®; Built-in Anti-Microbial Product Protection, and should pass Fungi Resistance as per ASTM G 21 and Bacterial Resistance as per ASTM E 2180.
- The insulation should be non-eroding & should pass Air Erosion Resistance Test in accordance to ASTM Standard C 1071-05 (section 12.7).
- The material should have a thermal conductivity not exceeding 0.047 W/m.K @ 20 Deg. C
- The material should withstand maximum surface temperature of +850C and minimum surface temperature of -200C
- The material should confirm to Class 1 rating for surface spread of Flame in accordance to BS 476 Part 7 & UL 94 (HBF, HF 1 & HF 2) in accordance to UL 94, 1996.
- The acoustic insulation should be tested and approved by Sound Research Laboratories Ltd., U.K.
- Thickness shall be 10mm for Duct Acoustic Lining
- Duct so identified and marked on Drawings and included in Schedule of Quantities shall be provided with internal acoustic lining for a distance of minimum 6 meters (or 30% of the duct length whichever is more)
- Thickness of the insulation material shall be as specified for the individual application. The insulation should be installed as per manufacturer's recommendation.

14.2.6 Accessories

Adhesive to adhere insulation to the inside walls of the duct shall be from the Insulation manufacturer only.

14.2.7 Under deck insulation

- ◆ Insulation material shall be Closed Cell Elastomeric Nitrile Rubber
- ◆ Density of Material shall be between 40 to 60 Kg/m³
- ◆ Thermal conductivity of elastomeric nitrile rubber shall not exceed 0.035 W/m²K at an average temperature of 0°C

- ◆ The insulation shall have fire performance such that it passes Class 1 as per BS476 Part 7 for surface spread of flame as per BS 476 and also pass Fire Propagation requirement as per BS476 Part 6 to meet the Class 'O' Fire category as per 1991 Building Regulations (England & Wales) and the Building Standards (Scotland) Regulations 1990
- ◆ Material should be FM (Factory Mutual), USA approved.
- ◆ Water vapour permeability shall not exceed 0.017 Perm inch (2.48 x 10⁻¹⁴ Kg/m.s.Pa), i.e. Moisture Diffusion Resistance Factor 'μ' value should be minimum 7000.

14.3 INSTALLATION PROCEDURE:

- The ceiling surface shall be cleaned with brush to remove all dirt, cement etc. If surface is uneven it should be made smooth prior to carrying out insulation work.
 - A layer of synthetic rubber adhesive should be applied on the ceiling with the help of brush so that all the pores are filled and surface becomes smooth and allow it to dry.
 - Allow an additional 5 mm to the total dimensions while cutting Insulation sheet. Ensure you measure the cutting dimensions on the top surface of the insulation sheet. This can be identified by the products markings; "they are always on the top surface. This surface is the one you will see after installation.
 - All Insulation sheet and ceiling surfaces shall have all-over adhesive coverage. Adhesive should be applied on the side that has no product markings and identification printing. This side is the one that curves inwards.
 - During installation avoid air bubbles. Always apply pressure while fixing the Insulation sheet, this action will ensure maximum bond strength.
 - All cut Insulation sheet edges shall be of a "clean cut nature and not cut rough".
 - All seams and joint shall be sealed with synthetic rubber adhesive.
 - Measurement of surface dimensions shall be taken properly to cut closed cell elastomeric rubbers sheets to size with sufficient allowance in dimension. Material shall be fitted under compression and no stretching of material shall be permitted. A thin film of adhesive shall be applied on the ceiling with brush and then on to the back of the insulating material sheet with brush/small piece of sheet metal having smooth edges. When adhesive is tack dry, insulating material sheet shall be placed in position and pressed firmly to achieve a good bond. All joints shall be sealed. The adhesive shall be strictly as recommended by the manufacturer. There is no need to make holes for wires etc. as no supporting wires/screws are required.
- While doing installation on the metal roofing, it is important to ensure that metal roof should not face direct sun light, as metal

sheets becomes very hot and adhesive may not work. In such conditions work should be done in the evening / night

14.4 APPLICATION OF INSULATION ON PIPES

- i) The surface to be insulated shall be first cleaned and a coat of shalikota or equivalent shall be given. The insulation shall be fixed tightly to the surface with hot bitumen/cold setting adhesive CPRX compound as recommended by the insulation manufacturer. All joints shall be staggered and sealed.
- ii) The insulation shall be finished as under:
 - a) **Chilled water piping inside the building and External above Ground. The pipe shall be properly cleaned removing all dirt, marks and any other external material. Apply 1 coat of red oxide primer and above that apply 2 coats of bituminous paint. The pipe then to be duly insulated with PUF 30-50mm 36kg/m³, pipe section insulation to be covered with one layer of 0.60mm GI jacket with necessary clamps and connection fittings.**
 - c) **Chilled water piping outside the building buried in ground. Duly insulated with EPS pipe section insulation and covered with one layer of polythene sheet, one layer of GI wire netting of 24 swg and 20 mm holes, one layer of sand cement plaster 20 mm thick smoothly finished and covered with one layer of Grade 1 tarfelt 3.5 mm thick, suitably overlapped and joints sealed with CPRX compound.**
- iii) All valves, fittings, strainers etc. shall be insulated to the same thickness and in the same manner as for the respective piping, taking care to allow operation of valves without damaging the insulation.

14.5 APPLICATION OF INSULATION ON PUMPS AND EXPANSION TANK

Fire retardant 15 mm thick nitrile rubber, GI wire netting 24 swg thick and with 20 mm holes.

15.0 QUALITY ASSURANCE

15.1 Inspection and testing

- I. All equipment and components supplied may be subjected to inspection and tests by the Consultants during manufacture, erection/installation and after completion. The inspection and tests shall include but not be limited by the requirements of this contract document. Prior to inspection and testing, the equipment shall undergo pre-service cleaning and protection.

- II. Tenderers shall state and guarantee the technical particulars listed in the Schedule of Technical Data. These guarantees and particulars shall be binding and shall not be varied without the written permission of the Consultants.
- III. No tolerances shall be allowed other than the tolerances specified or permitted in the relevant approved Standards, unless otherwise stated.
- IV. If the guaranteed performance of any item of equipment is not met and / or if any item fails to comply with the specification requirement in any respect whatsoever at any stage of manufacture, test or erection, the Consultants may reject the item, or defective component thereof.

15.2 Performance

It is the Tenderer's responsibility to ensure that the entire HVAC system as a whole and all its individual components deliver the specified levels of performance, reliably and continuously. The Quality Assurance will include but not be limited to the following criteria.

- i. Verification of design conformity.
- ii. Establishing that the fluid flow rates, volumes and operating pressures are as specified.
- iii. Ensuring that the energy consumption of all the relevant components of the system are as specified.
- iv. Establishing that the operating sound and vibration levels are within the specified limits.
- v. Adjusting and balancing the various systems as per the design parameters.
- vi. Recording and reporting the results as per the specified formats.

16. DIVISION OF WORK

The Division of Work between the Client and the Contractor will be as follows.

Client's scope of work.

1. Civil works like construction of AC plant room, AHU rooms and trenches for pipelines.

2. False ceiling, including trap doors for ceiling suspended units and frames for fixing grills/diffusers
3. Electrical work for the Air-conditioning system, including switch board, switch gear, cables and earthing.
4. Providing storage space at site for materials and equipments during the installation period.
5. Providing water and power supply for testing and commissioning of the AC system.

Contractor's scope of work.

1. Supply, installation, testing and commissioning of all the equipments and services listed out in the Technical specifications and the Bill of Quantities.
2. Providing the tools, tackles, ladders, scaffolding etc. required for the installation of the AC work.
3. Carrying out minor civil works like masonry pedestals for the equipments and breaking and making good wall openings for routing pipes, ducts etc.
4. Providing security at site for the equipments and materials till the plant is handed over to the Users.
5. Providing water and power supply for erection, installation & testing of all HVAC works.
6. The HVAC contractor must give his concurrence for the design and selection of switch gear, cables, earthing etc. by the Electrical contractor, with respect to the Electrical works of the Air-conditioning system. The HVAC contractor must also guide the Electrical contractor and render any supervisory assistance that may be required during the execution of the said work.
7. All technical detailed specification of equipments with respect to the HVAC works shall be submitted by the HVAC Contractor and approved by the Architects/Consultants, before commencement of work.
8. Contractor shall submit the detailed working drawings, shop drawings for all HVAC works including necessary sections, coordinated drawings for approval to consultant /client to should obtain approval before commencement of work.

LIST OF APPROVED MAKES FOR EQUIPMENT & MATERIALS

S.No	Details of Materials / Equipment	Manufacturer's Name
1.	Water Cooled Screw type Chiller	Blue Star, York, Hitachi, Trane, Carrier, Dunham Bush, Daikin McQuay
2.	Water Circulation Pumps	ITT Bell & Gossett, Armstrong , Grundfos
3.	Variable Frequency Drive system	ITT Bell & Gossett, Armstrong, Danfoss, Siemens, ABB, Panasonic
4.	Pressurized Expansion Tank and Air separator	ITT Bell & Gossett, Armstrong, Anergy
5.	Air Handling Unit	Blue Star, Carrier, Voltas, VTS, Caryaie, Edgetech, Zeco
6.	Fan Coil/Cassette Unit	Blue Star, Voltas, Caryaie, Mukund, Edgetech, Zeco, Midea
7.	Cooling Tower	Paharpur, Advance, Bell, Flow Tech, Mihir
8.	Centrifugal fans	Nikotra, Comfrei, Kruger
9.	Thermal Heat Recovery Wheel	ABB, Bry Air, Novelaire
10.	M.S. & GI Pipes.	Tata Steel, Jindal
11.	Balancing valves	TA Auto Flow, Advance, Navtech, Flowcon
12.	Ball valve (up to 30 mm)	Danfoss, RB, Sant, Rapid
13.	Butterfly valve	Intervolve, C&R, Audco, Advance, Econsto
14.	Check valve	Advance , Intervolve, Kirloskar, Econsto
15.	Pot / Y Strainer	Emerald , Rapidcool, Sant, Procedyne
16.	Pressure Gage	Fiebig, Wika, H Guru.
17.	Thermometer	Emerald, H Guru, Feibig

S.No	Details of Materials / Equipment	Manufacturer's Name
18.	Ball valves (Fan Coil Units)	Rapid Control, Emerald, Castel
19.	Auto Air Vent Valve	Rapid Control, RB, Anergy
20.	Grille/diffuser	Caryaire, Ravistar, Air Master, Dynacraft, Air Breeze / Ajanta
21.	Volume/Fire Damper	Caryaire, Ravistar, Air Master, Dynacraft Air Breeze / Ajanta
22.	Closed Cell Elastomeric Insulation along with adhesive	Armacell, Armaflex, Eurobatex, K Flex
23.	Fibreglass (Foil Faced)	UP Twiga, Owens Corning, Kimmco
24.	Expanded Polystyrene/ PUF (TF Quality)	Beardsell, Quality thermopack, Coolite
25.	Two way motorized valve for AHU & FCUs	Tour Andover , Johnson Control , Honeywell, Siemens
26.	Room Thermostat/Humidistat	Tour Andover , Johnson Control, Honeywell, Siemens
27.	Flow Switch	Honeywell, Siemens, Rapid Control
28.	Factory Fabricated Ducts/Flexible ducts	Zeco, Rolastar, Camduct, Western Air
29.	GI Sheets	Jindal, Tata
30.	Aluminium Sheet	Hindalco, Balco, Nalco
31.	Acoustic Insulation	UP Twiga, Owens Corning, Kimmco
32.	Exhaust Propeller Blower/Fans	Kruger, Caryaire, System air
33.	Hepa Filter	AAF, Aerofil, Pyramid

LIST OF BUREAU OF INDIAN STANDARDS CODES

IS : 277 - 1992	Galvanized steel sheet
IS : 655 - 1963 (Reaffirmed 1991)	Metal air ducts.
IS : 659 – 1964 (Reaffirmed 1991)	Air conditioning (Safety Code)
IS : 660 – 1963 (Reaffirmed 1991)	Mechanical Refrigeration (Safety Code)
IS : 780 - 1984	Sluice valves for water works purposes.
IS : 822-1970 (Reaffirmed 1991)	Code of procedure for inspection of welds.
IS : 1239 (Part - I) - 1990	Mild steel tube
IS : 1239 (Part - II) - 1992	Mild steel Tubulars and other wrought steel pipe fittings.
IS : 2379 - 1990	Colour code for the identification of pipelines.
IS : 3103 – 1975 (Reaffirmed 1999)	Code of practice for Industrial Ventilation.
IS : 4736 – 1986 (Reaffirmed 1998)	Hot-dip zinc coatings on steel tubes.
IS : 4894 - 1987	Centrifugal Fan.
IS : 5312 (Part-I) - 1984 (Reaffirmed 1990)	Swing - check type reflux Non return valves for water works
IS : 6392 - 1971(Reaffirmed 1988)	Steel pipe flanges.
ASHRAE Hand Books	The Latest versions and standards.

APPENDIX - III

INFORMATION REQUIRED WITH TENDER

CHILLING PACKAGE – SCREW TYPE

1. Make/Model
2. Refrigerant
3. Capacity (Kcals/hr.) at rated conditions
4. Input power at above capacity
5. Type of capacity control
6. Condenser surface area
Refrigerant side
- 7 Chiller surface area
Refrigerant side
Water side
8. Chilled water flow rate
9. Chilled water temp. drop
10. Chilled water pressure drop

CHILLED WATER PUMPS

1. Make / model
2. Type
3. Water flow rate/ Total head
4. Operating speed

AIR HANDLING UNITS

1. Make
2. Make of fan motor

APPENDIX - IV

TEST READINGS

S.NO	ITEM	TEST RESULTS
1.	Chiller (each circuit) a. Refrigerant gas suction pressure (ksc) b. Refrigerant discharge pressure (ksc) c. Input Kw at full load	
2.	Chilled water pumpsets Flow rate (LPS) Discharge Pressure (ksc) Suction Pressure (ksc)	
3.	Air-handling unit (for each AHU) a. Fresh air quantity (cfm) b. Return air quantity (cfm) c. Total air quantity at inlet (cfm) d. Fresh air temp. (deg. F) dry/wet Bulb e. Entering air temp. (deg. F) " " f. Leaving air temp. " " " g. Static pressure at fan discharge (inch wg.) h. Current (amps)	