## THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

## TENDER DOCUMENTS FOR

FIRE FIGHTING AND FIRE DETECTION WORKS AT
THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI),
12, SUDDER STREET,
KOLKATA - 700 016

ARCHITECT:
PARTHA DAS & ASSOCIATES

AE - 377, SECTOR-I, SALT LAKE CITY, KOLKATA- 700 064

## SECTION – I GENERAL INSTRUCTIONS

# <u>AIR CONDITIONING WORK AT</u> AUDITORIUM IN THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI), 12, SUDDER STREET, KOLKATA – 700 016

#### **GENERAL INDEX**

Sl. No.	<u>Description</u>	No. of Pages
	Section-I, General Instructions	1
1.	General Index	2
2.	Tender Notice	3
3.	Instruction to Tenderers	4-5
4.	Form of Tender	6
5.	Draft Articles of Agreement	7-8
6.	Conditions of Contract	9-28
7.	Special Conditions of Contract	29-34
8.	Appendix	35
9.	Technical specifications for Fire fighting and fire detection work	1-29
10.	Priced Schedule of Quantities for Fire fighting and fire detection work	1-6
11.	General summary and price Bid	1
12.	Tender Drawings	

### THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI) 12, SUDDER STREET, KOLKATA – 700 016

#### **TENDER NOTICE**

Sealed tenders are invited of behalf of the Institute of Cost Accountants of India, 12, Sudder Street, Kolkata – 700 016 in the prescribed form from reputed, bonafide and resourceful contractors for Fire fighting and fire detection work at Institute of Cost Accountants of India, 12, Sudder Street, Kolkata – 700 016.

S1.	Tender No.	Name of Work	Estimated Cost	Completion	Earnest Money
No.			(Rs.)	time in months	(Rs.)
1.		Fire fighting and fire detection work at Institute of Cost Accountants of India, 12, Sudder Street, Kolkata – 700 016	53,60,920.00	3	1,07,220.00

Earnest Money will be accepted in the form of Bank Draft drawn in favour of Institute of Cost Accountants of India payable at Kolkata. No interest will be paid in this amount of earnest money deposited by the tenderer.

Tender papers and other details will be available from 11/04/2013 to 23/04/2013.

{Pre-bid discussion will be held at the office of the Architect, AE-377, Sector – 1, (Ground floor), Salt Lake City, Kolkata 700 064 at 11 a.m. – 3 p.m. on 17/04/2013 for clarification, if any, required for quoting the price by the tenderers.}

Tender will have to be submitted in two parts: Cover-I & Cover-II separately sealed and superscribed with the name of work in the Tender Box of the Institute at 12, Sudder Street, Kolkata – 700 016.

Cover-I shall contain Earnest Money, covering letter and conditions, if any, stipulated by the tenderer together with credentials to establish experience of similar works in the last 5 years.

Cover-II shall contain the complete tender document duly filled and signed with stamp in all pages in duplicate. No condition stipulated in Cover-II other than general rebates shall be accepted.

Tenders in Cover-I & Cover-II shall again be put in a separate sealed cover. This will be received upto 3 p.m. on 24/04/2013. Cover-I will be opened at 4.30 p.m in the office of the Institute of Cost Accountants of India , 12, Sudder Street, Kolkata  $-700\,016$  on the same date in presence of the contractors or their authorized representatives who may like to be present. Time and date of opening of Cover-II of tender will be intimated thereafter. The Institute of Cost Accountants of India reserves the right to reject any or all of the tenders received without assigning any reason thereof.

The Institute of Cost Accountants of India retains right to cancel any of the items at a later date after the contract is awarded.

#### INSTRUCTIONS TO TENDERER

- 1. Sealed Tenders are hereby invited of behalf of the Institute of Cost Accountants of India, 12, Sudder Street, Kolkata 700 016 for Fire fighting and fire detection work at Institute of Cost Accountants of India, 12, Sudder Street, Kolkata 700 016. Estimated cost of work is Rs. 53,60,920.00 (Rupees fifty three lakh sixty thousand nine hundred twenty only)
- 2. Contract documents consisting of the plans, complete specifications, the schedule of quantities of the various classes of works to be done, and the set of conditions of contract may be downloaded from the
- 3. The site for the work is available to the Contractor in its present conditions. No space other than the above site can be made available to the contractor for site office, labour camps, storage etc.
- 4. Tender to be submitted on the printed form issued by the authority of the Institute of Cost Accountants of India, 12, Sudder Street, Kolkata 700 016
- 5. Sealed tenders on the prescribed form are to be addressed to the Institute of Cost Accountants of India, 12, Sudder Street, Kolkata 700 016 in two separate sealed covers containing the documents as under:

Cover – I : Earnest money, valid Income Tax and Sales Tax

Clearance Certificates and other stipulation, if any together with credentials to establish

experience of similar works in the last 5 years.

Cover – II : The priced tender papers along with Conditions of Contract, Technical Specifications

(in duplicate). Any condition stipulated in Cover-II (Priced tender paper) will not be

accepted.

The Cover I will be opened at about 4.30 P.M. on 24/04/2013 in presence of tenderers. The tenderers shall depute their authorised representative/s to be present at the time of opening. Tender without earnest money in proper form will be rejected.

The Cover II: Time and date of opening of Cover-II of tender will be intimated after opening Cover I.

- 6. The time allowed for the commencement of the work will be within fourteen days after date of written orders.
- 7. The contractors should quote in figures as well as in words the rate, and amount tendered by them. The amount for each item should be worked out and the total amount for sub section shall be given.
- 8. All corrections shall be attested by the initials of the tenderers with the seal of the firm. In case any discrepancy/difference is found on checking between rates quoted by the contractor in words and figures or in the amount worked out by him, the following procedure shall be followed:
  - a) The rates quoted in words is final and the corresponding amount will be considered for evaluation.
  - b) The decision of the Institute of Cost Accountants of India in resolving any ambiguity regarding the rates quoted will be final.
  - c) Amendments as mentioned above shall be based on the tender marked "original" only.
- 9. All writing should be in English and legible.
- 10. Earnest money, amounting to Rs. 1,07,220.00 in the form of Bank Draft drawn in favour of Institute of Cost Accountants of India payable at Kolkata. No interest will be paid in this amount of earnest money deposited by the tenderer.
- 11. The acceptance of a tender will rest with the competent authority of Institute of Cost Accountants of India who does not bind themselves to accept the lowest tender, and reserves to themselves the authority to reject any or all

of the tenders received without the assignment of a reason. All tenders in which any of the prescribed conditions are not fulfilled or are incomplete in any respect are liable to be rejected.

The Owner reserves the right to accept the tender in full or in part and the tenderer shall have no claim for revision of rates or other conditions if his tender is accepted in parts.

12. Canvassing in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

#### 13. **Deleted**

- 14. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Owner/Consultant shall be communicated to the Employer.
- 15. Special care should be taken to write the rates in figures as well as in words and the amounts in figures only. The total amount should be written both in figures and in words. In case of figures, the words 'Rs.' should be written before the figure of rupees and words 'P' after the decimal figures.
- 16. The owner does not bind itself to accept the lowest or any tender and reserves to itself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.
- 17. Sales tax or any other tax on material or on finished works like work's contract tax, Turnover Tax, etc. in respect of this contract shall be payable by the contractor and the owner will not entertain any claim whatsoever in this respect. All taxes, duties, cess etc. should be included in their rates. Any tax, cess etc. levied during the pendency of the contract, the same shall be borne by the contractor and no claim whatsoever in this regard will be entertained. Service tax shall be paid separately by the Owner as per prevailing norms during the payment.

#### 18. **Deleted**

- 19. The tender for works shall remain open for acceptance for a period of 90 days from the date of opening of tenders. If any tenderer withdraws his tender before the said period, then the owner shall be at liberty to forfeit Earnest Money paid along with the tender.
- 20. It will be obligatory on the part of the tenderer to tender and sign the tender documents in totality and the successful tenderer will have to enter into an agreement for the tendered work with the competent authority.
- 21. The appointed contractor must co-operate with other agencies appointed by the owner who will be working at the same site for different work for timely completion of the work.
- 22. The notification of award of contract will be made in writing to the successful tenderer by the owner.

Convener, Purchase Committee

For Institute of Cost Accountants of India

#### FORM OF TENDER (To be filled up by the Tenderer)

<u>FURM</u>	OF TENDER (10 be filled up by	the Tenderer)		
12, Sud	titute of Cost Accountants of India, der Street, – 700 016			
Dear Si	r,			
Re.:	Fire fighting and fire detection wor 12, Sudder Street, Kolkata – 700 0	k at Institute of Cost Accountants of India, 16		
1. 2,	I/We do hereby offer to perform, drawings, conditions of contract, s	ed by the Institute of Cost Accountants of India in connection with the above.  provide, execute, complete and maintain the works in conformity with the specifications, bill of quantities for the sum of Rs at the		
3.	conditions, subject to above, I/We a  Abide by and fulfil all the	es as to the site conditions, examined the drawings and all aspects of the tender do hereby agree & quote accordingly. terms and provisions of the said conditions annexed hereto;		
4.	b) Complete the works within the stipulated time as per the tender provision in two or three shifts is considered necessary by the Employer/Consultant at no extra cost to the Employer.			
i) 5. 6.	or iii) If the work is not commen	uted within 15 days from the date of receipt of the letter of acceptance.  aced within 14 days after issue of work order.  bund to accept the lowest or any tender you receive.		
		Yours faithfully		
		Signature		
the firm or Name power of the cont copy of	f Partner/Director of a authorised to sign e of person having of attorney to sign cract, (Certified true the power of attorney be attached)	Designation		
Signatu witness	re and address of :			
Name Addre	ess			
b) Signa Name	ature			

#### **DRAFT ARTICLES OF AGREEMENT**

ARTICLES OF AGREEMENT made the day of Two Thousand and be	tween the institute of Cost
Accountants of Indi , having its Office at Institute of Cost Accountants of India , 12, Sudder	Street, Kolkata - 700 016
(hereinafter called "the Owner") of the one part and	_ (hereinafter called "the
Contractor") of the other part.	
WHEREAS the Owner is desirous of executing the Fire fighting and fire detection work at Instit India, 12, Sudder Street, Kolkata – 700 016 and has caused drawings and specifications deprepared by M/s. Partha Das & Associates, AE-377, Sector-I, Salt Lake City, Kolkata – 700 064.	escribing the works to be
AND WHEREAS the said DRAWINGS numberedthe Schedule of items and quantities have been signed by and on behalf of the parties hereto.	to the Specifications and

AND WHEREAS the contractor has agreed to execute upon and subject to the conditions set forth herein and Schedule of Items and quantities, General Conditions of Contract, specifications and all correspondences exchanged by or between the parties from the submission of tender till the award of work, both letters inclusive, (all of which are collectively hereinafter referred to as 'the said conditions) the works shown upon the said drawings and/or described in the said specification and included in the schedule of items and quantities at the respective rates therein set forth amounting to the sum as therein arrived at or such other sum as shall become payable thereunder (hereinafter referred to as ""he said contract amount").

#### NOW IT IS HEREBY AGREED AS FOLLOWS:

- 1. In consideration of the said contract amount to be paid at the times in the manner set forth in the said conditions, the contractor shall upon and subject to the said conditions execute and complete the work shown upon the said drawings and described in the said specifications and the schedule of items and quantities.
- 2. The Owner shall pay the contractor the said contract amount, or such other sum as shall become payable, at the times and in the manner specified in the said conditions.
- 3. The project Consultant in the said conditions shall mean the said M/s. Partha Das & Associates, AE-377, Sector-I, Salt Lake City, Kolkata 700 064 or, in the event of their ceasing to be the Consultant for the purpose of this contract for whatever reason, such other person or persons as shall be nominated for that purpose by the Owner, provided always that no person subsequently appointed to be Consultant under this contract shall be entitled to disregard or over rule any previous decision or approval or direction given or expressed in writing by the Consultant for any time being.
- 4. The said conditions and Appendices thereto shall be read and considered as forming part of this Agreement, and the parties hereto shall respectively abide by, submit themselves to the said conditions and perform the agreements on their part respectively in the said conditions contained.
- 5. The plans, agreements and documents mentioned herein shall form the basis of this contract.
- 6. This contract is neither a fixed Lump Sum contract nor a piece work contract but is a contract to carry out the work in respect of the Air Conditioning work at Institute of Cost Accountants of India, 12, Sudder Street, Kolkata 700 016 as per the scope described and to be paid for according to actual measured quantities at the rates contained in the Schedule of Rates and Probable quantities or as provided in the said conditions.
- 7. The Owner reserves to itself the right of altering the drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this contract.
- 8. Time shall be considered as the essence of this contract and the contractor hereby agrees to commence the work on the day on which he is instructed to take possession of the site or from fourteenth day after the date of issue of formal work order as provided for in the said conditions whichever is later and to complete the entire work within 3 months subject nevertheless to the provisions for extension of time.
- 9. All payments by the Owner under this contract will be made only at Kolkata.
- 10. Any dispute arising under this Agreement shall be referred to arbitration in accordance with the stipulation laid down in the general conditions of contract.
- 11. That the several parts of this contract have been read by the contractor and fully understood by the contractor.

IN WITNESS WHEREOF the Owner and the Contractor has set their respective hands to these presents and two duplicates hereof the day and year first herein above written.

IN WITNESS WHEREOF the Owner has set Its hands to these presents through its duly authorised official and the contractor has caused its common seal to be affixed hereunto and the said two duplicates/has caused these presents and the said two duplicate hereof to be executed on its behalf, the day and year first hereinabove written.

Signature clause:
SIGNED AND DELIVERED by the hand of Shri (Name and Designation) In the presence of
(1) Address
(2) Address
Witness
SIGNED AND DELIVERED BY
in the presence of
(1) Address
(2) Address
Witness
The COMMON SEAL OF Was hereinto affixed pursuant to the resolutions passed by Its Board of Directors at the meeting held on
(1)
(2)
Directors who have signed this presence in token thereof in the presence of
(1)
(2)

If the contractor is a Partnership or an Individual.

If the Contractor is a Company.

If the party is a partnership firm or an individual should be signed by all or on behalf of all the partners.

If the contractor signs under its common seal, the signature clause should tally with the sealings clause in the Articles of Association

If the contractor is signed by the hand of power of attorney whether a company or individual.

#### **CONDITIONS OF CONTRACT**

Except where provided for in the description of the individual items in the schedule of quantities and in the specifications and conditions laid down hereinafter and in the Drawings, the work shall be carried out as per standard specifications and under the direction of Owner/Consultant.

#### 1. INTERPRETATION

In construing these conditions, the specifications the schedule of quantities, tender and Agreement, the following words shall have the meaning herein assigned to them except where the subject context otherwise requires:

- i) <u>"Owner"/ "Employer" /</u>: Shall mean competent authority of Institute of Cost Accountants of India , 12, Sudder Street, Kolkata 700 016 and shall include their assignees and successors and administrators
- ii) <u>Architect / Consultant</u>: The terms Architect / Consultant shall mean M/s Partha Das & Associates, AE-377, Sector-I, Salt Lake City, Kolkata 700 064 or in the event of their ceasing to be the Consultant for the purpose of this contract such other person/s as the Owner shall nominate for the purpose.
- iii) "Contractor": Shall mean Messrs \_\_\_\_\_ and shall include their assignees and/or successors his/their heirs and administrators.
- iv) <u>Site</u>: The site shall mean the site where the works are to be executed as shown within boundary in border on the site plan including any building and erections thereon allotted by the Owner for the contractor's use.
- v) "The Contract": This Contract shall mean the Tender Notices, Instructions to tenders, Conditions of Contract, Special Conditions of Contract, Safety Code, Form of Tender, Technical Specifications, Schedule of Quantities to be supplied by the University, the specification, schedule of quantities and rates and the drawings attached hereto and signed.
- vi) "Notice in Writing": Or written notice shall mean a notices in written, typed or printed characters sent (unless delivered personally or otherwise proved to have been received) by registered post to the last known business address or registered office of the addressee and shall be deemed to have been received when in the ordinary course of post it would have been delivered.
- vii) "Act of Insolvency" shall mean any act as such as defined by the Presidency Towns Insolvency Act, 1909 or in Provincial Insolvency Act, 1920 or any amendments of the said Acts.
- viii) <u>Drawings</u>: The work is to be carried out in accordance with drawings, specifications, the schedule of quantities. A set of drawings is provided with the tender to give the general idea about the total construction.
  - All drawings relating work given to the contractor together with a copy of schedule of quantities are to be kept at site and the Owner/Consultant shall be given access to such drawings or schedule of quantities whenever necessary.
  - In case any detailed Drawings are necessary contractor shall prepare such detailed drawings and/or dimensional sketches there or and have it conformed by the Owner/Consultant prior to taking up such work.
- ix) <u>"The Schedule of Quantities"</u> shall mean the schedule of quantities as specified and forming part of this contract.
- x) "Priced Schedule of Quantities" shall means the schedule of quantities duly priced with the accepted quoted rates of the contractor.

#### 2. SCOPE

The scope of work included in the tender consists of supply, installation, testing, commissioning of FIRE FIGHTING & FIRE DETECTION work in all respect at ICAI as mentioned in specifications, and as specified in schedule of items etc and direction and instruction which may be issued by the Employer/Architects from time to time during the execution of work.

The work shall be executed strictly accordance with to the relevant and current Indian Standard Specification and recent code of practice, National Building Code of India, the practice of Indian Institute of Architect and/or instruction and direction given by the Architect/Engineer-in-Charge and comply to the relevant lift rules as applicable and amended upto date.

The contractor shall carry out and complete the said work in every respect in accordance with the contract and with the direction of and to the satisfaction of the Architects and the Employer. Architects may from time to time issue further drawings marked "Released for Construction" and or written instruction, details, direction to the contractor for construction of the said work.

The scope also includes, providing necessary power, fuel, supplies, labor, materials, scaffoldings, construction equipment, tools and plants, appliances, as well as preparing details construction drawings including and getting them approved by the Engineer, necessary supervision by competent supervisors, insurance and execution of all incidental items not specified or indicated out implied or required to complete the work under this scope of all respects and in strict accordance with the specifications, schedule of items and drawings including their revisions and amendments made from time to time.

The scope of work includes conducting all necessary tests for all materials, providing drawings/catalogues, sample etc of all bought out items to the consultant supervisors at site or the Architect/Engineer in design office as per instruction of the consultant, at no extra cost to the Employer.

#### i) DEFECTS LIABILITY PERIOD

#### **Performance Guarantee and Defect Liability**

The performance guarantee of all equipment and Defects Liability shall be as below

#### a) Performance Guarantee

All equipment and the entire installation shall be guaranteed to yield the specified ratings and design conditions plus / minus 3% tolerance. Any equipment found short of the specified ratings by more than the allowable tolerance as determined by the test readings shall be rejected and replacement shall be given within 5 working days of rejection.

#### b) Defects Liability

All equipment and the entire installation shall be guaranteed against defective materials and workmanship for a period of 12 months reckoned after the plant is commissioned and handed over to the clients along with the 4 sets of completion documents. In case the testing of the plant is delayed for any reason attributable to the clients, then the defects liability shall be extended for a minimum period of 6 months from the date the test readings are accepted.

During the defects liability period, the contractor shall rectify, repair or replace defective parts and components free of cost except in the cast of those, which are due to normal wear and tear.

#### c) REPAIRS / REPLACSMENT OF PARTS DURING GUARANTEE

Any defects or other faults which may appear within defect liability / guarantee period of twelve months from the date of handing over the plant in a satisfactory working conditions to the Client (except for normal wear and tear)

arising in the plant from material or workmanship not in accordance with the contract specification will be rectified by the contractors free of cost & nothing shall be paid extra on any account.

#### d)TESTING

All testing instruments, velocity meter, measuring steel tapes, tools, scaffolding and ladders etc. that may be required for taking measurements shall be arranged by the contractor at his own cost.

All types of routine and other tests shall be carried out at the works of the Contractor or the manufacturers of the components. The Client shall be free to witness any or all tests, if they so desired. The Contractor has to inform to the Client before dispatch of any material / equipment.

On the completion of the installation the Contractor shall arrange to carry out various initial tests as detailed below, in the presence of and to the complete satisfaction of the Consultants or his representative / Engineer-Incharge, any defect or short-coming found during the tests shall be speedily rectified or made good by the Contractor at his own expenses. The initial tests shall include, but, not be limited to the following:

- To operate and check proper functioning of all electrically operated components viz. Pump motor etc. as well as other electrical motors.
- b) To test and check the proper functioning of electrical gears, safety and other controls to ensure their proper functioning.
- c) Contractor shall have to submit the capacity test of all equipment at site.
- d) On the satisfactory completion of all 'Initial' tests the plant shall be considered 'virtually Complete' for the purpose of taking over by the Client.
- e) In addition to the 'Initial' test the Contractor shall also give the necessary operational test in presence of Consultant / client / fire authority. After Completion of the test, the Contractors shall arrange the necessary Fire NOC from the govt. authority at his cost.
- f) AMC: All Inclusive maintenance contract will start after completion of the one year's warrantee as per Contract. The Payment of AMC will be paid after completion of every AMC period as per rate as mentioned in tender BOQ. This rate should be firm for 5yrs period and no variation will be accepted.

#### Calibration of instruments and meters

Instruments required for testing shall be furnished by the contractor for testing with initial requirements of all consumables. All the instruments, meters etc to be used at site and on the system shall have a valid calibration certificate issued by the competent authority. The contractor shall maintain and make available all such calibration certificates.

#### Handing over requirements

The plant shall be handed over after satisfactory testing along with following documents.

- 1. Detailed equipment data in the approved perform.
- 2. Manufacture's maintenance and operating instructions
- 3. Set of as built drawings, layouts, piping, ducting, cable routing, cable schedules etc
- 4. Approved test readings of all equipment and installations
- 5. Inspection certificates

- 6. Certificates of approval from statutory or Local Authorities for the operation and maintenance of the installations, wherever such approval or certification is required. This shall include Application filed along with enclosures and receipts of fees paid and deposits made.
- 7. List of recommended spares
- 8. Certificate from the contractor that he has cleared the site of all debris and litter caused by him without violating the EHS norms during the construction. However, contractor has also to periodically clear the site from all the debris which is generated from his part of scope.
- 9. Undertaking that all the materials supplied by him at site are fully tax paid and shall produce all documentation for satisfaction of Owner / PROJECT MANAGERS or taxation authorities.

Submission of the above documentation shall form a precondition for final acceptance of the plant and installation and final payments.

It is clarified that guarantee period shall start after successful completion of the above work & after obtaining the NOC from the Govt. authority.

#### d) AS BUILT DRAWINGS

At the completion of work and before issuance of certificate of virtual completion the contractor shall submit four (04) sets to the Engineer-in-charge, layout drawing drawn at appropriate scale indicating the complete Fire Fighting & Fire Detection system "as installed".

#### e) INSTRUCTION / MAINTENANCE MANUAL

The Contractor shall prepare and produce instruction, operation and maintenance manuals in English for use, operation and the maintenance of the supplied equipment and installations, and submit to the Engineer-in-charge in (04) Four copies at the time of handing over. The manual shall generally consist of the following:

- a) Description of the Project.
- b) Operating instructions.
- c) Maintenance instructions including procedures for preventive maintenance.
- d) Manufacturers catalogues.
- e) Spare parts list.
- f) Trouble shooting charts.
- g) Drawings.
- h) Type and routine test certificates of major items.
  - i) One (1) set of reproducible 'as built' drawings.

#### 3. DETAILED DRAWINGS AND INSTRUCTIONS

The Owner through its Consultant shall furnish with reasonable promptness additional instructions by means of drawings or otherwise necessary for the proper execution of the work. All such drawings and instructions shall be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom.

The work shall be executed in conformity therewith and the contractor shall not work without proper drawings and instructions.

Immediately after receipt of the work order of the contract the contractor shall prepare a progress schedule and submit the same to the Owner through the Consultant for approval which shall indicate the dates for the starting and completion of the various stages of constructions.

#### 4. <u>COPIES FURNISHED</u>

The Contractor on the signing hereof shall be furnished by the Owner through its Consultant free of charge with a copy of the priced schedule of quantities/rates, two copies of each of the said drawings and one copy of

specifications and two copies of all further drawings issued during the progress of the work. Any further copies of such drawings required by the Contractor shall be supplied on payment of charges thereof by the Contractor.

#### 5. OWNERSHIP OF DRAWING

All drawings, specifications and copies thereof furnished by the Owner through its Consultant are the property of the Owner. They are not to be used on other work, and with the exception of signed contract set, are to be returned to the Owner on request at the completion of the work.

#### 6. ROYALTIES AND PATENTS

The contractor shall pay all royalties and licence fees. He shall defend all suits for claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.

#### 7. Deleted

#### 8. <u>SUPERINTENDENCE SUPERVISION</u>

The Contractor shall give all necessary personal Superintendence during the execution of the work and this obligation and liability will continue until expiration of the 'Maintenance Period' (Retention Period). The contractor shall also during the whole time of work when in progress employ a competent representative who shall be constantly in attention at the site while his men are at work. Any directions, explanations, instructions or notices given by the Owner or the Consultant to such representative shall be deemed to have been given and duly served on the contractor.

#### 9. FAILURE BY CONTRACTORS TO COMPLY WITH OWNER'S/CONSULTANT' INSTRUCTIONS

If the contractor after receipt of written notice from the Owner and/or the Consultant requiring compliance within ten days fails to comply with such further drawings and/or Owner's/Consultant's instructions, the Owner through the Consultant or other person, may employ other person to execute any such work whatsoever that may be necessary to given effect thereto and pay all cost incurred in connection therewith and same shall be recoverable from the contractor by the Owner on the certificate of the Consultant as a debt or shall have right to deduct same from any moneys due or to become due to the contractor.

#### 10. TENDERER SHALL VISIT THE SITE

Intending tenderer shall visit the site and make himself thoroughly acquainted with the local site condition, nature and requirements of the works, facilities of transport condition, effective labour and materials, access and storage for materials and removal of rubbish. The tenderer shall provide in their tender for cost of carriage, freight and other charges as also for any special difficulties and including police restriction for transport etc. for proper execution of work as indicated in the drawings. The successful tenderer will not be entitled to any claim of compensation for difficulties faced or losses incurred on account of any site condition which existed before the commencement of the work or which in the opinion of the Owner/Consultant might be deemed to have reasonably been inferred to be so existing before commencement of work.

#### 11. TENDERS

The entire set of tender paper issued to the tenderer should be submitted fully priced and also signed on the all pages. Initial/signature will indicate the acceptance of the tender papers by the tenderer.

The schedule of quantities shall be filled in as follows:

The tendered amount is to be quoted as percentage above or below the estimated amount

i) When there is difference between the rates in figures and in words, the rate quoted in words prevail.

No modifications, writings or corrections can be made in the tender papers by the tenderer, but may at his option offer his comments or modifications to be given in Cover-I.

The Owner reserves the right to reject the lowest or any tender and also to discharge any or all the tenders for each section or to split up and distribute any item of work to any specialist firm or firms, without assigning any reason.

The works will be paid for as "measured work" on the basis of actual work done.

All items of work described in the schedule of quantities are to be deemed and paid as complete works in all respects and details including preparatory and finishing works involved, directly, related to and reasonably detectable from the drawings, specifications and schedule of quantities and no further extra charges will be allowed in this connection. In the case of lump sum charges in the tender in respect of any item of works, the payment of such items of work will be made for the actual work done on the basis of lump sum charges as will be assessed to be payable by the Owner/Consultant.

The Owner has power to add to omit from any work as shown in drawings or described in specifications or included in schedule of quantities and intimate the same in writing but no addition, omission or variation shall be made by the contractor without authorisation from the Owner. No variation shall vitiate the contract. The quantity of any item may vary to any extent based on the actual design & site condition. In such cases the rate for the respective items shall remain valid and the contractor has to execute as per instruction.

The tenderer shall note that his tender shall remain open for consideration for a period of \_\_\_\_days from the date of opening of the tender.

#### 12. TIME AND PROGRESS CHART

The contractor shall within 15 (fifteen) days of receipt of intimation that his tender has been accepted, submit to the Consultant/Owner a detailed programme of work so drawn as would enable him to complete the work within the time contemplated. The detailed work programme must indicate dates of starting and completion of respective parts or sections of the work. The detailed work programme would be subjected to the approval of the Owner/Consultant who will have the power of making such modification thereon as found necessary. The actual progress as compared with this chart will be reviewed periodically.

The contractors shall have to prepare their own material in flow according to the final Programme as accepted by Owner. The programme shall have to be updated at regular intervals and modified programme shall be submitted to the Consultant/Owner for approval. In no case the overall date for the completion of important items as indicated in the programme should be changed without prior consent of Consultant/Owner.

#### 13. CO-OPERATION

The contractor will be required to consult and co-operate with other contractors whose work may be affected by the work under this contract.

#### 14. Deleted

#### 15. PERMITS AND LICENCES

Permits and licences for release of materials which are under Government control will be arranged by the contractor. The Owner will render necessary assistance, sign any forms or applications that may be necessary.

#### 16. GOVERNMENT AND LOCAL RULES

The contractor shall conform to the provisions of all local Bye-laws and Acts relating to the work and to the Regulations etc. of the Government and Local Authorities and of any company with whose system the structure is proposed to be connected. The contractor shall give all notices required by said Act, Rules, Regulations and Bye-Laws etc. and pay all fees payable to such authority/authorities for execution of the work involved. The cost, if any, shall be deemed to have been included in his quoted rates, taking into account all liabilities for licences, fees for footpath encroachment and restoration etc. and shall indemnify the Owner against such liabilities and shall defend all actions arising from such claims or liabilities.

#### 17. TAXES AND DUTIES

The tenderers must include in their tender prices quoted for all duties, royalties, cess and sales tax or any other taxes or local charges if applicable. The rates shall also include prevailing sales tax on works contract as per State Government norms. All taxes, duties, cess etc. should be included in their rates. Any tax, cess etc. levied during the pendency of the contract, the same shall be borne by the contractor and no claim whatsoever in this regard will be entertained. Service tax shall be paid by the Owner as per prevailing norms during payment of their bills.

No extra claim on this account will in any case be entertained.

#### 18. POSSSESSION PRIOR TO COMPLETION

The Owner shall have the right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be an acceptance of any work not completed in accordance with the contract Agreement.

#### 19. PROVISIONAL SUMS (P S)

All provisional sums described in the schedule of quantities as P S shall be exclusively allotted to the purchase of materials and not for any handling and fixing to be done by the contractor. Such costs of handling and fixing with profit (including transport charges if required) shall be separately included in the contract price as described in the schedule of quantities. The disposal of the amounts covered under this head will be absolutely at the discretion of the Owner. Contractor is to make payments for these materials to the suppliers on certificate or order issued by the Owner/Consultant and realise them through his bills from the Owner.

#### **20 QUANTITY OF WORK TO BE EXECUTED**

The quantities shown in the schedule of quantities are intended to cover the entire new structure indicated in the drawings but the Owner reserves the right to execute only a part or the whole or any excess thereof without assigning any reason therefor.

#### 21. OTHER PERSONS ENGAGED BY THE OWNER

The Owner reserves the right to execute any part of the work included in this contract or any work which is not included in the contract by other Agency or persons and contractor shall allow all reasonable facilities and use of his scaffolding for the execution of such work. The main contractor shall extend all cooperation in this regard.

#### 22. RETENTION MONEY AND SECURITY DEPOSIT

An amount of 10% (including Earnest Money Deposit) of the gross value of each R.A. Bill of the contractor will be deducted as Retention Money. 50% of the Retention Money so deducted will be refunded after virtual completion of work, along with a certification of the Consultant and rest 50% will be refunded after expiry of Defect Liability Period provided that the contractor has satisfactorily carried out all the works, submitted all documents contractually called for and attended to all defects in accordance with the Conditions of Contract and also along with a certification of the Consultant. No interest is allowed on Retention Money.

#### 23. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY

The contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, schedule of quantities and specifications taken together whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred therefrom and if the contractor finds any discrepancies therein he shall immediately and in writing, refer the same to the Owner/Consultant whose decision shall be final and binding. The contractor shall provide himself for ground and fresh water for carrying out of the works at his own cost. The Owner shall on no account be responsible for the expenses incurred by the contractor for hired ground or fresh water obtained from elsewhere.

The rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplation of the contract, and beyond the unit price no extra payment will be allowed for incidental or contingent work, labour and/or materials inclusive of all taxes and duties whatsoever except for specific items, if any, stipulated in the tender documents.

The contractor shall supply, fix and maintain at his own cost, for the execution of any work, all tools, tackles, machineries and equipments and all the necessary centering, scaffolding, staging, planking, timbering, strutting, shoring, pumping, fencing, boarding, watching and lighting by night as well as by day required not only for the proper execution and protection of the said work but also for the protection of the public and safety of any adjacent roads, streets, walls, houses, buildings, all other erections, matters and things and the contractor shall take down and remove any or all such centering, scaffolding, planking, timbering, strutting, shoring etc. as occasion shall be required or when ordered so to do and shall fully reinstate and make good all matters and things disturbed during the execution of works to the satisfaction of the Owner/Consultant.

The contractor shall also provide such temporary road on the site as may be necessary for the proper performance of the contract, and for his own convenience but not otherwise. Upon completion, such roads shall be broken up and levelled where so required by the drawings unless the Owner shall otherwise direct.

The contractor shall at all times give access to workers employed by the Owner or any men employed on the buildings and to provide such parties with proper sufficient and if required, special scaffolding, hoists and ladders and provide them with water and lighting and leave or make any holes, grooves etc. in any work, where directed by the Owner as may be required to enable such workmen to lay or fix pipes, electrical wiring, special fittings etc. The quoted rates of the tenderers shall accordingly include all these above mentioned contingent works.

#### 24. TIME OF COMPLETION EXTENSION OF TIME AND PROGRESS CHART

24.1 <u>Time of Completion</u>: The entire work is to be completed in all respects within the stipulated period. The work shall deemed to be commenced within 3 months from the date of acceptance letter or date of handing over of site, whichever is earlier. Time is the essence of the contract and shall be strictly observed by the contractor.

The work shall not be considered as complete until the Owner/Consultant have certified in writing that this has been completed and the Defects Liability Period shall commence from the date of such certificate.

24.2 Extension of Time: If in the opinion of the Owner/Consultant the works be delayed (a) by reason of any exceptionally inclement weather, or (b) by reason of instructions from the Owner in consequence of proceedings taken or threatened by or disputes, with adjoining or neighbouring owners or (c) by the works, or delay of other contractors or tradesmen engaged or nominated by the Owner and not referred to in the specification or (d) by reason of authorised extra and additions or (e) by reason of any combination of workmen or strikes or lockout affecting any of the building or trades or (f) from other causes which the Owner may consider are beyond the control of the contractor, the Owner at the completion of the time allowed for the contract shall make fair and reasonable extension of time for completion in respect therefor. In the event of the Owner failing to give possession of the site upon the day specified above the time of completion shall be extended suitably.

In case of such strikes or lockouts, as are referred to above, the contractor shall, immediately give the Owner, written notice thereof. Nevertheless, the contractor shall use his best endeavours to prevent delay and shall do all that may be reasonably required, to the satisfaction of the Owner to proceed with the works and on his doing so that it will be ground of consideration by the Owner for an extension of time as above provided. The decision of the Owner as to the period to be allowed for an extension of time for completion hereunder (which decision shall be final and binding on the contractor) shall be promulgated at the conclusion of such strike or lockout and the Owner shall then, in the event of an extension being granted, determine and declare the final completion date. The provision in clause 62 with respect to payment of liquidated damages shall, in such case, be read and construed as if the extended date fixed by the Owner were substituted for and the damage shall be deducted accordingly. The proper evidences/supporting papers/written instruction for any such hindrances shall be maintained by the contractor with due information to the owner/consultant instantly.

24.3 <u>Progress of Work</u>: During the period of construction the contractor shall maintain proportionate progress on the basis of a Programme Chart submitted by the contractor immediately before commencement of work and agreed to by the Owner/Consultant. Contractor should also include planning for procurement of scarce material well in advance and reflect the same in the Programme Chart so that there is no delay in completion of the project.

#### 25. TOOLS, STORAGE OF MATERIALS, PROTECTIVE WORKS AND SITE OFFICE REQUIREMENTS

The contractor shall provide, fix up and maintain in an approved position proper office accommodation for the contractor' representative and staff which offices shall be open at all reasonable hours to receive instruction notices or communications and clear away on completion of the works and make good all work disturbed.

All drawings maintained on the site are to be carefully mounted on boards of appropriate size and covered with a coat of approved varnish. They are to be protected from ravages of termites, ants, and other insects.

The contractor shall provide at his own cost all artificial light required for the work and to enable other contractors and sub-contractors to complete the work within the specified time. The contractor shall provide a suitable temporary hut for the watchmen and clear away the same when no longer required and to provide all necessary attendance, lights etc. required.

The contractor shall arrange for temporary latrines for the use of workers and field staff and keep the same in a clean and sanitary condition to the satisfaction of the Public Health Authorities and shall cause such latrines and soil to be cleared away whenever necessary and shall make good all the works disturbed by these convenience.

Every precaution shall be taken by the contractor to prevent the breeding of mosquitoes on the works during the construction, and all receptacles, cistern, water tanks etc. used for the storage of water must be suitably protected against breeding of mosquitoes. The contractor shall indemnify the Owner against any breach of rules in respect of anti-malarial measures

The contractor shall not fix or place any placards or advertisement of any description or permit the same to be fixed or placed or upon any boarding gantry, building structure other than those approved by the Owner.

<u>Protective Measures</u>: The contractor from time to time of being placed in possession of the site must make suitable arrangement for watching, lighting and protecting the work, the site and surrounding property by day, by night, on Sundays and other holidays.

Contractor shall indemnify the Owner against any possible damage to the building, roads, or members of the public in course of execution of the work.

The contractor shall provide necessary temporary enclosures, gates, entrances etc. for the protection of the work and material and for altering and adopting the same as may be required and removing on completion of the works and making good all works disturbed.

<u>Storage of Materials</u>: The contractor shall provide and maintain proper sheds for the proper storage and adequate protection of materials etc. and other work that may be executed on the site including the tools and materials of nominated sub-contractors and remove the same on completion.

Cement godown shall be constructed for storing about six weeks requirement of cement and stored as per norms with a stack of 10 bags each and 2 feet opening alround with 2 feet passage of each stack. Structure shall be waterproof from all the sides and top. Cement should be stored one feet above the ground level and have pucca raised floor.

So also reinforcement bars are to be stored above the ground level to prevent the same from getting rusted.

<u>Tools</u>: Theodolite, levels, prismatic compass, chain, steel and metallic tapes and all other surveying instruments found necessary on the works shall be provided by the contractor for the due performance of this contract as instructed by the Site Engineer.

All measuring tapes shall be of steel and suitable scaffolding and ladders that may be required for safely taking measurement and shall be supplied by the contractor.

The mistries and the supervisors on the works shall carry with them always a one metre or two metres steel tape, a measuring tape of 30 metres, a spirit level, a plumb bob and a square and shall check the work to see that the work is being done according to the drawing and specifications. The Site Engineer will use any or all measuring instruments, or tools belonging to the contractors as he chooses for checking the works executed or being executed on the contract.

The contractor should cover in his rates for making provisions for all reasonable facilities for the use of his scaffolding, tools and plant etc. by nominated sub-contractors for their work.

#### 26. NOTICE AND PATENTS OF APPROPRIATE AUTHORITY AND OWNER

The contractor shall conform to the provisions of any Acts of the Legislature relating to the work, and to the Regulations and Bye-laws of any authorities, and/or any water, lighting and other companies, and/or authorities with whose systems the structures were proposed to have connection and shall before making any variations from the drawings or specification that may be associated to so conform, give the Owner/Consultant written notices specifying the variation proposed to be made and the reasons for making them and apply for instruction thereon. The Owner/Consultant on receipt of such intimation shall give a decision within a reasonable time.

The contractor/s shall arrange to give all notices required for by the said Acts, Regulations or Bye-laws to be given to any authority and to pay to such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the Owner.

The contractor shall indemnify the Owner against all claims in respect of patent rights, royalties, damages to buildings, roads or members of public in course of execution of work and shall defend all actions arising from

such claims and shall keep the Owner saved harmless and indemnified in all respects from such actions, coasts and expenses.

#### 27. <u>CLEARING SITE AND SETTING OUT WORKS</u>

The site shown on the plan shall be cleared of all obstructions, loose stone, and materials rubbish of all kinds. All holes or hollows whether or originally existing or produced by removal or loose stone or materials shall be carefully filled up with earth well rammed and levelled off as directed at his own cost. The expenditure incurred for making the site ready for taking up the work has to be borne by the contractor.

The contractor shall set out the works and shall be responsible for the true and perfect setting out of the work and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time, any error shall appear during the progress of any part of the work irrespective of the fact that the layout had bee approved by the Owner/Consultant, the contractor shall at his own expenses rectify such error, if called upon to the satisfaction of the Owner. The contractor shall further set out the works to the alternative positions at the site until one is finally approved and the rates quoted in his tender should include for this and no extra on this account will be entertained.

#### 28. <u>DATUM</u>

The average ground level will be considered as the crown of the nearest road, which should taken as "Datum" which is however, subject to final confirmation by the Owner/Consultant. All levels shown in the drawings are to be strictly adhered to.

#### 29. Deleted

#### 30. CONTRACTOR IMMEDIATELY TO REMOVE ALL OFFENSIVE MATTERS

All soil, filth or other matters of any offensive nature taken out of any trench, sewer, drain, cesspool or other place shall not be deposited on the surface but shall be at once carted away by the contractor to place provided by him.

The contractor shall keep the foundations and works free from water and shall provide and maintain at his own expenses electrically or other power driven pumps and other plants to the satisfaction of the Owner for the purpose, until the building is handed over to the Owner. The contractor shall arrange for the disposal of the water so accumulated to the satisfaction of the Owner and local authority and no claims will be entertained afterwards if he does not include in his rates for the purpose.

#### 31. ACCESS

Any authorised representative of the Owner shall at all reasonable times have free access to the works and/or to the workshops, factories or other places where materials are being prepared or constructed for the work and also to any place where the materials are lying or from where they are being obtained, and the contractor shall give every facility to the Owner or their representatives necessary for inspection and examination and test of the materials and workmanship. Except the representatives of the Owner no person shall be allowed at any time without the written permission of the Owner.

#### 32. MATERIALS, WORKMANSHIP, SAMPLES, TESTING OF MATERIALS

All the works specified and provided for in the specifications or which may be required to be done in order to perform and complete any part thereof shall be executed in the best and most workmanlike manner with materials of the best and approved quality of the respective kinds in accordance with the particulars contained in an implied by the specifications and as represented by the drawings or according to such other additional particulars, and instructions as may from time to time be given by the Owner/Consultant during the execution of the work, and to his entire satisfaction.

If required by the Owner/Consultant the contractor shall have to carry out tests on materials and workmanship in approved materials testing laboratories or as prescribed by the Owner/Consultant at his own cost to prove that the materials etc. under test conform to the relevant I.S. Standards or as specified in the specifications. The necessary charges for preparation of mould (in case of concrete cube) transporting, testing etc. shall have to be borne by the contractor. No extra payment on this account should in any case be entertained.

All the materials (except where otherwise described) stores and equipment required for the full performance of the work under the contract must be provided through normal channels and must include charge for import duties, sales tax, octroi and other charges and must be the best of their kind available and the contractor/s must be entirely responsible for the proper and efficient carrying out of the work. The work must done in the best workmanlike manner. Samples of all materials to be used must be submitted to the Owner/Consultant when so directed by the Owner/Consultant and written approval from Owner/Consultant must be obtained prior to placement of order.

During the inclement weather the contractor shall suspend concreting and plastering for such time as the Owner/Consultant may direct and shall protect from injury all work when in course of execution. Any damage (during constructions) to any part of the work for any reasons due to rain, storm, or neglect of contractor shall be rectified by the contractor in an approved manner at no extra cost.

Should the work be suspended by reason of rain, strike, lockouts or any other cause, the contractor shall take all precautions necessary for the protection of work and at his own expenses shall make good any damage arising from any of these causes.

The contractor shall cover up and protect from damage, from any cause, all new work and supply all temporary/doors, protection to windows, and any other requisite protection for the execution of the work whether by himself or special tradesmen or nominated sub-contractor and any damage caused must be made good by the contractor at his own expenses.

#### 33. REMOVAL OF IMPROPER WORK

The Owner shall during the progress of the work have power to order in writing from time to time the removal from the work within such reasonable time or times as may be specified in the order of any materials which in the opinion of the Owner/Consultant are not in accordance with specification or instructions, the substitution or proper re-execution of any work executed with materials or workmanship not in accordance with the drawings and specifications or instruction. In case the contractor refuses to comply with the order, the Owner shall have the power to employ and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereto as certified by the Owner/Consultant shall be borne by the contractor or may be deducted from any money due to or that may become due to the contractor. No certificate which may be given by the Consultant shall relieve the contractor from his liability in respect of unsound work or bad materials.

#### 34. SITE ENGINEER

The term "Site Engineer" shall mean the representative of the consultant who shall remain present at site during the progress of work in order to advise the contractor in all technical matters & issue written instructions with information to the owner. The contractor shall provide the Site Engineer every facility and assistance for examining the works and materials and for checking and measuring work and materials.

The Site Engineer shall have power to give notice to the contractor or his foreman, of non-approval of any work or materials and such work shall be suspended or the use of such materials shall be discontinued until the decision of the Owner is obtained. The work will from time to time be examined by the Consultant, Engineer of the Owner and the Site Engineer. But such examination shall not in any way exonerate the contractor from the obligation to remedy any defects which may be found to exist at any stage of the work or after the same is complete. Subject to the limitations of this clause the contractor shall take instructions only from the Consultant/Owner.

#### 35. OFFICE ACCOMMODATION FOR THE SITE ENGINEER

The contractor shall provide, erect, and maintain at his cost a separate simple watertight office accommodation for the Site Engineer. This accommodation shall be well lighted and ventilated and provided with windows, door with a lock. The Site Engineer's office shall be a minimum of 150 sq.ft. and the contractor shall provide a desk, chairs, drawers for keeping drawings, a cupboard having proper lock and a tackboard for displaying drawings. The accommodation shall be demolished when directed.

#### 36. CONTRACTOR'S EMPLOYEES

The contractor shall employ technically qualified and competent supervisors for the work who shall be available (by turn) throughout the working hours to receive and comply with instructions of the Owner/Consultant. The contractor shall engage at least one experienced Engineer as Site Engineer for execution of the work. The

contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job efficiently.

The contractor shall employ local labourers on the work as far as possible.

The employment of labour by the contractor shall be as per the prevailing labour laws.

Any labourer supplied by the contractor to be engaged on the work on day work basis either wholly or partly under the direct order or control of the Owner or his representative shall be deemed to be a person employed by the contractor.

The contractor shall comply with the provisions of all labour legislation including the requirements of:

- a) The Payment of Wages Act.
- b) Owner's Liability Act.
- c) Workmen's Compensation Act.
- d) Contract Labour (Regulation & Abolition) Act, 1970 and Central Rules 1971.
- e) Apprentices Act 1961.
- f) Any other Act or enactment relating thereto and rules framed thereunder from time to time.

The contractor shall keep the Owner saved harmless and indemnified against claims if any of the workmen and all costs and expenses as may be incurred by the Owner in connection with any claim that may be made by any workmen.

The contractor shall comply at his own cost with the order of requirement of any Health Officer of the State or any local authority or of the Owner regarding the maintenance of proper environmental sanitation of the area where the contractor's labourers are housed or accommodated, for the prevention of small pox, cholera, plague, typhoid, malaria and other contagious diseases. The contractor shall provide, maintain and keep in good sanitary condition adequate sanitary accommodation and provide facilities for pure drinking water at all times for the use of men engaged on the works and shall remove and clear away the same on completion of the works. Adequate precautions shall be taken by the contractor, to prevent nuisance of any kind on the works or the lands adjoining the same.

The contractor shall arrange to provide first-aid treatment to the labourers engaged on the works. He shall within 24 hours of the occurrence of any accident at or about the site or in connection with execution of the works, report such accident to the Owner and also to the competent authority where such report is required by law.

#### 37. <u>DISMISSAL OF WORKMEN</u>

The contractor shall on the request of the Owner immediately dismiss from works any person employed thereon by him, who may in the opinion of the Owner be unsuitable or incompetent or who may misconduct himself. Such discharges shall not be the basis of any claim for compensation or damages against the Owner or any of their officer or employees.

#### 38. ASSIGNMENT

The whole of the works included in the contract shall be executed by the contractor and the contractor shall not directly or indirectly transfer, assign or underlet the contract or any part, share or interest therein nor, shall take a new partner, without written consent of the Owner and no subletting shall relieve the contractor from the full and entire responsibility of the contract or from active superintendence of the work during their progress.

#### 39. NOMINATED SUB-CONTRACTOR

All specialists, Merchants, Tradesmen and others executing any work or supply and fixing any goods for which prime cost prices or provisional sums are included in the Schedule of Quantities/Rates and/or specifications who may be nominated or selected by the Owner are hereby declared to be sub-contractors employed by the contractor and are herein referred to as nominated sub-contractors.

No nominated sub-contractor shall be employed on or in connection with the works against whom the contractor shall make reasonable objection or have where the Owner and contractor shall otherwise agree who will not enter into a contract provided:

a) That the nominated sub-contractor shall indemnify the contractor against the same obligations in respect of the sub-contract as the Contractor is under in respect of this contract.

b) That the contractor shall indemnify the owner against claims in respect of any negligence by the subcontractor, his servants or agents or any misuse by him or them of any scaffolding or other plants the property of the contractor or under any workmen's compensation Act in force.

#### 40. DAMAGE TO PERSONS AND PROPERTY INSURANCE ETC.

The contractor shall be responsible for all injury to the work or workmen to persons, animals or things and for all damages to the structural and/or decorative part of property which may arise from the operations or neglect of himself of any sub-contractor or of any of his or a sub-contractor's employees, whether such injury or damage arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this contract. The clause shall be held to include inter-alia, any damage to buildings whether immediately adjacent or otherwise, and any damage to roads, streets, footpaths or ways as well as damages caused to the buildings and the works forming the subject of this contract by rain, wind or other inclemency of the weather. The contractor shall indemnify the Owner and hold harmless in respect of all and any expenses arising from any such injury or damages to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of compensation or damages consequent upon such claim.

The contractor shall reinstate all damage of every sort mentioned in this clause, so as to deliver the whole of the contract works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damages to the property or third parties.

The contractor shall effect the insurance necessary and indemnify the Owner entirely from all responsibility in this respect. The insurance must be placed with a company approved by the Owner and must be effected jointly in the name of the contractor and Owner the name of the latter being placed first in the policy i.e. Netaji Research Bureau. The scope of insurance is to include damage or loss to the contract itself till this is made over in a complete state. Insurance is compulsory and must be effected from the day of starting of the work. The contractor shall also be responsible for anything which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this contract i.e. the contractors. All Risk Insurance shall have extension for covering cross liability arising, if any, during execution of work relating to Air Conditioning, Electrification, Erection of Lift etc. The Owner shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or accruing from or in respect of any such claim or damages from any sums due or to become due to the contractor.

#### 41. INSURANCE

Unless otherwise instructed the contractor shall insure the works and keep them insured until the virtual completion of the contract against loss or damage by fire and/or earthquake, flood. The insurance must be placed with a company approved by the Owner, in the joint names of the Owner and the contractor for such amount and for any further sum if called to do so by the Owner, the premium of such further sum being allowed to the contractor as an authorised extra.

The contractor shall deposit the policy and receipt for premiums paid with the Owner within 21 (twenty one) days from the date of issue of work order unless otherwise instructed. In default of the contractor insuring as provided above, the Owner on his behalf may so insure and may deduct the premiums paid from any money due, or which may become due to the contractor. The contractor shall as soon as the claim under the policy is settled or the work reinstated by the Insurance Company should they elect to do so, proceed with due diligence with the completion of the works in the same manner as though the fire has not occurred and in all respects under the conditions of the contract. The contractor in case of rebuilding or reinstatement after fire shall be entitled to extension of time for completion as the Owner may deem fit.

#### 42. ACCOUNTS RECEIPTS AND VOUCHERS

The contractor shall, upon the request of the Owner furnish them with all the invoices, accounts, receipts and other vouchers that they may require in connection with the works under this contract. If the contractor shall use materials less than what he is required under the contract, the value of the difference in the quantity of the materials he was required to use and that he actually used shall be deducted from his dues. The decision of the Owner shall be final and binding on the contractor as to the amount of materials the contractor is required to use for any work under this contract.

#### 43. MEASUREMENT OF WORKS

The contractor will weekly record and submit measurements for verification and endorsement of Project Management Consultant/ representatives of Consultant and Owner. The Contractor should submit the bill with such endorsement. The joint measured so recorded will be made use for preparation of the bills by the contractor.

The Consultant shall from time to time intimate to the contractor that he requires the works to be measured, and the contractor shall forthwith attend or send a Qualified Agent to assist the Consultant or the Consultant's representative/Owner's representatives in taking such measurements and calculations and to furnish all particulars or to give all assistance required by either of them.

Should the contractor not attend or neglect or omit to send such Agent then the measurement taken by the Consultant or a representative approved by him shall be taken to be the correct measurement of the works, such measurement shall be net quantities for the work produced.

The contractor or his Agents may at the time of measurement take such notes and measurements as he may require. All authorised extra works, omissions and all variations made without the Consultant's knowledge, if subsequently sanctioned by him in writing, with the approval of the Owner shall be included in such measurements. The final measurement should be done within three months from the date of completion of work jointly by the Consultant and/or his representative. If the contractor fails to comply, the measurements taken by the Consultant will be final.

#### 44. PAYMENTS

All bills shall be prepared by the contractor in the form prescribed by the Owner/Consultant after the measurements are endorsed as mentioned in Clause No. 43 (Measurement of Works). The bills in proper forms must be duly accompanied by detailed measurements in support of the quantities of work done and must show deductions for all previous payments, retention money, etc. The bills prepared shall be submitted to the consultant with a copy to the owner. The bill should be complete in all respects with all necessary enclosures. Failure to provide the necessary documents/information with the bill will be treated as incomplete and non submission.

The Consultant shall issue a certificate after due scrutiny of the contractor's bill stating the amount due to the contractor from the Owner within 7 days of the submission. The Owner will have the discretion to amend the certificate of Consultant if considered necessary and the contractor shall be entitled to payment thereof, within the period of honoring certificates named in these documents. The owner will make all endeavour for making the payment in a reasonable time observing all the rules/practices of the University for making payment.

The Owner will deduct retention money as described in Clause 22 of these conditions. The refund of retention money will be made as specified in the said clause.

If the Owner has supplied any materials or goods to the contractor, the cost of any such materials or goods will be progressively deducted from the amount due to the contractor in accordance with the quantities consumed in the work.

#### **FINAL PAYMENT**

The final bill shall be accompanied by a certificate of completion from the Owner/Consultant. Payments of final bill shall be made after deduction of Retention Money, which sum shall be refunded after the completion of the Defects Liability Period after receiving the Owner's/Consultant's certificate that the contractor has rectified all defects to the satisfaction of the Owner/Consultant. The acceptance of payment of the final bill by the contractor would indicate that he will have no further claim in respect of the work executed.

#### 45. <u>VARIATION/DEVIATION</u>

The contractor may when authorised and shall, when directed in writing by the Owner/Consultant be bound under this contract to add and or omit, or vary the works shown in the drawings or described in the specifications or included in the priced schedule of quantities. The contractor on his own accord shall make no addition, omission or variation without such authorisation or direction. A verbal authorisation or direction by the Owner/Consultant shall when confirmed correctly by the contractor in writing within 7 days shall be deemed to have been given in writing.

The quantities of individual items may vary to any extent during execution of work which the tenderer has to keep in view while quoting the rates. Any extra claim in this regard will not be entertained.

The price of all such additional items/non-tendered items will be worked out on the basis of rates quoted for similar items in the contract wherever existing or on engineering rate analysis based on prevalent fair price of labour, material and other components as required as per the details hereinafter. The tender rates shall hold good for any increase or decrease in the tendered quantities to any extent.

No claim for an extra shall be allowed unless it shall have been executed by the authorisation of the Owner/Consultant as herein mentioned. Any such extra is herein referred to as an authorised extra. No variations, i.e. additions, omissions or substitutions shall vitiate the contract.

The rates of items not included in the Schedule of quantities shall be settled by the Consultant in accordance with the following rules:

- a) If the rates for the additional, altered or substituted works are specified in the contract for the work, the contractor is bound to carry out the additional, altered and substituted works at the same rates as are specified in the contract for the work.
- b) If the rates for the additional, altered or substituted works are not specifically provided in the contract for the work, the rates will be derived from the rates for a similar class of work as are specified in the contract for the work.
- c) If the rates for the additional, altered or substituted works can not be specified in the sub-clause (a) (b) above, the rates shall be derived on the basis of cost of materials and labour (rates for materials and labour will be as per the prevalent market rates for the same) plus 15% to cover overheads, supervision and profit etc. plus prevalent sales tax on works contract.

#### 46. <u>SUBSTITUTION</u>

Should the contractor desire to substitute any materials and workmanship, he/they must obtain the approval of the Owner/Consultant in writing for any such substitution well in advance. Materials designated in this specification indefinitely by such term as a "Equal" or "Other approved" etc. specific approval of the Owner/Consultant has been obtained in writing.

#### 47. PREPARATION OF BUILDING WORKS FOR OCCUPATION AND USE ON COMPLETION

The whole of the work will be thoroughly inspected by the contractor and deficiencies and defects put right. On completion of such inspection the contractor shall inform the Owner that he has completed the work and it is ready for inspection.

On completion the contractor shall clean all windows and doors including the cleaning and oiling if necessary, of all hardware, inside and outside, all floors staircases, and every part of the building. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the Owner.

#### 48. <u>CLEARING SITE ON COMPLETION</u>

On completion of the works the contractor shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a workmanlike condition to the satisfaction of the Owner/Consultant.

#### 49. DEFECTS AFTER COMPLETION

The contractor shall make good at his own cost and to the satisfaction of the Owner all defects, shrinkage, settlements or other faults which may appear within 12 months after completion of the work. In default the Owner may employ and pay other persons to amend and make good such damages, losses and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages, loss and expenses shall be recoverable from him by the Owner or may be deducted by the Owner, in lieu of such amending and making good by the contractor, deduct from any money due to the contractor a sum equivalent to the cost of amending such work and in the event of the amount retained being insufficient, recover that balance from the contractor from the amount retained together with any expenses the Owner may have incurred in connection therewith.

#### 50. <u>CONCEALED WORK</u>

The contractor shall give not less than 5 days notice to the Owner/Consultant whenever any work is to be buried in the earth, concrete or in the bodies of walls or otherwise becoming inaccessible later on, in order that the work

may be inspected and correct dimensions taken before such burial. In default thereof the same shall, at the opinion of the Owner/Consultant be either opened up for measurement at the contractor's expense or no payment may be made for such materials. Should any dispute for differences arise after the execution of any work as to measurements etc. or other matters which cannot be conveniently tested or checked, the notes of the Owner/Consultant shall be accepted as correct and binding on the contractor.

#### 51. <u>ESCALATION</u>

There will not be any provision for escalation for the rates quoted in the contract. The rate quoted shall be firm for the tenure of the contract (including extension of time, if any, granted) and will not be subject to any fluctuation due to increase in cost of materials, labour, taxes, octroi, etc..

#### 52. Deleted

#### 53. IDLE LABOUR

Whatever the reasons may be, no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entertained under any circumstances.

#### 54. SUSPENSION

If the contractor except on account of any legal restraint upon the Owner preventing the continuance of the work or in the opinion of the Owner shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default, the Owner shall have the power to give notice in writing to the contractor requiring the work be proceeded within a reasonable manner and with reasonable dispatch, such notice purport to be a notice under this clause.

After such notice shall have been given the contractor shall not be at liberty to remove from the site of the works or from any ground contiguous thereto any plant for materials to subsist from the date of such notice being given until the notice shall have been complied with. If the contractor fails even after 7 (seven) days of such notice to proceed with the works as therein prescribed, the Owner may proceed as provided in Clause 55 (Termination of Contract by Owner).

#### 55. TERMINATION OF CONTRACT BY OWNER

If the contractor being a company go into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjudicated insolvent or shall make an assignment or a composition for the benefit of the greater part, in number of amount of his creditors or shall enter into a Deed or arrangement with his creditors, or if the Official Assignee in insolvency, or the Receiver of the contractor in insolvency, shall repudiate the contract, or if a Receiver of the contractor's firm appointed by the court shall be unable within fourteen days after notice to him requiring him to do so, to show to the reasonable satisfaction of the Owner that he is able to carry out and fulfil the contract, and if so required by the Owner to give reasonable security therefor, or if the contractor shall suffer execution to be issued, or shall suffer any payment under this contract to be attached by or on behalf of and of the creditors of the contractor, or shall assign, charge of encumber this contract or any payments due or which may become due to the contractor, thereunder, or shall neglect or fail to observe and perform all or any of the acts matters of things by this contract, to be observed and performed by the contractor within three clear days after the notice shall have been given to the contractor in manner hereinafter mentioned requiring the contractor to observe or perform the same or shall use improper materials or workmanship in carrying on the works, or shall in the opinion of the Owner not exercise such diligence and make such due progress as would enable the work to be completed within due time agreed upon and shall fail to proceed to the satisfaction of the Owner after three clear days notice requiring the contractor so to do shall have been given to the contractor as hereinafter mentioned, or shall abandon the contract, then and in any of the said cases, the Owner may notwithstanding previous waiver determine the contract by a notice in writing to the effect as hereinafter mentioned, but without thereby affecting the powers of the Owner of the obligations and liabilities of the contractor the whole of which shall continue in force as fully as if the contract, had not been so determined and as if the works subsequently executed had been executed by or on behalf of the contractor (without thereby creating any trust in favour of the contractor) further the Owner or his agent, or servants, may enter upon and take possession of the work and all plants, tools, scaffoldings, sheds, machinery, steam and other power, utensils and materials lying upon premises or the adjoining lands or roads and sell the same as his own property or may employ the same by means of his own servants and workmen in carrying on the completing the works or by employing any other contractors or other persons or person to complete the works, and the contractor shall not in any way interrupt or do any act, matter or things to prevent or hinder such other contractors or other persons or person

employed from completing and finishing or using the materials and plants for the works when the works shall be completed, or as soon thereafter as conveniently may be, the Owner shall give notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within a period of 14 days after receipt by him the Owner may sell the same by Public Auction and shall give credit to the contractor for the amount so realised. Any expenses or losses incurred by the Owner in getting the works carried out by other contractors shall be adjusted against the amount payable to the contractor by way of selling his tools and plants or due on account of work carried out by the contractor prior to engaging other contractors.

#### 56. WATER SUPPLY

The rates quoted by the contractor shall include all expenditure for providing water for the full contract period required for the works, including that for the work people and all staff on the site. He shall make his own arrangement for the supply of good quality water suitable for use in the works and the work people. He shall obtain municipal connection and all charges for connection and consumption shall be borne by him. If municipal water is not available, or inadequate, he shall make other arrangements like sinking tubewells, or making borewells, or transport from outside by tanker, or any other suitable means entirely at his cost, and no separate payment for the same will be made. In any case, there should not be any deficiency of water for the work in view of quality.

#### 57. POWER

The contractor shall at his own cost arrange for necessary power for construction and lighting for the entire period of contract. If however, sparable power is available in the premises, the contractor shall make his own arrangement to obtain necessary connection, maintain an efficient service of electric lights and power and shall pay for all the requisite charges for the same as stipulated by the Institute of Cost Accountants of India.

The Owner, as well as the Consultant shall give all the recommendations necessary to obtain power and water connections from the concerned authorities, but the responsibility for obtaining the same shall rest with the contractor.

If any other contractor, appointed by the Owner, is required to use water and power, he shall be allowed to use the same and make temporary connections from the supply arranged by the main contractor at rates and terms that may be mutually agreed upon by both, failing which, at rates, terms and conditions that may be decided by the Consultant.

#### 58. <u>LAND FOR CONTRACTOR'S ESTABLISHMENT</u>

For the purpose of construction of contractor's storeyard, godowns, site office, etc., the contractor may utilize with the permission of the Consultant, portion of the land belonging to the Owner if available at such location as would not interfere with the execution of the works. The contractor shall for this purpose submit to the Consultant for his approval a plan or plans of the proposed layouts for the site facilities. The Consultant reserves the right to alter and modify the contractors' proposal as he may deem fit.

#### 59. <u>METHOD OF MEASUREMENT</u>

Unless otherwise mentioned elsewhere in the tender measurement will be on the net quantities of work produced in accordance with upto date rules laid down by the relevant IS specifications. In the event of any dispute with regard to the measurement of the work executed, the decision of the Consultant/Owner shall be final and binding on the contractor.

#### 60. <u>ACTION WHERE NO SPECIFICATION</u>

In the case of any class of work for which there is no such specification in Technical Specification, such work shall be carried out in accordance with the I.S. Specification and in the event of there being no I.S. specification, then in such case the work shall be carried out in all respect in accordance with the instructions and requirements of the Consultant/Owner.

### 61. <u>CONTRACTOR NOT TO DEPOSIT MATERIALS IN A MANNER THAT MAY INCONVENIENCE TO</u> THE PUBLIC

The contractor(s) shall not deposit materials on any site which will seriously inconvenience the public. The Consultant may require the contractor to remove any materials, which are considered by him to be a danger or inconvenience to the public or cause them to be removed at the contractor's cost.

#### 62. <u>LIQUIDATED DEMAGES</u>

The time allowed for carrying out the work as envisaged in the tender shall be strictly observed by the contractor and shall be reckoned from the 14<sup>th</sup> day from the date of issue of work order or the date on which possession of site is given to the contractor whichever is earlier. The work shall throughout the stipulated period of the contract be proceeded with, with all the due diligence (time being deemed to be of the essence of the contract, on the part of the contractor) and the contractor shall pay to the Owner, without prejudice to other right of the Owner as Liquidated Damages and not as penalty at 0.5% of the value of work for every week after the date stipulated "Time of Completion" or the extended date subject to a maximum of 5% of contract value. The Owner may deduct such sum from the contractor's security deposit and/or any sum payable to the contractor at that time or later. The 'Liquidated Damages' as stipulated shall be considered as a genuine pre-estimate of the loss/damage suffered by the Owner due to non-completion of the work in time. Decision of Owner in this respect shall be final and binding to the contractor.

#### 63. ACTION WHEN WHOLE OF SECURITY DEPOSIT IS FORFEITED

In any case in which under any clause or clauses of this contract, the contractor shall have rendered himself liable to pay liquidated damages amounting to the whole or his security deposit (whether paid in one sum or deducted by installments) the Owner/Consultant shall have power to adopt any of the following courses as they may deem best suited to the interest of the Owner:-

- a) To rescind the contract (of which rescission notice in writing to the contractor under hand of the Owner/Consultant shall be conclusive evidence), and in which case the security deposit of the contractor shall stand forfeited and be absolutely at the disposal of the Owner.
- b) To employ labour paid by the Owner and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and price of material (of the amount of which cost and price of a certificate of the Consultant/Owner shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract the certificate of Consultant/Owner as to the value of the work done, shall be final and conclusive against the contractor.
- c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess the certificates in writing of the Consultant/Owner shall be final and conclusive) shall be borne and paid by the original contractor and may be deducted from any money due to him by the Owner under the contract or otherwise, or from his security deposit or the proceeds of sale thereof, or a sufficient part thereof.

In the event of any of above courses being adopted by the Owner/Consultant the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements, or make any advances on account of, or with a view to the execution of the work or the performance of the contract. And in case the contractor shall be rescind under the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum or any work thereto for actually performed under this contract, unless, and until the Owner/Consultant will have 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.

#### 64. GUARANTEE FOR THE SPECIALISED WORKS

Wherever provision for submission of a guarantee has been advised the same shall be submitted from the specialised agency along with a counter guarantee by the main contractor engaged for the work. The guarantee shall be furnished on a non-judicial stamp paper of appropriate value. If the contractor is required to submit guarantee/guarantees for any item/items for a period of more than 12 moths, the guarantee/guarantees in case of those items shall remain valid even after expiry of the defect liability period of 6 months as stipulated in the contract.

#### 65. <u>TESTS/RESULTS/SITE REGISTERS ETC.</u>

The contractor will be required to maintain the following registers at site of work and should produce the same for inspection of the Owner/Consultant whenever desired by them.

Typical proforma are enclosed (Refer Table I to XIV)

i) Table - I Proforma of Hindrance to work.

ii) Table - II Proforma of Running Account Bill.

iii) Table - III Proforma of Memorandum for payment.

Contractor will have to submit their Running Account Bills in printed form shown in Table VI to VIII.

#### 66. INCOME TAX/SALES TAX ON WORKS CONTRACT

Statutory deduction of Income Tax/Sales Tax on works contract shall be made from all interim and final payments as per extend statute.

#### 67. <u>AGREEMENT</u>

The successful contractor will be required to enter into an agreement in accordance with the Draft Agreement form enclosed and the schedule of conditions within 15 days from the date of the contractor is advised by the Owner/Consultant that his tender has been accepted and he shall pay for all stamps and legal expenses incidental thereto. However, the written acceptance by the Owner of a tender will constitute a binding contract between the Owner and the person who so tendering whether such formal agreement is or is not subsequently executed.

#### 68. NO COMPENSATION FOR ALTERATION IN, OR RESTRICTION OF WORK TO BE CARRIED OUT

It at any time after the commencement of the work, the Owner/Consultant shall for any reason whatsoever not require the whole work thereof as specified in the tender to be carried out the Consultant/Owner shall give notice in writing of the fact to the contractor who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage with which he might have derived from the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been carried out; neither shall he has any claim for compensation by reason of any alterations having been made in the original specification, drawing, designs and instructions which shall involve any curtailment of the work as originally contemplated.

#### 69. ARBITRATION

All disputes or difference of any kind whatsoever which shall at any time arise between the parties hereto touching or concerning the works or the execution or maintenance thereof of this contract or the rights touching or concerning the works or the execution or maintenance thereof of this contract or the construction remaining in operation or effect thereof or to the rights or liabilities of the parties arising out of or in relation thereto whether during or after determination, foreclosure or breach of the contract (other than those in respect of which the decision of any person or persons is by the contract expressed to be final and binding) shall after written notice by either party to the contract to the other of them and to the Appointing Authority who shall be appointed for this purpose by the Owner be referred for adjudication to a sole Arbitrator to be appointed as hereinafter provided.

For the purpose of appointing the sole Arbitrator referred to above, the Appointing Authority will send within thirty days of receipt by him of the written notice aforesaid to the contractor a panel of three names of persons who shall be presently unconnected with the organisation for which the work is executed from the following categories of Arbitrators:

- 1. Retired High Court/Supreme Court Judges, who have experience in handling Arbitration cases.
- 2. Member of the Council of Arbitration.
- 3. Fellow of the Institution of Engineers (India)
- 4. Eminent Retired Chief Engineers from State/Central P.W.D./Public Sector Undertakings of good reputation and integrity.
- 5. Fellow of The Indian Institute of Architects.

The contractor shall on receipt by him of the names of aforesaid, select any one of the persons named to be appointed as a sole Arbitrator and communicate his name to the Appointing Authority within thirty days of receipt by him of the names. The Appointing Authority shall thereupon without any delay appoint the said person as the sole Arbitrator. If the contractor fails to communicate such selection as provided above within the period specified, the Appointing Authority shall make the selection and appoint the selected person as the Sole Arbitrator.

If the Appointing Authority fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the Appointing Authority a panel of three names of persons out of the above mentioned 5 categories of Arbitrators who shall be unconnected with either party. The appointing authority shall on receipt by him of the names of aforesaid select any one of the persons named and appoint him as the sole Arbitrator. If the appointing authority fails to select the person and appoint him as the Sole Arbitrator within 30 days of receipt by him of the panel and inform the contractor accordingly, the contractor shall be entitled to

appoint one of the persons from the panel as the Sole Arbitrator and communicate his name to the Appointing Authority.

If the Arbitrator so appointed is unable or unwilling to act or resigns from his appointment or vacates his office due to any reason whatsoever another sole Arbitrator shall be appointed as aforesaid.

The work under the contract shall, however, continue during the arbitration proceedings and no payment due or payable to the contractor shall be withheld on account of such proceedings.

The Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties fixing the date of the first hearing.

The Arbitrator may from time to time, with the consent of the parties, enlarge the time for making and publishing the award.

The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The Arbitrator shall decide each dispute in accordance with the terms of the contract. The venue of 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 who may direct to and by whom, and in what manner, such costs or any part thereof shall be paid and may fix or settle the amount of costs to be so paid.

The award of the Arbitrator shall be final and binding on both the parties.

In all cases where the amount of the claim is in dispute is Rs.75,000.00 (Rupees seventy five thousand only) and above, the Arbitrator shall give reasons for the award.

It is also a term of the contract that if contractor(s) do/does not make any demand for arbitration in respect of any claim(s) within 90 days of receiving intimation from Owner/Consultant that the bill after due verification is passed for payment of a lesser amount, or otherwise the contractor's right under this agreement to refer to arbitration shall be deemed to have been forfeited and Owner/Consultant shall be relieved and discharged of their liability under this agreement in respect of such claims(s). Further it is agreed that for the purpose of this clause, such notice is deemed to have been received by the contractor(s) within 2 days of posting of the letter by Owner/Consultant or when delivered by hand immediately after receipt thereof by the contractor(s), whichever is earlier. Further a letter signed by the officials of Owner/Consultant that the letter was so posted to the contractor(s) shall be conclusive.

Subject to aforesaid the provisions of the Arbitration Act 1940 or any statutory modification 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.

#### 70. <u>DECLARATION</u>

I/We have inspected the site of works and have made me/us fully acquainted with the local conditions in and around the sites of works. I/We hereby declare that I/We have gone through the conditions laid down in the Notice Inviting Tender, General Conditions of Contract, Technical Specifications and understood the same I/We quoted our rates in the schedule of quantities attached with the tender documents.

I/We shall also uniformly maintain such progress with the work, as may be directed by the Owner/Consultant to ensure completion of same within the target date as mentioned in the tender document.

Witness:	Signature of Tenderer
	Address

Date

#### SPECIAL CONDITIONS OF CONTRACT

#### 1.0 Errors, Omissions and Discrepancies

In case of errors, omissions and/or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc. the following order shall apply:

- i) Between scaled and written dimension (or description) on a drawing, the latter shall be adopted.
- ii) Between the written or shown description or dimensions in the drawings and the corresponding one in the specification the former shall be taken as correct.
- iii) Between written description of the item in the specifications and descriptions in bill of quantities of the same item, the latter shall be adopted.
- iv) In case of difference between rates written in figures and words, the rate in words shall prevail.
- v) Between the duplicate/subsequent copies of the tender shall be taken as correct.

#### 2.0 Ownership of drawings

All drawings, specifications and copies thereof furnished by the Institute of Cost Accountants of India, through its Consultant are the properties of the Institute of Cost Accountants of India. They are not to be used on other work.

#### 3.0 Remedy on Contractor's failure to insure

If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case Institute of Cost Accountants of India, may effect and keep in force any such insurance and any such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Institute of Cost Accountants of India, as aforesaid from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

Without prejudice to the other rights of the Institute of Cost Accountants of India, against contractors, in respect of such default, the employer shall be entitled to deduct from any sums payable to the contractor the amount of any damages, costs, charges, and other expenses paid by the Institute of Cost Accountants of India, and which are payable by the contractors under this clause. The contractor shall upon settlement by the insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with the diligence to rebuild or repair the works destroyed or damaged. In this event all the monies received from the insurer in respect of such damage shall be paid to the contractor and the contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged.

#### 4.0 Time for completion

Time is the essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period 3 months from the date of commencement. If required in the contract or as directed by the Consultant/ Owner, the contractor shall complete certain portions of work before completion of the entire work. However the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract. Contractor shall submit a detail bar chart of work programme keeping the stipulated time of completion of work as mentioned above for approval of Owner /Consultant showing the supply and installation of various activities of the work. The contractor shall proceed with work as per approved bar chart.

#### 5.0 Maintenance of Registers

The contractor shall maintain the following registers as per the enclosed proforma at site work and should produce the same for inspection of Owner /Consultant whenever desired by them. The contractor shall also maintain the records/registers as required by the local authorities/Govt. from time to time.

- i) Deleted
- ii) Deleted
- iii) Deleted
- iv) Deleted
- v) Register for Hindrance to Work
- vi) Register for Running Account Bill
- vii) Register for Memorandum of Payment
- viii) Deleted

#### 6.0 Accidents

The contractor shall immediately on occurrence of any accident at or about the site or in connection with the execution of the work report such accident to the Owner /Consultant. The contractor shall also report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

#### 7.0 Site Order Book

A site order book shall be maintained at site for the purpose of quick communication between the Owner /Consultant. Any communication relating to the works may be conveyed through records in the site order book and signed by the Owner /Consultant/Site Engineer. Such a communication from one party to the other shall be deemed to have been adequately served in terms of contract. Each site order book shall have machine numbered pages in triplicate and shall be carefully maintained and preserved by the contractor and shall be made available to the Owner /Consultant as and when demanded. Any instruction which the Owner /Consultant may like to issue to the contractor or the contractor may like to bring to the Owner /Consultants two copies of such instructions shall be taken from the site order book and one copy will be handed over to the party against proper acknowledgement and the second copy will be retained for their record.

#### 8.0 Site Meetings

Site meetings will be held to review the progress and quality evaluation. The contractor shall depute a senior representative along with the site representative and other staff of approved sub-contractors and suppliers as required to the site meetings and ensure all follow up actions. Any additional review meetings shall be held if required by the Consultant/ Owner

#### 9.0 Excise Duty, Taxes, Levies etc.

The contractor shall pay and be responsible for payment of all taxes, including VAT as applicable, duties, levies, royalties, fees, cess or charges in respect of the works including but not limited to sales tax, VAT, works contract tax, excise duty, and octroi, payable in respect of materials, equipment, plant and other things required for the contractor. All of the aforesaid taxes, duties, levies, fees and charges shall be to the contractor's account and the Institute of Cost Accountants of India shall not be required to pay any additional or extra amount on this account. Variation of taxes, duties, fees, levies etc. if any, till completion of work shall be deemed to be included in the quoted rates and no extra amount on this account will in any case be entertained. If a new tax or duty or levy or cess or royalty or octroi is imposed under as statue or law during the currency of contract the same shall be borne by the contractor.

#### 10.0 Idle Labour

Whatever the reasons may be, no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entertained under any circumstances.

Contractor or his authorized sub-contractors for electrical and sanitary & plumbing works should have valid license (if applicable) for carrying out such works from the concerned statutory/local bodies/authorities.

Witness:		Signature of Tenderer
Address	Address	
Date	Date	

#### PROFORMA FOR HINDRANCE TO WORK

Name w	ork	:		Date of S	Start of work:	:
Name of Contractor		:		Period of co	ompletion:	
Agreem	ent No.	:		Date of con	npletion of work	c
Sl. No.	Name of hindrance	Date of occurrence of hindrance	Date of on which hindrance was removed	Period for which hindrance existed	_	Signature of Owner's /Consultant's representative.

I.	Running	g A/c. Bi	<u>11</u>					
i) ii) iii) iv) v) vi) vii)	Name o Sl. No. o No. and Referen Date of	f work of this bil date of p ce to Ago written o	ctor/Agency  II  previous bill reement No. preder to common as per ag	mence :				
	Item Description	Unit	Rate (Rs.)	As per Tender Qty. Amount (Rs.)	Upto Previous R/A Bill Qty. Amount (Rs.)	Upto Date(Gross) Qty. Amount (Rs.)	Present Bill Qty. Amount (Rs.)	Remarks
1	2	3	4	5	6	7	8	9
	with re  2. If adho specific	asons for	allowing su	y item, it should b ich rate. should be mention		Net value sin	ce previous bill	
CEI	RTIFICATE							
	measuremen			hich the above en		ing Bill No re recorded at pages		
	e been taken			asurement book N				
Sign	nature and da	te of con	tractor	Signature a	and date of Consul tive (Seal)		nature and date of ineer.	Site
	work record ditions and sp			ationed measureme	ents has been done	e at the site satisfac	torily as per tend	er drawings
Con	sultant						Engineer/Owner'	's

(Rupee	s	) in words	
Net am	ount payable as per (E – F)		Rs(G)
Total d	eduction as per contract (E)	(-)	Rs(F
v)	Any other Departmental Service Charges to be recovered if any, As per contract (water, power Etc.) enclose statement	Rs	
iv)	Any other Departmental materials cost to be recovered as per contract if any	Rs	
b)	To be covered in this bill Rs	Rs	
a)	Outstanding amount (principal + interest) as on date Rs.		
iii)	Mobilisation Advance if any		
	Balance to be recovered	Rs	
	Less already recovered (-) Rs		
ii)	Retention money on value of works as per accepted tenders upto date amount Rs.		
i)	Secured advance pain in the previous R/A bill	Rs	
DEDU	CTIONS		
3.	Total amount due to the Contractor $(D + C)$		Rs(E)
2.	PVA on account of declaration in price of steel, cement and other materials and labour as detailed in separate statements enclosed.	(C) (+)	Rs
1.	Total amount due since previous Bill $(D) = (A + B)$		Rs
111.	MEMORANDUM FOR FATMENT		R/a Bill No
III.	MEMORANDUM FOR PAYMENT		

due test checking of the measurements of works a	(both figures and words) has been scrutinized by me after as required and is recommended for payment.
Dated signature of Owner's Engineer in charge of the Project.	Consultant's Signature
STATUTORY DEDUCTIONS:  1. Total amount due (E)	Rs
2. Less: I.T. Payable	Rs
Net Payable	Rs.
The figures given in the Memorandum for payabl (word	e has been verified and the bill passed for payment
Date	Signature of the Owner

#### **APPENDIX**

Name of Work : Fire fighting and fire detection works

Location : Institute of Cost Accountants of India,

12, Sudder Street, Kolkata - 700 016

Scope of work : As above and further detailed in the General Conditions of Contact.

Defect Liability Period : 12 months.

Date of Commencement : 14 days from the date of issue of work order or the date on which

the contractor is instructed to take possession of the site, which-

ever is earlier.

Date/time of completion : 3 months

Liquidated Damages : 0.5% of the accepted tender amount per week of delay subject to a

ceiling 5% of the accepted contracted sum.

Earnest Money Deposit (EMD) : Rs. 107220.00 in the form of Bank Draft drawn in favour of

Institute of Cost Accountants of India payable at Kolkata

Total Retention Money : Not to exceed 10% of the value of work (including EMD)

Release of Retention Money : 50% after virtual completion and balance 50%

after expiry of the defects liability period.

Period for honouring Certificates : 15 days for Interim Certificates and three weeks

for the final certificate from the date of certification.

Interest for delayed payment : Nil

TECHNICAL SPECIFICATIONS FOR DETECTION V	

Architect: PARTHA DAS & ASSOCIATES

1

### INTRODUCTION

### <u>The ensuing Technical Specification is for Fire Hydrant system for the Proposed</u> ICAI,PROJECT.

### Fire Hydrant System:

The Fire Hydrant System design features Wet riser for all floors complete with double headed landing Valves and hose reels at very floor level. The hose reels – accommodated in a glass – fronted boxes – are located in the lift Lobby at various floors, so as to have easy approachability. The system design has been carried out in accordance with relevant IS codes NBC regulations.

The ground floor area shall be provided with single headed landing Valve and hose reel assembly. The fire pumps shall be located in the pump room in basement floor/ below ground level. The firewater sump is located outside the building in the set back area. The levels of the tank and pump suction are such that positive suction is available for the pumps. Necessary puddle flanges are already being provided.

Yard hydrants placed at intervals as per specifications shall protect the external part of the building. The main piping for the hydrants shall be tapped – off from the discharge header of the fire pump sets and the same shall be run buried to some distance and suspended in the ceiling level with proper bracket support and also shall be laid exposed supported on the compound wall as shown in the layout drawings.

One sets of main fire pump and one no. Jockey pump are planned for. The main fire pump including jockey pump shall be of electrical motor driven pump. Also, one set of booster pump having a flow rate of **900 LPM** is provided at the terrace level.

### General:

Upon completion of installation the contractor shall test the system and hand over the same in operating condition to the owner or the agencies as assigned by the owner. Necessary operating and maintenance manuals together with as – built drawings. All in quadruplicate shall be submitted. The system shall be deemed to be taken over only upon submission of these documents and against the issuance of completion certificate from the Consultants.

### Approvals:

After completion of installation, necessary submission drawings shall be prepared by the contractor and submitted to the relevant authorities. The scope of this tender includes the responsibility of obtaining the approval for the installation from the fire department and other relevant departments and obtaining the required No Objection Certificate (NOC).

### TENDER DOCUMENT FOR FIRE HYDRANT AND SPRINKLER SYSTEM

### 1.0 GENERAL:

All materials shall be of the best-approved quality obtainable and unless otherwise specified they shall confirm to the respective Bureau of Indian Standard specifications.

Samples of all materials shall be got approved before placing order and the approved samples shall be deposited with the Employer.

In case of non – availability of materials in metric size, the nearest size in FPS units shall be provided with prior approval of the Employer / Consultants for which neither extra will be paid nor shall any rebate be recovered.

If directed / found necessary, materials shall be tested in any testing laboratory selected by the Employer and the Contractor shall produce the test results to the Consultant for his scrutiny and approval. The entire charges for original as well as repeated tests shall be borne by the Contractor. If required, the Contractor shall arrange to test portion of work at his own cost in order to prove the soundness of the same, to the Employer/Consultant or their representatives. The work or portion of work if found to be not satisfactory in the opinion of the Employer / Consultant or their representatives. Contractor shall pull down and re – do the same at his own cost. All defective materials shall be removed from the site immediately as ordered.

It shall be obligatory for the contractor to furnish certificates, if so demanded by the Employer / Consultant from manufacturer or the material supplier, that the work has been carried out by using their material and installed / fixed as per their recommendations.

### A.1.0 FIRE HYDRANT PIPES:

All fire hydrant pipes, sprinkler etc., shall be of MS pipe (`B' class).

**A.1.1 MS** Pipes shall be ERW pipes, socketed tubes confirming to the requirement of I.S 1239 – 1982 for medium grade. They shall be of the diameter (Nominal bore) as specified in the item specification / as directed by the Consultant nominal bores of the pipes for which they are intended. The MS pipes shall be of MAKE as per the list of approved makes only.

The pipes and sockets shall be clearly finished, and free from cracks, surface flaws, laminations and other defects. All screw threads shall be clean and well cut. The ends shall be cut clean and square with the axis of the tube.

Pipe 50mm dia and above shall have welded / flanged joints. All welding shall be done by qualified welder and shall shortly confirm to India standard code of procedure for manual metal are welding of mild steel.

The weights of MS pipes for various classes and diameters shall be as reproduced below:

Weights in kg per meter of common MS pipe of various diameters (plain ends)

Dia in mm	(Light) `A' Class	( Medium) `B' Class	( Heavy) ` C' Class
15	0.952	1.22	1.45
20	1.410	1.58	1.90
25	2.010	2.44	2.97
32	2.580	3.14	3.84
40	3.250	3.61	4.43
50	4.110	5.10	6.17
65	5.800	6.51	7.90

### **A.1.2** Pipe fittings:

The fittings shall be of malleable cast iron or galvanised mild steel tubes as called for complying with all the appropriate requirements given in para A.1.1 or as specified. The fitting shall be designated by the respective nominal bores of the pipes for which they are intended.

The fittings shall have screw threads at the ends and confirming to the requirement of IS-544 – 1955 (or revised). Female threads or fittings shall be parallel and male threads (except on running nipples and collars of unions) shall be tapered.

### A.1.3 Cutting, Laying and Jointing:

The pipes and fitting shall be inspected at site before use to ascertain that they confirm to the specifications given in para A.1.1 above. The defective pipes shall be rejected. Where the pipes have to be cut or rethread, the ends shall be carefully filed out so that no obstruction to born is offered. The ends of the pipes shall then be threaded confirming to the requirements of IS: 544 - 1955 with pipe dies and taps carefully in such a manner as will not result in slackness of joints when two pipes are screwed together. The taps and dies shall be used only for the straightening screw threads which have become bent or damaged and shall not be used for turning of the threads so as to make them slack, as the later procedure may not result in a water tight joint. The screw threads of pipes and fittings shall be protected from damage until they are fitted.

**A.1.4** The pipes shall be cleaned of all foreign matter before being laid. In jointing the pipes, the inside of the socket and the screwed end of the pipes shall be oiled and rubbed over with white lead and a few turns of cotton thread spun yarn wrapped round the screwed in the socket, tee etc., with the pipe wrench. Care should be taken that all pipes and fittings are properly jointed so as to take the joints completely watertight and pipes are kept at all time free from dust and dirt during the fixing, the joint shall be removed after screwing. After lying, the open ends of the pipes shall be temporally plugged to prevent access of water, soil or any other foreign mater.

Any threads exposed after jointing shall be painted or in the case of underground piping thickly coated with approved anticorrosive paint to prevent corrosion.

### A.1.5 External Works:

The galvanized iron mild steel pipes and fittings in external work for fire hydrant / yard hydrant piping shall be laid in neatly excavated trenches. The widths and depths of the trenches for different diameters of the pipes shall be as given in the table below, and shall be deep enough to have a clear cover of atleast 400mm above the top of pipes.

<u>Dia. Of pipe</u>	Width of trench	Depth of trench
80mm to 100mm	450cm	60cm
150mm to 100mm	600cm	75cm

At joints the trench, width shall be widened wherever it is necessary. The work of excavation and refilling shall be done true to line and gradient.

The pipes shall be painted with two coats of anticorrosive bitumastic paint of approved quality followed by wrapping with burlap or hessain based bitumen pipe kote of 4mm thickness with overlap of minimum 25mm. The pipes shall be laid on a layer of 7.5cm sand and filled with excavated earth. The supplies earth shall be disposed off as directed. The filling shall be done after testing & rectifying leakages and after final passing of work by the Consultant.

When the excavation is done in rock the bottom shall be cut deep enough to permit the pipes to be laid on a sand cushion of minimum 7.5cm. in case of bigger diameter pipes where the pressure is very high thrust blocks of cement concrete 1:2:4 (1 cement :2 coarse sand: 4graded stone aggregate of 20 nominal size) shall be constructed on all bends to transmit the hydraulic thrust without impairing the ground and spreading it over a sufficient area, as directed by the engineer – in – charge / Consultants.

### **A.1.6** Testing the joints:

After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost to Owner. The pipes and fittings after they are laid shall be tested to hydraulic pressure of 15kg/ sq.cm. (100 meter or double the designed working pressures whichever is more). The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw off takes and stop cooks shall be then closed and specified hydraulic pressure shall be applied gradually. Pressure gauge observations shall be made for atleast 2hrs. The pipes and fittings should be tested in section as the work of laying proceeds, keeping the joints exposed for inspection during the testing.

### **A.1.7** Measurements:

The lengths shall be measured in running mater correct to a cm for the finished work, which shall include MS pipes and sockets, MS fittings such as bends, tees, elbows, reducers, crosses, plugs, sockets, nipples and nuts, but exclude brass or gunmetal

taps (cocks), valves, lead connection pipes and shower rose. The length shall be taken along the central line of the pipefitting. All pipes and fittings shall be classified according to their diameter of the internal bore. The pipe shall be described as including all cuttings and wastage. In case of fittings of unequal bore, the largest bore shall be measured. Digging and refilling of trenches shall be measured separately or clubbed with main item as called for in the item specification/tender bill of quantities.

### **A.1.8** Internal work:

The rate of internal fire hydrant piping shall include the cost of labour and material involved in all the operations described above except in para A.1.7. The rate shall include the cost of cutting holes in walls and floors making good the same including clearing of the debris. Insulation of pipes for hot water supply will be paid separately as extra item.

### A.1.9 External work:

The rate of external fire hydrant work shall include the cost of labour and materials involved in all the operations described above except in Para A.1.5. This shall exclude excavation of trenches, painting of pipes and refilling all round the pipes.

### A.1.10 Gun metal Fittings: (General)

The brass or gunmetal fitting shall be heavy quality and approved manufacture and pattern with screwed or flanged ends as specified. The fittings shall in all respects comply with the Indian standard specifications No. I.S. 778 – 1984 (Fourth revision) and I.S. 781 – 1984 (Second revision). The standard size of brass or gunmetal fittings shall be designated by the nominal bore of the pipe outlet to which the fittings are attached. A sample of each kind of fittings shall be got approved from the Consultants / Employer and all supplies should be made according to the approved samples.

All cast fittings shall be sound and free from laps, blowholes and filings. Both internal and external surfaces shall be clean, smooth and free from sand etc. Burning, plugging, stopping or patching of the casting shall not be permissible. The bodies, bonnets, spindles and other parts shall be truly machined so that when assembled the parts shall axial, parallel and cylindrical with surfaces smoothly finished. The area of the water – way of the fittings shall be less than the area of the nominal bore.

The fittings shall be fully examined and cleared of all foreign matters before being fixed. The fittings shall be fitted in the line in a workman – like manner. The joints and fittings shall be leak – proof when tested to a pressure of 6kg / sq.cm. as described in Para above and the defective fittings and joints shall be replaced or redone, without any extra cost.

### A.2.0.1 Gun-metal full way valve with wheel:

These shall be of the gunmetal fitting with wheel and shall be of gate valve type opening full way and of the size as per specification. These shall generally confirm to I.S. 780-1984 (Sixth Revision).

### A.2.0.2 Butterfly / Ball Valves:

Valves up to 40 mm dia and below shall be Nickel plated brass body heavy stainless steel ball, lever operated, tested to 20Kg/sq.cm with female screwed ends. All ball valves shall be of full-bore type and of RB make.

Valves from 50mm up to 150mm dia shall be of cast of iron body butterfly valves lever operated with flange ends. Valves shall carry IS certification mark. The valves shall be of INTERVALVE make.

All valves shall be approved by consultants before they are used on work.

All globe and check valves shall have working parts suitable for hot and cold water, as required. Valves shall be tagged with permanent label under hand wheel indicating type or duty.

### A.2.0.3 Sluice Valves:

The sluice valves are used in a pipeline for controlling or stopping flow of water. They shall be of specified size and class and shall be of inside non – raising screw type spindle with either double flange or double sockets ends and cap or hand – wheel.

These shall in all respects comply with the Indian Standard specification IS. 778–1984 for Valves up to and including 300mm, size and No. BDC (429) p2 for valves above 300mm, size. Calls – I sluice valves are used for maximum working pressure of 10kg / cm2, (100 meter head) and class – II sluice valves for 15kg / cm2 (150 meter head).

The body, domes, covers, wedge gate and stuffing box shall be of good quality cast iron, the spindle of bronze the nut and valves seats of leaded tin bronze. The bodies, spindles and other parts shall be truly machined with surfaces smoothly finished. The area of the waterway of the fitting shall be not less than the area equal to the nominal bore of the pipe. The valve wheel shall be marked with an arrow to show the direction of turn for closing the valves.

The valve shall be fully examined and cleared of all foreign matter before being fixed. The fixing of the valve shall be done by means of bolts, nuts, and 3mm rubber insertions or chemically treated compressed fibre board of 1.5mm thick minimum thickness and of weight not less than 0.183gm per sq.cm with the flanges of spigot and the socketed tail pieces drilled, to the same specification in the case of S & S pipe and with flanges in case of flanged pipes. The tail pieces shall conform to IS. 1938 – 1960. These shall be jointed to the pipes line by means of lead caulked joints.

### **A.2.0.4** Appurtenances:

The other appurtenances of pipeline are mentioned below:

### a) Air Release Valves:

These are placed at every summit in the pipeline to permit the escape of air when the main is filled and afterwards, if any air carried out in to the mains. These are also placed on long stretches of nearly level main.

### b) <u>Scour Valves:</u>

These are placed at the bottom of all depressions for emptying the main of letting out the sediment.

### c) Reflux /Non-return Valves:

These are fixed so as to open in the direction of flow but automatically close if the water flows back. They are used to diminish the damage done by the escape of water due to a burst or prevent damage to impellers of pumps.

### A.3.0 Masonry Valve Chambers:

### **A.3.1** General:

All masonry valve chambers for sluice valves, etc., shall be built as per supplied drawings / shall be of size 1200 x 1200 x 1500mm depth with 600x600 mm cast iron manhole cover.

### **A.3.2** Excavation:

The excavation for valve chambers shall be done true to dimension and levels as indicated on plans or as directed by the Consultants / Site Engineering.

### **A.3.3** Bed Concrete:

This shall be cement concrete 1:3:6 (1 cement: 3 fine sand: 6 graded stone aggregate 40mm nominal size).

### A.3.4 Brick Work:

This shall be in Class B brick (Table Moulded) with crushing strength not less than 35kg / sq.cm, in cement mortar 1:6 (1 cement: 6 fine sand). Confirming to Relevant IS.codes.

### A.3.5 Plastering:

Plastering not less than 12mm thick shall be done in cement mortar 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.

### A.3.6 Surface Box:

This shall be of cast iron, well made and free from casting and other defects. All sharp edges shall be removed and finished smooth. The shape and dimensions for surface boxes for stopcocks, sluice valves etc., shall be as per approved samples.

### **A.3.7** Measurements:

Masonry chambers shall be enumerated under the relevant items.

### A.3.8 Rating:

The rate shall include the cost of materials and labour involvement in all the operations described above, except the excavation in soft or decomposed and hard rock. The difference in cost, between ordinary soil and soft or decomposed or hard rock as the case may be, shall be paid for separately if the rock is met with.

### **A.4.0** Thrust Blocks And Anchorage:

At all changes of directions or gradients, thrust blocks made of cement concrete M150 duly designed should be provided around the bends of the pipes made of MS/ GI withstand dynamic and static forces likely to be developed due to water running the pipes. The thrust blocks shall be made after the joints are tested and found OK.

### **A.4.1** `Y' Strainers:

Strainers shall be of approved make, equal `Y' type of pot strainers, with cast / MS fabricated bodies. Strainers shall have bronze screen with 3mm perforations. Screen shall be removable and replaceable without disconnection of the main pipes. All strainers shall be provided with equal size isolation valves, so that the strainer may be cleaned without draining the system. All `Y' type strainers wherever specified shall be MS fabricated type only. All pipe supports shall be mild steel, thoroughly cleaned and given on primary coat of red oxide paint before being installed.

### **A.4.2** Water Flow Switch:

Vane type water flow detectors shall be installed on the sprinkler system piping as designated on the drawings and / or as specified herein. Detectors shall be designed for mounting on either vertical or horizontal piping, but shall not be mounted in a fitting or within 300 mm (12 inches) of any fitting that changes the direction of water flow, and shall have a sensitivity setting to signal any flow of water that equals or exceeds the discharge from one sprinkler head. Detector switch mechanisms shall incorporate an instantly recycling pneumatic retard element with an adjustable range of 0 to 70 seconds. Switches shall have a minimum rated capacity of 7 amp 220 volt AC 0.25 amp 24 volt DC and shall be actuated by a polystyrene vane extending into the water way of the piping. Detector a 15-mm (1/2inch) conduit entrances and shall be finished in red baked enamel.

### **A.4.3** Tamper Switch:

If specified and listed in BOQ, valve supervisory switches shall be on all control valves throughout. Switches shall be mounted so to interfere with the normal operation of the valve and shall be adjusted to operate within two revolutions of the valve control or when the stem has moved no more than one fifth of the distance from its normal position. The switch shall provide an I tapped conduit entrance and incorporate the necessary facilities for attachment baked enamel. The switch mechanism shall have a minimum rated capacity of 7 amp. 220 volt, 0.25 amp 24 volt DC. The entire installed assembly shall be temper proof and arranged to cause a switch operation if the housing cover is removed or if the unit is removed from its mounting.

### **A.5.0** External Stand Post Type Hydrant Assembly:

### Stand Post

MS stand post with MS heavy grade pipe for seating the yard hydrant valve 80mm dia x 1800mm long.

### **A.5.1** Single Headed Hydrant Valve:

Gun metal oblique type hydrant valve of single outlet with necessary hose coupling adapter of 63 mm size, instantaneous spring lock arrangement and blank cap conforming to IS 5290.

### **A.5.2** Hose with coupling:

Controlled percolation / RRI, hose confirming to IS 8423 of 63mm dia. x 15 RMT long shall be provided with suitable fire hose delivery coupling of instantaneous spring lock arrangement comprising of male and female half and rubber cap washer as per IS 903.

### **A.5.3** Gun Metal Branch Pipe with Nozzle:

Gun metal short branch pipe shall be of shall be of 63 mm dia. female instantaneous inlet, male threaded outlet complete with hexagonal nozzle of 19 mm dia heavy quality as per IS 903 shall be provided.

### **A.5.4** Hose cabinet:

MS hose cabinet to accommodate two nos. of hosepipes with coupling and 1no branch pipe shall be provided for each yard hydrant valve. This cabinet shall be glass fronted with hinged door and lock. The cabinet shall be powder coated to scarlet red colour.

### **A.5.5** Fire Brigade Inlet Connection:

Fire brigade connection shall be provided to the reservoir comprising of four instantaneous pattern 63 mm dia inlets with four nos. built – in non- return valve including cap with chair and 150 mm dia sluice valve. The manifold shall be mounted in a MS cabinet with glass fronted door.

### **A.6.0** Internal Hydrant Assembly:

### A.6.1 Single Headed Hydrant Valve:

Gun metal oblique type hydrant valve of single outlet with necessary hose coupling adapter of 63 mm size instantaneous spring lock arrangement and blank cap confirming to IS 5290.

### **A.6.2** Hose with Coupling:

Controlled percolation / RRL hose confirming to IS 8423 of 63 mm dia x 15 RMT long shall be provided with suitable fire hose delivery coupling of instantaneous spring lock arrangement comprising of male and female half and rubber cup washer as per IS 903.

### **A.6.3** Gun metal Branch Pipe with Nozzle:

Gunmetal short branch pipe shall be of 63 mm dia. Female instantaneous inlet, male threaded outlet complete with hexagonal nozzle of 19 mm dia. Heavy quality as per IS 903 shall be provided.

### A.6.4 Hose Reel:

Hose reel of swing type with 19 mm dia and 36 RMT long hose and hand-controlled nozzle of 6.35 mm dia shall be provided on a drum with suitable bracket for fixing on the wall.

### **A.6.5** Hose Reel Cabinet:

MS hose cabinet of size to suit the location of fire duct shown in drawing for the fire escape hydrant and the hose reel assembly and shall be flush with the wall. These cabinets shall be glass fronted with hinged door and lock. The cabinet shall be powder coated to scarlet red colour.

### **A.6.6** Hose and Extinguisher Cabinet:

Where indicated on the plan installs the auxiliary hose stations within a fire hose cabinet.

Recessed Style – box shall be 18 gauge steel with 20 gauge hollow metal door and 16 gauge steel trim – door shall be due panel type with finish interior with trim – door shall be due panel type with finish interior with factory prime exterior set finished specified Croakers standard 5000 series.

### **A.7.0** Piping Installation:

Tender drawings indicate schematically the size and location of pipes. The Contractor on the award of the work. Shall prepare detailed working drawings, showing the cross section, longitudinal sections, details of fittings, locations of isolating and control valves, drain and air valves, and all pipe supports. He must view the specific openings in buildings and other structures through which pipes are designed to pass.

### A.7.1 Above Ground Piping:

All pipes inside and outside the building, laid above the ground shall be properly supported on, or suspended from, stands, clamps and hangers as specified and as required. The

contractor shall adequately design all the brackets, saddles, anchors, clamps and hangers, and be responsible for their section and usage. Approved type of anchor fastener shall be used along with standard pipe supports, like HITEC support the pipes shall be duly painted with one coat red oxide primer and two coats of synthetic enamel paint of fire red colour as per shade No 536per IS 5. The pipes shall be supported a minimum interval of 3.5 Mts. between adjacent supports.

- **A.7.2** Vertical risers shall be parallel to walls and column lines and shall be straight and plump. Risers passing from floor to floor shall be supported at each floor by clamps or collars attached to pipe and with a 15 mm thick rubber pad or any resilient material. Where pipes pass through the terrace floor, suitable flashing shall be provided to prevent water leakage.
- **A.7.3** Pipe sleeves 50mm larger diameter than pipes shall be provided wherever pipes through walls and slabs and annular space filled with fibreglass and finished with retainer rings.
- **A.7.4** All pipe work shall be carried out in a workman like manner causing minimum disturbance to the existing services, buildings roads and structure. The entire piping work shall be organized in consolation with other agencies work so that laying of pipe supports pipe and pressure testing for each area shall be carried out in one stretch.
- **A.7.5** Cut outs in the floor slab for installing the various pipes are indicated in the drawings. Modification of these cut-outs / additional cut-outs if required shall be included in the offer.
- **A.7.6** The contractor shall make sure that the clamps, brackets, clamps saddles and hangers provided for pipe supports are adequate. Piping layout shall take due care for expansion and contraction in pipes and include expansion joints where required.
- **A.7.7** All pipes shall be accuraction cut to the required sizes in accordance with relevant ISI codes and burrs removed before laying. Open ends of the piping shall be closed as the pipe is installed to avoid entrance of foreign matter. Where reducers are to be made in horizontal runs, eccentric reducers shall be used for the piping to drain freely. In other location, concentric reducers may be used.
- **A.7.8** All welding of pipes shall be carried out by certified welding only. A welding procedure shall be prepared and qualified before any welding is done. The welding standard shall be as per AWSD 10.9, level AR- 3. All pipe works of 40 mm NB and below shall be of screwed constructions.

### **A.7.9** Under Ground Piping:

All buried piping shall be duly painted with one coat of bituminous primer and above this one layer of tar felt of 4 mm thickness shall be wrapped. Above this a finished wrapping with PipeKote shall be provided. The UG piping is to be laid in such a way that TOP level is minimum 1mtr from ground level PCC 1:4:8 anchor supports shall be provided for bends and tees wherever change in flow direction occurs.

### A.7.10 Excavation and Back Filling:

Excavation for UG pipeline shall be done in all type of soil conditions to a minimum of 1mtr below the ground level i.e. to the top of pipe elevation.

### A.7.11 Testing & Balancing:

All piping shall be tested to hydrostatic test pressure of atleast One and Half time the maximum operating pressure but not less than 10kg per sq.cm gage for a period of not less than 2 hours. All leaks and defects in joints revealed during the testing shall be rectified and got approved at site.

- **A.7.12** Piping repaired subsequent to the above pressure test shall be re- tested in the same manner till no leaks and pressure drops are found.
- **A.7.13** System may be tested in sections and such sections shall be securely capped then retested for entire system.
- **A.7.14** The contractor shall give sufficient notice to all other agencies at site of his intention to test a section or sections of piping and all testing shall be witnessed and recorded by owner's site representative.

### **A.7.15** Measurements for piping:

Unless otherwise speEfied measurements for piping for the project shall be on the basis of centreline measurements described herewith.

### **A.7.16** Piping:

Shall be measured in units of length along the center line of installed pipes including all pipe fittings, flanges (with gaskets and nuts and bolts for jointing) unions, bends, elbows, tees, concentric and / or eccentric reducers, inspection pieces, expansion loops etc., the above accessories shall be measured as a part of piping length along the center line of installed pipes and no special rates for these accessories shall be permitted.

The quoted unit rates for centre line linear measurements piping shall include all wastage allowance, pipe supports including hangers, MS channel, wooden haunches, nuts and check nuts, vibration isolator suspension where specified or required and any other item required to complete the piping installation as per the specification. None of these items will be separately measure NOR paid for.

However, all valves (gate / globe / check / balancing / butterfly / ball etc.,) strainers, orifice plates, thermometers, pressure gages shall be separately measured and paid as per their individual unit rates.

### **B.1.0** Equipment, material and workmanship:

a) Determine that each piece of equipment meets that detailed requirements of the contract documents and that it is suitable for the installation shown. Notify the

Architect of any shortcomings found during the tendering period. Each piece of equipment furnished shall meet all detailed requirements will not be acceptable, even though specified by name along with other manufacturers.

b) Where two or more units of same class of equipment are furnished use products of the same manufacture, component parts of entire system need not product of the same manufacturer, but confirm to I.S.I standard. Furnished all materials and equipment, new and free from defects and of size, make type and quality here in specified or approved by the Employer / Architects. All shall be installed in a neat and workmanlike manner.

### **B.2.1** Mode of measurement:

- **B.2.2** All drainpipes shall be measured in linear lengths along the centreline of drainage line laid. Deductions shall be made for chambers and fitting lengths, etc. The rate shall include all works as specified in the respective items.
- **B.2.3** Stoneware or cast iron gully, traps, bends and junctions, sewer traps etc. shall be measured in numbers as in above.
- **B.2.4** All MS pipes for fire hydrant shall be measured in linear lengths along the centre line completed including the fittings like collars, elbows, tees, hex nipples etc. the rate shall include cutting, threading, jointing, pressure testing etc. complete as specified in the respective items.
- **B.2.5** Same rate shall be applicable for pipes of same size and materials laid in building at any level or floor.
- **B.2.6** The rock cutting shall be measured in cu. m of the stacks of excavated rock. The deductions for voids being 50% of the stack measurement. Only the rock which is removed by chiselling or blasting etc., shall be measured for this item of work. Boulders shall not be considered as a rock. The excavated rock will be the owner's property.

### C.0 MISCELLANEOUS WORKS:

### C.1.0 HANGERS & SUPPORTS:

### C.1.1 General:

Provide proper solid angle iron / channel section, supports for all pipe runs in the vertical ducts and run horizontally suspended from the slab, complete with clamps. Wherever insulation comes, to provide wooden guide to support pipe on the angle iron hangers / supports. For attachment in concrete, use `Dash' fasteners or Anchor plug type inserts or equivalent. Provide hangers within 900mm of all changes in direction of mains. A minimum of three hangers per expansion bends wherever shown in drawing. Provide all additional structural steel angles, channels or other members not specifically shown but are required for proper support.

Where necessary additional hangers to be provided to arrest water hammers of hydraulic resonance with proper rubber padding.

Space hangers as noted below, except on all soil pipes, which shall have a hanger of multiple fittings. Sufficient hangers shall be provided to maintain proper slope without sagging. In case of angle suspended line, the following is suggested.

$\overline{}$	١
a	,
	,

Pipe Sizes	Hanger Rod Dia.
20 through 50mm	10mm
65 through 125mm	12mm
150 and over	15mm

b)

Pipe Sizes	Spacing of Supports
12 to 20mm	1.5m apart
25 to 40mm	2 m apart
50 above	2 m apart or as per IS.

Provide floor stands, brackets or masonry piers etc. for all lines running under the floor or near walls for those lines can be properly supported or suspended from the walls or floors. Pipelines near concrete or masonry walls shall be supported by hangers carried from wall brackets. Hanging of any pipe from another is prohibited.

### C.2.0 Cutting, Patching, Repairing & Making good:

C.2.1 Cutting, patching and repairing required for the proper installation and completion of the work specified in each division, including chasing, plastering, masonry work, concrete work, etc. and making good shall be carried out by the contractor wherever required. Holes which are cut oversize shall be refilled, so that a tight fit is obtained around the pipe or passing through. Any damages to water proofed location should not be patched up, without rectification by the water proofing agency (specialist contractor) to ensure his guarantee. Repair of waterproofing shall be born by the sanitary contractor if the damage is done by sanitary contractor.

### **C.3.0** Equipment Protection:

**C.3.1** Keep all pipe and conduit openings closed by means of plugs or caps to prevent the entrance of foreign matter. Protect all piping, conduit, fixtures, equipment or apparatus. Any such work shall be restored to its original condition or replaced at no expense to the owner.

### **C.3.2** Accessibility:

The installation of valves, thermometers, cleanout fittings and other indicating equipment or specialties requiring frequent reading, adjustment, shall be conveniently and accessibly located with reference to the finished buildings. Thermometers and gauges shall be installed so as to be easily read from the floor. For floor cleanouts minimum distance of 600mm shall be available from any wall.

### D.1.0 Cleaning, operation & Tests:

- **D.1.1** Fire hydrant equipment piping etc. shall be free of stampings, making (except those required by codes) iron cutting and other foreign materials.
- **D.1.2** Fire hydrant and sprinkler piping shall be cleaned thoroughly, filled and flushed with water.
- **D.1.3** The entire mechanical apparatus shall operate at full capacity without objectionable noise or vibrations.
- **D.1.4** Test all fire hydrant systems in the presence of the site engineer / supervisor and the Consultant as herein specified. Provided all equipment, materials and labour necessary for inspection and tests. After repairs are made, repeat test until units / a system is found satisfactory, to the above authorities. Carry out tests prior to concealing, insulating or back filling over any piping. No exceptions will be made.

### **D.2.1** Water Test:

Test entire system or sections of system by closing all openings except the highest opening and filling system with water to the point of overflow. If the system is tested in sections, plug each opening except the highest opening of the section filled with water. Keep the water in system or in portion under test for atleast 2 hours before inspection starts with test pressure / head lasting for two hours. The system must be tight at all joints.

### D.3.0 All hydrant Piping:

Hydro – static test 15 kg / cm 2 or twice the working pressure which ever is higher. Without drop in pressure as required.

All tests on below ground lines shall be continued to backfill on such a line are completed to disclose any damages caused by back filling.

All system shall be tested in section as required to expedite the work of other trades and meet construction schedules and final test on completion.

- **D.3.1** On completion of the works, the following tests shall be performed to the satisfaction of the consultants / client representative before issue of virtual completion certificate, if so required.
- a) Hydraulic Test
- b) Pump rating and output

The contractor shall arrange for similar tests during the progress of works to ensure that there are no defects in materials / workmanship in portions of work to be concealed or embedded under the floor or walls in ceiling and get this approved by the

consultants. The under floor pipe works shall not be closed without the approval of consultant.	

### **FIRE HYDRANT PUMPS**

### **E.O** Automatic Fire pumps & Controllers:

- a) Complete Fire pump System, including pump motor auxiliary components, controllers and interconnecting power and control wiring.
- **b)** For rating model No. Total dynamic head and electrical characteristics of pumps refer to schedule in drawings and BOQ.
- c) Motor: shall be of suitable rating as specified and shall be TEFC squirrel cage induction type with class B insulation.
- d) The pump shall also deliver not less than 150% of rated capacity at a pressure less than 65% rated head. The shut off pressure should not exceed 120% of the rated pressure.
- e) The following accessories shall be included with the pump unit:

Eccentric Suction Reducer
Discharge Tee
Test header with valves and caps
Casing Relief Valve
Overflow Cone
Suction and discharge gauges
Coupling guard
Vibration Isolator

- f) Pump and driver shall be mounted on a common base plate of either cast iron or fabricated steel and direct connected through a flexible coupling. The pump shall have Bronze impellers mounted on to SS shafts.
- **g)** Provide name and capacity plate with pump.
- h) Prior to shipment, the pump and motor for this project shall be thoroughly shop tested as a complete unit by the pump manufacturer. This shall include a hydrostatic test to twice the working pressure, but in no case too less than 1724 KPA (250 psig). A certified characteristic curve showing the pump performance based upon the results of the shop test shall be furnished to the purchaser. The test data shall include a plot of motor speed Vs pump capacity over the entire range from shut off to beyond 150% of design capacity.

### E.1.0 JOCKEY PUMP:

- a) Pumps shall be horizontal centrifugal end section top discharge type having bronze impellers, which are pinned for positive driving to stainless steel impeller shafts.
- b) For pump rating total dynamic head and electrical characteristics refer to schedule on drawings

- c) Pump shall contain close grained cast iron diffusers and equipped with and equipped with bronze casing rings. Sleeve type base bearings shall be bronze.
- d) Pump base and motor adapter shall be cast iron with complete mechanical shift seals and standard TEFC / SPDP proof motors drip canopies.

### **E.1.1 DIESEL ENGINE DRIVEN PUMP SET:**

As stand – by for the main electric motor driven pump set a diesel engine pump set shall be provided. The pump construction and duty conditions shall be similar to the electric motor driven pump sets.

The engine shall be multi cylinder radiator water-cooled diesel engine directly coupled to the pump. The capacity of the engine shall be atleast 20% greater than HP required to drive the pump at its duty point. The engine shall be complete with following accessories.

- a) Fly Wheel.
- b) Direct coupling for pump and coupling guard, radiator with fan, water pumps drive arrangement and guard.
- c) Air Cleaner
- d) Corrosion resistor
- e) Fuel service tank (8hour) level gauge, supports, fuel oil filter with GI pipe work and valves from tank to engine.
- f) Lube oil pump and filter
- g) Electrical staring battery 2 x 12V
- h) Residential Exhaust silencer with insulated exhaust piping.
- i) Instrumentation panel complete with Lube oil pressure, temperature gauges, water temperature, pressure gauges, tachometer, hour meter and starter switch with key for manual operation.
- j) Safety controls consisting of low lube oil pressure, high cooling water and lube oil temperature and over speed.
- k) Anti-vibration mounting
- I) Battery charger with float and booster charger.

### E.1.2 Control Panels:

A combined control for automatic/manual operation of fire pump sets shall be provided. The functional requirement of control panel shall be as follows:

- **a.** When the water pressure in the system fall 0.35Kg/sq.cm below normal system pressure, the jockey pump shall start automatically when set to auto status and shut down when the system pressure reaches set value.
- b. When the water pressure in the system falls 0.35 kg / sq.cm below the normal system pressure (due to opening of hydrant / test valves etc.,) the main electric pump shall start automatically when set to auto status and shut down when system pressure reaches set value. The pressure setting shall be adjustable.
- c. If within a preset period the electric pump has not started pumping water or electric fire pump fails during operation the electric pump shall be locked out and start up of diesel pump shall be initiated. An audiovisual alarm shall be given indicating failure of main pump operation.
- **d.** If with in a preset period the stand by pump also to start pumping water the stand by pump shall be given a control panel.
- **e.** The control panel shall have been manual / auto operation selector switches. During manual operation individual pumps shall be manually operated through relevant push buttons.
- **f.** Returning the locked out pumps to normal operation shall be feasible by manual rest of locked out units by operation of appropriate push buttons.
- **g.** When main fire pump is in operation an audible tone shall be provided to indicate healthiness of the system. This tone will be shut down along with main fire pump shut down.
- **h.** Alarm for failure / lock out of the pump shall be distinct from the healthy alarm. Failure alarm shall be loud and can be silenced on acceptance.
- i) The control panel shall have visual announciator for running of jockey & fire pumps, power failure and mains on.
- j) The control system shall be designed for 24 VDC supply and shall be complete with battery charger unit with boost / flot charge facility with voltmeter capable of charging 2 sets of batteries at a time.

### **E.1.3 POWER PANEL:**

Incomer	:	250 A TP&N Fuse Switch Units with HRC Fuses.	
Bus bar	:	250 A TP&N Aluminium bus bar	
Outgoing	:	a) 200 A TP&N fuse switch unit with HRC fuses and star & Delta starter suitable for main pump motor.	
		b) 63 A TP&N fuse switch units with HRC fuse and star & delta starter suitable for jockey pump motor.	
		c) 16 A TP&N fuse switch units with HRC fuses for battery charger and control panel.	
		d) Indication Lamps and Ammeter with CTs for Fire pump motors.	

The panel shall be totally enclosed free standing floor mounted cubicle type fabricated out of sheet of 2 mm / 1.6 mm. The construction shall be

compartmentalized sectionalised suitable for front operation with all connections accessible from the front. Removable gland plates shall be provided at top / bottom as required. The bus bars shall be electrolytic grade aluminium (grade E91E of IS: 5082) with current density not exceeding 130 Amps / sq.cm. The bus bars shall be covered with PVC sleeves and supported by non hygroscope insulated supported such as DMC and shall be capable of withstanding 50 KARMS symmetrical current for 1sec. GI earth bus of 25 mm x 5 mm shall be run along entire be run along entire length of board with 2 earth terminals. The entire panel shall be given a primer coat of red lead after degreasing and phosphating and 2 coats of final paint of approved shade. Suitable engraved panels shall be fixed at the panel for all switches, instruments, push button, indicating lamps etc.,

### E.1.4 SUBMITTALS:

- 1. Pump factory test data.
- 2. Shop drawings for the sprinkler system showing the location of the sprinkler pipe layout location of landing valves and hose reel assemblies, etc., shall be submitted and approval sought for from the consultants before start of work. Care should be taken to co- ordinate with other services like lighting etc., so that there shall be no mutual hindrances.
- 3. Upon completion of the installation as built drawings for the entire system shall be prepared and submitted along with 4 sets of operating manuals for the systems.

### **E.1.5 PARTICULAR SPECIFICATION:**

Fire Pumps:

ITEM	MAIN PUMP	DIESEL PUMP	JOCKEY PUMP	BOOSTER PUMP
Water flow rate LPM	2850	2850	180 LPM	900 LPM
Total Head in mtr	70	70	70	35
Pump speed RPM	2900	1500 / 1800	2900	2900
Pump type	Centrifugal End suction top discharge.	Centrifugal End suction top discharge.	Centrifugal End suction top discharge.	Mono block Type
Pump Drive	Electric motor	Diesel engine	Electric motor	Electric motor
Type of Coupling	Direct	Direct	Direct	Direct
Pump casing material	Cast Iron	Cast Iron	Cast Iron	Cast Iron
Impeller	Bronze	Bronze	Bronze	Bronze
Shaft	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Shaft Seal	Mechanical	Mechanical	Mechanical	Mechanical
Type of Starting	Star Delta	Battery start	DOL	
Location Ground Floor		Ground Floor	Ground Floor	Terrace near Overhead Tank

### TECHNICAL SPECIFICATIONS FOR AUTO MATIC FIRE ALARM SYSTEM

### SPECIFICATION FOR AUTOMATIC FIRE ALARM SYSTEM:

The work under this section shall consist of supply of all materials, equipments and labour required to install automatic fire detection and alarm system OR manually operated fire alarm system, complete with main control panels, annunciations, electronic hooters, manual call stations, visual alarm indicators etc. it shall also include laying of cables in ducts, conducts etc. the control panel and the fire alarm system shall confirm to IS 2189 in respect of design and installation. The system shall be suitable to operate on 250 V AC or 24 V DC. The design shall be modular so that additional zones can be added to cater for large installations and to provide facility for future expansions up to 25% more of present capacity.

The system shall be fully supervised for all fault conditions with distinctive alarms operated for FAULT and FIRE conditions. The fire or fault lamp shall continue to glow until the fault condition has been corrected or the fire extinguished. Test push buttons shall be provided on the main control panel to test electronic circuits in each zone.

Dual lamps shall be provided to indicate FIRE condition and to ensure against lamp failure. A common electronic audible alarm shall be provided but the fire signal shall be different from the fault signal by providing different tones for fire and fault conditions. The system shall be supervised for the following conditions:

- a) Normal conditions.
- b) OPEN circuit in system wiring.
- c) SHORT circuit in system wiring.
- d) FIRE conditions.
- e) AC mains failure.
- f) Battery LOW conditions.

### **FIRE ALARM PANEL:**

Main fire alarm control panel shall have adequate number of zones suitable for the subject building. The control panel shall confirm to IS – 2189. The panel shall be totally enclosed dust and vermin proof type made of 16 SWG sheet steel with power-coated finish. The panel shall be completely of solid-state design. The basic function of the control panel shall be to respond automatically to the operation of any manual call stations of smoke / heat detector and to give a fire alarm and to indicate the area where the devices has activated. The other function of the control panel shall be to indicate the faults with in the system. A fault warning shall be given by an audible and visual signal on the control panel. There shall be two indicators for fire and one for fault in the control panel corresponding to each zone.

### **MANUAL CALL POINTS:**

They shall be of break glass type completed encased in sheet steel housing, with provision for cable or conduit entry. The words "IN CASE OF FIRE BREAK GLASS' shall be inscribed in clear bold letters on the front. It shall be provided with a push button of 300 V 3 Amp rating with 2 sets of NO & NC contacts. The call points shall be wall mounting type and shall be provided with a chain and hammer attached to it. Installation of manual call points shall be as per IS – 2189.

### **ELECTRONIC HOOTERS:**

The dual tone hooters shall be of electronic type and shall give continuous / intermittent audible alarm automatically whenever a detection device is activated. They shall be complete with electronic circuitry, speaker and have wall mounting type. Installation of electronic hooters shall be as per IS – 2189.

### **SMOKE DETECTOR:**

The general requirements, Performance test and criteria for conformity for ionization type smoke detector for use in automatic fire alarm system shall be as per Is-11360 – 1985. A visual indication of detectors alarm condition shall be provided which shall be visible from distance and visually different from other conditions. All the Detector should also be either UL / EN certified.

The detector shall be suitable for 24V DC two Wire supply. The sensitivity of the detectors shall not vary with change in ambient temperature, humidity, Pressure or Voltage Variation. All Detectors shall be identical in construction, design and characteristic to facilitate easy replacement. The detector housing shall be damage resistant made of polycarbonate with plug-in housing base of universal type suitable either surface or recess mounting. It shall have in-built safety device to monitor the removal and pilferage protected. The detector shall have remote alarm indication facility. The installation and spacing of these detectors shall be as per IS 2189.

### **HEAT DETECTORS:**

Heat detector shall be of electro pneumatic type, working on both rate of rise and fixed temperature principal. The rate of rise element shall be carefully calibrated to ignore any normal fluctuation in temperature, but to respond quickly when the temperature rise is 9 degrees or more per minute. The fixed temperature feature should be entirely independent of the rate element. The operating temperature of fixed temperature element is factory set to respond when room temperature reaches the limit the detector shall be suitable for two-wire system, low DC voltage operation and with indicator facility. It shall be possible loop heat detectors with smoke detectors and manual call points in the same circuit the installation and pacing of these detectors shall be as per IS 2189. All the Detector should also be either UL / EN certified.

### **RESPONSE INDICATORS:**

RED colored LED mounted on MS housing inscribed fire shall be provided for all detectors installed out of direct line of sight the response indicators LED will repeat the normal or alarm conditions of ties respective detectors.

### **CONDUITS:**

These shall be 16WG mild steel, threaded circular tubing or Rigid PVC tubes of 20 or 25 mm diameter.

### **CABLES:**

The wiring shall be done using 1100V grade PVC insulated copper conductor wires of 1.5 sq.m cross section when laid in side conduits. Otherwise they shall be 2core 1.5sqmm PVC insulated copper conductor armoured PVC sheeted control cable.

### TECHNICAL SPECIFICATIONS FOR PUBLIC ADDRESS SYSTEM:

The main objective of the public address system is to convey clear and audible instructions to all the people on all floors of the building in case of an occurrence of fire or other emergency. The sound output should not be so loud that people nearest to the speakers feel uncomfortable, no so weak that people away cannot listen to what is being broadcast this is achieved by working the system at 65 to 70% power output and distributing the speakers uniform all over the floor area.

### **GENERAL DESCRIPTION:**

The system will comprise of a microphone of suitable technical specification, a set of Amplifiers whose output is fed to loud speakers on various floors / buildings to obtain objective. The system shall consists of the following:

- a) Control desk.
- b) Amplifiers.
- c) Microphone. Loud Speakers
- d) Connecting cables and conduits.

### **CONTROL DESK:**

The control desk is fabricated of sheet steel metal and shall have the following controls and features:

- a) One gooseneck type moving coil/cardio microphone with ON/OFF switch.
- b) ON/OFF switch for public address system with LED indication.
- c) Push switch / selector switch for all building/floors with LED indicators.
- d) Push switch / selector switch for calling individually selected building / floors with LED indication.
- e) Monitor loudspeaker.
- f) Preamplifier with output connection to output transformer.

### **AMPLIFIERS:**

Amplifiers shall be of suitable wattage with solid-state circuitry and shall be able to drive low impedance speakers (2 to 16 hms) and speakers with transformers. They should have V.U meters and distortion less than 3% at the rated output power at 1 KHZ. They

shall work on AC 230V input and stand by power in case of main supply failure shall be provided.

### **LOUD SPEAKERS:**

The following type loud speakers shall be used in public address system:

- a) Wall mounted box type loud speakers of 5 watts power rating.
- b) Speaker column 15 watts power rating for use in halls, service areas, Parking areas, and semi open space.

### **CABLES:**

The cables shall be 24/0.2mm annealed tinned copper PVC insulated as per IS: 694-77 in rigid PVC or MS conduits of 20mm diameter.

### HAND APPLIANCES (FIRE EXTINGUISHERS).

Fully charged and tested ISI marked fire extinguishers of various types as required shall be installed in readily accessible locations with brackets fixed to wall by suitable anchor fasteners.

Each appliance shall be provided with an inspection card indicating the date of inspection, testing, change of charge and other relevant data.

All appliances shall be fixed in a true workman like manner, truly vertical and at correct locations.

Fire extinguishers shall be installed as per Indian standard 'code of practice for selection, installation and maintenance of portable first aid appliances' IS-2190-1962.

### **TYPES OF FIRE EXTINGUISHERS:**

- 1. Water Co2 fire extinguishers confirming to IS-940 shall be used to extinguish class A fires.
- 2. Chemical foam fire extinguishers confirming to IS-933 and mechanical foam extinguishers confirming to IS-10204 shall be used to extinguish class B fires.
- 3. Dry chemical fire extinguishers confirming to IS-2171 shall be used to extinguish class B and class c fires.
- 4. Carbon dioxide fire extinguishers confirming to IS 2878 shall be used to extinguish class B and class C fires.
- 5. Fire extinguishers filled with mono-ammonium phosphate cited with silicon and pressurized with Nitrogen, as propelling agenda shall be used to extinguish class A, class B and class C fires.

Fire Buckets of 9 litre capacity fabricated out of 24SWG sheet steel filled with clean fine sand a shall be provided at required places.

### **GUARANTEE AND MAINTENANCE:**

A warranty for all equipments, materials and accessories supplied shall be submitted against manufacturing defects or under capacity fraction for a period of 12 months from

handing over. During this guarantee period any defective items shall be repaired / replaced without any additional cost and with out any considerable delay.

### LIST OF APPROVED MAKE

SL. NO.	DESCRIPTION		BRAND NAMES / MAKE
01	DEISEL ENGINE	:	KIRLOSKAR / ASHOK LEYLAND
02	FIRE PUMPS	:	KIRLOSKAR / SEIMENS
03	ELECTRICAL MOTORS	:	KIRLOSKAR / SEIMENS
04	BOOSTER PUMP		KIRLOSKAR / SEIMENS
05	GI / MS. PIPES (`C' CLASS)	:	TATA / ZENITH
06	GI / MS fittings	:	R' Brand / Unik
07	BUTTERFLY VALVES	:	INTERVALVE / AUDCO
08	BALL VALVE (15-40mm dia)	:	RB / ITAP / TBS / CIMBRIO
09	SLUICE VALVES	:	KIRLOSKAR / UPADYAYA
10	NON - RETURN VALVE - FLAP TYPE CAST IRON	:	INTERVALVE / AUDCO / C&R
11	CANVASS HOSE	:	JAYSHREE / NEWAGE / CRC
12	FIRE EXTINGUISHER	:	SAFEX / MINIMAX / CASEFIRE
13	PRESSURE GUAGE	:	H - GURU / FIEBIG
14	PRESSURE SWITCH	:	DANFOSS / INDFOSS
15	TERMINATION LUGS	:	DOWELLS / USHA
16	PVC INSULATED COPPER WIRES	:	FINOLEX / WINCAP
17	CABLES	:	UNIVERSAL / CCI / GLOSTER
18	SFU's / FSU's	:	EE / L&T /C&S
19	HRC FUSES	:	HAVELLS / EE

20 OVER LOAD RELAYS : EE / L&T

21 SINGLE PHASE PREVENTOR : L&T / SEIMENS

22 INDICATING LAMPS & PUSH

**BUTTONS** 

: L&T / TECHNIC

23 AIR BREAK CONTACTORS : SEIMENS / L&T / ABB

24 SPRINKLER HEAD : TYCO / RELIABLE /

GRINNEC / VIKIN

25 SPRINKLER ICV : TYCO / WORMALD /

RELIABLE / VIKIN

26 GUN METAL BRANCH PIPE : NEWAGE / WINCO /

KAILASH

27 GUN METAL NOZZEL : NEWAGE / WINCO /

KAILASH

28 AIR RELEASE VALVE : RB / TBS /

CIMBRIO

29 RUBBER HOSE REEL : EVER SAFE MINIMAX / USHA FIRE

30 FIRE BUCKETS : SAFEX / MINIMAX / PETERAUTOKIT

31 SUCTION STRAINER 'Y' : ANIL / UPADYAYA / KEYSTORE

32 BATTERY : EXIDE / COMTECH

33 PIPE SUPPORT : HI - TECH / FABRICATED AS PER SITE

CONDICATION

34 DOUBLE HEDDED HYDRANT VALVE . NEWAGE / WINCO

/ GHOSH ENGG.

35 YARD HYDRANT SINGLE VALVE : NEWAGE / WINCO

36 FOOT VALVE (CAST IRON) : KIRLOSKAR

### FIRE ALARM SYSTEM

	01	PC SERVER / PC	IBM / HP
	02	FACP	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
03 SOFTWARE		SOFTWARE	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
	04	PHOTO ELECTRIC SMOKE DETECTOR	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL

05	HEAT DETECTOR	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
06	MULTI SENSOR	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
07	CONTROL MODULE	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
08	MONITOR MODULE	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
09	RELAY MODULE	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
10	ISOLATOR MODULE	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
11	MANUAL CALL POINT	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
12	HOOTER CUM STROBE	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
13	RESPONSE INDICATOR	EDWARDS/ NOTIFIER / FIRE FINDER / BOSCH / HONEYWELL
14	CABLES	DELTON / LAPP / FINOLEX / POLYCAB
15	PVC CONDUITS	VIP / AVON / NATIONAL
16	PA & TALK BACK SYSTEM	BOSCH

	FIR	E BOQ 1	FOR ICA	AI PROJ	ECT			
SI. No.	<u>Description</u>	<u>Unit</u>	<u>Qty</u>	Final Unit Supply Rate	Supply Amount	Final Unit Erection	Erection Amount	<u>Total</u>
Α	FIRE WATER PUMP HOUSE					Rate		
1.0	ELECTRICAL MOTOR DRIVEN FIRE WATER MAIN PUMP OF VERTICAL IN LINE MULTISTAGE CENTRIFUGAL TYPE IN CI CASING,BRONZE IMPELLER, SS- SHAFT & SLEEVE OF CAPACITY 2850 LPM, 50 MWC RATED HEAD,2900 RPM WITH SUITABLE CAPACITY MOTOR, BASE PLATE, FOUNDATION BOLTS, NUTS AND ALL ACCESSORIES.	Nos.	3	421145.00	1263435	17539	52617	1316052
2.0	ELECTRICAL MOTOR DRIVEN FIRE WATER JOCKEY PUMP OF VERTICAL INLINE MULTISTAGE CENTRIFUGAL TYPE 900 LPM, 50 MWC RATED HEAD, 2900 RPM WITH MOTOR 11 KW, BASE PLATE, FOUNDATION BOLTS, NUTS AND ALL ACCESSORIES	Nos.	1	95028	95028	8770	8770	103798
3.0	CI GATE VALVE PN 1.6							
3.1	200 NB	Nos.	3	24760	74280	1754	5262	79542
3.2	150 NB	Nos.	3	16337	49011	1228	3684	52695
3.3	80 NB	Nos.	1	8169	8169	702	702	8871
3.4	50 NB	Nos.	3	7624	22872	527	1581	24453
4.0	NON RETURN VALVES OF SWING CHECK TYPE PN 1.6 AS PER IS 5312 OF CI AS PER IS 210 GR. FG 260							
4.1	150 NB	Nos.	3	13059	39177	1404	4212	43389
4.2	80 NB	Nos	1	6530	6530	702	702	7232
5.0	Y STRAINER							
5.1	200 NB	Nos.	3	19293	57879	3508	10524	68403
5.2	80 NB	Nos	1	8770	8770	1404	1404	10174
6.0	CLINITEDELY VALVE (MAEED TYPE)							
6.1	CI BUTTERFLY VALVE (WAFER TYPE) 150 NB	Nos.	4	6513	26052	1754	7016	33068
6.2	100 NB	Nos.	9	4175	37575	1053	9477	47052
6.3	80 NB	Nos	3	3315	9945	877	2631	5946
0.0	00112	1100		3313	7773	011	2031	3740
7.0	Foot valve							
7.1	200 MM dia	Nos	2	16503	33006	1000	2000	35006
8.0	ABOVEGROUND PIPE AS PER IS1239 PART 1 MS ERW MEDIUM GR. FOR 150 AND BELOW AND AS PER IS 3589 GR. 330 6.0 MM THICK MS BLACK ERW FOR ≥ 200 NB (PIPE INCLUDING FITTINGS, FLANGES, SUPPORTS, GASKETS, FASTENERS AND PAINTING).	Mar	45	3439	2/570	092	14745	51215
8.1	200 NB X 6 MM THK MS 150 NB MEDIUM	Mtr Mtr	15 30	2438 1570	36570 47100	983 632	14745 18960	51315 66060
8.3	100 NB MEDIUM	Mtr	10	874	8740	421	4210	12950
8.4	80 NB MEDIUM	Mtr	20	620	12400	337	6740	19140
8.5	50 NB MEDIUM	Mtr	15	367	5505	211	3165	8670
8.6	15 NB MEDIUM	Mtr	5	178	890	176	880	1770
9.0	UNDER GROUND PIPE AS PER IS1239 PART 1 MS BLACK ERW MEDIUM GR. FOR 150 AND BELOW AND AS PER IS 3589 GR. 330 6.0 MM THICK FOR ≥ 200 NB (PIPE INCLUDING FITTINGS, FLANGES, WRAPPING COATING & EXCAVATION & BACKFILLING).							
9.1	200 NB X 6 MM THK	Mtr	15	2438	36570	1123	16845	53415
10.0	AIR RELEASE VALVE WITH 25NB ISOLATION VALVE	Nos	1	1650.0	1650	120	100	1750
11.0	ELECTRICAL ITEMS							
11.1	MCC CUM ANNUNCIATION PANEL FOR 2 NO OF MOTOR DRIVEN FIRE PUMPS, 1 NO OF MOTOR DRIVEN JOCKEY PUMP & 1 NO. TERRACE PUMP WITH ALL STARTERS AND ALL OTHER ACCESSORIES.	Nos.	1	438456	438456	5262	5262	443718

11.2	EARTHING MATERIAL FOR ALL MOTORS,	Lot	1	70153	70153	7016	7016	77169
	PANELS ETC.				11.5			111 11
11.3	3CX 70 mm <sup>2</sup> AL. ARMOURED CABLE	Mtr	25	341	8525	50	1250	9775
11.4	3Cx10 mm <sup>2</sup> AL. ARMOURED CABLE	Mtr	13	122	1586	50	650	2236
11.5	2Cx1.5mm <sup>2</sup> CU. ARMOURED CABLE	Mtr	100	86	8600	50	5000	13600
11.6	7Cx1.5mm <sup>2</sup> CU. ARMOURED CABLE	Mtr	15	203	3045	50	750	3795
12.0	PRESSURE GAUGE WITH GAUGE COCK	Nos.	7	2421	16947	527	3689	20636
13.0	PRESSURE SWITCH WITH ISOLATION VALVE	Nos.	5	4423	22115	527	2635	24750
14.0	900 LPM X 40 MWC Terrace pump with valves and accessories	Nos.	1	155314.0	155314	4385	4385	159699
В	HYDRANT SYSTEM							
1	ABOVEGROUND PIPE AS PER IS1239 PART 1 MS ERW MEDIUM GR. FOR 150 AND BELOW AND AS PER IS 3589 GR. 330 6.0 MM THICK FOR ≥ 200 NB (PIPE INCLUDING FITTINGS, FLANGES, SUPPORTS, GASKETS, FASTENERS AND PAINTING).							
1.1	150 NB	Mtr	50	1570	78500	632	31600	110100
1.2	100 NB	Mtr	20	874	17480	421	8420	25900
1.3	25 NB	Mtr	10	178	1780	158	1580	3360
	LILIUM DIDE COLLUD (1975)				20.50.5	40	6217	27010
2.0	HUME PIPE 225 NB (NP2)	Mtr	5	6139	30695	1263	6315	37010
3.0	UNDER GROUND PIPE AS PER IS1239 PART 1 MS BLACK ERW MEDIUM GR. FOR 150 AND BELOW AND AS PER IS 3589 GR. 330 6.0 MM THICK FOR ≥ 200 NB (PIPE INCLUDING FITTINGS, FLANGES,WRAPPING COATING & EXCAVATION & BACKFILLING).							
3.1	150 NB	Mtr	120	1570	188400	737	88440	276840
4	INTERNAL SINGLE HEADED STAINLESS STELL (S.S.) HYDRANT VALVES 63 MM (AS PER IS 5290 TYPE A, ).	Nos.	4	7292	29168	527	2108	31276
5	EXTERNAL SINGLE HEADED STAINLESS STEEL (S.S.)HYDRANT VALVES 63 MM (AS PER IS 5290 TYPE A,).	Nos.	4	8519	34076	527	2108	36184
6	WALL MOUNTED TYPE MS HOSE BOX FOR (18 SWG) INTERNAL HYDRANT WITH LOCKABLE ARRANGEMENT TO ACCOMMODATE 2 RRL HOSE OF 15 M LENGTH & ONE BRANCH PIPE PAINTED WHITE INSIDE & RED OUTSIDE WITH ONE KEY.	Nos.	4	7717	30868	702	2808	33676
8	HOSE PIPE OF 15 M LONG 63 MM DIA(AS PER IS 636 TYPE A RRL, ISI MARKED WITH STAINLESS STEEL (S.S.)	Nos.	8	6060	48480	176	1408	49888
	COUPLINGS)  19 mm (3/4) swinging hose reel drum							
9	fabricated from 18 swg CRCA sheet with 19 mm X 30 Mtr long reinforced PVC BS red hose & fitted with 19 mm spray nozzle 1" (25 mm) dia inlet assembled, LPCB certified.	Nos.	8	8901	71208	790	6320	77528
10	STAINLESS STEEL (S.S.) BRANCH PIPE WITH NOZZLE 20mmDIA (STANDARD JET TYPE AS PER IS 903).	Nos.	8	2365	18920	88	704	19624
11	DRAIN VALVE 25 NB	Nos.	8	2045	16360	351	2808	19168
12	CAST IRON BUTTERFLY VALVE (WAFER TYPE)							
12	100 NB	Nos.	4	4175	16700	1754	7016	23716
12	80 NB	Nos.	4	4000	16000	1750	7000	23000
13	AIR RELEASE VALVE WITH 25NB ISOLATION VALVE	Nos.	1	4499.0	4499	439	439	4938
14	4WAY GM FIRE BRIGADE CONNECTION.	Nos.	2	11430	22860	351	702	23562
С	SPRINKLER SYSTEM							

1.0	ABOVEGROUND AS PER IS1239 PART 1 MS ERW MEDIUM GR. FOR 150 AND BELOW AND AS PER IS 3589 GR. 330 MIN. 6 MM THICK FOR > 200 NB (PIPE INCLUDING FITTINGS, FLANGES, GASKETS, FASTENERS AND PAINTING).							
1.1	200 NB	Mtr	50	1600	80000	700	35000	115000
1.2	150 NB	Mtr	10	1570	15700	632	6320	22020
1.3	125 NB	Mtr	30	1450	43500	580	17400	60900
1.4	100 NB	Mtr	75	874	65550	421	31575	97125
1.5	80 NB	Mtr	40	620	24800	337	13480	38280
1.6	65 NB	Mtr	61	465	28132.5	274	16577	44709.5
1.7	50 NB	Mtr	90	367	33030	211	18990	52020
1.8	40 NB	Mtr	128	257	32896	169	21632	54528
1.9	32 NB	Mtr	165	223	36795	135	22275	59070
2.0	25 NB	Mtr	650	178	115700	158	102700	218400
2.0	150 NB ALARM VALVE ASSY. COMPLETE WITH HYDRAULIC TRIM, BASIC TRIM, ELECTRICAL TRIM, WATER MOTOR GONG.	Nos.	1	48231	48231	877	877	49108
3.0	CI BUTTERFLY VALVE (WAFER TYPE)							
3.1	100 NB	Nos.	4	4175	16700	1053	4212	20912
0.1		. 100.		+173	10700	1033	T212	20/12
4.0	PENDENT TYPE SPRINKLER	Nos.	342	281	96102	106	36252	132354
5.0	50 NB DRAIN (BALL)VALVE	Nos.	4	6202	25572	614	2456	28028
3.0	OU HE BIVAIN (BALL)VALVE	1405.	-	6393	23312	014	2430	20020
6.0	AIR RELEASE VALVE WITH 25NB ISOLATION VALVE	Nos.	1	4499.0	4499	439	439	4938
7.0	FLOW SWITCH	Nos.	4	1930	7720	351	1404	9124
8.0	SIGHT GLASS WITH DRAIN VALVE	Nos.	4	7016	28064	351	1404	29468
D	EXTINCHISHED							
D	EXTINGUISHER  4.5 KG CAPACITY CO2 TYPE		l	l				
1.0	EXTINGUISHER	Nos.	2	7893	15786	141	282	16068
	EXTINGUICILE.							
2.0	9 LITER CAPACITY WATER CO2 TYPE EXTINGUISHER	Nos.	4	4104	16416	141	564	16980
3.0	9 LITER CAPACITY MECHANICAL FOAM TYPE EXTINGUISHER	Nos.	2	4736	9472	141	282	9754
4.0	SIGN AGES	Lot	4	2631	10524	0	0	10524
5.0	FIRE BUCKETS	Nos.	8	527	4216	0	0	4216
3.0	THE BOOKETO	1405.		321	7210	J	0	4210
E	FDA SYSTEM							
1.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF 2 LOOP MICROPROCESSORS BASED ANALOG ADDRESSABLE,NETWORKABLE FIRE ALARM PANEL WITH BATTERY AND BATTERY CHARGER.	Nos.	1	92956	92956	1872	1872	94828
2.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF INTELLIGENT ADDRESSABLE SMOKE DETECTOR WITH STANDARD DETECTOR BASE	Nos.	131	2213	289903	188	24628	314531
3.0	SUPPLY, INSTALATION, TESTING & COMMISSIONING OF REFLECTIVE TYPE BEAM DETECTOR(50 MTR. RANGE) WITH MODULE	Nos.	R.O	41864	0	1560	0	0
4.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF CONTROL MODULE FOR HOOTERS	Nos.	4	2393	9572	234	936	10508
5.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF FAULT ISOLATOR MODULE	Nos.	4	2393	9572	188	752	10324
6.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF CONTROL RELAY MODULE FOR AHU TRIPPING	Nos.	1	2153	2153	234	234	2387
7.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF ADDRESSABLE BREAK GLASS TYPE MANUAL CALL POINT	Nos.	4	1914	7656	188	752	8408

8.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF HOOTER	Nos.	4	1376	5504	188	752	6256
9.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF MONITOR MODULE FOR FLOW SWITCH	Nos.	4	2034	8136	234	936	9072
10.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF RESPONSE INDICATOR	Nos.	R.O	63	0	63	0	0
11.0	SUPPLY & LAYING OF 2X1CX1.5 SQ, MM. PVC INSULATED COPPER WIRE	Mtrs.	250	37	9250	13	3250	12500
12.0	SUPPLY & LAYING OF 4CX1.0 SQ, MM. PVC INSULATED UNSHIELDED COPPER WIRE	Mtrs.	250	52	13000	16	4000	17000
13.0	SUPPLY & LAYING OF 25 MM PVC CONDUIT	Mtrs.	350	50	17500	22	7700	25200
14.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF JUNCTION BOX	Lot	2	1560	3120	0	0	3120
				•	•		•	
F	PA SYSTEM							
1.0	SUPPLY, INSTALATION, TESTING & COMMISSIONING OF PA CONSOLE WITH 150 W POWER AMPLIFIER & MICROPHONE	Nos.	2	28544	57088	624	1248	58336
2.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF CEILING/WALL MOUNTED SPEAKER(MINIMUM 6W)	Nos.	4	582	2328	156	624	2952
3.0	SUPPLY & LAYING OF 2X1CX1.5 SQ, MM. PVC INSULATED COPPER WIRE	Mtrs.	400	37	14800	13	5200	20000
4.0	SUPPLY & LAYING OF 20 MM PVC CONDUIT	Mtrs.	400	39	15600	22	8800	24400
G	TALKBACK SYSTEM		1	1		1	1	
1.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF MASTER HANDSET	Nos.	1	15598	15598	780	780	16378
2.0	SUPPLY,INSTALATION,TESTING & COMMISSIONING OF FIELD HANDSET	Nos.	4	780	3120	156	624	3744
3.0	SUPPLY & LAYING OF 1PX0.5 ATC TELEPHONE CABLE	Mtrs.	350	8	2800	8	2800	5600
4.0	SUPPLY & LAYING OF 16 MM PVC CONDUIT	Mtrs.	350	35	12250	22	7700	19950
	TOTAL							5360919.50
н	Arrangement for Obtaining Final Fire NOC from all concern departments after completion of work as per provisional fire NOC.	Lot	1					
ı	All Inclusive annual Maintenance Charge including arrangement of fresh FIRE NOC.							
	451	1 -4						
	1 <sup>st</sup> year i.e after one year warrantee	Lot	1					
	2 <sup>nd</sup> Year	Lot	1					
	3 <sup>rd</sup> Year 4 <sup>th</sup> Year	Lot Lot	1					
	5 <sup>th</sup> Year	Lot	1					
	o real	LUI						
J	Arrangement For General Fire Notice as per Fire department requirement in proper binding and frame work	Nos	4					
			1					
	TOTAL							

### <u>THE INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)</u> <u>12, Sudder Street, Kolkata–700 016</u>

### **General summary**

Item No.	Description of work	Amount Rs. P.
1.	Fire fighting and fire detection	53,60,920.00
	work	

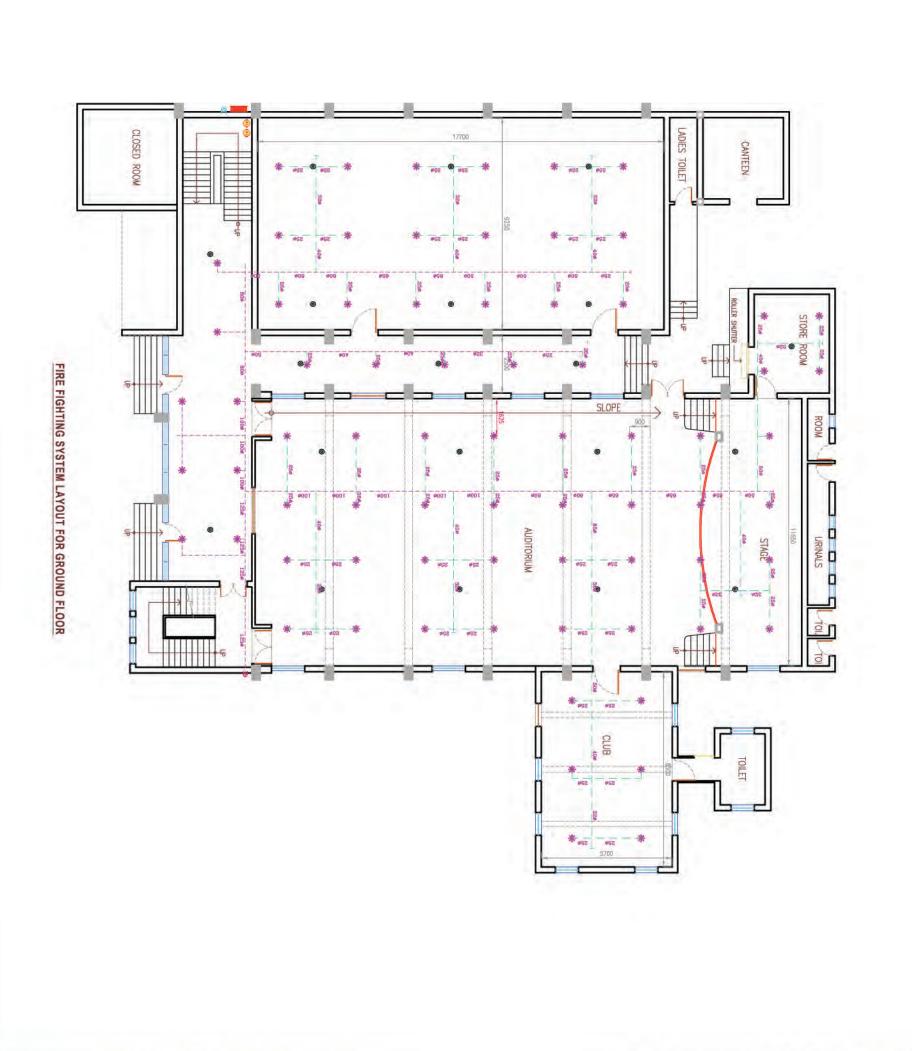
Rupees fifty three lakh sixty thousand nine hundred twenty only.

### **TENDER - PRICE BID**

1 /	we	agree	to	carry	out	tne	work	mentionea	ın	tne	tender	at	par∗	/		%
(				_percent	t) abo	ve* /		% (					_ perce	nt)	below*	the rates
show	n in th	e specif	fied p	rice sch	nedule	of pr	obable i	tems with ap	proxi	imate	quantitie	es.				
								Sign	atur	e of t	the Ter	ıder	er wit	th S	Seal a	nd Date

### **Signature of the Tender accepting Authority**

<sup>\*</sup> Please strike out whichever is not applicable



## 1. ALL DIMENSIONS ARE IN MILIMETRES 2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED NOTES

AREA OF WORK IN GROUND FLOOR = 650.25 SQM.

## LEGEND

00	7	6	Ch	4	CN	N	0	O	
FIRE HOSE RILL	FIRE BUCKET	FIRE BRANCH PIPE	FIRE DRAIN PIPE	FIRE SPRINKLER RISER	FIRE HYDRANT RISER	FIRE SMOKE DETECTOR	FIRE SPRINKLER	DESCRIPTION	
1	00			A	A	0	*	SYMBOL	

FIRE FIGHTING AND FIRE DETECTION WORK IN INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

## DRAWING TITLE

FIRE FIGHTING SYSTEM LAYOUT OF GROUND FLOOR

# FIRE FIGHTING CONSULTANT:

AIRTECH CONSULTANCY SERVICES CG-145, SALT LAKE, SECTOR-II KOLKATA - 700 091

ARCHITECT:

PARTHA DAS & ASSOCIATES
ARCHITECTURE LIBBAN DESIGN, LANDSCAPE, INTERIORS
ARST , SECTORAL SAL TLAKE CITY, CALCULTA-700084

# ISSUED FOR TENDER PURPOSE ONLY

DATE - 25.03.2013 SCALE - 1:150 @A3 DRAWN BY - KANAU

|--|



FIRE FIGHTING SYSTEM LAYOUT FOR FIRST FLOOR

### NOTES

1. ALL DIMENSIONS ARE IN MILIMETRES
2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED

AREA OF WORK IN FIRST FLOOR = 683.25 SQM. AREA:

### LEGEND

NO DESCRIPTION SYMBOL  FIRE SPRINKLER  FIRE SMOKE DETECTOR  FIRE HYDRANT RISER  FIRE SPRINKLER RISER  FIRE BRANCH PIPE  FIRE BRANCH PIPE  FIRE BRANCH PIPE
PESCRIPTION  FIRE SPRINKLER  FIRE HYDRANT RISER  FIRE SPRINKLER RISER  FIRE BRANCH PIPE  FIRE BRANCH PIPE
PESCRIPTION  FIRE SPRINKLER  FIRE MOKE DETECTOR  FIRE HYDRANT RISER  FIRE SPRINKLER RISER  FIRE DRAIN PIPE
DESCRIPTION  FIRE SPRINKLER  FIRE SMOKE DETECTOR  FIRE HYDRANT RISER  FIRE SPRINKLER RISER
DESCRIPTION  FIRE SPRINKLER  FIRE SMOKE DETECTOR  FIRE HYDRANT RISER
DESCRIPTION  FIRE SPRINKLER  FIRE SMOKE DETECTOR
DESCRIPTION FIRE SPRINKLER
DESCRIPTION

### PROJECT:

FIRE FIGHTING AND FIRE DETECTION WORK IN INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

# CLIENT: INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

DRAWING TITLE

FIRE FIGHTING SYSTEM LAYOUT OF FIRST FLOOR

AIRTECH CONSULTANCY SERVICES CG-145, SALT LAKE, SECTOR-II KOLKATA - 700 091 FIRE FIGHTING CONSULTANT:

PARTHA DAS & ASSOCIATES ARCHITECTURE. LIRBAN DESIGNALANDSCAPE, INTERIORS AESTT. SECTORI, SALTIAKE CITY, CALCULTA-700064

# ISSUED FOR TENDER PURPOSE ONLY

DATE - 2 SCALE -DRAWN I

BY-KANAUJ	-1:150 @A3	25.03.2013
D. NO PDA/ICAI/AD/TND/AR 2	CHK, BY - DD	DESIGN -
-	į	_



FIRE FIGHTING SYSTEM LAYOUT FOR SECOND FLOOR

## 1. ALL DIMENSIONS ARE IN MILIMETRES 2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED NOTES

## AREA:

AREA OF WORK IN SECOND FLOOR = 647.00 SQM.

### LEGEND

NO	DESCRIPTION	SYMBOL
	FIRE SPRINKLER	*
N	FIRE SMOKE DETECTOR	0
Į,	FIRE HYDRANT RISER	
4	FIRE SPRINKLER RISER	A
CI	FIRE DRAIN PIPE	
on .	FIRE BRANCH PIPE	
7	FIRE BUCKET	(A)
00	FIRE HOSE RILL	

SN	品	PR
를	FIG	ROJECT
FOF	FIGHTING A	13
STITUTE OF COST ACCOUNTANTS O	SANI	
TAC	AND FIRE	
SOUN	EDE	
TAN	TECTIO	
TS OF	ON V	

FIRE FIGHT WORK IN F INDIA (ICAI)

# INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

DRAWING TITLE

FIRE FIGHTING SYSTEM LAYOUT OF SECOND FLOOR

AIRTECH CONSULTANCY SERVICES CG-145, SALT LAKE, SECTOR-II KOLKATA - 700 091 FIRE FIGHTING CONSULTANT:

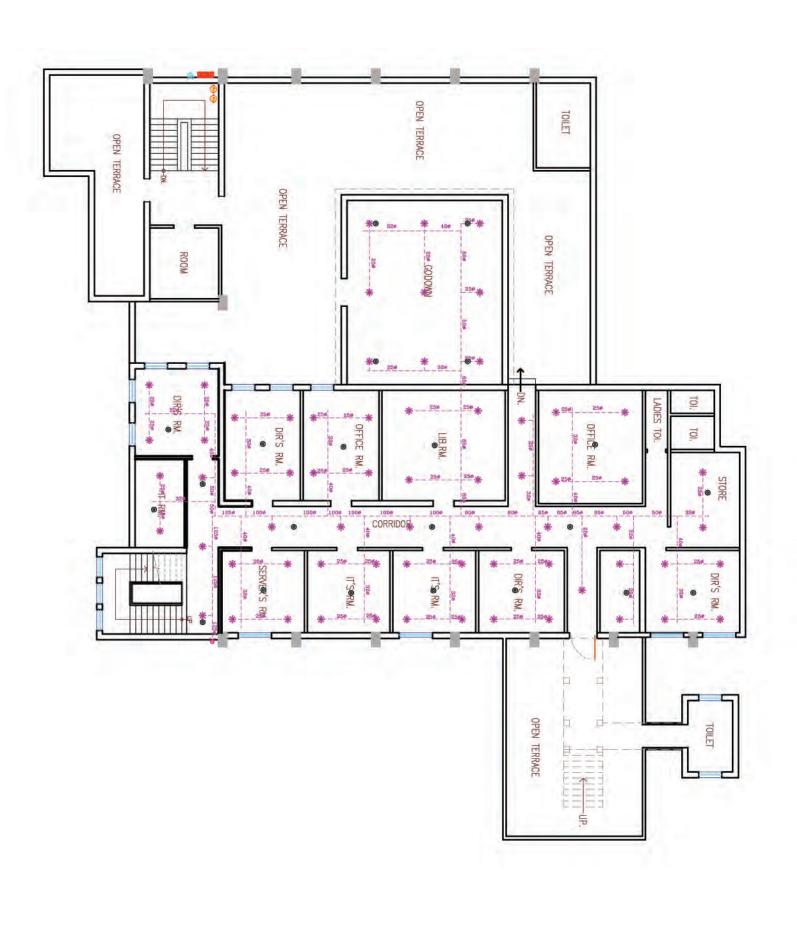
PARTHA DAS & ASSOCIATES ARCHITECTURE, URBAN DESIGNI, ANDSCAPE, INTERIORS AESTT, SECTORI, SALTIAKE CITY, CALCUIT A-700064

ARCHITECT:

# ISSUED FOR TENDER PURPOSE ONLY

DATE - 25.03.2013

П	D. NO PDA/ICAI/AD/TND/AR 3	DRAWN BY - KANAUJ
В	CHK, BY - DD	SCALE - 1:150 @A3



FIRE FIGHTING SYSTEM LAYOUT FOR THIRD FLOOR

## 1. ALL DIMENSIONS ARE IN MILIMETRES 2. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED NOTES

### AREA:

AREA OF WORK IN THIRD FLOOR = 343.20 SQM.

### LEGEND

7 6 FIR				FIR	3 FIR	2 FIR	FIR	NO DE
FIRE BUCKET		FIRE BRANCH PIPE	FIRE DRAIN PIPE	FIRE SPRINKLER RISER	FIRE HYDRANT RISER	FIRE SMOKE DETECTOR	FIRE SPRINKLER	DESCRIPTION
	60			A	ħ	0	*	TOBMAS

FIRE FIGHTING AND FIRE DETECTION WORK IN INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

CLIENT:
INSTITUTE OF COST ACCOUNTANTS OF INDIA (ICAI)

## DRAWING TITLE :

FIRE FIGHTING SYSTEM LAYOUT OF THIRD FLOOR

# FIRE FIGHTING CONSULTANT:

AIRTECH CONSULTANCY SERVICES
CG-145, SALT LAKE, SECTOR-II
KOLKATA - 700 091

PARTHA DAS & ASSOCIATES ARCHITECTURE URBAN DESIGNLANDSCAPE,INTERIORS AEST7, SECTORASALTIAKE CITY, CALCULTIA-700064

# ISSUED FOR TENDER PURPOSE ONLY

	D. NO PDA/ICAI/AD/TND/AR 4	RAWN BY - KANAUJ
4	CHK, BY - DD	3CALE - 1:150 @A3
<u> </u>	DESIGN -	DATE - 25,03,2013