INDIAN INSTITUTE OF TECHNOLOGY MADRAS
ENGINEERING UNIT
CHENNAI – 600 036
TENDER NO. 29/ 2013-14 / ELDB

INDEX

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

ENGINEERING UNIT

CHENNAI – 600 036

1. Notice Inviting Tenders

TENDER NO. 29 / 2013-14 / ELDB

EXECUTIVE ENGINEER, Indian Institute of Technology Madras, Chennai - 600 036 invites sealed tenders, in two envelope system (Application for eligibility and Financial bid) for the following work from the contractors who satisfy the Eligibility Criteria.

1. **PARTICULARS OF WORK**

1.1 Name of Work	**: Provision of firm alarm, CCTV, PA system & Access control system and fire fighting system to Main, PC & FTC building for NCCRD at IIT Madras**
1.2. Estimated Cost	: Rs. 42,97,000/-
1.3. Earnest Money Deposit (EMD)	: Rs. 85,970/-
1.4. Cost of Tender Document	: Rs. 525/-
1.5. Time Period for Completion	: Six Months
1.6. Validity of the Tender	: 90 days from the date of opening of the tender
1.7. Date of Prebid Meeting	: 01/11/2013 at 11:00 AM
1.8 Date and Time of submission of tender	: 07/11/2013 at 3:00 PM
1.8. Date and Time of Opening of the Applications for Eligibility (Envelope No. 1)	: 07/11/2013 at 3:10 PM
1.9. Date of Opening of the Financial bid (Envelope 2)	: Will be intimated later
1.10. Place of submission of tenders	: Office of the Executive Engineer, Engineering unit Administrative Building 3rd Floor IIT Madras, Chennai – 600 036.

1.11. Deadline for submission of tender

Tenders must be received by the Employer at the following address not later than 3.00 PM on the date of opening mentioned. In the event of the specified date for the submission of the Tender being declared a holiday by the Employer, the Tenders will be received up to the appointed time on the next working day

1.12. Address for Submission of Tender

The Executive Engineer
Engineering Unit, Administrative Building, 3rd floor,
Indian Institute of Technology Madras
Chennai – 600036.

1.13. The Employer may extend the deadline for submission of Tenders by issuing an amendment in writing in which case all rights and obligations of the Employer and the Tenderer previously subject to the original deadline will be subject to new deadline.

1.14. LATE TENDER

Tenders received late will not be accepted.

2. T E N D E R

2.1. I/We have read and examined the notice inviting tender, schedules A & B, Specifications applicable, drawings, Conditions of contract and other documents and rules referred to in the conditions of contract and all other contents in the tender documents for the work.

2.2. I/We hereby tender for the execution of the work specified for the Indian Institute of Technology Madras, within the time specified in Schedule – 'F' and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in General Rules and Directions and in Clause 11 of Form 8 (General conditions of contract) and with such materials as are provided for, and in all respects in accordance with such conditions applicable.

2.3. I/We agree to keep the tender open for Ninety (90) days from the date of opening of tender and not to make any modifications in its terms and conditions

2.4. I/We agree that the EMD deposited by me/us be retained by IITM towards Security Deposit to ensure execution of all works referred to in the tender documents on the terms and conditions contained or referred to therein.

2.4. If I/We fail to furnish the prescribed performance guarantee as mentioned elsewhere within prescribed period, I/we agree that IITM shall, without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely.

2.5. I/we agree that in case of forfeiture of earnest money as aforesaid, I/we shall be debarred from participating in the re-tendering process of the work.

2.6. If I/we fail to commence work as specified in clause 3A of the contract, I/we agree that IITM shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely,

2.7. I/We agree to carry out such deviations as may be ordered, up to a maximum percentage mentioned in Schedule 'F' and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the contract.

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

2.9. I/We hereby certify that the tender document downloaded is the exact copy of the document published by the IITM and no alterations and additions have been made by me / us in the tender document.

Contractor

Dated

Signature of the Tenderer

Postal Address

Witness

Signature

Name

Postal Address

Occupation

3. Acceptance

The above tender is accepted by me for an on behalf of the Board of Governors, IITM for a sum of Rs._____(Rupees_____
_____
_____)

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

a)

b)

c)

For & on behalf of the Board of Governors, IITM.

Signature _____

Designation _____

Date_____

4. Conditions of contract

4.1. Definitions

In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them:-

1. The expression 'works' or 'work' shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed, whether temporary or permanent, and whether original, altered, substituted or additional.
2. The 'Site' shall mean the land/or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
3. The 'contractor' shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
4. The 'Engineer-in-charge' means the Engineer who shall supervise and be in-charge of the work and who shall sign the contract on behalf of IIT as mentioned in Schedule 'F' hereunder.
5. 'Accepting Authority' shall mean the authority mentioned in Schedule.
6. 'Excepted Risks' are riots (other than those on account of contractor's employees), war, acts of God such as earthquake, lightening and unprecedented floods, and other such causes over which the contractor has no control and accepted as such by the Accepting Authority.
7. 'Market Rate' shall be the rate as decided by the Engineer-in-charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'F' to cover all overheads and profits.
8. 'Schedules(s)' referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard schedule of Rates of the CPWD mentioned in schedule 'F' hereunder, with the amendments thereto issued up to the date of receipt of the tender.
9. 'Department' means IITM which invites the tenders.
10. 'District specification' means the specifications followed by the state of Tamil Nadu in the area where the work is to be executed.
11. 'Tendered value' means the value of the entire work as stipulated in the letter of award.
12. 'Employer means IITM

13. Where the context so requires, words imparting the singular also include the plural and vice versa. Any reference to masculine gender shall whenever required shall refer to feminine gender and vice versa.
14. Wherever the expression “Divisional Officer” appears in the Clauses, it should be substituted by the expression “Superintending Engineer / Executive Engineer”.
15. “Engineer in Charge” means Superintending Engineer/ Executive Engineer, IITM, and the Engineer means the officer representing the Engineer-in-Charge of the Project.

4.2. Authority to sign the tender document

The tender must be signed by the person / persons competent to sign as indicated below. Same stipulations will also apply in the case of Receipt of payments for the work done.

1. If the Applicant is an individual, he should sign above his full typewritten name and current address.
2. If the Applicant is a proprietary firm, the Proprietor should sign above his full typewritten name and the full name of his firm with its current address.
3. If the Applicant is a firm in partnership, the Documents should be signed by all the Partners of the firm above their full typewritten names and current addresses. Alternatively the Documents should be signed by a Partner holding Power of Attorney for the firm and in this case a certified copy of the Power of Attorney should accompany the tender documents. In both cases a certified copy of the Partnership Deed and current address of all the partners of the firms should be furnished.
4. If the Applicant is a limited Company, or a Corporation, the Documents shall be signed by a duly authorized person holding Power of Attorney for signing the Documents, accompanied by a copy of the Power of Attorney. The Applicant should also furnish a copy of the Memorandum of Articles of Association duly attested by a Public Notary

4.3 .Instructions for filling the Bill of Quantities (Schedule A)

1. Rate for each item shall be filled in words and figures and there shall be no discrepancy between the rate quoted in figures and words. However, if a discrepancy is found, the rate which corresponds with the amount worked out by the contractor shall unless otherwise proved, be taken as correct.
2. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct.
3. Where the rates quoted by the contractor in figures and in words tally but the amount is not worked out correctly, the rates quoted be the contractor, will, unless otherwise proved, be taken as correct and not the amount.
4. If no rate has been quoted for any item(s), leaving space both in figure(s), words(s) and amount, it will be presumed that the contractor has included the cost of this / these item(s)

in other items and rate for such items(s) will be considered as zero and work will be required to be executed accordingly.

5. Amount must be quoted in full rupees only.
6. Special care should be taken to write the rates in figures as well as in words and the amount in figures in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs' should be written before the figure of 'Rupees' and the word ' P ' after the decimal figures, eg.' Rs 2.15P' and in case of words the word, "Rupees" should precede and the work 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word 'only', it should invariably be up to two decimal places. While quoting each rate in schedule of tender, the word 'only' should be written closely following the rate and it should not be written in the next line.
7. In the case of item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below/above the rates quoted is liable to be rejected
8. Tenders containing proposal for any alteration in the work or in the time allowed for carrying out the work, or which contain any other condition including conditional rebates, will be summarily rejected.
9. The officer inviting tenders shall have the right to reject all or any of the tenders and will not be bound to accept the lowest or any other tender.
10. The tender for the work shall not be witnessed by a Contractor or Contractors who himself / themselves has/have tendered for the same work. Failure to observe this condition would render tenders of the Contractor tendering, as well as witnessing the tender, liable to summary rejection.
11. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such tender is liable to be rejected.
12. The tenderers shall sign a declaration under the Official Secret Act, 1923, for maintaining secrecy of the tender documents, drawings or other records connected with the work given to them.

4.4. Refund / forfeiture of EMD

1. In the event of a tender being accepted, a receipt for the Earnest Money forwarded therewith shall thereupon be given to that Contractor.
2. In the event of a tender being rejected, the Earnest Money forwarded with such unaccepted tender shall thereupon be returned to the Contractor remitting the same, without any interest.
3. Tender for the work shall remain open for acceptance for a period of 90 days from the date of opening of the Tender.

4. If any tenderer withdraws his tender before the said period or issue of acceptance, whichever is earlier or makes any modification in the terms and conditions of the tender which are not acceptable to the Institute, then IITM, shall without prejudice to any other right or remedy, be at liberty to forfeit 50 % of the said earnest money.

4.5 Documents to be submitted upon acceptance of the tender.

1. On acceptance of the tender, the name of the accredited representative(s) of the Contractor who would be responsible for taking instructions from the Engineer in Charge shall be communicated in writing to the Engineer in Charge.
2. The Contractor shall give a list of IITM employees related to him.

4.6 Signing of Agreement.

1. The successful contractor on acceptance of his tender shall within 14 days from the stipulated date of start of the work, sign the contract.

2. Documents constituting the contract

a. Non judicial stamp paper for value not less than Rs.100 containing the brief description of the contract duly signed by both parties to the contract.

b. The notice inviting tender, the financial bid and all other the documents including drawings, if any, forming the tender as issued at the time invitation of tender and acceptance thereof together with any correspondence leading thereto.

c. Decisions taken in the Pre-bid meeting if conducted.

d. Letter of acceptance

e. Letter of award (After submission of Performance Guarantee)

4.7 Special conditions

1. Child Labour is strictly prohibited.
2. Construction labour shall not be permitted (except staff for watch and ward) to stay inside the campus and no labour camp shall be allowed to be set up inside the campus.
3. The construction activities and storage of materials shall be restricted within the area earmarked around the proposed building, which shall be barricaded with materials approved by IITM.
4. The contractor shall abide by the restrictions imposed by the security wing of the Institute on the working and on movement of labour, materials etc. and nothing extra shall be payable on this account. The contractor shall arrange for necessary photo identity passes for the labour for entry into the campus. Advance action for obtaining such passes shall be taken by the contractor and no claim on this account shall be entrained.
5. Movement of labour should be restricted to the areas where work is carried out. Workers should be made to confine themselves to the work areas and should not wander into the near by areas / buildings/ forest.

6. The work should be executed during day time only. If the work is required to be carried out in the night, necessary permission of the Engineer-in-charge shall be obtained. Contractor will make his own arrangement for lighting the area and no extra amount for carrying out the work during night is payable. To the extent possible engaging women labour in the night shift should be avoided
7. The work shall be carried out with least hindrance to the adjoining buildings and offices and the contractor will be responsible for any damage, caused to the existing fixtures, electric fittings, cables, roads, pipelines etc. in the course of execution and the contractor shall make good any such damages for which nothing extra is payable.
8. Water for construction shall be arranged by the contractor. The contractor will not be allowed to use any of the water resources available within the campus nor will be permitted to dig any bore well inside the campus.
9. No plot rent shall be charged for materials stocked in the institute land during the course of construction with the prior approval the Engineer. All such materials shall be removed at the time of completion of the work.
10. The contractor shall make his own arrangement for electricity required during the construction period.
11. Tenderers shall inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the site and shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not. Submission of a tender implies that the tenderer has read the complete contract documents and is aware of the conditions, specification of the work to be done and of the local conditions and other factors having a bearing on the execution of work. Any claim either for extra amount or for additional time for execution due to ignorance about the site and working condition is not payable.
12. All documents forming the contact shall be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scaled.
13. In the case of discrepancy between the schedule of Quantities, the specifications and/or the Drawings, the following order of precedence shall be observed.
    i. Description of item in the Schedule of Quantities.
    ii. Particular Specifications and special conditions, if any
    iii. Drawings.
    iv. C.P.W.D Specifications
    v. Specifications of B.I.S.
14. If there are varying or conflicting provisions made in any one document forming part of the contract, the Engineer-in-charge shall be the deciding authority with regard to the

interpretation of the documents and his decision shall be final and binding on the contractor.

15. Any error in description, quantity or rate in schedule of Quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract. All such variations, errors additions, substitutions etc shall be decided as per the terms of the contract
16. The building work shall be carried out complying in all respects with the requirements of relevant bye-laws of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-Charge and nothing extra will be paid on this account.
17. The work of water supply, internal sanitary installations and drainage work etc. shall be carried out as per the local body bye-laws and the contractor shall produce necessary completion certificate from such authorities after completion of the work, if required.
18. Where CPWD specifications are not available for fittings and fixtures, the same should conform to bye-laws and specification of the local Body. The contractor should engage licensed plumbers for the work.
19. The contractor shall comply with all legal orders and directions of the local or public authority or municipality and abide by them.
20. The contractor shall give a performance test of the installation(s) as per specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.
21. Any cement slurry added over base surface (or) for continuation of concreting to obtain better bond between old and new concrete is deemed to have been included in the items and nothing extra shall be payable or extra cement considered in consumption on this account
22. The Rate for RCC works includes cost of concreting in sloped & curved roof, chajjas & beams and no extra rate shall be payable for concreting in such situations.
23. The rate for Centering & shuttering under concrete items will be the same for Centering & shuttering in curves & arches also unless specified otherwise in the BOQ.
24. The contractor should construct proper mortar bands of lean mix with adequate depth & size over the roof for flooding with water & proper curing. In case of Arches, wet gunny bags shall be used for a period of two weeks.
25. Holes and chase for water supply and drainage, etc, shall be provided as directed during progress of work without any claim for extra for finishing
26. The rate quoted for tiling on walls shall include providing the bevel edges for the corners or the PVC corner strips. No additional payment shall be payable on this account.

27. Sample of all materials, fixtures, flooring tiles, wall tiles, doors, windows, sanitary fittings, roofing sheets electrical fittings etc, shall be got approved in advance from the Engineer-in-Charge before taking up the respective work. The contractor shall produce all the materials in advance so that there is sufficient time for testing and approving the materials and clearance of the same before their use in work.
28. The contractor shall be furnished, free of cost one certified copy of the contract documents except Standard Specifications, Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that **of this** contract
29. For any dispute arising out of this agreement, the legal jurisdiction will be at Chennai in Tamil Nadu only.
30. It is not binding on the competent authority to accept the lowest or any other tender and any or all the tenders received can be rejected without assigning any reason.
31. Canvassing whether directly or indirectly, in connection with tender is strictly prohibited and the tenders of the contractors who resort to canvassing will be liable to rejection.
32. The competent authority reserves the right to accept part of the tender and the tenderer shall be bound to perform the same at the rates quoted.
33. The contractor shall associate an Electrical contractor of the appropriate class to carry out the electrical works. But it is the principal contractor who is responsible for completion of the Electrical work also as per contract. No agreement is created between the Electrical contractor associated by the tenderer and IITM in this regard.
34. Other agencies related to this project will also simultaneously execute their part of works and the contractor shall cooperate and allow smooth working of all such agencies. The contractor shall leave such holes, openings etc, for laying / burying of pipes, cable, conduits, clamps, boxes and hooks for fans etc. as may be required for other agencies. Conduits for electrical wiring shall be laid in such a way that they leave enough space for concreting and do not adversely affect the structural members. The rates quoted for the items of work are deemed to include charges for coordinating with all such agencies and nothing extra is payable on this account.
35. The following events will take place in the Campus which may hinder the progress of work.

The duration of the events are

a. Shaastra and Saar ang - 10 days (normally in January)
b. Convocation - 2 days (normally in July)

The completion time stipulated in the contract is deemed to have included the above, if they happen during the duration of the contract.

5. SCHEDULES

Schedule 'A' - The Bill of Quantities enclosed in this document.

Schedule 'B' - Schedule of materials proposed to be issued to the tenderer

NO MATERIAL SHALL BE ISSUED TO THE TENDERER BY IITM

Schedule 'C'- Schedule of tools and plants proposed to be hired to the tenderer

NO TOOLS AND PLANTS SHALL BE HIRED TO THE CONTRATOR BY IITM

Schedule 'D' - Extra schedules for specific requirements / documents for the work, if any.

Schedule 'E'- Price escalation will be as per CLAUSES – 10C of the agreement. Apart from these price escalations no other claim for escalation for execution of work during the period/extended period of the contract is payable.

Schedule 'F'

Name of work: **Provision of firm alarm, CCTV, PA system & Access control system and fire fighting system to Main, PC & FTC building for NCCRD at IIT Madras**

Estimated cost of work	: Rs. 42,97,000/-
Earnest money	: Rs.85,940/-
Performance Guarantee	: 5% of the tendered value
Security Deposit	: 5% of the tendered value

General Rules and Directions:

Officer inviting tender	Executive Engineer, IIT Madras
Maximum percentage for quantity of items work to be executed beyond which rates are to be determined in accordance with clause 12.2 and 12.3.	See below

Definition

Engineer-in-charge	Executive Engineer
Accepting authority	Director, IIT Madras
Percentage on cost of material and labour to cover all overheads and profit	15%
Standard schedule of rates	CPWD DSR 2012
Department	IIT Madras
Standard CPWD contract form	CPWD form 8 with upto date Modification and correction

Clause 1

i.) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance in days. — 7 (seven) Days

(ii) Maximum allowable extension beyond the period provided above — 7(Seven) Days.

Clause 2

Authority for levying compensation under clause 2. — Superintending Engineer

Clause 2a

Whether clause 2a shall be applicable : Yes applicable.

Clause 5

Number of days from the date of issue of letter of acceptance for reckoning the date of start : 14 Days

Time allowed for execution of work : Six months

Authority to give fair and reasonable Extension of time for completion of work : EXECUTIVE ENGINEER, IITM

Clause 6, 6A : Clause 6A shall be applicable.

Clause 7

Gross work to be done with net payment after adjustment of advances for material collected, if any, since the last such payments for being eligible to interim payment. : Rs.2 Lakhs

Whether Clause 10B (ii) shall be applicable — Yes

Clause 10 C — Applicable

Clause 11

Specification to be followed for execution of work

CPWD Specifications 2009 Volume I to II and revised CPWD Specifications up to date, general specifications for electrical works part – I 2004, general specifications for electrical works Part - III Fire Alarm and Fire Hydrant Systems.

Clause 12

Deviation limit beyond which clauses 12.2 & 12.3 shall apply for building work (Excluding foundation) — 30% for construction

50% for maintenance

Deviation limit beyond which clauses 12.2 & 12.3 shall apply for foundation work. } 100%

Clause 16

Competent Authority for deciding reduced rates for items which are not as per specification — Executive Engineer IIT Madras

Clause 36(i) Technical Personnel to be employed at site.

Designation	**Minimum qualification and experience required**	**Discipline**	**Rate of recovery per month for non employment**
Technical Representatives	Diploma in Engineering with minimum 5 years of experience – 1 No.	Electrical / Mechanical Engineering	Rs. 20000

6. ADDITIONAL SPECIFICATIONS

The additional specification given below is not substitute to CPWD specifications or IS specifications. These shall be read along with CPWD specifications or IS specifications.

6.1. GENERAL

1. The work shall be carried out using metric dimensions only and shall be measured and paid in metric dimensions. F.P.S. units, if any, mentioned in drawings etc are for guidance only.
2. Wherever any reference to any Indian Standard Specification occurs in the documents relating to this contract the same shall be inclusive of all amendments issued thereto or revision thereof if any, up to the date of receipt of tenders.
3. Unless otherwise specified in the schedule of quantities the rates for the various items are for execution at all heights, levels and locations.
4. Unless otherwise specified in the schedule of quantities the rate for the items of the work shall be considered as inclusive of pumping out or bailing out water during execution, if required, for which no extra payments will be made. This will include water encountered from any source, such as rains, floods, sub-soil water table being high or due to any other cause whatsoever.

6.2. Electrical Conduits Laying

For fixing electrical conduits in walls the required chase should be cut using only electrically operated circular saw. Using of hammer and chisel is completely prohibited

7. STATUTORY REQUIREMENTS / APPROVAL FROM STATUTORY AUTHORITIES

Work for electrical installation shall be carried out in accordance with this specification and complying with the relevant statutory requirements and national standards. It shall be the responsibility of the contractor to obtain approvals of competent Central or State Government authorities and satisfy them regarding the compliance with relevant regulations for this scope of work.

The work should be carried out only under the supervision of licensed supervisors. The licenses possessed by the Contractor's supervisor shall be made available to the Client for scrutiny before commencement.

Test certificate for installation shall be prepared in the form required by the Electrical Inspectorate Govt. of Tamilnadu and Tamilnadu Electricity Board. Any rework on account of remarks by Electrical Inspector shall have to be carried out by the Electrical contractor at no extra cost.

8. Forms

8.1 Guarantee bond

Form of performance security (guarantee) Bank guarantee bond

In consideration of the Indian Institute of Technology Madras (hereinafter called "The Institute") Having offered to accept the terms and conditions of the proposed agreement between ……and……(hereinafter called "the said contractor (s))for the work…….. (hereinafter called "the said agreement") having agreed to production of a irrevocable bank Guarantee for Rs……..(Rupees…….only) as security / guarantee from the contractor (s) for compliance of his obligations in accordance with the terms and condition in the said agreement.

1) We……(hereinafter referred to as "the Bank") hereby (Indicate the name of the Bank) Undertake to pay to the Institute an amount not exceeding Rs…….(Rupees……..only) on demand by the Institute.
2) We……do hereby undertake to pay the amounts due and payable under this Guarantee without any demure, merely on a demand from the Institute stating that the amount claimed is required to that recoveries due or likely to be due from the contractor (s). Any such demand on the Bank shall be conclusive as regard the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs……..(Rupees…….only)
3) We, the said bank further undertake to pay to IITM any money so demanded notwithstanding any dispute or disputes raised by the contractor (s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present guarantee being absolute and unequivocal.

   The payment so made by us under this bond shall be a valid discharge of our liability payment therein under and the contractor (s) shall have no claim against us for making such payment.
4) We……..further agree that the guarantee herein (indicate the name of the bank) Contained shall remain in full force and effect during the period that would be taken for the said performance of the said agreement and that

it shall continue to be enforceable till all the dues of the Institute under or by virtue of the said agreement have been fully paid and claims satisfied or discharged or till Engineer-in-charge on behalf of the Institute certifies that the terms and conditions of the said agreement have been fully and properly carried out by the said contractor (s) and accordingly discharges this guarantee.

5) We……further agree with the Institute that (Indicate the name of the Bank) the Institute shall have the fullest liberty without our consent without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor (s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Institute against the said contractor (s) and to forebear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said contractor (s) or for any forbearance, act of omission on the part of the Institute on any indulgence by the Institute to the said contractor (s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

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

7) We……lastly undertake not to revoke this (Indicate the name of the Bank) Guarantee except with the previous consent of the Institute in writing.

8) This guarantee shall be valid up to……unless extended on demand by Institute. Notwithstanding anything mentioned above, our liabilities under this guarantee is restricted to Rs …… (Rupees ……) and unless a claim of writing is lodged with us within six month of the date of expiry or extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharge.

Dated the……..day of…….for……..(Indicate the name of the Bank)

8.2. Form of guarantee bond for EMD

In consideration of the Indian Institute of Technology Madras (hereinafter called "The Institute") Having offered to accept the terms and conditions of the proposed tender for the work of ……..……..……..……..……havin g agreed to production of an irrevocable bank Guarantee for Rs……..(Rupees……..only) as security from the contractor (s) for compliance of his obligations in accordance with the terms and condition in the tender.

1) We……. (hereinafter referred to as "the Bank") hereby (Indicate the name of the Bank) Undertake to pay to the Institute an amount not exceeding Rs…….(Rupees……..only) on demand by the Institute.

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

3) We, the said bank further undertake to pay to IITM any money so demanded notwithstanding any dispute or disputes raised by the contractor (s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present guarantee being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability payment therein under and the contractor (s) shall have no claim against us for making such payment.

4) We……..further agree that the guarantee herein (indicate the name of the bank) Contained shall remain in full force during the **SIX months period.**

5) We……..further agree with the Institute that (Indicate the name of the Bank) the Institute shall have the fullest liberty without our consent without effecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor (s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Institute against the said contractor (s) and to forebear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said contractor (s) or for any forbearance, act of omission on the part of the Institute on any indulgence by the Institute to the said contractor (s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

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

7) We…….lastly undertake not to revoke this (Indicate the name of the Bank) Guarantee except with the previous consent of the Institute in writing.

8) This guarantee shall be valid up to **SIX months** unless extended on demand by Institute. Notwithstanding anything mentioned above, our liabilities under this guarantee is restricted to Rs……. (Rupees ……) and unless a claim of writing is lodged with us within six month of the date of expiry or extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharge.

Dated the……..day of…….for……..(Indicate the name of the Bank)

9. Special conditions

9.1. Protection of Environment

1. The debris / construction waste and other waste generated from the work spot should not be thrown inside the campus. All waste material should be taken out of the campus or should be dumped at a place earmarked by the Engineer in charge. All construction material should be stored only at places earmarked by the engineer in charge.
2. Material like cement, aggregate, steel etc should not be stored in buildings that are in use. If any material stored in unauthorized location the same shall got removed at the cost of contractor and necessary rent shall be levied for the area used for storage.
3. For Intercarting of various materials use of animal drawn vehicles are strictly prohibited.
4. Preparation of concrete, mortars in the roads, pavements, bare floors under the building is strictly prohibited.
5. While transporting the materials along the road, spillage of material should be avoided. If any spillage occurs, the same should be got cleaned immediately.
6. No vegetation inside the campus should be damaged.
7. Smoking is strictly prohibited at workplace.

10.0 Safety at the Site

1. The contractor must appoint a qualified person (full time) for taking care of implementation of Safety systems
2. The Contractor shall submit the **Project Safety Plan** stating the methodology of implementation of systems to ensure the safe and environment friendly work place. The Safety Plan must include the following.

    a. Organization Chart
    b. Reporting relationship of the safety enforcement personal in a flow chart
    c. Safety Committee Structure – Chairman, secretary and committee members

10.1 Roles & Responsibilities of the Safety committee

Enforcement of

1. applicable Statutory requirements, standards and codes related to safety and its adherence,
2. General safety rules and regulations concerning use of personal protective equipment and safety devices relevant to site activities, Awareness and Training Programs, Motivational schemes, programs for safe Access, Egress and workstation safety
3. Safe use of construction power supply and upkeep / maintenance of installations
4. Work permit systems
5. Use, maintenance and inspection of Plant & machinery
6. Scaffold & formwork norms
7. Use, maintenance and inspection of Lifting Tools
8. Fire Protection and prevention
9. Emergency preparedness

10.2.1 Status of Safety implementation at site will be discussed in the Weekly Review meeting. Contractor must submit the safety statistics every month in the enclosed format. Merit Certificate will be issued for the achievement of safety mile stones like 0.5 million safe man hours, one million safe man hours,1.5 million safe man hours and so on.

10.2.2 The General Guidelines governing the safety implementation shall include the following Rules., while preparing the safety plan.

1. All the workmen shall undergo Safety Induction, screening before engaging them on the job. Physical fitness of the person to certain critical jobs like working at

height or other dangerous locations to be ensured before engaging the person on work.

2. Sub-contractors shall ensure adequate supervision at workplace. They shall ensure that all persons working under them shall not create any hazard to self or to co-workers.
3. Nobody is allowed to work without wearing safety helmet. Chinstrap of safety helmet shall be always on. Drivers, helpers and operators are no exception.
4. All labour should be dressed properly attending to work wearing dhotis, lungies should be avoided to the extend possible.
5. The workmen shall wear suitable protection devices like mask, gloves, shoes etc,
6. No one is allowed to work at or more than three meters height without wearing safety belt and anchoring the lanyard of safety belt to firm support preferably at shoulder level.
7. No one is allowed to enter into workplace and work at site without adequate foot protection.
8. Usage of eye protection equipment shall be ensured when workmen are engaged for grinding, chipping, welding and gas-cutting. For other jobs as and when site safety co-coordinator insists eye protection has to be provided.
9. All PPE like Safety shoes, Safety helmet, Safety belt, Safety goggles etc. shall be arranged before starting the job.
10. All excavated pits shall be barricaded & barricading to be maintained till the backfilling is done. Safe approach to be ensured into every excavation.
11. Adequate illumination at workplace shall be ensured before starting the job at night.
12. All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded. Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work platforms.
13. Erection zone and dismantling zone shall be barricaded and nobody will be allowed to stand under suspended loads.
14. Contractors should spray water using Water browser periodically in the site to reduce the dust rising due to wind.
15. Horseplay is completely prohibited at workplace. Running at the site is completely prohibited, except in the case of emergency.
16. Material shall not be thrown from the height. If required, the area shall be barricaded and one person shall be posted outside the barricading for preventing the tre-passers from entering the area.
17. Other than electricians with red helmet no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.

18. All electrical connections shall be made using 3 or 4 core cables, having a earth wire.
19. Proper Earthling pits at site to be constructed. And the sensitivity must be maintained less than 1 ohm
20. Main panel boards should have MCB's and RCCB / ELCB's (30 mA sensitivity).
21. Inserting of bare wires for tapping the power from electrical sockets is completely prohibited.
22. All major, minor accidents and near misses to be recorded and reported to the IITM and the management must take necessary steps to avoid the recurrence.
23. Scaffoldings used should be of proper construction. No Casuarina pole / bamboo scaffolding is permitted. It should be inspected by competent person(s) before use
24. All tools and tackles shall be inspected before use. Defects to be rectified immediately. No lifting tackle to be used unless it is certified by the competent authority.
25. All tools and tackles shall be tested and have a Identification no., SWL and date of next test marked on them.
26. A tools and tackles inspection register must be maintained and updated regularly.
27. Good housekeeping to be maintained. Passages shall not be blocked with materials. Materials like bricks shall not be stacked to the dangerous height at workplace.
28. Must have a reverse horn on all the Earth moving vehicles and Equipments used at site.
29. Debris, scrap and other materials to be cleared from time to time from the workplace and at the time of closing of work everyday.
30. Adequate fire fighting equipment shall be made available at workplace and persons are to be trained in fire fighting techniques with the co-ordination of site safety co-ordinator.
31. All the unsafe conditions, unsafe acts identified by contractors, reported by site supervisors and / or safety personnel to be corrected on priority basis.
32. No children shall be allowed to enter the workplace.
33. Other than the Driver / operator, no one shall travel in a tractor / tough rider etc.
34. All the lifting tools and tackles shall be stored properly when not in use.
35. Clamps shall be used on Return cables to ensure proper earthling for welding works.
36. Return cables shall be used for earthling.
37. All the pressure gauges used in gas cutting apparatus shall be in good working condition.
38. Proper eye washing facilities shall be made in areas where chemicals are handled.

39. Connectors and hose clamps are used for making welding hose connections.
40. Proper warning boards and caution notices to be displayed at required areas inside the site.
41. All cranes must have a trained signal man for signaling.
42. All underground cables for supplying construction power shall be routed using conduit pipes.
43. Spill trays shall be used to contain the oil spills while transferring / storing them.
44. Tapping of power by cutting electric cables in between must be avoided. Proper junction boxes must be used.

10.3 Any violation of above will attract levy of penalty by the engineer in charge on the contractor.

11. INSURANCE

1. Insurance of Works

The Contractor shall effect Contractor's all risk insurance policy (CAR policy) in the joint names of the Employer and the Contractor, the name of the former being placed first in the policy, covering the following:

(a) The Works at the contract price together with the materials for incorporation in the works at their replacement value.

(b) All plants and equipment and other things brought to the site by the Contractor at their replacement value.

The insurance shall be against all losses or damages from whatever causes, other than excepted risks, as defined in Clause 2 of Conditions of Contract, for which the Contractor is responsible under the Contract. The insurance cover shall be for the period of contract and also for the period of maintenance, for loss or damage arising from a cause prior to commencement of the period of maintenance, and for any loss or damage, occasioned by the Contractor in the course of any operations carried out for the purpose complying with his course of any operations carried out for the purpose of complying with his obligations during maintenance period under Clause 17 of Clauses of Contract. Such insurance shall be effected with an insurer and with terms approved by the Employer. The Contractor shall, whenever required, produce the policy or policies and the receipts for payment of the current premiums.

2. Third Party Insurance

Before commencing the execution of the Works, the contractor shall insure against the liability for any material or physical damage, loss or injury which may occur to any property or life including that of the Employer or to any person, including any employee of the Employer, by or arising out of the execution of the works or in the carrying out of the Contract. The sum insured will be for Rs.5 lakhs. Such insurance shall be effected with an insurer and in terms approved by the Employer. The Contractor shall, whenever required, produce before the Engineer-in-charge the policy or policies of insurance and the receipts of payment of the current premiums.

3. Workmen's Insurance

The Employer's shall not be liable for any payment in respect of any damages or compensation payable according to law in respect or in consequence of any accident or injury or loss of life to any workman or other person in the employment of the Contractor or any sub-contractor, except an accident or injury resulting from any act or default of the Employer, his agents or servants. The Contractor shall insure against such liability with an insurer approved by the Employer for sum of the established norms during the entire period till completion of Period of Maintenance.

4. Recovery from the Contractor

Without prejudice for the other rights of the Employer against the Contractor in respect of default, the Employer shall be entitled to deduct from any sums payable to the Contractor the amount of any damages, compensation costs, charges and other expenses paid by the Employer and which are payable by the Contractor under this clause.

5. **Extension of time**

The Contractor, in case of rebuilding or reinstatement, shall be entitled to such extension of time for completion as the Engineer-in-charge may deem fit, but shall, however not be entitled to reimbursement by the Employer of any shortfall or deficiency in the amount finally paid by the insurer in settlement of any claim arising as set out herein.

6. Insurance by Sub-Contractors

Without prejudice to his liability under this clause the Contractor shall also cause all Sub-Contractors to effect, for their respective portions of the works, similar policies of insurance in accordance with the provisions of this clause and shall produce or cause to produce to the Employer such policies. The Contractor shall not permit a Sub-Contractor to commence work at the site unless the said insurance policies are submitted. In the event of failure of the Sub-Contractor to take out such a policy of insurance before commencing the works at the site, the Contractor shall be responsible for any claim or damage attributable to the said Sub-Contractor.

7. Period of Policies

All the insurance covers mentioned above shall be kept alive during the complete period of the contract. If the Contractor shall fail 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 the Contract, then and in any such case the Employer on advice of the Engineer-in-Charge may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Employer as aforesaid from any moneys due or which may become due to the Contractor, or recover the same as debt due from the Contractor.

8. Damage to Persons and Property – Employer to be Indemnified

The Contractor shall indemnify the Employer against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the works and against all claims, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto, except any compensation or damages for or with respect to:

(a) The permanent use or occupation of land by the works or any part thereof.

(b) The right of the Employer to execute the works or any part thereof on, over, under, in

or through any land.

(c) Injuries or damage to persons or property resulting from any act or neglect of the Employer, his agents, servants or other contractors, not being employed by the Contractor or for or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents, such part of the compensations as may be just and equitable having regard to the extent of the responsibility of the Employer, his servant or agent or other Contractors, for the damage or injury.

-Sd-

Signature of Contractor

Executive Engineer (E)

12. Progress Reports

The contractor shall submit monthly progress report of the work in a computerized form. The progress report shall contain the following.

1. Construction schedule of the various components of the work through bar chart for the next 3 quarters, showing the milestones, targeted tasks and up to date progress.
2. Progress chart of the various components of the work that are planned and achieved for the month as well as cumulative up to the month with reasons for deviations, if any, in a tabular 12.format.
3. Plant and machinery statement, indicating those deployed in the work, and their working status.
4. Man power statement, indicating the labour and staff employed in the work and the details of work carried out.
5. Financial statement, indicating the broad details of all the running account payments received up to date, such as gross value of work done. Advances taken, recoveries effected, amounts withheld, net payments, details of payments received, etc.
6. A statement showing the extra and substituted items submitted by the contractor and the payments received against them, items pending for sanctions / decisions by the Institute , broad details of the bank guarantees, indicating their validity period, board details of the insurance policies taken by the contractor, if any, advances received and adjusted from the department etc.
7. Progress photographs in colour of the various items / components of the work done up to date to indicate visually the actual progress of the work.
8. Quality assurance and quality control tts conducted during the month with results thereof.
9. Safety report.
10. Other details asked for by the engineer-in-charge.

Proforma for Reports

Physical Progress

Name of Item	Quantity as per Agreement	Quantity executed during the month	Total up to date quantity executed	Anticipated balance quantity

Financial Progress

Amount of work done during the month	Total amount of work done up to date	Anticipated amount of balance work

TOTAL MANHOURS WORKED DURING THE MONTH

S. N	Description	Number	Man-hours worked	OT Performed	Total
1	Company Staff				
2	Subcontractor's Workmen (including security personnel				
	GRAND TOTAL OF MANHOURS WORKED DURING THE MONTH				

Total Man-hours worked since inception :

Safe man hours from last reported :

Lost time due to injury :

Details of Reportable Lost Time Injury

S N	Name of Injured	Date of Accident	Resumed duty on	Man days lost			Claim Status
				Up to last month (1)	This month (2)	Total (1+2)	

Man days Lost during the month (Cumulative of 2)	

Number of Dangerous Occurrences : _____

No of Near Miss Cases : _____

Routed through

Site In charge /Time Keeper

Signature:_____

Date: _____

Site Safety Co-ordinator

Signature:

Date: _____

The contractor has to submit the progress report to the Engineer-in-Charge in triplicate by 10th day of every month as per the above proforma along with photographs of the work done during that month. The contractor shall be charged @ Rs.5000 (Rupees five thousand only) in the event of non-receipt of monthly progress report on due date (i.e. on 10th of every month) in the manner prescribed above. In case 10th day happens to be a closed holiday then the progress report will be submitted on the next working day.

A videography of the work should be undertaken at various stages of construction right from the day of start of work to date of completion / occupation covering all major events inspections etc. The videography shall be reviewed time to time by the Engineer in charge.

13.0 CPWD - FORM - 8

CLAUSES OF CONTRACT

CLAUSE 1

i. The contractor shall submit an irrevocable performance guarantee of 5 % (Five percent) of the tendered amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and / or without prejudice to any other provisions in the contract) within the period specified in schedule 'F' from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-charge upto a maximum as specified in schedule 'F' on written request of contractor stating the reason for delays in procuring the performance guarantee, to the satisfaction of the Engineer-in-charge. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs.10,000/-) or Banker's Cheque of any scheduled bank / Demand Draft of any scheduled Bank

ii. The performance guarantee shall be initially valid upto the stipulated date of completion plus 60 days beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of performance guarantee extended to cover such enlarged time for completion of work. After recording of the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor, without any interest.

iii. The Engineer-in-charge shall not make a claim under the performance guarantee except for amounts to which the Institute is entitled under the contract (not withstanding and / or without prejudice to any other provisions in the contract agreement). In the event of:

(a) Failure by the contractor to extend the validity of the Performance guarantee as described herein above, in which event the Engineer-in-charge may claim the full amount of the performance guarantee.

(b) Failure by the contractor to pay the Institute any amount due, either as agreed by the Contractor or determined under any of the clauses / conditions of the agreement, within 30 days of the service of the notice to this effect by Engineer-in-charge.

iv. In the event of contract being determined or rescinded under provision of any of the Clause / Condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Institute.

CLAUSE 1 A

The person/persons whose tender(s) may be accepted (herein after called the contractor) shall permit Institute at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5 % of the gross amount of each running bill till the

sum along with the sum already deposited as earnest money, will amount to security deposit of 5 % of the tendered value of the work. Such deductions will be made and held by Institute by way of Security Deposit unless he/ they has / have deposited the amount of Security at the rate mentioned above in cash.

All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from or from any sums which may be due to or may become due to the contractor by the Institute on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions.

The contractor shall within 10 days make good in cash any sum or sums which may have been deducted from his security deposit or any part thereof. The security deposit shall be collected from the running bill of the contractor at the rates mentioned above and the earnest money deposited at the time of tenders will be treated as a part of security deposit.

The Security deposit as deducted above can be released against bank guarantee issued by a scheduled bank, on its accumulations to a minimum of Rs 5 Lakhs subject to the condition that amount of such bank guarantee, except last one shall not be less than Rs 5 Lakhs.

CLAUSE 2

If the contractor fails to maintain the required progress in terms of clause 5 or fails to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the Institute on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below by the authority specified in schedule 'F' (whose decision in writing shall be final and binding) may decided on the amount of tendered value of the work for every completed day / month (as applicable) that the progress remains below the specified in clause 5 or that the work remains incomplete.

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

i. Compensation for delay of work : @ 1.5 % per month of delay to be computed on per day basis

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

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the Institute. In case, the contractor does not achieve a particular milestones mentioned in schedule 'F', or the re-scheduled milestone(s) in terms of clause 5.4, the amount shown against that milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the

contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestones, amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

CLAUSE 2A

In case, the contractor completes the work ahead of scheduled completion time, a bonus @ 1 % (one percent) of the tendered value per month, computed on per day basis shall be payable to the contractor, subject to a maximum limit of 5 % (five percent) of the tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Provided always that provision of the clause 2 A shall be applicable only when so provided in schedule 'F'.

CLAUSE 3

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

If the contractor having been given by the Engineer-in-charge a notice in writing to rectify, reconstruct or replace any defective work or that work is being performed in an inefficient or otherwise improper or un workman like manner shall omit to comply with the requirement of such notice for a period of 7 days thereafter.

If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the w ork with due diligence so that in the opinion of the Engineer-in-charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-charge.

If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completions and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-charge.

If the contractor persistently neglects to carry out his obligations under the contract and / or commits default complying with any of the terms and conditions of the contract and does not a remedy it or takes effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-charge.

If the contractor shall offer to give or agree to give to any person in Government service or to any other person on his behalf any gift or consideration of any kind as an inducement or

reward for doing or for bearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for Government.

If the contractor shall enter into a contract with the Institute in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer – in – Charge.

If the contractor shall obtain a contract with the Institute as a result of wrong tendering or other non-bonafide methods or competitive tendering.

If the contractor being an individual or if a firm any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any insolvency Act of the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditor or purport so to do, or if any application be made under insolvency act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.

If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receive or a manager on behalf of a creditor shall be appointed or if the circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.

If the contractor shall suffer an execution being levied on his good and allow it to be continued for a period of 21 days.

If the contractor assigns transfers, sublets (engagement of labour on piece – work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof with out the prior written approval of the Engineer – in – charge.

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

To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and performance guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the Institute.

After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part there of, as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined or

rescinded as above, shall not be allowed to participate in the tendering process for the balance work.

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

CLAUSE 3 A

In case, the work cannot be started due to reason not within the control of the contractor within 1/8th of the stipulated time for the completion of the work, either party may close the contract. In such an eventuality, the earnest money deposit and performance guarantee of the contractor shall be refunded, but no payment on account of interest, loss of profit or damages etc. shall be payable at all.

CLAUSE 4

In any case in which any of the powers conferred upon Engineer-in-charge by clause 3 thereof, shall have become exercisable and the same are not exercised, the non exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensations shall remain unaffected. In the event of Engineer-in-charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take positions of (or at the sole discretion of the Engineer-in-charge which shall be final and binding on the contractor) use as on hire, (the amount of the hire money being also in the final determination of the Engineer-in-charge) all or any tools, plants, materials and stores in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work / or any part thereof, paying or allowing for the same in account at the contract rates, or, in the case of this not being applicable, at current market rates to be certified by the Engineer-in-charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice) in the event of the contactor failing to comply with any such requisition, the Engineer-in-charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor on his risk in all respects and certificate of the Engineer-in-charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

CLAUSE 5

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

5.1 As soon as possible after the contract is concluded the contractor shall submit a time and progress chart for each mile stone and get it approved by the Engineer-in-charge. The chart shall be prepared in direct relation to the time slated in the contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-charge and the contractor within the limitations of time imposed in the contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given in Schedule 'F’.

5.2 If the work(s) be delayed by :

Force majeure, such as abnormally bad weather, flood, cyclone or any other act of God or serious loss or damage by fire, or civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work or any other cause which, in the absolute discretion of the Engineer in charge is beyond the Contractor’s control then upon the happening of any such event causing delay, the contractor shall immediately give notice

thereof in writing to the Engineer-in-charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-charge to proceed with the works.

5.3 Request for rescheduling of milestones and extension of time, to be eligible for consideration, shall be made by the contractor in writing within fourteen days of the happening of the event causing delay on the prescribed form. The contractor may also, if practicable, indicate in such a request the period for which extension is desired.

5.4 If any such case the Engineer in Charge may give a fair and reasonable extension of time and reschedule the mile stone for completion of work. Such extension shall be communicated to the contractor by the Engineer-in-charge in writing, within 3 months of the date of receipt of such request. Non-application by the contractor for extension of time

shall not be a bar for giving a fair and reasonable extension by the Engineer-in-charge and this shall be binding on the contractor.

CLAUSE 6

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CLAUSE 6A

Engineer – in – charge shall, except as otherwise provided ascertain and determine measurement for the value of work done in accordance with the contract.

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

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

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

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

The contractor shall also submit to the Engineering Unit separately his computerized Abstract of cost and the bill based on these measurements, duly bound and its pages machine numbered along with two spare copies of the 'bill'. Thereafter this bill will be processed by the Engineering Unit and allot a number as per computerized record in the same way as done for the measurement book meant for measurements.

The contractor shall, without extra charge, provide assistance with every appliance, labour and other things necessary for checking of measurements / levels by the Engineer – in – Charge or his representative.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with procedure set forth in the specifications notwithstanding any provision in the relevant standard methods of measurements or any general or local custom. In the case of items which are not covered by specifications, measurement shall be taken in accordance with the relevant standard method of measurement issued by Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The contractor shall give not less than 7 days notice to the Engineer-in-charge or his authorized representative in charge of the work before covering up or otherwise placing beyond the reach of checking and / or test checking the measurement of any work in order that the same may be checked and / or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking measurement and / or test checking measurement and shall not cover up and place beyond reach of measurement of any work without consent in writing of the Engineer-in-charge or his authorized representative in-charge of the work who shall within the aforesaid period of 7 days inspect of the work, and if any work shall be covered up or placed beyond the reach of checking and / or test checking measurements without such notice having been given or the Engineer-in-charge's consent being obtained in writing the same shall be uncovered at the contractor expenses or in default thereof no payment or allowance shall be made for such work or the material with which the same was executed

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

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

CLAUSE 7

No payment shall be made for work, estimated to cost Rs.25 Lakhs/- or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over Rs.25 Lakhs/- the interim of running account bill shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the Institute in triplicate on or before the date of every month fixed for the same by the Engineer-in-charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment / adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in schedule 'F' in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is achieved. Engineer-in-charge shall arrange to have the bill verified by the taking or causing to be taken, where necessary, the requisite measurement of the work. In the event of the failure of the contractor to submit the bills Engineer-in-charge shall prepare or cause to be prepared such bills in which the events no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in-charge certifying the sum to which the contractor is considered entitled by way of interim payment of such rates as decided by the Engineer-in-charge. The amount admissible shall be paid within 21 working days after day of presentation of the bill by the contractor to the Engineer-in-charge

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

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

The Engineer-in-charge in his sole discretion on the basis of a certificate from his Site Engineer to the effect that work has been completed up to the level in question make interim advance payments without detailed measurement for work done (other than foundation, item, to be covered under finishing items) upto lintel level (including sunshade etc) and slab level for

each floor working out at 75 % of the assessed value. The advance payment so allowed shall be adjusted in the subsequent interim bill by taking detailed measurement thereof.

CLAUSE 8

Within 10 days of the completion of the work the contractor shall give notice of such completion to the Engineer-in-charge and within 30 days of the receipt of such notice the Engineer-in-charge shall inspect the work and if there is no defect in the work shall furnish the contractor a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the Contractor and / or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of the completion shall be issued, nor shall the work be considered to be completed until the contractor shall have removed from the permission on which the work shall be executed all scaffolding, surplus materials, rubbish, all huts and sanitary arrangements required his / their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and clean of the dirt from all wood work, doors, windows, walls, floor, other part of the buildings, in, upon, or above which the work is to be executed or which he may have had positions for the purpose of the execution thereof, and not until the work shall have been measured by the Engineer-in-charge. If the contractor shall fail to comply with the requirement of this clause as to removal of scaffoldings, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning of dirt on or before the date fixed for the completion of the work, the Engineer-in-charge may at the expense of the contractor remove such scaffoldings, surplus materials and rubbish etc. and dispose of the same as he thinks fit and clean of such dirt as aforesaid and the contractor shall have no claim in respect of scaffolding surplus materials as aforesaid except for any some actually realized by the sale thereof.

CLAUSE 8A

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

CLAUSE 8 B

The contractor shall submit completion plan as required vide general specification for electrical works (Part I – Internal) 2005 and (Part II – External) 1994 as applicable within 30 days of the completion of the work.

In case the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5 % of the value of the work subject to a ceiling of Rs.50,000/- (Rupees fifty thousand only) as may be fixed by the Executive Engineer concerned and in this respect the decision of the Executive Engineer shall be final and binding on the contractor.

CLAUSE 9

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-charge whichever is earlier. No further claim shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of this bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-charge, will, as far as possible be made within the period specified herein under, the period being reckoned from the date of receipt of the bill by the Engineer-in-charge or his authorized Assistant Executive Engineer, complete with account of materials issued by the Department and dismantled materials.

i. if the tendered value of work is upto Rs.15 Lakhs : 3 months.

ii. if the tendered value of work exceeds Rs.15 Lakhs : 6 months.

CLAUSE 9 A

Payments due to the contractor be made to his bank registered financial co-operative or thrift societies or recognized financial institutions instead of direct to him. The contractor has to furnish the Engineer-in-charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank. Registered, Financial, Co-operative or Thrift Societies or recognized financial institutions to receive payments and (2) his own acceptance of the correctness of the amount made out as being due to him by Institute or his signature on the bill or other claim performed against Institute before settlement by the Engineer-in-charge of the account of claim by payment to the Bank, registered, financial, co-operative or thrift society, recognized financial institutions. While the receipt given by such banks, registered, financial, co-operative or thrift societies or recognized financial institutions shall constitute a full and sufficient discharge for the payment the contractor shall whenever possible present his bills duly receipted and discharged through his bank, registered financial, co-operative or thrift society, recognized financial institutions.

Nothing herein contained shall operate to create in favour of the bank; registered financial co-operative or thrift society, recognized financial institutions any rights or equities vis-à-vis the Institute.

CLAUSE 10

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CLAUSE 10 A

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

The contractor shall, at his own expense and without delay, supply to the Engineer-in-charge samples of materials to be used on the work and shall get his approval in advance. All such materials to be provided by the contractor shall be in conformity with specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-charge furnish proof, to the satisfaction of the Engineer-in-charge that the materials so comply. The Engineer-in-charge shall within 30 days of supply of samples or within such further period as he may require intimate to the contractor in writing whether samples are approved by him or not. If samples or not approved the contractor shall forthwith arrange to supply to the Engineer-in-charge for his approval fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with the specifications, approval of the Engineer-in-charge shall be issued after the test results are received.

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

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

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

The contractor shall at his own expense provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with testing equipments as specified in schedule – 'F'.

CLAUSE 10 B

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

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

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

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

An advance for plant, machinery & shuttering material required for the work and brought to site by the contractor may be given, if requested by the contractor in writing, within one month of bringing such plant and machinery to site. Such advance shall be given on such plant and machinery, which in the opinion of the Engineer-in-charge will add to the expeditious

execution of work and improve the quality of work. The amount of advance shall be restricted to 5 % (five percent) of the tender value. In the case of new plant and equipment to be purchased for the work, the advance shall be restricted to 90 % of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence satisfactory to the Engineer-in-charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50 % of the depreciated value of plant and equipment as may be decided by the Engineer-in-charge. The contractor shall, if so required by the Engineer-in-charge submit the statement of value of such old plant and equipment duly approved by a Registered Value recognized by the Central Board of Direct Taxes under the Income-Tax Act, 1961. No such advance shall be paid on any plant and equipment of perishable nature and on any plant and equipment of a value less than Rs.50,000/- seventy five per cent of such amount of advance shall be paid after the plant & equipment is brought to site and balance twenty five percent on successfully commissioning the same.

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

Leasing company, which gives certificate of agreeing to lease equipment to the contractor.

Engineer-in-charge and the contractor.

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

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

The mobilization advance and plant and machinery advance in (ii) & (iii) above bear simple interest at the rate of 10 percent per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced and interest shall be made by the deductions from the contractors bills commencing after first 10% of the Gross value of the work is executed and paid, on prorata percentage basis to the Gross value of the work build beyond 10% in such a way that the entire advance is recovered by the time 80% of the Gross value of the contract is

executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

If the circumstances are considered reasonable by the Engineer-in-charge, the period mentioned in (ii) and (iii) for request by the contractor in writing for grant of mobilization advance and plant and equipment advance may be extended at the discretion of the Engineer-in-charge.

The said bank guarantee for advances shall initially be made for the full amount and valid for the contract period, and be kept renewed from time to time to cover the balance amount and likely period of complete recovery together with interest.

CLAUSE 10 C

If after submission of the tender, the price of any material incorporated in the works(excluding the materials covered under Clause 10CA and not being a material supplied the Engineer-in-Charge's stores in accordance with Clause 10 thereof) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty) beyond the prices/wages prevailing at the time of the last stipulated date of receipt of tenders including extensions, if any, for the work during contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, then the amount of the contract shall accordingly be varied and provided further that any such increase shall be limited to the price/wages prevailing at the time of stipulated date of completion or as prevailing for the period under consideration, whichever is less. If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) and/or wages of labour as prevailing at the time of last stipulated date of receipt of tender including extensions, if any, is decreased as a direct result of the coming into force of any fresh law or statutory rules or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty), Institute shall in respect of materials incorporated in the works (excluding the materials covered under Clause 10CA and not being material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 hereof) and/or labour engaged on the execution of the work after the date of coming into force of such law statutory rule or order be entitled to deduct from the dues of the contractor, such amount as shall be equivalent to the difference between the prices of the materials and/or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the prices of materials and/or wages of labour on the coming into force of such law, statutory rule or order. This will be applicable for the contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2.

Engineer-in-Charge may call books of account and other relevant documents from the contractor to satisfy himself about reasonability of increase in prices of materials and wages. The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such materials and/or wages of labour, give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply.

For this purpose, the labour component of the work executed during period under consideration shall be the percentage as specified in Schedule F, of the value of work done during that period and the increase/decrease in labour shall be considered on the minimum daily wages in rupees of any unskilled adult male mazdoor, fixed under any law, statutory rule or order.

Clause 10 CA

If after submission of the tender, the price of materials specified in schedule 'F' increases / decreases beyond the price(s) prevailing at the time of the last stipulated date for receipt of tenders (including extension, if any) for the work, then the amount of the contract shall accordingly be varied and provided further that any such variations shall be effected for stipulated period of contract including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2

However for work done / during the justified period extended as above it will be limited to indices prevailing at the time of stipulated date for completion or as prevailing for the period under consideration, whichever is less.

The increase / decrease in prices shall be determined by the All India wholesale price indices of Materials as published by Economic Advisor to Government of India, Ministry of Commerce and Industry and base price for material as issued under the authority of Director General (Works), CPWD as valid on the last stipulated date of receipt of tender, including extension if any and for the period under consideration. In case price index of a particular material is not issued by the Ministry of Commerce and Industry the price of nearest similar material as indicated in schedule F shall be followed.

The amount of the contract shall accordingly be varied for all such materials and will be worked out as per the following formula given below :

a) Adjustment for component of '**Cement'**

$$V = P \times Q \times \frac{CI - CI_0}{CI_0}$$

Where,

V = Variation in material cost i.e. increase or decrease in the amount in Rupees to be paid or recovered.

P = Base Price of materials as issued under authority of DG (W), CPWD valid at the time of the last stipulated date of receipt of tender including extensions, if any.

Q = Quantity of materials used in the works since previous bill.

CI_0 = All India wholesale Price Index for the material as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce as valid on the last stipulated date of receipt of tenders including extensions, if any.

CI = All India wholesale Price Index for the material for period under consideration as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce.

(In respect of the justified period extended under the provisions of clause 5 of the contract with out any action under clause 2, the index prevailing at the time of stipulated date of completion or the prevailing index of the period under consideration whichever is less shall be considered)

b) Adjustment for component of '**Steel'**

$$Vs = Ps \times Q_s \times \frac{SI - SI_0}{SI_0}$$

Where,

Vs = Variation in cost of steel reinforcement bars i.e. increase or decrease in the amount in rupees to be paid or recovered.

Ps = Base Price of steel reinforcement bars, as issued under authority of DG (W), CPWD at the time of the last stipulated date of receipt of tender including extensions, if any.

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

SI_0 = All India wholesale Price Index for Steel (bars & rods) for the period under consideration as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce as valid on the last stipulated date of receipt of tenders including extensions, if any.

SI = All India wholesale Price Index for Steel (bars & rods) for the period under consideration as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce.

Note: (i) In respect of the justified period extended under the provisions of clause 5 of the contract with out any action under clause 2, the index prevailing at the time of stipulated date of completion or the prevailing index of the period under consideration whichever is less shall be considered)

(ii) If during progress of work or at the time of completion of work, it is noticed that any material brought at site is in excess of requirement, then amount of escalation if paid earlier on such excess quantity of material shall be recovered on the basis of cost indices as applied at the time of payment of escalation or as prevailing at the time of effecting recovery, whichever is higher.

Provided always that provisions of the preceding Clause 10 C shall not be applicable in respect of materials covered in this clause.

CLAUSE 10 CC

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CLAUSE 10 D

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

CLAUSE 11

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

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

CLAUSE 12

The Engineer-in-charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may

appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with nay instructions given to him in writing signed by the Engineer-in-charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein any in any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

12.1 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, be extended, if requested by the contractor, as follows :

i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus.

ii) 25 % of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-charge.

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

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

In the case of substituted items (items that are taken up with partial substitution or in lieu of items of work in the contract), the rate for the agreement item (to be substituted) and substituted item shall also be determined in the manner as mentioned in the following para

If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be

substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

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

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

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

12.5 For the purpose of operation of Schedule 'F', the following works shall be treated as works relating to foundation unless & otherwise defined in the contract.

(i) For Buildings : All works up to 1.2 metres above ground level or up to floor 1 level whichever is lower.

(ii) For abutments, piers and well staining : All works up to 1.2 m above the bed level.

(iii) For retaining walls, wing walls, compound walls, chimneys, over head reservoirs/tanks and other elevated structures : All works up to 1.2 metres above the ground level.

(iv) For reservoirs/tanks (other than overhead reservoirs/tanks) : All works up to 1.2 metres above the ground level.

(v) For basement: All works up to 1.2 m above ground level or up to floor 1 level whichever is lower.

(vi) For Roads, all items of excavation and filling including treatment of sub base.

12.6 Any operation incidental to or necessarily has to be in contemplation of tenderer while filing tender, or necessary for proper execution of the item included in the Schedule of

quantities or in the schedule of rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said schedule of rates, as the case may be. Nothing extra shall be admissible for such operations.

CLAUSE 13

If at any time after acceptance of the tender, the Institute shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

The contractor shall be paid at contract rates full amount for works executed at site and, in addition, a reasonable amount as certified by the Engineer-in-charge for the items hereunder mentioned which could not be utilized on the work to the full extent in view of the foreclosure:

Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.

Institute shall have the option to take over contractor's materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however, Institute shall be bound to take over the materials or such portions thereof as the contractor does not desire to retain. For materials taken over or to be taken over by Institute, cost of such materials as detailed by Engineer-in-charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.

If any materials supplied by Institute are rendered surplus, the same except normal wastage shall be returned by the contractor to Institute at rates not exceeding those at which these were originally issued less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting such materials from site to Institute stores, if so required by Institute, shall be paid.

Reasonable compensation for transfer of T & P from site to contractor's permanent stores or to his other works, whichever is less. If T & P are not transported to either of the said places, no cost of transportation shall be payable. Reasonable compensation for repatriation of contractor's site staff and imported labour to the extent necessary.

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

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

CLAUSE 14

If contractor:

i. At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; or.

ii. Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; or

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

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

(a) Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/or

(b) Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor

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

In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The

certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the Institute are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by Institute in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by Institute as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to Institute in law or per as agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days. If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.

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

CLAUSE 15

The contractor shall, on receipt of the order in writing of the Engineer-in-charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons :

on account of any default on the part of the contractor or; for proper execution of the works or part thereof for reasons other than the default of the contractor; or for safety of the works or part thereof.

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

If the suspension is ordered for reasons (b) and (c) in sub-para (i) above; the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25 % for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and ; If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-charge may consider

reasonable in respect of salaries and / or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2 % to cover indirect expenses of the contractor. Provided the contractor submits his claim supported by details to the Engineer-in-charge within fifteen days of the expiry of the period of 30 days.

If the works or part thereof is suspended on the orders of the Engineer-in-charge for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-charge requiring permission within fifteen days from receipt by the Engineer-in-charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by Institute or where it affects whole of the works, as an abandonment of the works by Institute shall with in 10days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-charge. In the event of the contractor treating the suspension as an abandonment of the contract by Institute, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-charge may consider reasonable, in respect of salaries and / or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2 % to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-charge within 30 days of the expiry of the period of 3 months.

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

CLAUSE 16

All works under or in course of execution or executed in pursuance of the contract shall at all times be open and accessible to the inspection and supervision of the Engineer-in-charge, his authorized subordinates in charge of the work and all the superior officers, officer of the Quality Assurance unit of the Institute or any organization engaged by the Institute for Quality Assurance and of the Chief Technical Examiner's Office , and the contractor shall, at all times, during the usual working hours and all at other time at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose.

Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-charge or his authorized subordinates in-charge of the work or officers of the organization engaged by the Institute for quality assurance to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made with in twelve months (six months in case of work costing Rs. 10 Lac and below except road work) of the completion of the work from the Engineer-in-charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause 2 of the contract (for non-completion of the work in time) for this default.

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

CLAUSE 17

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grass land, or cultivated grand contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within twelve months (six months in the case of work costing Rupees Ten lacks and below except road work) after a certificate final or otherwise of its completion shall have been given by the Engineer-in-charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-charge as cause the same to be made good by other workmen and deduct the expense from any sums that may be due or at any time thereafter may become due to the

contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months (six months in the case of work costing Rupees Ten lakhs and below except road work) after the issue of the certificate final or otherwise of completion of work or till the final bill has been prepared and passed whichever is later. Provided that incase of road work, in the opinion of the Engineer in charge, half of the security deposit is sufficient, to meet al liabilities of the contractor under this contract, half of the security will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later.

In case of Maintenance and Operation works of E & M services, the security deposit deducted from contractors shall be refunded within one month from the date of final payment or within one month from the date of completion of the maintenance contract whichever is earlier.

CLAUSE 18

The contractor shall provide at his own cost all materials (except such special materials if any as may in accordance with the contract be supplied form the Engineer – in – Charge stores), machinery, tools & Plants as specified in schedule 'F'. In addition to this appliances, implements, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing the same may be provided by the Engineer-in-charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

CLAUSE 18 A

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

CLAUSE 18 B

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

CLAUSE 19

The contractor shall obtain a valid license under the Contract Labour (R&A) Act 1970, and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labour (Prohibition and Regulation) Act, 1986.

The contractor shall also comply with the provision of the building and other construction workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

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

CLAUSE 19A

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

CLAUSE 19B

Payment of Wages:

The contractor shall pay to labour employed by him either directly or through sub-contractors, wages not less than fair wages as defined in the C.P.W.D. Contractor's Labour Regulations or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and the contract Labour (Regulation and Abolition) Central Rules, 1971, wherever applicable.

The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.

In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this

contract, the contractor shall comply with or cause to be complied with the Central Public Works Department contractor's Labour Regulations made by Government of India from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorizedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other matters of the like nature or as per the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, and the Contract labour (Regulation and Abolition) Central Rules 1971, wherever applicable.

a) The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the regulations.

b) Under the provision of Minimum wages (Central) Rules, 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labors and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-charge concerned.

The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947 Maternity Benefits Act, 1961, and the Contractor's Labour (Regulation and Abolition) Act 1970, or the modifications thereof or any other laws relating thereto and the rules made thereunder from time to time.

The Contractor shall indemnify and keep indemnified institute against payments to be made under and for the observance of the laws aforesaid and the C.P.W.D. Contractor's labour Regulations without prejudice to this right to claim indemnity from his sub-contractors.

The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.

Whatever is the minimum wage for the time being, or fi the wage payable is higher that such wage, such wage shall be paid by the contractor to the workman directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commission or otherwise.

The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

CLAUSE 19 C

In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall at this own expense arrange for the safety provisions as per C.P.W.D. Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to

pay a penalty of Rs.200/- for each default and in addition the Engineer-in-Charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

CLAUSE 19 D

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

The number of labourers employed by him on the work,

Their working hours,

The wages paid to them,

The accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them, and

The number of female workers who have been allowed maternity benefit according to Clause 19F and the amount paid to them.

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

CLAUSE 19 E

In respect of all labour directly or indirectly employed in the work for the performance of the contractor's part of this contract, the contractor shall comply with or cause to be compiled with all the rules framed by Government of India/Institute from time to time for the protection of health and sanitary arrangements for workers employed by the Institute and its contractors.

CLAUSE 19 F

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

Leave :

(i) In the case of delivery – maternity leave not exceeding 8 weeks, 4 weeks upto and including the day of delivery and 4 weeks following that day,

(ii) In the case of miscarriage – upto 3 weeks form the date of miscarriage.

Pay :

In the case of delivery – leave pay during maternity leave will be at the rate of the women's average daily earnings, calculated on total wages earned on the days when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater.

In the case of miscarriage – leave pay at the rate of average daily earning calculated on the total wages earned on the days when full time work was done during a period of three months immediately preceding the date of such miscarriage.

Conditions for the grant of maternity Leave.

No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than six months immediately preceding the date on which she proceeds on leave.

The contractor shall maintain a register of Maternity (Benefit) in the prescribed Form as shown in annexure – I and II, and the same shall be kept at the place of work.

CLAUSE 19 G

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

Should it appear to the Engineer-in-charge that the contractor(s) is / are not properly observing and complying with the provisions of the C.P.W.D. Contractor's Labour Regulations and Model Rules and the provisions of the Contract Labour (Regulation and Abolition) Act 1970, and the Contract Labour (R&A) Central Rules 1971, for the protection of health and sanitary arrangements for work-people employed by the contractor(s) (hereinafter referred as 'the said Rules') the Engineer-in-charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and / observe the said Rules and to provide the amenities to the work-people as aforesaid, the Engineer-in-charge shall have the power to provide the amenities herein before mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/their own expense and to approved standards all necessary huts and sanitary arrangements required for his / their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Engineer-in-charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be remodeled and/or reconstruct such huts and sanitary arrangements according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

CLAUSE 19 H

Deleted

CLAUSE 19 I

The Engineer-in-charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors employ upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements.

CLAUSE 19 J

It shall be the responsibility of the contractor to see that the building under construction is not occupied by any body unauthorized during construction, and is handed over to the Engineer-in-charge with vacant possession of complete building, If such building through completed is occupied illegally, then the Engineer-in-charge shall have the option to refuse to accept the said building / buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay a levy upto5% of tendered value of work may be imposed by the Engineer-in-charge whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, the Engineer-in-charge, thorough a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

CLAUSE 19K

The contractor shall, at all stages of work, deploy skilled / semi skilled tradesmen who are qualified and possess certificate in particular trade from CPWD training institute / Industrial Training Institute / national Institute of Construction Management and Research (NICMAR) / National Academy of Construction / CIDC or any similar reputed and recognized institute managed ./ certified by State / Central Government. The number of such qualified tradesmen shall not be less than 20 % of total skilled / semi skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade , its scheduling and the list of qualified tradesmen along with requisite certificate from recognized institute to Engineer – in – charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade the contractor shall substitute such tradesmen with in two days of written notice from Engineer in charge . Failure on the part of the contractor to obtain approval of Engineer – in – charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of RS 100 per such tradesman per day. Decision of the Engineer – in – charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding. Provided always, the provisions of this clause, shall not be applicable for works with estimated cost put to tender being less than Rs 5 crores

CLAUSE 20

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

CLAUSE 21

The contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or person in the employ of Government in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the Institute shall have

power to adopt the course specified in Clause 3 hereof in the interest of Institute and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

CLAUSE 22

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

CLAUSE 23

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

CLAUSE 24

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

CLAUSE 25

Settlement of Disputes & Arbitration

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

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

If the Superintending Engineer fails to give his instructions or decisions in writing within the aforesaid period or if the contractor is dissatisfied with the instructions or decision of the Superintending Engineer, the contractor may, within 15 days of the receipt of Superintending Engineer's decision appeal to the Chairman (Engineering Unit), IITM who shall afford an opportunity to the contractor to be heard, if the matter so desires and

to offer evidence in support of his appeal. The Chairman (Engineering Unit), IITM shall give his decision within 30 days of receipt of contractor's appeal.

If the contractor is dissatisfied with the decision of the Chairman (Engineering Unit), he may within a period of 15 days of the receipt of the Chairman's decision appeal to the Director , IITM who shall afford an opportunity to the contractor to be heard, if the matter so desires and to offer evidence in support of his appeal. The Director, IITM shall give his decision within 30 days of receipt of contractor's appeal.

If the contractor is dissatisfied with the decision of the Director IITM, he shall within 30 days of the receipt of the decision shall give notice to the Director, IITM for appointment of an arbitrator to adjudicate his claims, failing which the said decision of the Director, IITM shall be final and binding on the contractor.

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

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

It is also a term of this contract that no person other than a person appointed by such Director, IITM, as aforesaid should act as arbitrator.

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

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

It is also term of this Contract that the arbitrator shall adjudicate on only such disputed as are referred to him by the Director, IITM and give separate award against each dispute and claim referred to him and in all cases where the total amount of the claims by any party exceeds **Rs.1,00,000/-** the arbitrator shall give reasons for the award.

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

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

thereof shall be paid and fix or settle the amount of costs to be so paid.

CLAUSE 26

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

CLAUSE 27

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CLAUSE 28

In the case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standards Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturer's specifications, if not available then as per District Specifications. In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

CLAUSE 29

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

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or Institute will be kept withheld or retained as such by the Engineer-in-Charge or Institute till the claim arising out of or under the contract is determined by the arbitrator (if the contractor is govern by the arbitration clause) by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where

the contractor is a partnership firm or a limited company, the Engineer-in-Charge or the Institute shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/ limited company as the case may be, whether in his individual capacity or otherwise.

ii) Institute shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract, etc., to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for Institute to recover the same from him in the manner prescribed in sub-clause (i) of this clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by Institute to the contractor, without any interest thereon whatsoever.

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

CLAUSE 29A

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

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

CLAUSE 30

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CLAUSE 31

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

i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-charge.

ii) The Engineer–in-Charge shall make alternative arrangements for supply of water at the risk and cost of

contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in- Charge, unsatisfactory.

iii) No bore wells / open wells shall be constructed inside the IITM Campus for drawl of water.

CLAUSE 31 A

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CLAUSE 32

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CLAUSE 33

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CLAUSE 34

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CLAUSE 35

The contractor undertakes to make arrangement for the supervision of the work by the firm supplying the bitumen used. The contractor shall collect the total quantity of bitumen required for the work as per standard formula, before the work is started and shall hypothecate it to the Engineer-in-Charge. If any bitumen remains unused on completion of the work on account of lesser use of materials in actual execution for reasons other than authorized changes of specifications and abandonment of portion of work, a corresponding deduction equivalent to the cost of unused materials as determined by the Engineer-in-Charge shall be made and the material returned to the contractors. Although the materials are hypothecated to Institute, the contractor undertakes the responsibility for their proper watch, safe custody and protection against all risks. The materials shall not be removed from site of work without the consent of the Engineer-in-Charge in writing.

The contractor shall be responsible for rectifying defects noticed within a year from the date of completion of the work and the portion of the security deposit relating to asphaltic work shall be refunded after the expiry of this period.

CLAUSE 36

Contractors Superintendence, Supervision, Technical Staff & Employees

The contractor shall provide all necessary superintendence during execution of the work and as along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(s) and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical representative(s) who will be supervising the work, minimum requirement of such technical representative(s) and their qualifications and experience shall not be lower than specified in Schedule ‘F’. The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative(s) to the contractor. Any such approval may at any time be withdrawn and incase of such withdrawal, the contractor shall appoint another such representative(s) according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect.

Such a principal technical representative shall be appointed by the contractor soon after receipt of the approval from Engineer-in-Charge and shall be available at site before start of work.

If the contractor (or any partner in case of firm/company) who himself has such qualifications, it will not be necessary for the said contractor to appoint such a principal technical representative but the contractor shall designate and appoint a responsible agent to represent him and to be present at the work whenever the contractor is not in a position to be so present. All the provisions applicable to the principal technical representative under the clause will also be applicable in such a case to contractor or his responsible agent. The principal technical representative and/or the contractor shall on receiving reasonable notice from the Engineer-in-Charge or his designated representative(s) in charge of the work in writing or in person or otherwise, present himself to the Engineer-in-Charge and/or at the site of work, as required, to take instructions. Instructions given to the principal technical representative of the responsible agent shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and/or the contractor or his responsible authorized agent shall be actually available at site especially during important stages of execution of work, during recording of measurement of works and whenever so required by the Engineer-in-Charge by a notice as aforesaid and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative in the site order book and shall affix his signature in token of noting down the instructions and in token of acceptance of measurements.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is / are effectively appointed or is / are effectively attending or fulfilling the provision of this clause, a recovery (nonrefundable) shall be effected from the contractor as specified in Schedule 'F' and the decision of the Engineer-in-Charge as recorded in the site order book and measurement recorded checked / test checked in Measurement Books shall be final and binding on the contractor. Further if the contractor fails to appoint a suitable technical representative and / or other technical representative(s) and if such appointed persons are not effectively present are absent by more than two days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is / are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) along with every on account bill/final bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

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

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

removed shall be replaced as soon as possible by competent substitutes.

CLAUSE 37

Clause 37 "Levy / Taxes Payable by Contractor"

i) Sales tax including VAT (except Service tax) Building and other Construction Workers Welfare Cess or any other tax or Cess in respect of this contract shall be payable by the Contractor and IITM shall not entertain any claim whatsoever in this respect. However in respect of service tax , same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to him by the Engineer-in-charge after satisfying that it has been actually and genuinely paid by the contractor.

ii) The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, stone, kankar, etc. from local authorities.

If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the Institute and does not any time become payable by the contractor to the State Government / Local authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the Institute and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor.

CLAUSE 38

i) All tendered rates shall be inclusive of all taxes and levies (Except Service tax) payable under respective statutes. However. If any further tax or cess is imposed by Statute ,after the last stipulated date for the receipt of tender including extentions if any and the contractor thereupon necessarily and properly pays such taxes/levies/cess, the contractor shall be reimbursed the amount so paid. provided such payments, if any, is not, in the opinion of the Engineer-in-charge (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.

ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorised representative of the Institute and/or the Engineer-in-Charge and further shall furnish such other information/document as the Engineer-in-Charge may require from time to time.

iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy or excess, , give a written notice thereof to the Engineer-in-Charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

CLAUSE 39

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

CLAUSE 40

The contractor shall not be permitted to tender for works in the Institute (responsible for award and execution of contracts) in which his near relative is posted as Assistant Registrar(Engineering unit, IITM) or as an officer in any capacity between the grades of the Superintending Engineer and Junior Engineer (both inclusive). He shall

also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Official in the Institute. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of the Institute. If however the contractor is registered in any other department, he shall be debarred from tendering in Institute for any breach of this condition

NOTE: By the term "near relatives" is meant wife, husband, parents and grand parents, children and grand children, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.

CLAUSE 41

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

CLAUSE 42

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CLAUSE 43

The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation upto the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by the Superintending Engineer concerned. The contractor shall be paid for the damages/destruction suffered and for the restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the-contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.

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

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

CLAUSE 44

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

CLAUSE 45

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

14.0 C.P.W.D. SAFETY CODE

Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used, an extra mazdoor shall be engaged for holding the ladder and If the ladder is used for carrying materials as well suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 to 1 (1/4 horizontal and 1 vertical.)

Scaffolding of staging more than 3.6 mt. (12ft.) above the ground or floor, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm. (3ft.) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.

Working platforms, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 m (12ft.) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.

Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90 cm.(3ft.)

Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m. (30ft.) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. (111/2") for ladder upto and including 3 m. (10 ft.) in length. For longer ladders, this width should be increased at least 1/4" for each additional 30 cm/1 foot of length. Uniform step spacing of not more than 30 cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defence of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.

Excavation and Trenching - All trenches of 1.2 m. (4ft.) or more in depth, shall at all times be supplied with at least one ladder for each 30 m. (100 ft.) in length or fraction thereof Ladder shall extend from bottom of the trench to at least 90 cm. (3ft.) above the surface of the ground. The side of the trenches which are 1.5 m. (5ft.) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the

danger of sides collapsing. The excavated materials shall not be placed within 1.5 m. (5ft.) of the edges of the trench or half of the depth of the trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances, undermining or undercutting shall be done.

Demolition - Before any demolition work is commenced and also during the progress of the work,

All roads and open areas adjacent to the work site shall either be closed or suitably protected

No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.

All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding.

No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned:- The following safety equipment shall invariably be provided.

Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective gloves and goggles.

Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes, shall be provided with protective gloves and goggles.

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

Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.

When workers are employed in sewers and manholes, which are in active use, the contractors shall ensure that the manhole covers are opened and ventilated atleast for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measure are adhered to :

Entry for workers into the line shall not be allowed except under supervision of the JE or any other higher officer.

At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manhole for working inside.

Before entry, presence of Toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.

Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.

Safety belt with rope should be provided to the workers. While working inside the manholes, such rope should be handled by two men standing outside to enable him to be pulled out during emergency.

The area should be barricaded or cordoned of by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day. .

No smoking or open flames shall be allowed near the blocked manhole being cleaned.

The malba(debris) obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba(debris).

Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge may decide the time up to which a worker may be allowed to work continuously inside the manhole.

Gas masks with Oxygen Cylinder should be kept at site for use in emergency.

Air-blowers should be used for flow of fresh air through the manholes. Whenever called for portable air blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.

The workers engaged for cleaning the manholes/sewers should be properly trained before allowing to work in the manhole.

The workers shall be provided with Gumboots or non sparking shoes bump helmets and gloves non sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with barrier cream for anointing tile limbs before working inside the sewer lines.

Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.

If a man has received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.

The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.

The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken:-

i) White lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.

ii) Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.

iii) Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.

iv) Facilities shall be provided to enable the working painters to wash during and on the cessation of work.

The following precaution should be taken while painting:

White lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.

Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray. Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping. Adequate facilities shall be provided to enable working painters to

wash during and on cessation of work.

Overall shall be worn by working painters during the whole of working period.

Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.

Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man appointed by Institute.

Institute may require, when necessary medical examination of workers.

Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

When the work is done near any place where there is risk of drowning, all necessary equipments should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.

Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions :

i)

(a) These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.

(b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.

ii) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.

iii) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension, the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

iv) The contractor shall notify the safe working load of the machine to the Engineer-in-Charge whenever he brings any machinery to site of work who may get it verified.

Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energised, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided. The worker should not wear any rings, watches and carry

keys or other materials which are good conductors of electricity.

All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.

These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place at work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.

To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by labour officer or other department or Engineer-in-Charge or their representatives.

Notwithstanding the above clauses from (1) to (15) there is nothing in these to exempt the contractor from the operations of any other Act or Rule in force in the Republic of India.

1. APPLICATION

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

2. DEFINITION

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

3. FIRST AID FACILITIES

i) At every work place there shall be provided and maintained, so as to easily accessible during working hours, first–aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed..

ii) The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment

a) For work places in which the number of contract labour employed does not exceed 50 Each first-aid box shall

1. 6 small sterilised dressings
2. 3 medium size sterilized dressings.
3. 3 large size sterilized dressings.
4. 3 large sterilized burn dressings.
5. 1 (30ml) bottle containing a two per cent alcoholic solution of iodine
6. 1 (30 ml) bottle containing salvolatile having the dose and mode of administration indicated on the label.
7. 1 snakebite lancet.
8. 1 (30 gms.) bottle of potassium permanganate crystals
9. 1 pair scissors
10. 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
11. 1 bottle containing 100 tablets (each of 5 gms) of aspirin.

12. Ointment for burns

13. A bottle of suitable surgical antiseptic solution.

b) For work places in which the number of contract labour exceed 50.

Each first-aid box shall contain the following equipments.

12 small sterilised dressings.

6 medium size sterilised dressings.

6 large size sterilised dressings.

6 large size sterilised burn dressings.

6 (15 gms.) packets sterilised cotton wool.

1 (60 ml.) bottle containing two per cent alcoholic solution iodine.

1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.

1 roll of adhesive plaster.

1 snake bite lancet.

1 (30 Gms) bottle of potassium permanganate crystals.

1 pair scissors

1 copy of the first-aid leaflet issued by the director General Factory Advice Service and labour Institutes / government of India.

A bottle containing 100 tablets (each of 5 Gms) of aspirin.

Ointment for burns.

A bottle of suitable surgical antiseptic solution.

iii) Adequate arrangements shall be made for immediate recoupment of the equipment when necessary.

iv) Nothing except the prescribed contents shall be kept in the First-aid box.

v) The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.

vi) A person in Charge of the First aid box shall be a person trained in First-aid treatment, in the work places where the number of contract labour employed is 150 or more.

vii) In work places where the number of contract labour employed is 500 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.

viii) Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

4. DRINKING WATER

In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.

Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other

source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn form it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and waterproof.

A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHING FACILITIES

In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of contract labour employed therein.

Separate and adequate cleaning facilities shall be provided for the use of male and female workers.

Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

6. LATRINES AND URINALS

i) Latrines shall be provided in every work place on the following scale namely:

Where female are employed there shall be at least one latrine for every 25 females.

Where males are employed, there shall be at least one latrine for every 25 males.

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

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

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

iv) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men only" or "For Women Only" as the case may be.

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

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

vi) a) The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.

b) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.

vii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

viii) Disposal of excreta: - Unless otherwise arranged for by the local sanitary authority, arrangements

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

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

7. PROVISION OF SHELTER DURING REST

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

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

8. CRECHES

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

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

The contractor shall supply adequate number of toys and games in the play room and sufficient number of cots and beddings in the bed room.

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

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

9. CANTEENS

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

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

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

The floor shall be made of smooth and impervious materials and inside walls shall be lime-washed or colour washed at least once in each year.

Provided that the inside walls of the kitchen shall be lime-washed every four months.

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

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

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

The dining hall shall accommodate at a time 30 per cent of the contract labour working at a time.

The floor area of the dining hall, excluding the area occupied by the service counter and any furniture except tables and chairs shall not be less than one square meter (10 sft) per diner to be accommodated as prescribed in sub-Rule 9.

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

b) Washing places for woman shall be separate and screened to secure privacy.

(xii) Sufficient tables, stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule 9.

(xiii) a) 1. There shall be provided and maintained sufficient utensils crockery, furniture and any other equipment necessary for the efficient running of the canteen.

2. The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.

b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.

2. A service counter, if provided, shall have top of smooth and impervious material.

3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipments.

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

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

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

a) The rent of land and building.

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

The cost of purchase, repairs and replacement of equipments including furniture, crockery, cutlery and utensils.

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

The interest and amounts spent on the provision and maintenance of equipments provided for the canteen.

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

10. ANTI-MALARIAL PRECAUTIONS

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

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

12. AMENDMENTS

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

15.0 C.P.W.D. Contractor's Labour Regulations

1. **SHORT TITLE**

These regulations may be called the CPWD/PWD (DA Contractors Labour Regulations.

2. DEFINITIONS

1) Workman means any person employed by contractor directly or indirectly through a subcontractor with or without the knowledge of the Institute to do any skilled, semiskilled or unskilled manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment are expressed or implied but does not include any person :

a) Who is employed mainly in a managerial or administrative capacity: or

b) Who, being employed in a supervisory capacity draws wages exceeding five hundred rupees per mensem or exercises either by the nature of the duties attached to the office or by reason of powers vested in him, functions mainly of managerial nature: or

c) Who is an out worker, that is to say, person to whom any article or materials are given out by or on behalf of the principal employers to be made up cleaned, washed, altered, ornamental finished, repaired adopted or otherwise processed for sale for the purpose of the trade or business of the principal employers and the process is to be carried out either in the home of the out worker or in some other premises, not being premises under the control and management of the principal employer.

No person below the age of 18 years shall be employed to act as a workman.

ii) Fair wages means wages whether for time or piece work fixed and notified under the provisions of the Minimum Wages Act from time to time.

iii) Contractors shall include every person who undertakes to produce a given result other than a mere supply of goods or articles of manufacture through contract labour or who supplies contract labour for any work and includes a subcontractor.

iv) Wages shall have the same meaning as defined in the Payment of Wages Act.

i) Normally working hours of an adult employee should not exceed 9 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.

ii) When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week, he shall be paid over time for the extra hours put in by him at double the ordinary rate of wages.

iii) a) Every worker shall be given a weekly holiday normally on a Sunday, in accordance with the provisions of the Minimum Wages (Central) Rules 1960 as amended from time to time irrespective of whether such worker is governed by the Minimum Wages Act or not.

b) Where the minimum wages prescribed by the Government under the minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker shall be entitled to rest day wages at the rate applicable to the next preceding day, provided he has worked under the same contractor for a continuous period of not less than 6 days.

c) Where a contractor is permitted by the Engineer-in-Charge to allow a worker to work on a normal weekly holiday, he shall grant a substituted holiday to him for the whole day on one of the five days immediately before or after the normal weekly holiday and pay wages to such worker for the work performed on the normal weekly holiday at overtime rate.

4. DISPLAY OF NOTICE REGARDING WAGES ETC.

The contractor shall before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain in a clear and legible condition in conspicuous places on the work, notices in English and in the local Indian languages spoken by the majority of the workers giving the minimum rates of wages fixed under Minimum Wages Act, the actual wages being paid, the hours of work for which such wage are earned, wages periods, dates of payments of wages and other relevant information as per Appendix 'III'.

5. PAYMENT OF WAGES

The contractor shall fix wage periods in respect of which wages shall be payable.

No wage period shall exceed one month.

The wages of every person employed as contract labour in an establishment or by a contractor where less than one thousand such persons are employed shall be paid before the expiry of seventh day and in other cases before the expiry of tenth day after the last day of the wage period in respect of which the wages are payable.

Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.

All payment of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the expiry of the wage period, final payment shall be made within 48 hours of the last working day.

Wages due to every worker shall be paid to him direct or to other person authorised by him in this behalf.

All wages shall be paid in current coin or currency or in both.

Wages shall be paid without any deductions of any kind except those specified by the Central Government by general or special order in this behalf or permissible under the Payment of Wages Act 1956.

A notice showing the wages period and the place and time of disbursement of wages shall be displayed at the place of work and a copy sent by the contractor to the Engineer-in-Charge under acknowledgment.

It shall be the duty of the contractor to ensure the disbursement of wages in the presence of the Junior Engineer or any other authorised representative of the Engineer-in-Charge who will be required to be present at the place and time of disbursement of wages by the contractor to workmen.

The contractor shall obtain from the Junior Engineer or any other authorised representative of the Engineer-in-Charge as the case may be, a certificate under his signature at the end of the entries in the "Register of Wages" or the "Wage-cum Muster Roll" as the case may be in the following form:

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

6. FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES

(i) The wages of a worker shall be paid to him without any deduction of any kind except the following:

a) Fines

b) Deductions for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.

c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to his neglect or default.

d) Deduction for recovery of advances or for adjustment of overpayment of wages, advances granted shall be entered in a register.

e) Any other deduction which the Central Government may from time to time allow.

ii) No fines should be impose on any worker save in respect of such acts and omissions on his part as have been approved of by the Chief Labour Commissioner.

Note: - An approved list of Acts and omissions for which fines can be imposed is enclosed. Appendix 'X'

iii) No fine shall be imposed on a worker and no deduction for damage or loss shall be made from his wages until the worker has been given an opportunity of showing cause against such fines or deductions.

iv) The total amount of fine which may be imposed in anyone wage period on a worker shall not exceed an amount equal to three paise in a rupee of the total wages, payable to him in respect of that wage period.

v) No fine imposed on any worker shall be recovered from him by installment, or after the expiry of sixty days from the date on which it was imposed.

vi) Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

7. LABOUR RECORDS

The contractor shall maintain a Register of persons employed on work on contract in Form XIII of the CL (R &A) Central Rules 1971 (Appendix IV)

The contractor shall maintain a **Muster Roll** register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix V).

The contractor shall maintain a **Wage Register** in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VI)

(iv) Register of accident : The contractor shall maintain a register of accidents in such form may be convenient at the work place but the same shall include the following particulars :

Full particulars of the labourers who met with accident

Rate of wages

Sex

Age

Nature of accident and cause of accident

Time and date of accident

Date and time when admitted in Hospital

Date of discharge from the Hospital

Period of treatment and result of treatment.

Percentage of loss of earning capacity and disability as assessed by Medical officer.

Claim required to be paid under Workmen's Compensation Act.

Date of payment of compensation

Amount paid with details of the person to whom the same was paid.

Authority by whom the compensation was assessed.

Remarks

v) The contractor shall maintain a **Register of Fines** in the Form XII of the CL (R &A) Rules 1971 (Appendix-XI)

The contractor shall display in a good condition and in a conspicuous place of work the approved list of acts and omissions for which fines can be imposed (Appendix-X)

vi) The contractor shall maintain a **Register of deductions for damage or loss** in Form XX of the CL (R&A) Rules 1971 (Appendix-XII)

vii) The contractor shall maintain a **Register of Advances** in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIII)

viii) The contractor shall maintain a **Register of Overtime** in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIV)

8. ATTENDANCE CARD-CUM-WAGE SLIP

The contractor shall issue an **Attendance card – cum – wage slip** to each workman employed by him in the specimen form at (Appendix-VII)

The card shall be valid for each wage period.

The contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.

The card shall remain in possession of the worker during the wage period under reference.

The contractor shall complete the wage slip portion of the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.

The contractor shall obtain the signature or thumb impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

9. EMPLOYMENT CARD

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

10. SERVICE CERTIFICATE

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

11. PRESERVATION OF LABOUR RECORDS

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

12. POWER OF LABOUR OFFICER TO MAKE INVESTIGATIONS OR ENQUIRY

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

13. REPORT OF LABOUR OFFICER

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

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

14. APPEAL AGAINST THE DECISION OF LABOUR OFFICER

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

15. PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER

i) A workman shall be entitled to be represented in any investigation or enquiry under these regulations by :-

a) An officer of a registered trade union of which he is a member.

b) An officer of a federation of trade unions to which the trade union referred to in clause (a) is affiliated.

c) Where the employer is not a member of any registered trade union, by an officer of a registered trade union, connected with the industry in which the worker in employed or by any other workman employed in the industry in which the worker is employed.

ii) An employer shall be entitled to be represented in any investigation or enquiry under these regulations by :-

An officer of an association of employers of which he is a member

An officer of a federation of associations of employers to which association referred to in clause (a) is affiliated.

Where the employers is not a member of any association of employers, by an officer of association of employer connected with the industry in which the employer is engaged or by any other employer, engaged in the industry in which the employer in engaged.

(iii) No party shall be entitled to be represented by a legal practitioner in any investigation or enquiry under these regulations.

16. INSPECTION OF BOOKS AND SLIPS

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

17. SUBMISSIONS OF RETURNS

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

18. AMENDMENTS

The Central Government may from time to time add to or amend the regulations and on any question as to the application/Interpretation or effect of those regulations the decision of the Executive Engineer concerned shall be final.

16.0 LIST OF APPROVED MAKE / BRAND

16.1 IIT Madras reserves the right to select any of the make/brand shown below and only those makes/brands will be allowed to be used in the work. Nothing extra is payable even if there is cost difference between one make/brand and another.

16.2 **List of approved Makes and Brands – Electrical**

Sl.No.	Material	Makes / Manufactures
1	LT Panel boards	CPRI approved manufacturers
2	MCB / MCB DB /ELCB	LEGRAND / MERLIN GERIN / L&T HAGER / SIEMENS
3	Moulded Case Circuit Breaker	MERLIN GERIN /SIEMENS/GE / L&T /SCHNEIDER
4	SANDWICH RISING MAIN AND TAPOFFBOXES	GODREJ-HENIKWON/GE SPECTRA/SCHNEDER
5	LT Contactors / Timer	SIEMENS / L&T / LEGRAND
6	L.T. Cables (XLPE)	CCI-TROPODURE/POLYCAB/ GLOSTER /UNIVERSAL
7	Instruments (DIGITAL)	AE / IMP / ENERCON
8	CTs / PTs	KAPPA/ PRAGATHI/INSTRANS/AE
9	Control Switch / Indication Lamp/	SIEMENS / TEKNIC / KAYCEE / Push Button / L&T/ SCHNEIDER
10	Switch / Switch box / Flush mounted Socket / Fan Regulators / RJ11 / RJ 6	MK / MOSAIC (MDS)/SIEMENS
11	FRLS Copper wires	FINOLEX / Q-FLEX /RR KABELS
12	PVC Conduits & Accessories	AVONPLAST/VASAVI/WAVIN
13	MS Conduits & Accessories	BHARAT / GUPTA / WIMCO
14	Ceiling Fan	ORIENT PSPO/CROMTON
15	Exhaust fans/Fresh air fans	ALMONARD/KHAITAN/ORIENT
16	Industrial Type Plug & Sockets	LEGRAND/MERLIN GERIN / L&T / HAGER / SIEMENS
17	Telephone Cable/wire	Finolex / DELTON
18	Data cables/Socket	Molex / Krone

19	Cable Glands	COMET / PRABHAT
20	Cable Trays & Accessories	PROFAB / TECHNOFAB
21	LED Lighting luminaires	CG / iLED /PHILIPS/MIC
22	LIGHTING LUMINAIRES	PHILIPS / WIPRO / BAJAJ / CROMPTON GREAVES / K – LITE
23	SFU/FSU	L & T / SIEMENS / GE
24	Telephone terminals	KRONE
25	GI PIPE/MS PIPE	KALINGA / TATA / JINDAL
26	Pumps	Kirloskar / KSB / Crompton
27	Motors	Kirloskar / KSB / NGEF / Crompton
28	Butterfly valves	Audco / Intervalve
29	NRV	Normax
30	Hydrant valve, Branch pipe	Newage / Sukan / Winco
31	Hose reel/Hose box	As per IS/fabricated
32	Pressure Gauge	H-Guru
33	Pressure Switch	Danfoss / Switzer
34	Control panel/Auto start panel	Bright Engg / Excel
35	Enamel paints	NEROLAC/ASIAN
36	Starter	L & T / SIEMENS
37	Push button	L & T / SIEMENS

NOTE

The Successful tenderer shall submit test reports for all the materials / equipments. If any make is not in accordance with the tender specification it will not be accepted even if the make is indicated in the above List.

TECHNICAL SPECIFICATIONS (ADDRESSABLE FIRE ALARM SYSTEM)

SPECIFICATION FOR FIRE DETECTION & ALARM SYSTEM

Fire detection & alarm systems consists of microprocessor based addressable Network fire alarm panel, Intelligent addressable field mounted devices like Multi- criteria smoke detectors, Optical smoke detectors, Heat detectors, Air sampling smoke detectors, Duct mounted smoke detectors, Beam type detectors, Manual call points, Input & Output modules. Electronic hooters, Response indicators, Strobe, Floor indicator panels and Repeater fire alarm panels.

DESIGN CRITERIA

Each floor will have manual call points at all strategic points such as staircase landing, emergency exits etc. and all open areas. These along with fire detector spread all over the area will be monitored on a Fire alarm panel (FAP). Repeater fire alarm panels (RFAP) connected with FAP. MCPs and Detectors are connected to FAP by means of (class A) FRLS armored Cu. conductor cable.

The Cabling between RFAP, FIP and FAP will be done by 2 Pair FRLS armored Cu. Conductor cables. On detection of fire at any one of the zones, the fire-affected zone will be annunciated on the FAP and the same will be repeated on the RFAP and respective FIP. Hooters shall be located at strategic point in floors for sounding the fire alarm.

The 230V power supply will be made available for FAP, RFAP and FIP. In case of failure of main power supply the standby power supply will be capable of maintaining the system in normal operation for period of 24 hours after which sufficient capacity would remain to provide full load operation for at least 30 minutes. Standby Power supply derived from Lead acid SMF batteries.

CODES AND STANDARDS

NFPA – 72E - Standard for fire alarm system

TAC - Rules for fire alarm system

British Standard Institute / European Standards

All Applicable codes and standards including BS EN 54

AREA CLASSIFICATION OF SYSTEM DEVICES

The Fire alarm panel (FAP) will be located at Ground Floor.

1 No. repeater fire alarm panels (RFAP) provided at Security room.

The detectors are provided.

Multi-criteria detectors .

Heat detector

Manual call point provided at all staircases.

FIRE ALARM PANEL

A fully self-contained control unit with an integrated emergency supplies and possibility of integration with BMS system located at Ground Floor.

GENERAL

Maximum system availability will be realized by decentralizing the system intelligence whereby the detection and evaluation task is performed by the detector. The FAP will verify and process the detectors output signals in conjunction with the pre-defined used data, e.g. display the event, perform pre-defined control, signal tasks and respond to manual commands entered by the system operator.

The FAP will fully comply with the requirements of the standard EN 54 part 2/ NFPA.

The FAP will be capable of operating conventional/collective, analog and interactive detector lines. A combination of these circuits in the same FAP, for the initial installation or for any future system expansions, will be possible.

The FAP will allow easy system expandability up to 500 addressable detecting points.

The FAP will be capable of communicating with up to 12 remote operating terminals. Each terminal will be pre-programmable to operate on the whole of the detection system or only a certain section of it.

It will be possible to freely locate and group detectors (minimum one zone per detecting device) according to the geographical and architectural requirements of the users premises. This will allow maximum user orientation in case of an alarm event.

- To optimize the response characteristics of automatic detectors, it will be possible to monitor these and to download different algorithms sets.
- An audible and visual application warning signal will automatically be activated per detector, if the response characteristic of the detector does not correspond with the environmental conditions it is operating in.

Detector line communication – Intelligent addressable.

The FAP shall be 32bit Microprocessor based and shall be able to process in coming signals from Collective devices, such as smoke & heat detectors & manual call points etc. via two wire line.

The line capacity will allow the handling of up to 125 detector/devices .

It will be possible to process a short circuit condition on the detector line as an alarm or optionally as a fault condition.

Detector line communication – Intelligent addressable.

The FAP shall be able to process in coming signals from Analog addressable devices, such as smoke & heat detectors, manual call points, input & output modules etc. via two wire line.

The line capacity will allow the handling of up to 125 Analog addressable detector/devices.

Up to 4 intelligent addressable lines will be interfaced to the FAP.

A drift indication will permit, automatically or upon request, status information of an automatic smoke detector.

To optimize the field wiring installation, the detection line will allow T –tap connections.

An address will be freely assigned to all the devices that have been connected to an Analog detector line.

The Intelligent addressable detector line will at least process the following verified signal condition between the detection devices and FAP.

Adjusting the detectors sensitivity level changing the detectors response characteristics multi zone evaluation.

The system will be able to identify the type of detector installed in each base and consequently, verify this information during normal operation and service.

Detector line communication – Interactive

The FAP shall be able to process in coming signals from Interactive devices, such as smoke & heat detectors, manual call points, input & output modules etc.via two wire line.

The line capacity will allow the handling of up to 125 Analog addressable detector/devices up to loop length of 3.5Km.

A drift indication will permit, automatically or upon request, status information of an automatic smoke detector.

To optimize the field wiring installation, the detection line will allow T –tap connections.

An address will be freely assigned to all the devices that have been connected to a detector line.

The Analog addressable detector line will at least process the following verified signal condition between the detection devices and FAP.

Adjusting the detectors sensitivity level changing the detectors response characteristics multi zone evaluation.

The system will be able to identify the type of detector installed in each base and consequently, verify this information during normal operation and service.

It will be possible to assign to each automatic detector an algorithm set that can, whenever desired, be manually or automatically exchanged for that another type.

All the Detectors and Devices should be of soft addressable type and shall be able to Programming from PC.

Hardware configuration / Mechanical design.

The FAP will consist entirely of standard modular, printed circuit board assemblies to facilitate removal, easy maintenance and modular system expansion.

Provide a central CPU module controlling an operating terminal and an internal bus onto which detection lines, various input/output modules, bell and remote alarm circuits can be connected.

Provide a remote microprocessor based operating terminal.

Provide an ac/dc converter module, with charging unit.

Provide line modules to operate Analog addressable detectors.

Provide a battery capacity for 24 hours emergency supply in standby mode and 30 minutes in an alarm condition.

Application warning:

The FAP will be capable of monitoring the frequent occurrence of warning signals released by an automatic detector. This will occur if the detection response behavior of the detector does not correspond to the environmental conditions the detector is operating in. An application

warning will then be displayed by means of an audible and visual indication at the operating terminal

Multi detector logic:

It will be possible to indicate an alarm signal at the operation terminal if two or more automatic detector, monitoring the same area, activate a warning signal.

Alarm processing concept.

In the manned mode of the FAP, a response from automatic detectors (e.g. smoke, heat, etc) will remain as a local alarm for a pre-programmed period. Referred to as T1.

During this delay time (t1) an internal alarm will be given, to bring attention to the local staff. If the alarm is not acknowledged before T1 runs out, a full alarm condition will automatically be initiated. This will sound the local alarm horns and send a remote signal to the fire brigade.

If the alarm is acknowledged during the delay time (T1), it will be reset and pre-programmed time T2 will be started, in order to provide time for human investigation for the cause of the raised alarm.

If the raised alarm is not reset during the delay time (T2), a full alarm condition will automatically be initiated. This will sound local alarm horns and send a remote alarm signal to the fire brigade.

The initiation of a manual call point will at all times immediately sound local alarm horns and send a remote alarm signal to the fire brigade.

The remaining time for the mentioned time periods T1 and T2 will continuously be displayed at the operating terminal. In the unmanned mode of the FAP, a response from any automatic detector (e.g. smoke, heat, etc.) or from a manual call point will at all time immediately sound the local alarm horns and send a remote alarm signal to the fire brigade.

Access levels and password

Operator access shall be granted via three different access level.

It shall be possible to configure at least 20 concurrent passwords at the FAP.

History File

The FAP will save and display the data of at least 10000 system-operating event.

The historical data will be displayed at the operating terminal as follows:

- All messages listed in a chronological order
- All test alarms
- All test alarms from the same date
- All faults listed in chronological order
- All isolate off connect and normal conditions in chronological order
- All information
- All active control functions
- Real time clock
- The actual real time shall be displayed on the operating terminal.

Operating & Display terminal

- The FAP will be designed such, that the operating terminal serving as a person-machine interface, be either an integrated part of the FDA, or a separate unit suited to be installed at a remote location, or both.

- The FAP will communicate with the operating terminal via a communication bus, that operates in a loop configuration and includes an emergency operation concept as per EN 54.
- It will be possible to operate the entire system from one operating terminal.
- Additionally up to 12 operating terminal can be used to perform dedicated display and control operations for pre-defined section of the system.
- To guide the operator through the operating process, the operating procedure at the operating terminal will be fully menu driven.
- The layout of the front plate for the operating terminal will guarantee, that the incoming event messages are clearly distinguished by the operator, For this purpose, theses will be categorized as follows :
- Alarm conditions
- Fault conditions
- Isolated / disabled conditions
- Status information
- A library of up to 16 different intervention orders will be available, for allocation to individual groups (zones).

SYSTEMS FIELD MOUNTED DEVICES

Multi-criteria Smoke detector - Intelligent Addressable

- The detector shall use at least two typical characteristics (e.g. smoke and temperature) of a fire to evaluate a possible dangerous condition in the supervised area.
- The evaluation shall not be per formed only by simple AND and/or OR logic.
- The design of the smoke sensitive system shall guarantee a uniform response behavior to all combustion products of smoke-forming flaming and smoldering fires.
- The detection principle shall employ a multiple light pulse coincidence circuit.
- The smoke detector shall conform to EN 54-7/9 or Vds or UL.
- The detector, dependent upon its sensitivity setting, shall have a equivalent performance as requirements specified in European Standards for smoke detectors.
- The detector shall be controlled by a custom designed application specific integrated circuit (custom – ASIC) in order to guarantee a maximum reliability of the electronic circuit.
- The detector shall be able to transmit up to two (2) alarm-level information to the control unit for evaluation according to the customer specific programming of the control unit.
- The electronic circuits of the detector shall be internally supervised and be able to signal up to two (2) different status informations to the control unit.
- The detector shall be able signal deviations from the standard sensitivity to the control unit.
- The detector shall be equipped with a response indicator and shall have the possibility to drive up to two (2) remote indicators in order to signal alarm conditions.
- The detector shall be able to isolate short circuits on the detector-line bus in order not to disrupt the proper function of the rest of the detectors connected on the detection-line bus.
- Reversed polarity or faulty wiring shall not damage the detector.
- The detector shall be individually identifiable from the control unit by geographical location in the system.
- The system shall not use any switch to set the address of the detector.
- All electronic circuits shall be in the detector head, thus not requiring any active electronic circuits in the base.
- The detector shall connect to the local control unit via a fully supervised two wire circuit (class B wiring) or a four wire circuit (class A wiring). Wiring may be unshielded pair type.
- The system shall allow T-Tap wiring without degrading the information exchange between detectors connected via T-Tap wiring and the control unit.

- The detector shall have a digital communication with the control unit on the basis of error recognizing protocol with multiple transmission of information.
- The system shall be able to signal a priority alarm message no less than two (2) seconds after the detector has recognized this situation.
- The optical chamber shall be designed for detection of every type of visible smoke (including dark smoke) and therefore have a scattering angle superior of 700.
- A built in barrier shall prevent the entry of insects into the sensor.
- The detector shall be designed for easy dismantling for factory cleaning.
- The detector shall be inserted in to a base without the need of tools.
- When installed, the base shall be completely hidden by the body of the detector.
- The base shall include all necessary terminals to connect installation wiring.
- The base shall allow the removal of the detector without disconnecting the installation wiring.
- The detector shall be inserted into or removed from the base by a simple push-twist mechanism with an appropriate tools up to 7m above floor level.
- It shall be possible to protect the detector against unauthorized removal from the base.
- The manufacturer shall produce and provide test equipment which allows a full functional test, including smoke entry openings, of the smoke detectors up to 7m above floor level without smoke or other aerosol producing devices.
- A comprehensive range of accessories shall be available to fulfill requirements for special applications (e.g. protective cage).

Optical Smoke detector - Intelligent Addressable

- The design of the smoke sensitive system shall guarantee a uniform response behavior to all combustion products of smoke-forming flaming and smoldering fires.
- The detection principle shall employ a multiple light pulse coincidence circuit.
- The smoke detector shall conform to EN 54-7/9 and Vds or UL
- The detector shall be controlled by a custom designed application specific integrated circuit (custom – ASIC) in order to guarantee a maximum reliability of the electronic circuit.
- The detector shall be able to transmit up to two (2) alarm-level informations to the control unit for evaluation according to the customer specific programming of the control unit.
- The electronic circuits of the detector shall be internally supervised and be able to signal up to two (2) different status informations to the control unit.
- The detector shall be able signal deviations from the standard sensitivity to the control unit.
- The detector shall be equipped with a response indicator and shall have the possibility to drive up to two (2) remote indicators in order to signal alarm conditions.
- The detector shall be able to isolate short circuits on the detector-line bus in order not to disrupt the proper function of the rest of the detectors connected on the detection-line bus.
- Reversed polarity or faulty wiring shall not damage the detector.
- The detector shall be individually identifiable from the control unit by geographical location in the system.
- The system shall not use any switch to set the address of the detector.
- All electronic circuits shall be in the detector head, thus not requiring any active electronic circuits in the base.
- The detector shall connect to the local control unit via a fully supervised two wire circuit (class B wiring) or a four wire circuit (class A wiring). Wiring may be unshielded pair type.
- The system shall allow T-Tap wiring without degrading the information exchange between detectors connected via T-Tap wiring and the control unit.
- The detector shall have a digital communication with the control unit on the basis of error recognizing protocol with multiple transmission of information.

- The system shall be able to signal a priority alarm message no less than two (2) seconds after the detector has recognized this situation.
- The optical chamber shall be designed for detection of every type of visible smoke (including dark smoke) and therefore have a scattering angle superior of 700.
- A built in barrier shall prevent the entry of insects into the sensor.
- The detector shall be designed for easy dismantling for factory cleaning.
- The detector shall be inserted in to a base without the need of tools.
- When installed, the base shall be completely hidden by the body of the detector.\
- The base shall include all necessary terminals to connect installation wiring.
- The base shall allow the removal of the detector without disconnecting the installation wiring.
- Any type of detector shall be inserted into or removed from the base and detector should be of soft addressable type.
- The manufacturer shall produce and provide test equipment, which allows a full functional test, including smoke entry openings, of the smoke detectors up to 7m above floor level without smoke or other aerosol producing devices.
- A comprehensive range of accessories shall be available to fulfill requirements for special applications (e.g. protective cage).

Intelligent Addressable Heat Detector

- The detection system shall be a combination of rate-of-rise and fixed temperature principle. It shall comply with EN: 54 Part 3, 5 & 7/UL/Vds.
- The detector shall communicate with the panel and report 2 different danger levels (“quiescent”, ALARM).
- All electronic circuits must be solid state, using SMD technology and must be completely coated to prevent influence from dust, humidity or dirt.
- The detector shall have a fail-safe operation mode.
- A common detector base design shall be utilized for the heat detector and all other detectors in the system range.
- If the detector un-installed, it shall completely cover the base.
- Reversed polarity or faulty zone wiring shall not damage the detector.
- The detector must have a built-in response indicator. In addition to that it shall have the possibility to connect a remote indicator.
- The detector must have a built-in line isolator; to isolate the lines between two points, in case of line short-circuits.
- The detector shall have automatic self-test functions.
- For environment protection purposes, the detector shall
- have no disposable parts like caps or packing
- have recyclable packing
- be easy to maintain
- be easy to dismantle and to separate different material types
- have markings on plastic by ingraining (not ink)

Manual Call Point - Analog Addressable

- The alarm shall be activated by breaking the glass without the need of an additional instrument (e.g.hammer)
- The glass plate shall be designed in away to prevent injuries when struck by the operator.
- The manual call point shall be able to isolate short circuits on the detection-line bus in order not to disrupt the proper function of the rest of the detectors connected on the detection-line bus. The isolating function shall be restored upon request by the control unit, when the short circuit condition is removed.

- The manual call point shall be controlled by a custom designed application specific integrated circuit (custom-ASIC) in order to guarantee a maximum reliability of the electronic circuit
- The call point shall have a digital communication with the control unit on the basis of error recognizing protocol with multiple transmission of information.
- It shall be possible to test the manual call point without destroying the covering window.
- Unauthorized removal of the call points cover must release an alarm.
- The manual call point shall comply with standard EN 54-11 or BS 5839-2or UL
- The call point shall fit on a surface mounting box which contains at least three terminals for the connection of the field wiring
- It shall be possible to mount the part containing the sensitive electronic circuit separately just before commissioning, thus preventing any possible damage due to inappropriate installation work.

Monitor input module - intelligent addressable

- The intelligent addressable input module shall be designed to be capable of being connected along with other analogue addressable elements on a loop. The devices shall be interfacing a stub line for simple dry contacts(switch) to the addressable fire alarm loop.
- Interface units shall be capable of accepting 4 input signals, 2 output signals. Dependent upon the specific application, input signals OR output signal may be interpreted by the system.
- The stub line shall be supervised with an end-of-line resistor.
- Programmable normally open or normal closed contacts shall be usable
- The analogue addressable input module shall be equipped with a line separator/isolator function, the operation of which shall not impair the function of the device when connected in loop mode.
- The built-in LED shall indicate an alarm when the connected contact is in alarm condition
- The Intelligent addressable input module shall be soft addressable type. An additional built-in LED shall indicate the functionality of the device.
- It shall be possible to exchange the electronic parts without removing the housing or the wiring.
- The housing shall be able to be equipped with 6 PG 16 cable glands.
- The Intelligent addressable input module shall be equipped with screw less terminals with built-in strain relief mechanism
- The box with wiring terminals and the electronic parts shall be available separately n order to carry out the wiring before inserting the electronic device and / or to fit the electronics into any other standard installation box of suitable size.
- For environmental protection purposes, the detector shall have no disposable parts like caps or packing
- Have recyclable packing
- Be easy to maintain
- Be easy to dismantle and to separate different material types
- Have markings on plastic by ingraining (not ink)

Output Module - Analog Addressable

- The analogue addressable output module shall be designed to be placed somewhere along the other analogue addressable devices on a detector loop. The device shall provide an interface as a control output of the fire alarm panel to equipment such as fire doors, smoke vents, smoke curtains etc.
- The output contact of the analogue addressable output module shall be rated to 240Vac/2A.
- The output control device should be controllable by any detector connected to the same fire detection control unit.

- The intelligent addressable output module shall be microprocessor based and soft addressable type.
- The intelligent addressable output module shall be equipped with line separator/isolator function without loosing its control and confirmation function.
- The analogue addressable output control device shall resume its normal status automatically after a short circuit.
- The analogue addressable output module shall be equipped with a built-in push button to activate the device for testing and for assigning its address during commissioning. An internal LED shall indicate the functionality of the device. Both, LED and button shall only be accessible with open case.
- It shall be possible to exchange the electronic parts without removing the housing or the wiring.
- The housing shall be able to be equipped with 6 PG16 cable glands.
- The analogue addressable output module shall be equipped with screw less terminals with built-in strain limits to prevent permanent deformation of the terminal and weakening of the contact pressure.
- The wiring terminals and the electronic parts shall be available separately in order to carry out the wiring before inserting the electronic device and/or to fit the electronics into any other standard installation box of suitable size.
- Fire environmental protection purposes, the detector shall have no disposable parts like caps or packing have recyclable packing
- Be easy to maintain
- Be easy to dismantle and to separate different material types
- Have markings on plastic by ingraining (not ink)

TECHNICAL SPECIFICATIONS (PUBLIC ADDRESS SYSTEM)

PUBLIC ADDRESS SYSTEM

GENERAL SYSTEM REQUIREMENTS:

The voice alarm system shall be the integrated solution for BGM and EVAC. The voice alarm system shall be designed for public address and emergency evacuation. All the essential EVAC functionality – such as system supervision, spare amplifier switching, loudspeaker line surveillance, digital message management and a fireman's panel interface – shall be combined.

The system shall provide for emergency call (EMG), business call and BGM audio, up to 60 zones, 8 call stations and two remote control panels.

The voice alarm system shall be a one channel/two channel system. It shall be compatible with BGM sources and 100 V booster amplifiers. It shall be capable of connecting to EVAC compliant loudspeakers and accessories for an integrated public address and voice alarm solution.

The system shall be fully IEC 60849 compliant.

It shall have full system supervision, loudspeaker line impedance supervision, a supervised emergency microphone on the front panel and a supervised message manager for at least 200 pre-recorded messages and chimes.

It shall be possible to merge messages to allow even more flexible use of pre-recorded announcements and evacuation messages. It shall be possible for each message to have any length within the total available capacity.

The memory shall have a capacity of 16 MB. It shall be possible to upload from a PC via USB into the memory, after which the unit shall operate without PC connection.

The standard WAV-format shall be used for the messages and sample rates of 8kHz up to 24kHz with 16-bit word length (linear PCM) shall be supported.

Volume override relay contacts shall be provided for each zone separately for overriding local loudspeaker volume controls. All current override schemes shall be supported (3-wire and 4-wire override schemes i.e. standard 24V and failsafe). Upon a call or an activated trigger input these contacts shall be activated for the appropriate zones, together with an additional voltage free contact (Call Active) for control purposes.

A 24Vdc output shall be available to supply power to external relays, so no external power supply shall be required for that purpose. A LED VU-meter shall allow for monitoring of the master output.

The maximum allowed total cable length between the controller and the last router in the chain shall be 1000 meters.

The maximum allowed total cable length between the controller and the last call station in the chain shall be 1000 meters.

The maximum allowed total cable length between the controller and the RC panel shall be 1000 meters.

The controller and each connected router shall have 12 trigger inputs to start business and emergency messages. Each shall be configurable for a message consisting of a sequence of up to 8 wave files.

It shall be possible for wave files to be used in different combinations with other messages, optimizing flexibility and used storage space.

The messages shall be merge able to allow even more flexible use of pre-recorded announcements and evacuation messages. The system will be configured for 24 zones, expandable to up to 60 zones using additional six zone routers. Up to 8 call stations shall be connectable. Interconnections shall be made using standard RJ45 connectors and CAT5 cable.

It shall be possible to connect 1000 watts booster amplifier per router. The audio output shall use standard analog audio 100 V line switching for full compatibility with public address equipment and EVAC-compliant loudspeakers. The system shall be configured using DIP switches for basic functionality and a PC for more advanced functions. It shall be possible to specify 16 priority levels.

A built-in 240 W booster amplifier shall provide the power for the emergency call channel and BGM. It shall be possible to add additional booster amplifiers as spare, to provide two-channel operation or if the total power requirement exceeds 240 W (maximum 1000 W per 6 zones).

The maximum/rated output power of the internal booster shall be 360 W / 240 W. max mains inrush current shall be 8A @ 230 Vac / 16A @ 115 Vac

All control equipments should operate on Mains voltage which will be either 230Vac or 115Vac, ±15%, 50 / 60Hz (selectable)

The power supply voltage range shall be 18 – 24V with a current consumption of less than 50 mA.

Power consumption of the Central Control Unit shall not exceed 600 Watts, and that of the Matrix shall not exceed 50Watts.

In case of Power failure Battery backup facility should be available and the battery voltage shall be 24Vdc, +20% / -10%.

The nominal sensitivity shall be 85 dB SPL (gain preset 0dB).

The nominal output level shall be 700 mV.

The maximum allowable sound pressure level shall be 110 dBSPL.

The microphone shall have a limiter. The distortion shall be less than 0.6% at maximum input.

The equivalent input noise level shall be no more than 30 dB SPL. The frequency range shall be 100Hz – 16kHz.

The speech filter shall be a 315 Hz, high-pass, 6 dB/oct filter. The output impedance shall be 200 Ohms. The stem length with microphone shall be 390 mm.

All low level connections and volume override shall be on MC1,5/XX-ST-3,5 type connector blocks.

All high level connections except mains shall be on MSTB 2,5 /XX-ST.

The input contact shall have supervision based on a series and parallel resistor.

All control equipments shall be rack mountable with removable rack mounts. The matrix shall be not higher than 2U. The controller shall be not higher than 3U. The rack mounting kit shall be included.

The operating temperature range shall be -10°C to +55°C. The storage temperature range shall be -40°C to +70°C.

The system shall comply to the following standards:

EVAC compliance	acc. to IEC 60849
EMC emission	acc. to EN 55103-1
EMC immunity	acc. to EN 55103-2
Safety	acc. to EN 60065

CENTRAL CONTROL UNIT SPECIFICATION

As the basis of the voice alarm system, the Central control unit shall have all the essential functionality for compliance with IEC 60849 standard, including full system supervision, loudspeaker line impedance supervision, a supervised emergency microphone on the front panel and a supervised message manager.

Frequency response shall be 60 Hz – 18 kHz (+1/-3 dB, @ -10 dB ref. rated output. The distortion shall not exceed 1% at the rated output, 1 kHz.

Control unit shall have tone controls to allow for adjustment of the BGM sound.

It shall have separate bass and treble controls.

The controller shall have two BGM source inputs and a mic/line input with configurable priority, speech filter, phantom power and selectable VOX activation.

It shall be possible to select 16 priority levels for microphone, call stations and trigger inputs for optimum system flexibility. It shall have two connectors to connect call stations. It shall have 12 input triggers with 6 supervised trigger inputs.

Furthermore it shall have one record output on cinch connectors.

The trigger outputs shall be on floating relays with a rating of 250V @ 7A.

The controller shall have an emergency active relay, a fault relay and two general purpose relays, for control purposes. The fault relay shall be failsafe.

The output section shall have six transformer-isolated 100 V constant voltage outputs for driving 100 V-loudspeakers in six separate zones.

All zones shall be individually selectable from the front panel and the BGM output level in each zone shall be individually settable in 6 steps.

The BGM output shall be connected to the 70V line, thus it shall be possible to connect a total load of 480 Watts in a two channel system combined with a 480 Watt booster.

The output of the booster shall be also available as a separate output on 100V and 70 V. A separate 100 V Call Only output shall be provided for addressing an area where BGM is not required but where evacuation announcements are. Six configurable volume override output contacts shall be available for overriding local volume controls during priority calls. A LED VU-meter shall monitor the output.

MATRIX SPECIFICATION:

The Matrix shall be an expansion unit adding 6 zones as well as 12 input- and 8 output contacts to the voice alarm system.

It shall be able to use the booster built in the central control unit.

It shall provide outputs and inputs for one or two boosters in a multi amplifier for one- or two-channel system.

It shall provide dual channel operation for calls and BGM simultaneously to a maximum of six different zones, using two booster amplifiers.

Also single channel operation shall be possible with only one booster.

The matrix shall have a set of relays for zone-switching the power amplifier output(s) to different loudspeaker groups.

Each of the zones shall be switched between the call channel (upon call-station selection or all-call microphone or emergency activation), the BGM channel (upon front panel selection), or off.

The zone power handling capacity of the matrix shall be 1000 Watts.

The router shall also have 12 input triggers. 6 triggers shall be supervised for EMG purposes.

PAGING STATION SPECIFICATION:

The 6-zone paging station shall be a stylish high quality call station with a stable metal base, a flexible microphone stem and a unidirectional condenser microphone.

It shall be intended for making calls to selected zones.

The special design shall allow for neatly flush mounting in desk tops.

Using dip switches on the bottom of the call station, the call station ID shall be selectable. The call station shall have selectable gain, speech filter and limiter for improved intelligibility.

On each call station it shall be possible to select 6 zones with the possibility to connect a paging station keypad to increase the number of zones or zone groups that can be selected.

It shall have LED indications for zone selection, fault and emergency state.

The call station extension shall provide seven additional zone and zone group keys.

On each paging station shall be possible to select 6 zones with the possibility to connect up to 8 call station keypads to increase the number of zones or zone groups that can be selected. Selected zones are indicated with LEDs on the call station, three additional LEDs give visible feedback on the active state of the microphone and the system. Green indicates microphone active, amber indicates that the system has detected a fault (IEC 80649) and red indicates that the system shall be in the emergency state.

LOUD SPEAKER CEILING MOUNT:

Recess mount speaker with metal grill, designed in accordance with IEC268-5 Power handling capacity standards. CE conformity. Safety according to EN60065. Ball-proof according to DIN 18032-3. Complete with metal fire dome, with following specifications:

- Maximum power : 9 watts
- RMS : 6 watts. Tappings at 6/3/1.5w
- SPL : 99dB At 6w/1watt (1 kHz at 1 mtr)
- Rated impedance : 1667 ohm 2 pole push-in terminal block

SURFACE MOUNT SPEAKER:

Suitable for speech and music reproduction. Metal enclosure designed to mount on surface or for recess mount. Conforming to CE and safety according to EN60065 and Evacuation compliance to BS5839-8 complete with back box with following specifications:

- Maximum power : 9 watts
- RMS : 6 watts with tapping at 6/3/1.5/0.75 watts.
- SPL : 102dB at 6 watts /1w (1kHz, 1mtr)
- Frequency : 150 Hz to 20kHz.
- Impedance : 1667 ohm with 3 pole screw connector.

AMPLIFIER:

- 19 inch rack mounting 2U high metal housing with dual priority switching.
- Inputs for 100 volts slave operation.
- Level controls for input 1 and 2.
- 240 watts RMS
- Frequency range: 50Hz to 20kHz
- Distortion: <1% at rated output power, 1kHz
- Inputs and outputs available at 100volts.
- Direct output : 100 volts / 70 volts and 8 ohm.
- Operation: 230 volts AC and 24VDC

BGM SOURCE:

Back ground music source consisting of DVD/CD/MP3 player with USB input and a separate FM player. Simultaneous operation of player and FM set

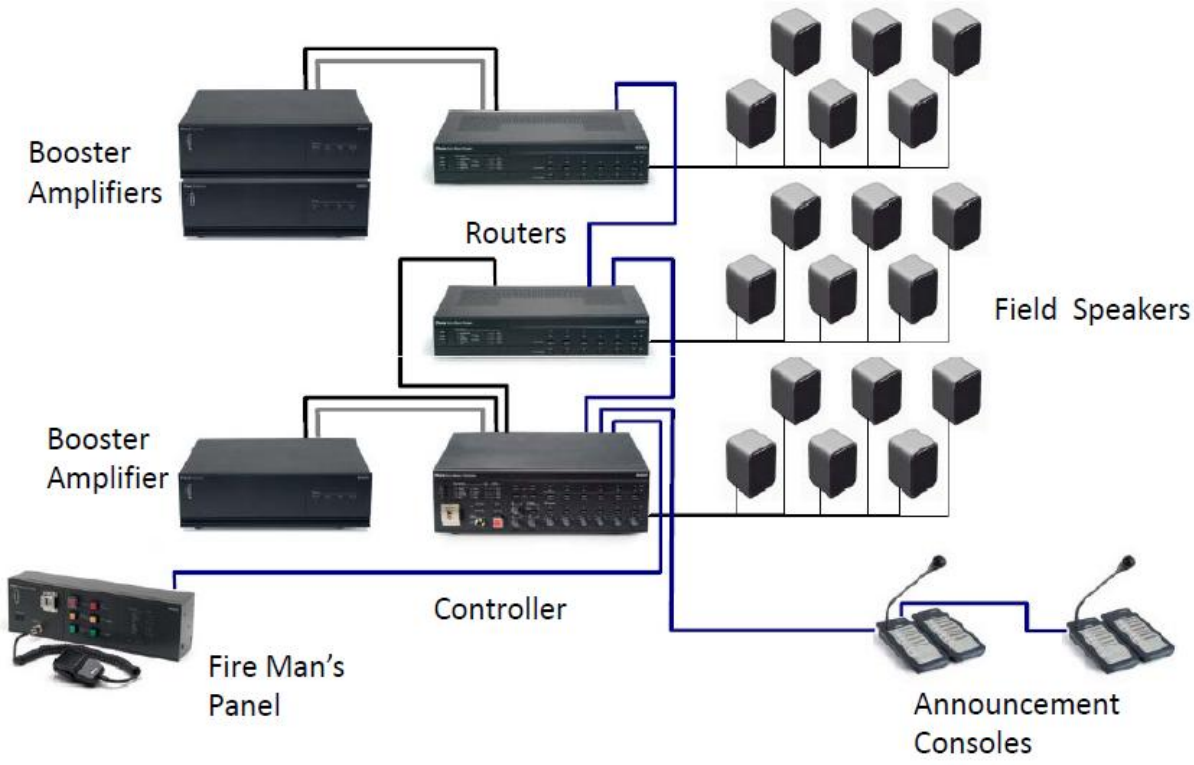
2 CORE CABLE

2 core 1 Sq mm Multi Stranded Overall PVC FRLS Cable of any Standard Make. This will be laid in the Pre-laid Conduits

VOLUME CONTROL SWITCH

- 12/36/100 watts 100 volts volume control with over ride relay.
- Suitable for 3 and 4 wire system.
- Continuous rotating system
- Self-extinguishing according to UL 94
- Safety according to EN60065 certification
- Five attenuation steps
- Frequency response: 50Hz to 20kHz
- Consumption: 20mA at 24VDC
- Mounts on MK switch panel

Public Address : Typical Scheme



TECHNICAL SPECIFICATIONS (CCTV SYSTEM)

CLOSED CIRCUIT MONITORING SYSTEM

GENERAL SYSTEM REQUIREMENTS:

The scope of work shall include supply, installation, testing and commissioning of all indoor and outdoor cameras, DVRs and control panels with all inter connection as required. The scope includes supply and laying of video coaxial cables, power and control wiring.

GENERAL SYSTEM DISCRIPTION:

The CCTV is required to supply the operator with the following information and facilities:

- Display of images on monitors through commands given by the operators' keyboard.
- Automatic camera selection, positioning and display to pre-set positions.
- Remote camera, monitor and recording selection.
- Display of single and/or quadruplicated images on any selectable monitor.
- Recording driven by Digital Video Recorders.

TECHNICAL BRIEF:

Digital Video Recorder –

The digital recorder shall be a 16-channel Analog input disk digital recorder. The digital recorder shall have the capability to carry 2 drive bays, and thus it shall have the capability to carry up to 4TB with the optional hard disk drives.

The digital recorder shall have the capability to record 25fps per channel @ CIF resolutions and any 2 channel at 4CIF resolution

The Digital recorder should support the latest compression technology H.264 algorithm.

The Digital video recorder should be capable of pentaplex functions.

The digital recorder shall have field recording. The digital recorder shall have 4 different recording modes – 1. Manual 2. Continues 3. Video Alarm Trigger 4. Alarm Trigger

The digital recorder shall have the ability to provide backup of the recorded images through USB, eSATA & network and should have min 1xeSATA.

The digital recorder shall have built-in coaxial and RS-485/422 telemetry allowing control of PTZ cameras of PELCO, Honeywell and LG.

The digital recorder shall have the following play back functions forward, reverse, fast playback, slow playback, freeze.

The digital recorder shall have 4 audio inputs and 1 audio output.

The digital recorder shall have a built-in LAN terminal. The digital recorder shall have the capability to connect to any PC over a LAN, and it shall have the capability to monitor and setup the digital recorder through network. Also, video and audio recordings shall be downloaded to a networked PC.

The digital video recorder should have separated recording/network Dual Streaming feature for transferring the data online with less bandwidth consumption and Frame rate can be adjustable.

The recording device should have remote management software CMS.

The digital recorder shall offer the following search modes:

- Date/Time search
- Calendar

- Event

The digital recorder shall operate on AC Free 100 to 240 V, 50 / 60Hz with the operating temperature of 0degre to 40ºC.

The digital recorder shall be CE/FCC/UL.

Video Input	16ch Composite (BNC)
Video Output	Main Output (Simultaneous) : VGA, Composite,HDMI
	Spot Output : Composite (up to 16channels division)
Operating System	Embedded Linux
Compression	H.264 Hardware Codec
Multiplex Function	Pentaplex (Live,Recording,Playback,Network,Backup)
Recording FPS	D1, Half D1, CIF
Frame Rate	480fps (NTSC),400fps (PAL) at CIF Resolution
Recording Mode	Continuous, Alarm, Motion, Instant
Playback Mode	Calendar, Date/Time, Event (Motion, Alarm), Bookmark
Display Mode	1, 4, 9, 16,
Audio	4 lines Input / 1 line Output
Storage	Internal HDD up to 4 SATA Hard disk, 8 TB Storage Supported
Backup	USB Memory Network, e-Sata
Export	USB Storage, Network,Internal/External ODD
Network	10/100/1000 base Ethernet, DDNS,
	TCP/IP, DHCP, PPOE
Data retention	Support (Auto Delete setting on Setup)
NTP	Support
Health Check	Support
Operation Control	Front Key, Mouse and Remote Controller
Firmware Update	USB Memory, Network

Dome camera Indoor -

The colour camera shall incorporate 6mm (1/3 Type) Super HAD Ⅱ Color CCD. The colour video camera shall produce a picture with 540 lines of horizontal resolution. The CCTV camera shall have the ability to switch from colour mode to black & white mode automatically in Low light conditions. The video camera shall have a minimum light requirement of 1.0 Lux @ F2.0.The video camera shall have a video signal to noise ratio of more than 50dB.

The video output level shall be 1.0 Vp-p (75 ohms composite) with a BNC type connection.

The video camera shall have advanced intelligence to eliminate light hunting and picture distortions caused by colour/black and white switching. The video camera should be Day & Night Camera.

The video camera shall have options for back light compensation in the form of Digital WDR / AGC / BLC.

The video camera shall have 3D-Digital Noise Reduction.

The camera shall have internal sync system capabilities.

The camera shall have Enhanced functions like Picture In Picture, Quad View, Mirror, Digital Zoom, Privacy Masking, Motion Detection

The Camera Electronic shutter min speed should be 1/50~1/100,000.

Power requirements for the video camera shall be 12V DC and shall consume approx. 3 W.

The camera should have a multi Language OSD including English.

The video camera shall be CE/FCC/UL-ETL Listed.

Imaging Sensor	(1/3 Type) Super Had CCD II
ISP	Digital Signal Processor
Lens Type	3.6/ 6 mm Fixed Lens
Sync. System	Internal / Line Lock (Option)
Horizontal Resolution	540TV Lines
S/N Ratio	48dB
Minimum Illumination (F1.2, 50IRE)	1 Lux
Video Output Signal	1Vp-p Composite (75Ω)
Day & Night	Digital (Auto / Day / Night)
Backlight Compensation	Digital WDR / AGC / BLC / BMB
Auto Gain Control	0-40 db
Electronic Shutter Speed	Auto / Fixed (1/60 ~ 1/100,000) / Manual (256 Steps) / Flickerless
White Balance	ATW (1700-11000K)/AWC
Multi OSD Language	Required
Power Source	DC 12V
Power Consumption	3 W
Operating Temperature / Humidity	-10˚C ~ 50˚C / 0% ~ 80%RH (Non-Condensing)
Storage Temperature / Humidity	-20˚C ~ 60˚C / 0% ~ 85%RH (Non-Condensing)

Day/Night Box camera Indoor -

The color camera shall incorporate a 3.6/6mm (1/3 Type) Super HADⅡ CCD. The colour video camera shall produce a picture with 580 lines of horizontal resolution. The CCTV camera shall

have the ability to switch from colour mode to black & white mode automatically in low light conditions. The video camera shall have a minimum light requirement of Color: 1 Lux @ Sens-up Off, F1.2,

The video camera shall have a video signal to noise ratio of more than 52db.

The video output level shall be 1.0 Vp-p (75 ohms composite) with a BNC type connection.

The video camera shall have advanced intelligence to eliminate light hunting and picture distortions caused by colour/black and white switching. The video camera should be Day & Night Camera.

The camera shall be C-mount and CS-mount selectable with a help of jack fitted on the camera.

The video camera shall have options for back light compensation in the form of BLC to mask the high source of light & BMB.

The video camera shall have Digital Noise Reduction with options so that there should not be any tail of light follow the vehicle.

The video camera shall have eight privacy Zones, white balance (auto and manual adjustment available).

The camera shall have internal sync system capabilities.

The colour video camera shall have Electronic Image Stabilization features available as that is required.

The Camera Electronic shutter min speed should be 1/50~1/90,000.

Power requirements for the video camera shall be 12V DC and shall consume approx. 2.5W.

Camera shall have the enhanced functions like Picture In Picture, Quad View, Mirror, Digital Zoom, Privacy Masking and Motion Detection.

The camera should have a multi Language OSD including English.

The video camera shall be CE/FCC/UL-ETL Listed.

TECHNICAL SPECIFICATIONS (ACCESS CONTROL SYSTEM)

ACCESS CONTROL SYSTEM

The functional requirements of the Access Control System (ACS) shall be as follows:

It shall provide means to configure control access to nominated doors and to secured areas of premises by configuring the access privileges stored in Access Door Controllers (ADC). These privileges define the access right of cards presented at readers.

It shall support distributed architecture with central monitoring and control. If communication to the central control fails, the ACS shall continue providing access based on the predefined security configuration. Until communication is regained, all event logs and alarms shall be stored locally (based on ADC capacity). These events shall be sent to the central control when the communication is regained.

It shall have peer-to-peer communication for inputs and outputs from the ADCs.

It shall have multiple supervised inputs. The dynamic status of each input shall be continuously monitored and each change should be reported immediately.

It shall provide programmable inputs, i.e. the ability to apply a variety of conditions to the way in which these inputs are monitored. These conditions shall be expressed in definite terms.

It shall be able to produce and communicate various types of outputs (Audible sirens, relay switching etc.) based on the above definition. These outputs shall be standard in terms and shall be interfaced as inputs to other Building Management System.

ACS communications should support RS232, RS485, TCP/IP, dial up modems.

All ACS software/firmware upgrades shall be downloadable through the network to the ADC.

Shall provide a fully integrated ACS application that shall utilize a user friendly Windows Graphical User interface. It shall utilize keyboard and mouse operations with graphical presentations of screen information. ACS operators/administrators shall be able to change the look and feel of the applications according to their personal taste.

Shall provide a fully integrated report generator wizard. The wizard should provide the possibility to view and print any part of the ACS information (not only history). It should also allow filtering and ordering by any field. It should also provide storage of user defined reports.

The following features shall be part of the ACS application:

a) Time Zones with intervals.

b) Access Levels

c) Access Groups

d) Holidays

e) Database segmentation

f) Field hardware communication

g) Field hardware configuration

h) Area controls with local & global Anti-Passback

i) Global input/output event linkage

k) Alarm and event logging

l) Scheduling

m) Multiple card formats

n) Context sensitive help

o) Monitor zones

q) Text instructions

s) Alarm priorities

t) Alarm event mapping

u) System download

The ACS shall provide the following alarm features:

a) Alarm enunciation configuration

b) Alarm handling & reporting

c) Current status indication

d) Alarm priorities

e) Alarm acknowledgement & processing with valid comments

f) Optional real-time, time lapse and live video user verification

g) Trace functions for cards

i) Manual overrides

j) Video interfacing

k) Real time dynamic graphical maps

l) Alarm sorting capabilities

m) Guard tour interface

The following minimum features shall be part of card enrolment and personal data management:

a) Creating and maintaining cardholder database with image attributes

b) Modify existing field names of cardholder form

c) Assigning of access level

d) Bulk assignment/deletion of access levels

e) Record searching

In addition to the ACS and Alarm functions previously defined, following modules shall be part of the ACS, as standard or optional:

a) Parking Module

b) Lift Module

c) Time & Attendance module

d) Bio-Identification module

e) Badge printing module

Access Control General Features

The Access Control System shall allow global functions:

a) Global Anti-Passback with or without PC.

b) Area definition.

c) Input/output linking between different controllers.

In a case of global communication failure, each door controller shall grant access considering the complete card number (site code included), i.e. downgraded mode shall not exist.

The hardware should be equipped with an optional secondary communication interface in the case of communications failure, enabling communication to proceed in case the main network is down.

When a new ADC is being defined by the operator, the software shall automatically define, according to the controller type, all its components: readers, inputs and relays. The following basic controller parameters should also be automatically defined and configured: door alarm input, door open time, request to exit input, reader weekly program. The newly created reader should be automatically added to the default access group which allows door pass on all doors, at any time.

The Access Control and Security Management system (ACS) shall provide a number of security automation functions including the ability to regulate access through specific doors and gates to secured areas.

The ACS functions are categorized into the following:

a) Access Control system

b) Alarm Monitoring system

c) Attendance recording system

d) Biometric Verification

e) Guard Patrol system

f) Lift (elevators) control system

g) Parking Management system

h) Video Surveillance & Recording system

i) Integration with intelligent perimeter Security

j) Card designing and printing facility.

The ACS shall be developed so that all modules (access control, alarm monitoring, digital video, intrusion detection, etc.) shall seamlessly integrate into a single application with GUI.

The ACS shall be modular in nature and easily expandable without any hardware/software limitations.

The ACS shall support many Clients / Workstations with all functionality available from client / workstation on the network

The ACS shall utilize a single seamless integrated relational database for all functionality.

The data archival and back up shall be part of the system architecture and process.

The ACS shall support Microsoft Windows XP/2003/Vista/Win7 operating systems.

The ACS shall be expandable to support an unlimited number of field devices and integrated client workstation.

The alarm monitoring client workstation shall be able to connect to, and monitor, field hardware devices, such as card readers and Access Door Controller (ADC).

The ACS shall provide graphical map display that shall allow administrators/users to import customized map backgrounds of the facility and position custom symbols on these maps.

The ACS shall be designed to perform a wide variety of feature rich functions as part of an integrated security automation and management system.

Alarm & access events shall be integrated with video system and shall be hardwired with various sub-systems.

The ACS shall support a fault tolerant server and redundant database architecture.

In the event of a server failure, the system shall automatically switch over to a backup server from the primary server without impeding the operation of the ACS.

In case the communication path between the ACS database server and the ADC is broken, the data shall be stored in a temporary queue and shall be automatically downloaded once the communication is restored.

Cardholder Definition

Each cardholder can be validated or invalidated.

Each cardholder can be validated for a given period by setting the start date and end date. The system shall automatically update the database and the controllers within 30 minutes (default) of the relevant change.

The ACS shall allow defining types of cardholder: Employee, Guard. The software shall provide separate views for viewing guards. This is to enable defining operators that can see only these cardholder's types.

Each cardholder can be assigned with a different card for each reader technology (Magnetic, Wiegand, etc.)

It shall be possible to associate a cardholder picture by attaching a photo file or by taking a still image using a web cam or other camera. The picture taking process must be operated directly from within the access control software.

It shall be possible to assign one or more access groups for each cardholder.

Each cardholder can have a different weekly program on each reader. This weekly program can be mutual to all members of the access group. Alternatively each cardholder can have a personal weekly program to be used where no mutual weekly program was selected.

The ACS shall allow reader authorization exceptions for limited period. These exceptions should override the access group definitions within the defined times.

The ACS shall allow attaching scheduled changes in access groups.

The ACS shall allow defining a personal cardholder privilege to avoid anti-passback restrictions.

The ACS shall allow providing last reader name where the cardholder passed including the date/time of the event.

The ACS shall allow setting cards status to: Used, Free, Canceled, Lost or Stolen.

Allow creating of two or more cardholders with the same first name and last name. The distinction in these cases shall be based on a special administrative number.

Badge printing shall be an integral part of the cardholder screen. It should allow creating and designing unlimited number of badge layouts.

Each cardholder can have a Personal Identity Number (PIN) to be used on readers with keypad.

It shall be possible to allocate each cardholder with a lift program, which is a list of floors (in fact, relays) to be activated when he/she passes a reader defined as a 'lift reader'.

When the operator deletes a cardholder– the program should not remove him from the database. Instead the program should mark him as 'deleted', and hide him from the list of cardholders (unless the user explicitly asks to show the deleted ones). Following the deletion his/her badge should be deallocated. Operator should be able to revert a cardholder status back to normal. There should be a special option to use when the final removal of deleted cardholders is required.

The cardholder screen should include, in addition to the standard information fields (address, phone, etc.) an option to create an unlimited number of customized fields. E.g. height, eye color, army rank, etc.

The system should include a location status screen providing the location of every cardholder in the site. This screen should allow viewing, for each defined area (and sub area), the real time list of cardholders currently present in the area and show their total count. The areas and sub areas should be shown in a tree view.

Report Generator Wizard

The system should include an advanced report wizard enabling the user to issue reports for logged events, alarms and all system components: controllers, readers, access groups, cardholders, etc. Reports should support filter by any field. Operator should be able to create and design custom-made reports and save their layout and filter rules for future use. All reports should support export to external files in known formats: RTF (MS-Word), PDF, HTML, XLS (MS-Excel), TIF, TXT (Text).

These reports shall be able to be filtered to show requested times, dates, events and/or monitor points, doors, relays, inputs, operators, card users, controllers as pre-programmed by the user.

The system should allow automatic print/preview/export any user defined report containing the current updated values (e.g., recent events). The trigger for the report print/preview/export may be either a selected event or a pre-defined schedule.

A report can be saved with its filtering rules as defined by the operator so the next time it will show the corresponding latest records.

The system should provide Time & Attendance (T&A) report. For each reader it should be possible to define whether it is IN, OUT, or None (i.e., its event should not be included in the attendance report. The T&A report should contain the total work hours for each cardholder based on all the relevant access events. Operator should be able to add and correct missing IN/OUT access events.

Minimum system capacities and features:

SYSTEM CAPABILITY	
Number of cards	2,000 - 250,000
On line remote site	LAN/WAN
Door controllers (RS-485)	Unlimited
Door controller RS-485 Loops	Unlimited
Door controllers (TCP/IP)	Unlimited
Card readers	Unlimited
Keypads	Unlimited
Monitored points (inputs)	Unlimited
Door lock outputs	Unlimited
Access Groups	Unlimited
Daily Schedule of 4 Intervals each	255 Max.
Weekly Schedule of 7 daily Schedules + holiday	127 Max.
Holidays and Special Days	180

Operator workstations (MS-SQL)	Up to 200 (MS-SQL Server 2000/2005)
Multi Software Operators	Yes
System Operator User/Passwords	Unlimited
Operator Security Levels	Unlimited
Multiple operator languages	Unlimited
Number of printers	Limited by network
User Defined Cardholder Fields	40
FUNCTIONS & FEATURES	
Cardholder Database Import	ODBC compliant (Access, Excel, etc.)
Anti Passback	Local/Timed/Global w/ & w/o PC
Advanced Report Wizard	View/print/edit layout
User Defined Reports	Yes
Operating System / Compatibility	Windows 2000/XP/Vista/Win7
Remote Management/Dial-up	Yes
Database	Access/MS-SQL
Integrated Badge Printing	View/print/edit layout
ADVANCED FEATURES	
Action and Process control	Yes
Time and attendance report	Yes
Operator response (dispatch) instructions	Unlimited
Translation Tool for Software Localization	Yes
Duress keypad code	Yes
Real time cardholders & cars location	Yes
Communication Encryption	Yes
User Defined Encryption Password	Yes
CONTROLLER	
Readers	2 or 4
Inputs	Up to 16 supervised
Outputs	Up to 64
Communication port	Up to 3
TCP on board	Yes
Max. Number of Events in Controller Memory	25,000
DIN Rail support	Yes
Readers Sabotage Detection	Yes
Reader Multi Technology Support	Yes

18. BILL OF QUANTITIES - SCHEDULE A

INDIAN INSTITUTE OF TECHNOLOGY MADRAS, CHENNAI 36					
Name of the Work : Provision of Fire Alarm,CCTV, PA system & access control system and Fire Fighting system to main,pc & FTC buiding for National center for combustion research & development(NCCRD) at IIT Madras					
Tender No: 22/2013-14/Eldb					
BILL OF QUANTITIES FOR FIRE ALARM WORK-MAIN BUILDING – PART - A					
Sl. No.	**DESCRIPTION**	**QTY**	**UNIT**	**RATE**	**AMOUNT**
A	**Fire Alarm System**				
1	Supply, installation , testing & commissioning of Microprocessor based 2 loops analogue addressable Networkable type fire alarm control panel with 168 character LCD display, our access levels, 1000 event historical logging, flash EPROM sufficient numbers of programmable relay controls, 240 volts AC power supply, automatic battery charger, 24 volts sealed lead acid batteries sufficient for 24 hours normal working and then be capable of operating the system for 2 hours during an emergency condition. Each Loop can accommodate 125 Detectors or 125 Devices , ete complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/ Schneider.	1.00	No		
(Rate in words Rupees…….)					
2	Supply, installation, testing & commissioning Repeater panel with 40 characters back lit super twist LCD display with system function keys like system reset. Alarm acknowledge, Alarm Silence, Trouble Acknowledge etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/Schneider	1.00	No.		
(Rate in words Rupees…….)					
3	Supply, installation , testing & commissioning of Intelligent addressable type Multisensor type smoke detectors with standard base etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/ Schneider	55.00	Nos		
(Rate in words Rupees…….)					

4	Supply, installation , testing & commissioning of Intelligent addressable type rate of rise and fixed temperature heat detectors etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/Schneider	40.00	Nos		
(Rate in words Rupees……..……)					
5	Supply, installation, testing & commissioning of Addressable type Manual Call Point unit etc. complete as per the detail technical specification and as per the instruction of site Engineer.	6.00	Nos		
(Rate in words Rupees……..……)					
6	Supply, installation, testing & commissioning of Addressable sounder with strobe etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/Schneider	6.00	Nos		
(Rate in words Rupees……..……)					
7	Supply, installation , testing & commissioning of Fault Isolation Module etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/Schneider	8.00	Nos		
(Rate in words Rupees……)					
8	Supply, laying & testing of 2 x 1.5 sq mm FRLS shielded single core cable in suitable MS conduit pipe of 1.6 mm thick concealed in wall/ceiling as required. Approved make of cable will be Finolex / Polycab/ RR Kabel.	2,000.00	Mtrs		
(Rate in words Rupees……..……)					
B	**CCTV System (DVR Based)**				
9	Supply, installation , testing & commissioning of Indoor 1/3"color fixed dome camera with 540 TV lines resolution complete with power supply and accessories ete complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Bosch /GE / Pelco/ Honeywell.	14.00	Nos		
(Rate in words Rupees……)					

10	Supply, installation , testing & commissioning of Digital Video recorder 2 TB HDD ete complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Bosch /GE / Pelco/Honeywell.	1.00	Lot		
(Rate in words Rupees……)					
11	Supply, installation , testing & commissioning of 21" LCD colour monitors ete complete as per the detail technical specification and as per the instruction of site Engineer. Viewsonic / Samsung / LG.	1.00	Nos		
(Rate in words Rupees……)					
12	Supply, laying & testing of RG 11 video cable complete as per the detail technical specification in 25mm dia PVC pipe of 2 mm wall thickeness concealed in ceiling/wall as required.	400.00	Mtrs		
(Rate in words Rupees……)					
13	Supply, laying & testing of 2 Core 1.5 sqmm FRLS copper singel core cable in 20mm dia PVC pipe of 2mm wall thickness concealed in wall/ceiling as required.	100.00	Mtrs		
(Rate in words Rupees……)					
C	**Public Address System**				
14	Supply, installation , testing & commissioning of Audio amplifiers including all necessary control desk and microprocessor based control unit with microphone, BGM, Call Station & PC input including providing necessary rack for mounting the Amplifier etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Bosch / Bose / ATIES/ Notifier.	1.00	Set		
(Rate in words Rupees……)					
15	Supply, installation , testing & commissioning of Speakers wall / ceiling mounted - 6W, complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Bosch / Bose / ATIES/ Notifier.	80.00	Nos.		
(Rate in words Rupees……)					

16	Supply, installation , testing & commissioning of Announcement console complete with microphone and Zone selection etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Bosch / Bose / ATIES/ Notifier.	1.00	Set		
(Rate in words Rupees……)					
17	Supply, laying & testing of 2 Core 1.5 sqmm FRLS copper singel core cable in 20mm dia PVC pipe of 2mm wall thickness concealed in wall/ceiling as required.	1,200	Mtrs		
(Rate in words Rupees……)					
D	**Access Control System**				
18	Supply, installation , testing & commissioning of 4 Reader Controller with battery back up and TCP/IP Connectivity etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Honeywell/ GE/ Bosch.	8.00	Nos		
(Rate in words Rupees……)					
19	Supply, installation , testing & commissioning of HID Proximity readers etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Honeywell/ GE/ Bosch.	32.00	Nos		
(Rate in words Rupees……)					
20	Supply of HID proximity cards	500.00	Nos		
(Rate in words Rupees……)					
21	Supply, installation & testing of EM Lock with external Door Magnetic Contacts etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved make are BEL/ Capture/ ALGATEC.	16.00	Nos		
(Rate in words Rupees……)					

22	Supply, installation & testing of Resettable Emergency release Box etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Honeywell/ GE/ Bosch.	16.00	Nos		
(Rate in words Rupees……)					
23	Access Control software with Time & attendance feature etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Honeywell/ GE/ Bosch.	1.00	Nos		
(Rate in words Rupees……)					
24	Supply, laying & testing of 8 core x 1 sq mm shielded FRLS copper unarmoured cable in 25mm PVC pipe of 2mm wall thickness on ceiling /wall as required	400.00	Mtrs		
(Rate in words Rupees……)					
25	Supply, laying & testing of 2 Core 1.5 sqmm FRLS copper singel core cable in 20mm dia PVC pipe of 2mm wall thickness concealed in wall/ceiling as required.	400.00	Mtrs		
(Rate in words Rupees……)					
Total – PART A					

Total Amount for Part A – Rupees in words .....

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BILL OF QUANTITIES FOR FIRE ALARM WORK-PC & FTC Building – PART - B					
S.No	**DESCRIPTION**	**QTY**	**UNIT**	**UNIT**	**AMOUNT**
A	**Fire Alarm System**				
26	Supply, installation , testing & commissioning of Intelligent addressable type Multisensor type smoke detectors with standard base etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/ Schneider	6.00	Nos		
Rate in words Rupees……)					
27	Supply, installation , testing & commissioning of Addressable type Manual Call Point unit etc. complete as per the detail technical specification and as per the instruction of site Engineer.	3.00	Nos		
(Rate in words Rupees……)					
28	Supply, installation , testing & commissioning of Addressable sounder with strobe etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/Schneider	3.00	Nos		
(Rate in words Rupees……)					
29	Supply, installation , testing & commissioning of Fault Isolation Module etc. complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Secutron / Notifier / Edwards / Honeywell / Siemens/Schneider	2.00	Nos		
(Rate in words Rupees……)					
30	Supply & laying of XLPE insulated PVC sheathed copper conductor, 1.1 kV grade armoured shielded cable conforming to IS:7098, as per approved make in ground/ trench/ surface/ pipe, etc. whereever required as per direction of Engineer In-charge. Note: The rate of Installation should be inclusive of Cable clamps, tags Saddles, Consumables etc. Trays/pipes, trenches, ,conduting etc complete. Approved makes are Finolex / Polycab/ RR Kabel.				-
30.1	Supply,,laying & testing of 2 core 1.5 sq mm FRLS shielded armoured cable.	50.00	Mtr		
(Rate in words Rupees……)					

31	Supply, laying & testing of 2 x 1.5 sq mm FRLS shielded single core cable in suitable MS conduit pipe of 1.6 mm thick concealed in wall/ceiling as required. Approved make of cable will be Finolex / Polycab/ RR Kabel.	150	Mtrs		
(Rate in words Rupees……)					
B	**Public Address System**				
32	Supply, installation , testing & commissioning of Speakers wall / ceiling mounted - 6W, complete as per the detail technical specification and as per the instruction of site Engineer. Approved makes are Bosch / Bose / ATIES/ Notifier.	3.00	Nos.		
(Rate in words Rupees……)					
33	Supply & laying of XLPE insulated PVC sheathed copper conductor, 1.1 kV grade FRLS armoured shielded cable conforming to IS:7098, as per approved make in ground/ trench/ surface/ pipe, etc. wherever required as per direction of Engineer In-charge. Note: The rate of Installation should be inclusive of Cable clamps, tags Saddles, Consumables etc. Trays/pipes, trenches, conduting etc complete. Approved makes are Finolex / Polycab/ RR Kabel.				
33.1	Supply, laying & testing of 2 core 1 sq mm shielded FRLS armoured cable	50.00	Mtrs		
(Rate in words Rupees……)					
34	Supply, ,laying & testing of 2 x 1.5 sq mm FRLS shielded single core cable in suitable PVC conduit pipe of 2.0 mm thick concealed in wall/ceiling as required. Approved make of cable will be Finolex / Polycab/ RR Kabel.	50.00	Mtrs		
(Rate in words Rupees……)					
TOTAL –PART B					
Total Amount for Part B – Rupees in words ..... **.....** **.....**					

BILL OF QUANTITIES FOR FIRE HYDRANT WORK-Main Building – PART - C					
Sr. No.	**Description**	**Qty**	**Unit**	**Rate**	**Amount**
A	**Pump House Equipment, Pipes & Valves**				
35	Electric driven main pumping set having capacity 54 M^3 / Hr. @ 35 MWC Head with motor-, complete with base plate, coupling guard, Antivibration mounting pads.	1	Set.		
(Rate in words Rupees……)					
36	**Control Panel for Fire pump.**				
	Fabricating & Supply, installing, testing and commissioning of control panel for Booster Pump.	1	Set		
(Rate in words Rupees……)					
37	Supply, erection, testing & commissioning of Pressure switches of suitable range for pump sets with Ball valves, Fittings like unions / collars / reducers etc.	1	No.		
(Rate in words Rupees……)					
38	Supply, erection, testing & commissioning of Pressure gauges of suitable range for pump sets with Ball valves, siphon, Fittings like unions / collars / reducers etc.	1	No.		
(Rate in words Rupees……)					
39	Supplying, installing, testing and commissioning of G.I. Pipes confirming to IS 1239 Pt - I Heavy grade with painting, suitable type of supports, anchor fasteners, bolts nuts (Galvanised), clamps, "U" bolts, fittings such as Reducers,Tees, elbows, flanges. Including cutting, Welding, fixing in / on walls, ceiling by using suitable supports etc, as per drawings. The quoted rate shall also include for chasing / chipping walls and making them good with filler material and finished in cement morter etc. complete.				
39.1	150mm nominal dia	30	mtr		
(Rate in words Rupees……)					

39.2	100mm nominal dia	30	mtr		
(Rate in words Rupees……)					
39.3	80mm nominal dia	12	mtr		
(Rate in words Rupees……)					
40	Supplying, Installing, testing and commissioning CI butterfly valves as per BS 5155 (PN 16) slim seal standard lever operated / gear operated type with required flanges, nuts, bolts etc. complete.				
40.1	150mm nominal dia	2	Nos.		
(Rate in words Rupees……)					
41	Supplying, installing and commissioning C.I. flanged "Y" type Strainer with SS mesh, suitable flanges, nuts, bolts, gaskets etc. complete.				
41.1	150mm dia.	1	No.		
(Rate in words Rupees……)					
42	Supplying, installing, testing and commissioning of C.I. Non-return valves as per IS:5312(PN 16) swing check type with required flanges, nuts, bolts and gaskets etc. complete.				
42.1	150 mm nominal dia	1	Nos.		
(Rate in words Rupees……)					
	1100 V GRADE POWER / CONTROL CABLES				
43	Supplying, laying, testing & commissioning of FRLS,PVC outer sheathe, steel armoured, aluminium / copper conductor, 1100v grade power cables with glands etc. The cables shall be laid in tray. as required..The size of the cables shall as mentioned below,				
43.1	4 C x 16 Sqmm. Aluminum for Booster pump	15	mtr		
(Rate in words Rupees……)					

B	**Hydrant System**				
44	Supplying, installing, testing and commissioning of hydrant comprising of the following,				
44.1	Single headed hydrant valve as per IS 5290, made of gunmetal with 63 mm dia instantaneous out & 80 mm dia fanged inlet inlet, Blank cap , chain and hand wheel etc complete.	6	Nos.		
(Rate in words Rupees……..……)					
44.2	Supply, erection, testing & commissioning of G.M. Branch pipe with nozzles	6	Nos.		
(Rate in words Rupees……..……)					
44.3	Supply, erection, testing & commissioning of 63 MM x 15 Mtrs. Long RRL hose pipe complete with pair of GM couplings.	12	Nos.		
(Rate in words Rupees……..……)					
45	Supply, erection of M.S. Hose cabinet stand mounted type fabricated out of M.S. sheet of 16 swg. with glass fronted (4mm thick glass with rubber beeding) door and size of the cabinet shall be 600mm x 750 mm x 250 mm Quoted rate shall be includes suitable all fasteners etc, and cabinet shall be powder coated of approved colour both inside and out side.	6	Nos.		
(Rate in words Rupees……..……)					
46	Supply, erection, of Fire duct Shutter fabricated out of M.S. sheet and frame, door shall be 900mm x 1500 mm min. & fixed with 4 mm thick Glass, suitable Rubber beedibg and Locking arrangement. Quoted rate shall be includes all fasteners etc, and complete shutter shall be powder coated of approved colour both inside and out side.	5	Nos.		
(Rate in words Rupees……..……)					
47	Supply, erection, testing & commissioning of Hose reel drum of swinging type with 20 mm dia Rubber braided hose of 36.5M. length with Gate valve (on upstream) and Shut off nozzle, complete.	6	Nos.		
(Rate in words Rupees……..……)					

48	Supplying, installing and commissioning Portable Fire extinguishers of following type & capacity.				
48.1	Carbon-di- oxide type fire extinguisher of 4.5 kgs. Capacity, CO2 gas filled in brand new seamless cylinder with powder coated finish, made out of Manganese steel, with wheel type valve, discharge nozzle, bend & horn, wall mounting bracket etc. complete, confirming to IS: 2878.	6	Nos.		
(Rate in words Rupees……)					
48.2	ABC powder type fire extinguisher of 6 Kgs. Capacity, with initial filling in brand new cylinder with powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge, discharge hose, floor trolley type / wall mounting bracket etc. complete, confirming to IS:13849.	6	Nos.		
(Rate in words Rupees……)					
48.3	Clean Agent type 5 kg Extinguishers	16	Nos.		
(Rate in words Rupees……)					
D	**Supply, erection of Emergency Escape System**				
49	Emergency Exit (5"X12")	20	Nos.		
(Rate in words Rupees……)					
50	Fire exit (5"X12")	20	Nos.		
(Rate in words Rupees……)					
51	Co2 fire extinguishers (8"X16")	6	Nos.		
(Rate in words Rupees……)					
52	ABC fire extinguishers (8'X16")	6	Nos.		
(Rate in words Rupees……)					

53	Fire Lift (4"X12")	10	Nos.		
(Rate in words Rupees……)					
54	In case of fire do not use lift, use staircases (8"X8")	10	Nos.		
(Rate in words Rupees……)					
55	Fire hose reel. (8"X8")	6	Nos.		
(Rate in words Rupees……)					
56	Manual call point. (4"X4")	6	Nos.		
(Rate in words Rupees……)					
57	Fire alarm panel. (4"X4")	1	Nos.		
(Rate in words Rupees……)					
58	Fire hydrant (4"X4")	6	Nos.		
(Rate in words Rupees……)					
59	Route Markers (10 mtrs rolls)	1	Nos.		
(Rate in words Rupees……)					
60	Letters and Nos. (8"X3")	50	Nos.		
(Rate in words Rupees……)					
T O T A L - PART C					

Total Amount for Part C – Rupees in words .....

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BILL OF QUANTITIES FOR FIRE HYDRANT WORK-FTC Building – PART – D

S.No	Description	Qty	Unit	Rate	Amount
61	Supplying, installing, testing and commissioning of G.I. Pipes confirming to IS 1239 Pt - I Heavy grade with Coating & Wrapping of 4mm Thick Tape of IWL & fittings such as Reducers, Tees, elbows, flanges. Including cutting, Welding, fixing as per drawings. The quoted rate shall also include for Excavation & Back filling complete.				
61.1	100mm nominal dia	84	mtr		
(Rate in words Rupees……)					
61.2	80mm nominal dia	48	mtr		
(Rate in words Rupees……)					
62	Supplying, Installing, testing and commissioning CI butterfly valves as per BS 5155 (PN 16) slim seal standard lever operated / gear operated type with required flanges, nuts, bolts etc. complete.				
62.1	100mm nominal dia	1	Nos.		
(Rate in words Rupees……)					
63	Supplying, installing, testing and commissioning of hydrant comprising of the following,				
63.1	Single headed hydrant valve as per IS 5290, made of gunmetal with 63 mm dia instantaneous out & 80 mm dia fanged inlet inlet, Blank cap , chain and hand wheel etc complete.	3	Nos.		
(Rate in words Rupees……)					
63.2	Supply, erection, testing & commissioning of G.M. Branch pipe with nozzles	3	Nos.		
(Rate in words Rupees……)					
63.3	Supply, erection, testing & commissioning of 63 MM x 15 Mtrs. Long RRL hose pipe complete with pair of GM couplings.	6	Nos.		
(Rate in words Rupees……)					

64	Supply, erection of M.S. Hose cabinet stand mounted type fabricated out of M.S. sheet of 16 swg. with glass fronted (4mm thick glass with rubber beeding) door and size of the cabinet shall be 600mm x 750 mm x 250 mm Quoted rate shall be includes suitable all fasteners etc, and cabinet shall be powder coated of approved colour both inside and out side.	3	Nos.		
(Rate in words Rupees……)					
65	Supply, erection, testing & commissioning of Hose reel drum of swinging type with 20 mm dia Rubber braided hose of 36.5M. length with Gate valve (on upstream) and Shut off nozzle, complete.	3	Nos.		
(Rate in words Rupees……)					
66	Supplying, installing and commissioning Portable Fire extinguishers of following type & capacity.				
66.1	Carbon-di- oxide type fire extinguisher of 4.5 kgs. Capacity, CO2 gas filled in brand new seamless cylinder with powder coated finish, made out of Manganese steel, with wheel type valve, discharge nozzle, bend & horn, wall mounting bracket etc. complete, confirming to IS: 2878.	3	Nos.		
(Rate in words Rupees……)					
66.2	ABC powder type fire extinguisher of 6 Kgs. Capacity, with initial filling in brand new cylinder with powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge, discharge hose, floor trolley type / wall mounting bracket etc. complete, confirming to IS:13849.	3	Nos.		
(Rate in words Rupees……)					
T O T A L – PART D					

Total Amount for Part D – Rupees in words .....

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TOTAL AMOUNT

PART – A	**Rs.**
PART – B	**Rs.**
PART – C	**Rs.**
PART – D	**Rs.**
GRAND TOTAL	**Rs.**

Grand Total Amount Rupees in words ……

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Signature of the contractor

-Sd-
Consultant (Electrical)

-Sd-
Executive Engineer (E)