



CREATIVE MUSEUM DESIGNERS

(Section 8 company guaranteed by NCSM)

NCSM Campus, Building II, 6th Floor, 33, Block - GN, Sector - V, Bidhan Nagar,
Kolkata - 700091, India. Phone: 033 2357 6041, Website: www.cmdncsm.in

NOTICE INVITING TENDER FOR FIREFIGHTING AND FIRE DETECTION WORK

Ref. No.: CMD 007.12.35(Works)/22-23/21 Dated 21.11.2022

Tenders are invited from reputed and experienced contractors for Supply, Installation, Testing and Commissioning of Firefighting & Fire Detection System (Fire Detection & Alarm, Fire Pump with Equipments, Fire Hydrant, Fire Sprinkler, Fire Extinguishers etc.) in connection with Proposed K. D. Malaviya National Oil Museum at Khanapara, Guwahati, Assam at an **estimated cost of Rs. 144.45 Lakhs (including GST)**.

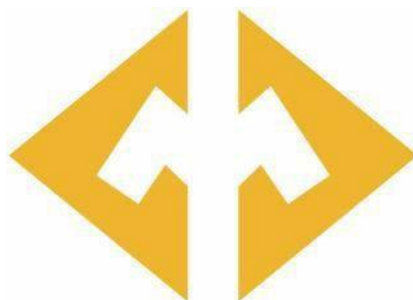
Interested contractors may please collect the Tender document from **CMD website (www.cmdncsm.in)** from **23.11.2022**. **Last date of submission of Tender (in hard copy) is 15.12.2022.**

For any corrigendum/addendum etc. relating to this Tender will be available on **Company's website (www.cmdncsm.in) only.**

CMD reserves the right to accept or reject any or all applications.

**TENDER DOCUMENTS
FOR
SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF
FIRE FIGHTING & FIRE DETECTION SYSTEM (FIRE
DETECTION & ALARM, FIRE PUMP WITH EQUIPMENTS, FIRE
HYDRANT, FIRE SPRINKLER, FIRE EXTINGUISHERS ETC.) IN
CONNECTION WITH PROPOSED K D MALAVIYA NATIONAL
OIL MUSEUM AT KHANAPARA, GUWAHATI, ASSAM
TENDER NO. CMD 007.12.35(WORKS)/22-23/21, DATE: 21.11.2022**

.....
(Name of the Company)



CREATIVE MUSEUM DESIGNERS

(Section 8 company guaranteed by National Council of Science Museums)

NCSM Campus, 33, Block- GN
6th Floor, CRTL Building – II, Sector-V
Bidhan Nagar, Kolkata-700091
Website: www.cmdncsm.in



TENDER DOCUMENT

FOR

SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF FIRE FIGHTING & FIRE DETECTION SYSTEM (FIRE DETECTION & ALARM, FIRE PUMP WITH EQUIPMENTS, FIRE HYDRANT, FIRE SPRINKLER, FIRE EXTINGUISHERS ETC.)

FOR

**CONSTRUCTION OF K.D. MALAVIYA NATIONAL OIL MUSEUM,
GUWAHATI**

FOR

CREATIVE MUSEUM DESIGNERS

ISSUED TO:

**FIRE FIGHTING CONSULTANT
LALIT KUMAR BOSE
46/A, S.N. Roy Road
KOLKATA 700 038, W.B., India
Email: lalit267.bose@gmail.com**



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NOTICE INVITING TENDER
Tender No. CMD007.12.35(WORKS)/22-23/21

No. CMD007.12.35(WORKS)/22-23/21

Date:21.11.2022

1. The Creative Museum Designers is a Section 8 Company guaranteed by National Council of Science Museum, Kolkata.
 2. Sealed tenders are hereby invited from reputed and experienced Engineering/Technical contractors capable of carrying out the work of **“Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Fire Pump with Equipments, Fire Hydrant, Fire Sprinkler, Fire Extinguishers etc.) in connection with Proposed K. D. Malaviya National Oil Museum at Khanapara, Guwahati, Assam”** with excellent finishing quality and having adequate past experience during the preceding seven years in successfully executing works of similar nature to that referred herein above.
 3. The place of work would be **K D Malaviya National Oil Museum, Khanapara, Guwahati, Assam, 2 Kms from the City Centre and 0.5 Kms away from NH-37.**
 4. Estimated cost of the work is approximately **₹1,44,45,315.00**
 5. Time of completion of work will be **09 (Nine)** months from the date of issuance of Letter of Intent for Supply, installation, testing and commissioning of Fire Fighting & Fire Detection System work. Order for equipments like Fire Detection & Alarm, Fire Pump, Fire Hydrant, Sprinkler & Fire Extinguishers etc. should be placed immediately after receiving of Letter of Intent (LOI).
- Defect Liability Period will be up to 01 (One) year after successful completion of SITC of entire firefighting & fire detection system under scope of the tender.
6. Contract documents consist of the NIT, General Conditions of the Contract, Special Condition of Contract, one set of tender drawings, Technical Specifications, Schedule of Quantities and Rates of various items, Summary of Price etc.
 7. The tender documents will be available between 11.00 AM and 6.00 PM on any working days from **23.11.2022 to 14.12.2022 and also available in our website (www.cmdnccsm.in) from 23.11.2022**. Completed tender documents will be received **up to 15.12.2022 till 11.00 AM** and will be opened on the same day at 03.00PM in the conference hall of CMD in the presence of the tenderers or their authorized representatives who may like to attend. Tenderers may note that opening of the tenders in their presence or in the presence of their authorized representatives is not obligatory on the part of the Company. In case the tenderers or their authorized representatives are not present, tenders will be opened as per rules and on scheduled time and date unless it is notified otherwise by the Company earlier. The Company reserves the right to alter the dates of issue, receipt and or opening of tenders etc. if so necessary.



Corrigendum, Addendum etc. pertaining to this tender, if any, will be available in Company's web site (www.cmdncsm.in) only.

- 7.1 Prebid Discussion:** Prebid discussions will be held on **30.11.2022** at **11.00 AM** in the office of **Creative Museum Designers, Saltlake, Kolkata** in presence of Consultants and the intending bidders.

8. BIDDER QUALIFICATION CRITERIA:

Bidders intending to participate shall fulfil the following Qualification criteria:

8.1 Experience Criteria (techno- Commercial)

8.1.1 Bidders shall fulfil the following experience criteria.

The bidders should have experience of executing similar work i.e. Supply, Installation, testing & commissioning of Fire Fighting & Fire Detection System (Fire Detection & Fire Alarm, Fire Pump with Equipments, Fire Hydrant, Fire Sprinkler, Fire Extinguishers etc.) having minimum contract values as indicated below in last 07 (seven) years reckoned from the due date for submission of bid. Bidders must submit the copies of duly certified Job Completion Certificate supported with Work Order/ Letter of Intent & relevant documents confirming the proof of execution of work with description and executed value of ongoing/ executed works of similar in nature.

- a) One contract having minimum value of 80% of estimated value (**₹1,44,45,315.00**)
- b) Two contracts each having minimum value of 50% of estimated value (**₹1,44,45,315.00**)
- c) Three contracts each having minimum value of 40% of estimated value (**₹1,44,45,315.00**)

Similar work means Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Fire Alarm, Fire Pump with Equipments, Fire Hydrant, Fire Sprinkler & Fire Extinguishers etc.) complete for firefighting & fire detection system for public places like educational institutional complex/ software IT park/office campuses, Shopping malls, multi storied buildings, factories/ industrial projects etc. successfully with high quality of workmanship & time.

Bidder should submit their Bid as an individual agency but not as Joint Venture or Associate / Consortium with other agency. Bidders in the form of Direct or Indirect Joint Venture / Consortium/ Special Purpose Vehicle (SPV)/ Special Purpose Entity (SPE) are not permitted.

8.2 Financial Criteria.

8.2.1 Annual turnover : Bidder must have minimum average annual financial turnover is **₹1.44 Crs. (Rupees One Crore Forty Four Lakh Only)** during the last three financial years ending 31st March, 2022 i.e, 2019-2020, 2020-2021 & 2021-2022. The copies of audited balance sheet / Certificate of Chartered Accountant to be submitted.

8.2.2 Bank Solvency : Bidder shall have a Latest Bank Solvency of **Rs. 48.00 Lakhs**. The Bidder shall submit in original/ attested copy of the Latest Bank Solvency Certificate, not older than 03 (three) months prior to date of issue of this Tender., issued by any Nationalized/ Scheduled Bank, in original.



8.2.2a) **Net worth** : Bidder shall not have incurred any loss in more than two years during the last five years ending 31.03.2022. Bidder should submit net worth certificate duly certified by a practising Chartered Accountant.

b) The bidder must have PAN issued by the Income Tax Department of India.

c) Bidder should have GST, PF & ESI registration with the concerned authority.

9. Bidder having pending Litigation / Court Case with CMD/ NCSM / OIL against previous Tender(s)/ Contract(s) will not be considered.



“ANNEXURE –A”

10. Bidders are requested to furnish the following details in seriatim as under, in support of Prequalification criteria.

Conditions for Qualification:

Sl. No.	Description	To be filled by agency
1.	Name of the Agency	
2.	Year of Establishment	
3.	Registered office with full address	
4.	Full Postal Address of communication	
5.	Telephone Number(s) of office	
6.	Contact person Name with Mobile No.	
7.	Fax number	
8.	E-Mail ID	
9.	Website if any	
10.	i. Nature of Entity - Limited Company, Partnership etc. (attach copy of partnership Deed/ Certification of incorporation as applicable) ii. Date of Incorporation	
11.	The bidder should have to submit their Bid as an Individual Agency i.e. not as Joint Venture or Associate/ Consortium with other Agency. Bidders in the form of Direct or Indirect Joint Venture/ Consortium/ Special Purpose Vehicle (SPV) / Special Purpose Entity (SPE) are not permitted	
12.	Name (s) of Director / Proprietor / Partners with address and telephone nos.	
13.	Technical Staff employed (Attach a separate sheet of the employees with qualifications)	
14.	Qualification Criteria: <u>A. Techno Commercial Criteria:</u>	



	<p>The bidders should have experience of executing similar work i.e. Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Fire Pump with Equipments, Fire Hydrant, Sprinkler Fire Extinguishers etc.) for public places like educational institutional complex/ software IT park/office campuses, Shopping malls, multi storied buildings, factories/ industrial projects of having minimum contract value as indicated below in last 7(seven) years reckoned from the due date for submission of Bid document</p> <p>i. One contract having minimum value of 80% of estimated value (<u>₹1,44,45,315.00</u>)</p> <p>ii. Two contracts each having minimum value of 50% of estimated value (<u>₹1,44,45,315.00</u>)</p> <p>iii. Three contracts each having minimum value of 40% of estimated value (<u>₹1,44,45,315.00</u>)</p>	
	<p><u>B. Financial Criteria:</u></p> <p>i. Average Annual Turnover for last 5 (five) years</p> <p>ii. Net worth</p> <p>iii. Bank Solvency Certificate from Nationalized Bank/ Scheduled Bank</p>	
15.	PAN of Bidder with supporting document	
16.	PF/ ESIC/ GST Registration etc. of Bidder with documentary evidence	
17.	Copy / copies of completion certificate(s) of similar type of work(s) stated in Sl. No. 14.A above duly certified by respective Owner(s) / Client(s) mentioning name and nature	



	of work(s), date(s) of commencement/ completion and value(s) of the job(s) executed in last 7(seven) years.	
18.	Yearly Sales /Turnover and Audited Balance Sheet duly signed by Chartered Accountant with his / her Seal, Signature & Registration Number for Last 3 (three) years i.e. 2019-2020, 2020-2021 and 2021-2022.	
19.	P.F. Registration No. (if not registered with PF Department, successful Bidder have to take Registration within one month from the date of Award).	
20.	Current Income Tax Deposition Acknowledgement.	
21.	Constitution and legal status along with attested copies of Deeds / Articles and Memorandum of Association etc. as applicable.	
22.	Power of Attorney in favour of the Authorised Signatory who has signed the bid (In case of other than Proprietor / CEO / Partner etc.).	
23.	Whether any Civil Suit / Litigation arisen in the contracts executed during the last 5 years / being executed. If yes, please furnish the name of the contract, employer, nature of work, contract value, work order and date & details of litigation briefly	
24.	Details of work in hand and current commitment. (As per enclosed ANNEXURE-A2)	
25.	No Deviation Certificate in Bidder's Letter Head (ANNEXURE – C1)	
26.	List of Plant & Machineries & other construction equipment's owned by the Firm. (As per ANNEXURE-A3)	
27.	List of Clients (Details with Location) As per enclosed ANNEXURE-A1	

Important Notes:

1. Bidder is liable to be disqualified, even though they meet the qualifying criteria, if they :
 - a) Made misleading or false representations, statements and attachments submitted in proof of the qualification requirements, and / or
 - b) Record of poor performance such as abandoning the works, not properly completing the supply order, inordinate delays in execution or supply, litigation history, or financial failures etc.
 - c) If the tenderer deliberately gives wrong information / submit fake, false, fabricated, forged documents in his tender, CMD reserves the right to reject such tender at any stage or to cancel the contract if awarded and forfeit the Earnest Money / Security Deposit / any other money due.
2. The Bidder must provide any further details required for the review upon request from CMD. Failure to comply with any request of CMD for such information will result in rejection of their offer.
3. CMD may, in its absolute discretion suspend or disqualify a Bidder/ Bidders who, at any time, is considered to have breached any of the qualification conditions or has performed in an unsatisfactory manner without assigning any reason whatsoever.
4. CMD will not be liable for any loss or damages incurred by the bidder/ bidders in the above exercise.

I / We hereby solemnly declare that all the information / statements are true to the best of my / our knowledge. I / We also declare that my / our firm is not involved in any Litigation or Arbitration with any company for last 5 years. I / We further declare that the decision of Creative Museum Designers regarding finalization of contractors qualification/ selection shall be final and binding on me/ us.

Place:

Date:

(Signature with date & seal)

N.B.: All the documents shall be submitted in Hard Copies.



“ANNEXURE – A1”

TABLE A: DETAILS OF ALL WORKS OF CLASS/ NATURE COMPLETED DURING THE LAST SEVEN YEARS

S. No.	Name of work/ project and location (Give brief of nature of work)	Name of the Owner/organization and designation Name of officer signing agreement	Cost of works in crores of rupees Estimated cost put to tender Tendered Cost	Stipulated date of start as per agreement Actual date of start	Stipulated date of completion Actual date of completion	Litigation/ Arbitration Pending / inprogress withdetails*	Name and Address and Phone no. of officer to whom reference may be made	Give brief reason for delay in execution, if any	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

* Indicates gross amount claimed and amount awarded by arbitrator

Signature of applicant(s)



“ANNEXURE – A2”

TABLE-B: PARTICULARS OF CURRENT PROJECTS IN PROGRESS/AWARDED

PARTICULARS OF PROJECTS UNDER EXECUTION OR AWARDED

S. No.	Name of work/ project and location (Give brief of nature of work) Role in project (as main contractor or Sub Contractor, State name of maincontractor)	Name of client Owner or organization	Cost of Works in crores of rupees Estimated cost put to tender Tendered Cost	Stipulated date of start as per agreement Actual dateof start	Stipulated date of completion	Up to date percentage progress of work	Slow progress if any and reasons thereof	Name and Address/ Phone no.of officer to whom reference may be made	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Certified that the above list of works is complete and no work has been left over and that the information given is correct.

Signature of applicant(s)



TABLE-C: PARTICULARS OF SIMILAR PROJECTS COMPLETED IN THE LAST SEVEN YEARS

DETAILS OF ALL WORKS OF SIMILAR CLASS COMPLETED DURING THE LAST SEVEN YEARS ENDING LAST DAY OF THE MONTH AS ON 31/03/2022

S. No.	Name of work/ project and location (Give brief of nature of work)	Owner or organization name and designation Of officer signing agreement	Cost of Works in crores of rupees Estimated cost <u>put to tender</u> Tendered Cost	Stipulated date of start as per <u>agreement</u> Actual date of start	Stipulated date of <u>completion</u> Actual date of completion	Litigation/ Arbitration Pending in progress with details*	Name and Address and Phone no. of Officer to whom reference may be made	Give brief reason for delay in execution	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Signature of applicant(s)



“ANNEXURE – A3”

TABLE-D: LIST/DETAILS OF PLANT & EQUIPMENT LIKELY TO BE DEPLOYED/ USED ON THE PROJECT/ WORKSHOP

S. No.	Name of equipment	Capacity / specification	Age	Condition	Quantity	Ownership Status			Current Location	Remarks
						Personally owned	Leased	To be purchased		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

Signature of applicant(s)



11. Earnest Money:

- a) The Earnest Money amounting to **Rs. 3,61,133/- (Rupees Three Lakh Sixty One Thousand One Hundred Thirty three Only)** being approx.2.5% of the estimated value of the work (rounded off to the nearest rupee), only in the form of **Bank Guarantee/ Pay Order/ Demand Draft/ Banker's Cheque/ NEFT** from any Nationalized Bank/Scheduled Bank. For NEFT, the details of our Banker is furnished as below:

Details of Bankers:			
Bank Name:	1. STATE BANK OF INDIA	or	2. INDIAN OVERSEAS BANK
Beneficiary Name:	CREATIVE MUSEUM DESIGNERS		CREATIVE MUSEUM DESIGNERS
Bank Address:	State Bank of India, Swasthya Bhawan, Institute of Family & Health Welfare, 29, GN Block, Sector V, Bidhan Nagar, 700091		Indian Overseas Bank, GN 34/2, Sector - V, II Studio, Saltlake, Kolkata - 700091, West Bengal, India
A/c No.:	35354841157		164201000001214
IFSC Code:	SBIN0010043		IOBA0001642

Bank Guarantee/ Pay order/ Demand Draft/ Banker's Cheque / NEFT to be drawn in favour of **Creative Museum Designers payable at Kolkata**. Demand Draft/ Banker's Cheque/ Documents confirming NEFT (amount must be credited to CMD's account as mentioned above on or before the last date of submission i.e. **15.12.2022 up to 11.00 AM**) for the Earnest Money Deposit must accompany the part I of tender as indicated in Clause 20 below. All the tenderers must submit their complete document within the last date of submission i.e. **15.12.2022 up to 11.00 AM**. Tenders received after the due date and/ or without Earnest Money Deposit (EMD) will be summarily rejected. No deviation from the mode of depositing Earnest Money stipulated above will be permissible and any deviation will render the tenders liable for rejection.

The validity period of Bank Guarantee (EMD) shall be minimum 120 (One hundred twenty) days from the due date of opening of tenders with claim period up to minimum 03 (three) months. This period may be extended with mutual consent if required by CMD for any unavoidable reason(s).

- b) **Demand Draft / Pay Order/ Banker's Cheque/ NEFT** must be drawn only on Nationalized Bank/Scheduled Bank at the place mentioned in Clause 11 above, failing which the Earnest Money deposited shall be deemed as inadequate, and the tender shall be liable for rejection.

- 11.1 **Tender Fees** : Tenderers / Bidders to submit **Rs. 5,900/- (Rupees Five Thousand Nine Hundred Only) including GST**, towards the cost of Tender Document By **Demand Draft / Banker's Cheque/ Pay order/ NEFT** and to be drawn in favour of Creative Museum Designers, payable at Kolkata as per details given in Clause 11 above.

Tender Fees is NON- REFUNDABLE.

12. Security Deposit (SD):



The successful bidder shall deposit **10%** of total contract value as **Security Deposit/Retention Money in the form of Demand Draft or Bank Guarantee**. The EMD submitted by the successful bidder will be returned after receiving total 10% of contract value as Security Deposit security deposit in the form of Demand Draft/ Bank guarantee. The security deposit so submitted in the form of Demand Draft will be retained till completion of Defect Liability Period without any interest. The security deposit so submitted in the form of Bank Guarantee shall have validity period up to completion of Defect Liability Period (DLP) plus 01 (one) year claim period. Please refer to the Clause 17 of General Conditions of Contract.

13. Tenderers, who do not fulfil any of the above conditions or are incomplete in respect of any document(s) supporting the above qualification criteria are liable for summary rejection.
14. The company does not bind itself to accept the lowest tender and reserves to itself the authority to reject or partially accept any or all the tenders, tendered items or schedules received without assigning any reason whatsoever.
15. Canvassing in connection with tenders is strictly prohibited and the tenders submitted by the tenderers who resort to canvassing will be liable for rejection on that ground alone.
16. Tenders incorporating additional conditions are liable to be rejected.
17. The tenderers must declare in writing that they are no way related to any official(s) in the Creative Museum Designers, Kolkata and National Council of Science Museums (NCSM), Kolkata.
18. All Applicable Statutory Taxes and Duties on equipments, GST on materials & services, freight & transit Insurance F.O.R. site and any other payments to be made to the local authorities for the completion of the job will be inclusive in the rate offered by the successful tenderer & payable by them. Nothing extra will be payable for increase in such taxes or duties even if imposed or levied either before or after the tenders are opened or during currency of contract.
19. Before submitting the tender, the tenderer shall examine all specifications, drawings, conditions of contract and inspect the site. The tender must be balanced in respect of individual items so that the rates quoted shall remain in force even if the quantities deviate before or during the execution of the work.



20. The tender must be submitted [in two separate sealed covers marked Part I (Techno-Commercial bid) and Part II (Financial bid)] and addressed to the Company and each envelope super scribed “Tender for **Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection& Alarm, Fire Pump with equipments, Fire Hydrant, Sprinkler & Fire Extinguishers etc.) in connection with Proposed K D Malaviya National Oil Museum, Khanapara, Guwahati, Assam ----Part I (Techno-Commercial bid) Due Date on.....**” and “Tender for **Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Pump with equipments, Fire Hydrant, Sprinkler & Fire Extinguishers etc.) in connection with Proposed Construction of K D Malaviya National Oil Museum, Khanapara, Guwahati, Assam -----Part II (Financial bid) Due Date on.....**” and finally both Part I & Part II to be sealed in a separate sealed envelope supercribing “Tender for **Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Pump with equipments, Fire Hydrant, Sprinkler & Fire Extinguishers etc.) in connection with Proposed Construction of K D Malaviya National Oil Museum, Khanapara, Guwahati, Assam. ”**”

The contents of Part I & II will be as follows:

- (a) The sealed cover marked Part I shall contain the following documents only:
- (i) Earnest Money and Tender Fees in the form as described in Clause 11 of the Notice Inviting Tender (NIT).
 - (ii) Documents in support of Bidders qualification criteria as per Clause 8 above.
 - (iii) An up to date and valid Audited Balance Sheet & Income Tax Returns for last 03 (three) years of the bidder in original or true copy thereof duly attested by a Chartered Accountant and the Permanent A/C No. Of the bidder.
 - (iv) Forwarding letter (in duplicate) clearly indicating the documents attached therein. The tenderer has to clearly state in the forwarding letter that he has not quoted any extra condition along with the tender in title Part II sealed envelope.
 - (v) Each and every page of the tender document to be duly signed and stamped by the tenderer.
 - (vi) Necessary Power of Attorney/ Authorization in favour of the person, signing the tender document to be submitted.
 - (vii) Declaration as per **ANNEXURE – C2**.
 - (viii) Declaration for No-Deviation of Tender as per **ANNEXURE – C1**
- (b) The sealed cover marked Part II shall contain the Offer Form complete with financial bid i.e. Schedule of Quantities & Rates (As per **ANNEXURE – D**) and Summary of Price Sheet (As per **ANNEXURE - E**) duly signed and stamped by the tenderer on each and every page and should not have any additional condition whatsoever. If any such additional conditions found in this cover it will not be taken into consideration and will not form part of the tender.



21. For the purpose of opening of the tenders as described in Clause 7 of the Notice Inviting Tender (NIT) it is clarified that only the sealed envelope marked Part I will be opened first. Initially the documents contained in Part I will be opened & scrutinized and agencies will be shortlisted for opening the Part II. The shortlisted agencies will be informed about the opening date & time of Part II. In case documents in envelope marked Part II are not opened at all, the same will be returned to the tenderer treating it as invalid and his/their acknowledgements will be obtained in token of receipt of the same.
22. However, after opening Part I, if required, CMD may send communications through email to tenderers seeking necessary documents, clarifications etc. for the purpose of qualification.
23. Earnest Money is liable to be forfeited if the successful tenderer selected for the work fails to submit the acceptance of Letter of Intent (LOI) & sign the formal agreement within 15 (fifteen) days from the date of issue of Letter of Intent (LOI) by the Company.
24. The successful tenderer will be issued a Letter of Intent by the Company and will be given 15 (fifteen) days mobilisation time which shall be counted from the date of issue of the Letter of Intent (LOI). Within the mobilisation time the tenderer must scrutinise all the drawings, CPM/PERT/BAR CHART, specifications, etc. and obtain clarifications from the authority wherever necessary and submit a revised & detailed CPM/PERT/BAR CHART. During the mobilisation time, the tenderer shall also mobilise all his resources including men and materials, obtain the supply of water and electricity necessary for construction, erect a temporary office/godown at site and sign an Agreement with the Company in approved format on a non-judicial stamp paper of Rs.100/- (Rupees Hundred only). The date of commencement of work shall be the date of issue of Letter of Intent (LOI).
25. The validity period of the tender shall be 120 (One hundred twenty) days from the date of opening of tenders. This period may be extended with mutual consent if required by CMD for any unavoidable reason(s).



APPENDIX TO NOTICE INVITING TENDER

(a) SUMMARY CONDITIONS OF CONTRACT		
Name of Work	:	Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Fire Pump with equipments, Fire Hydrant, Sprinkler & Fire Extinguishers etc.) in connection with Proposed K. D. Malaviya National Oil Museum, Khanapara, Guwahati, Assam
Consultant	:	Lalit Kumar Bose, 46/A, S.N.Roy Road, Kolkata-700038
Scope of Work	:	Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Fire Pump with equipments, Fire Hydrant, Sprinkler & Fire Extinguishers etc.) complete .
Defect Liability Period (DLP)	:	01 (One) Year from the date of completion as certified by the Company.
Time of Completion	:	09 (Nine) months from the date of letter of intent as per Clause 5 & 24 of NIT.
Minimum value of work for Interim Payment (Running Account Bill)	:	20 (Twenty) lakhs only and 01 (one) running account bill will be processed in a month.
Cost of Tender (Non Refundable)	:	Rs. 5,900/- (including GST)
Earnest Money to be deposited with the tender	:	Rs. 3,61,133/- (Rupees Three Lakh Sixty One Thousand One Hundred Thirty Three only)
Liquidated damages for non-completion of work in time [Clause 61d of the General Conditions of Contract (GCC)]	:	01(One) percent per week of the contract value subject to a maximum of 10% (ten percent) of the contract value awarded
Payment terms	:	<p>For Supply, Installation, Testing & Commissioning of complete Fire Fighting & Fire Detection System.</p> <ul style="list-style-type: none"> ➤ 60% after supply of equipments, materials after successful inspection by the Consultant/CMD at site. ➤ 20% after installation of equipments accessories etc. as per tender & specifications on foundation/position, alignment & fixing/ grouting (wherever required). ➤ 10% on completion of testing and commissioning.



		➤ 10% on completion of all works/ system in all respects and issuance of completion certificate & NOC from the concerned authority.
(b) RETENTION MONEY FOR INTERIM PAYMENT		
Security Deposit/ Retention Money	:	10% of the Contract Value including Earnest Money Deposit (EMD) as follow, i. EMD: 2.5% of the tender value. ii. Performance Guarantee: 7.5% (including 2.5% EMD) contract value. iii. Balance amount 2.5% to be deducted from each Running Account Bill during the progress of work and shall be kept as Retention Money. Or Total 10% by Bank Guarantee upon award of work.
Release of Security Deposit/ Retention Money/ Performance Guarantee	:	Shall be released after completion of Defect Liability Period (DLP) of the contract, without any interest.
Performance Guarantee	:	On receipt of the L.O.I from the CMD by the successful tenderer, the contractor shall furnish a Bank Guarantee or Demand Draft (From Nationalized Bank/Scheduled Bank) in favour of Creative Museum Designers, Kolkata of an amount equivalent to 7.5% (including 2.5% EMD) of the contract value towards PERFORMANCE GUARANTEE, valid up to completion time plus additional 12 (twelve) calendar months from the date of completion time with claim period of 01 (one) year thereafter. Or Total 10% of awarded contract value by Bank Guarantee/ Demand draft upon award of work. The same shall be submitted within 15 (fifteen) days from the date of issuing Letter of Intent (LOI)
Escalation Clause	:	Not applicable for this contract
Period of submitting final bill by the successful bidder	:	Within 03 (three) months from the date of virtual completion of SITC of firefighting & fire detection system work

INSTRUCTIONS TO BIDDERS

1.	<p>SINGLE PERCENTAGE BASED Bids are invited by CMD in two part system from resourceful & capable tenderers fulfilling the Qualifying Criteria furnished in ANNEXURE – A, ANNEXURE – A1, ANNEXURE – A2 & ANNEXURE – A3 of the NIT by Creative Museum Designers (CMD) for the work : “Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Fire Pump with equipments, Fire Hydrant, Sprinkler & Fire Extinguishers etc.) in Connection with K D Malaviya National Oil Museum at Khanapara, Guwahati, Assam.”.</p>
	<p><u>Procedure for Submission of Bid:</u></p>
	<p>Tender Fee – The Tenderer must submit ₹ 5,900.00 (Rupees Five thousand nine hundred only) including GST as cost of Tender Document (TD) (non-refundable) in the form of A/c Payee <u>Demand Draft (DDs) / Pay Order/ Banker’s Cheque/ NEFT</u> in favour of Creative Museum Designers (CMD) payable at Kolkata as cost of Tender Document (Non-refundable) along with their offer.(No A/c Payee Cheque/ Cash shall be considered).Tax Invoice shall be prepared by CMD, Kolkata Office for cost of tender document.</p> <p>The Offer of the Bidder shall not be considered further if the Cost of Tender Document and EMD are not submitted in the form and manner as stated above and their offer is liable to be rejected.</p>
	<p>In case of non-submission of Tender Fee, EMD and any other documents (Hard-copy) specified in NIT /Tender Document, the offer will be summarily rejected.</p>
	<p>Under no circumstances the Tenderers should incorporate any changes/ modifications etc., in the Tender Document itself to avoid rejection of their Tenders.</p>
	<p>If any tenderer withdraws or make any changes in his offer already submitted before the expiry of the above validity period or any extension thereof without the written consent of the company, the offer may be liable to be cancelled and the amount submitted by the bidder against EMD will be forfeited.</p>



	<p><u>Prebid Discussion:</u></p> <p>Prebid discussions will be held on 30.11.2022 at 11.00 AM in the office of Creative Museum Designers, Saltlake, Kolkata in presence of Consultants and the intending bidders.</p>	
	<p>Bid shall be submitted in two part system:</p>	
	Part I (Techno – Commercial):	Containing one Copy each of following documents :
		(i) Bidder should submit the Tender Fee, Letter of Submission (in Company's letter head); Detail of information to be furnished by the bidder and Power of Attorney in favour of the person who has signed the bid, Earnest Money Deposit (EMD).
		(ii) No Deviation Certificate (as per ANNEXURE – C1), Format for declaration & undertaking (as per ANNEXURE – C2, ANNEXURE – C3 & ANNEXURE – C4) in Bidder's Letter Head to be furnished by the bidder.
		(iii) Documents pertaining to Qualifying Criteria furnished in Clause 10 of the NIT.
		(iv) Signed & Stamped NIT, ITB, GCC, SCC, Technical Specification, Un-priced SOQR with the word “ Quoted” written against each Item, Drawing i.e. complete NIT documents as a token of acceptance along with all other submittals as prescribed in the Bidding document.
	Part-II (Financial bid):	The Financial Bid format is provided in Offer Form , the rates offered should be entered on SINGLE PERCENTAGE RATE basis (to be applicable on all items) on the “Summary Sheet” as provided in ANNEXURE - E. The Financial Bid / SOQR template must not be modified / replaced by the bidder; else the bid submitted is liable to be rejected for this tender.
		Telegraphic or Fax or Email offers shall not be accepted under any circumstances.

	<p>Due date for submission of tender document is 15.12.2022 upto 11.00 hrs. and shall be addressed to,</p> <p>Administrative Officer, CREATIVE MUSEUM DESIGNERS NCSM Campus, 33, Block-GN, Building-II Bidha Nagar, Sector –V, Kolkata – 700091 Phone No. 033 2357 6041 Email: cmd.ncsm.civil@gmail.com</p>
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2.	<p><u>Tender Validity</u></p> <p>Tender submitted by tenderer shall remain valid for acceptance for a period of 120 days from the last date set for submission of the tender. The tenderer shall not be entitled within the said period of 120 (one hundred twenty) days to revoke or cancel or vary the offered rate in tender or thereof, without the consent of CMD. In case tenderer revokes or cancels or varies his tender in any manner without the consent of CMD, within this period, his earnest money/retention money will be forfeited.</p>
3.	<p>This Tender is a Single Percentage Rate tender with estimated item rates already mentioned in the Schedule Of Quantities & Rates (SOQR). Bidder has to quote single percentage, variation from the same (On total amount only) proposed by him either in positive or in negative or at par as the case may be in the Summary Sheet and Offer Form provided separately. Summary sheet & Offer Form and Schedule Of Quantities & Rates (SOQR) duly stamped & signed shall only be included in the PRICE BID.</p>
4.	<p>Price Bids of those Bidders who will be Techno-commercially qualified for the subject job on the basis of evaluation of techno commercial bids, will be opened on specified date. The date & time to open the Financial bid (Part –II) shall be <u>intimated to the qualified bidders only through EMAIL.</u></p>
5.	<p>The complete signed and stamped Tender Document and all other required documents pertaining to this tender shall be submitted by the Tenderers as a token of Tenderer's acceptance.</p>
6.	<p><u>EVALUATION OF BIDS</u></p> <p>Technical Bids submitted by the tenderer will be opened first and evaluated based on documentary evidences submitted along with the offer for qualification. After</p>

	qualification of Bidders, Price Part of the Tender will be considered for opening in respect of the qualified tenderers only for Evaluation of Price.
7.	<p><u>AUTHORISATION AND ATTESTATION</u></p> <p>Tender shall be signed by a person duly authorized/empowered to do so. An attested copy of the Power of Attorney, in case the tender is signed by an individual other than Director/ Proprietor / Partner, shall be submitted along with the tender.</p>
8.	<p><u>LANGUAGE</u></p> <p>The tenderer shall quote the rates in figures & words in English language.</p>
9.	The successful Tenderer shall accept Letter of Intent (LOI) & sign the formal agreement within 15 (fifteen) days from the date of issue of Letter of Intent (LOI) by the Company, failing which the award of work may be liable to be cancelled.
10.	<p><u>Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders</u> about the nature of the work and site situation, environments, facilities available, position of material and labour, means of transport and access to Site (so far as is practicable), the form and nature of the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. No claim will be entertained later on the grounds of lack of knowledge of any of these conditions.</p> <p>A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity, access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract document. Submission of a tender by tenderer implies that he has read these instructions and all other contract documents and has made himself aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.</p>

11	<u>REJECTION OF TENDER AND OTHER CONDITIONS</u>
11.1	CMD does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without assigning any reason thereof. Tenders in which any of the prescribed condition is not fulfilled or any condition



	including that of conditional rebate is put forth by the tenderer shall be liable for rejection.
11.2	Conditional tenders, unsolicited tenders, tenders which are incomplete or not in the form specified or defective or have been materially altered or not in accordance with the tender conditions, specifications etc., are liable to be rejected.
11.3	Tenders are liable to be rejected in case of unsatisfactory performance of the tenderer with CMD/ NCSM, or tenderer under suspension (hold / banning / delisted) by CMD/NCSM. CMD reserves the right to reject a bidder in case it is observed that they are overloaded and may not be in a position to execute this job as per the required schedule. The decision of CMD will be final in this regard.
11.4	If a tenderer who is a proprietor expires after the submission of his tender or after the acceptance of his tender, CMD may at their discretion, cancel such tender. If a partner of a firm expires after the submission of tender or after the acceptance of the tender, CMD may then cancel such tender at their discretion, unless the firm retains its character.
11.5	If the tenderer deliberately gives wrong information in his tender, CMD reserves the right to reject such tender at any stage or to cancel the contract if awarded and forfeit the Earnest Money / Security Deposit / any other money due.
11.6	Canvassing in any form in connection with the tenders submitted by the Tenderer shall make his offer liable for rejection.
11.7	Tenderer must submit the declaration as per ANNEXURE – C2 stating the non relationship with any Employee of CMD/ NCSM.
11.8	The successful tenderer should not sub-contract part or complete work detailed in the tender specification undertaken by him without written permission of CMD. The tenderer is solely responsible to CMD for the work awarded to him.
11.9	The Tender submitted by a techno commercially qualified tenderer shall become the property of CMD, which under no circumstances shall be returned to the bidder.
11.10	Unsolicited discount received after the due date and time of Bid Submission shall not be considered for evaluation.

11.11	CMD shall not be liable for any expenses incurred by the bidder for site visit and preparation of the tender etc. irrespective of whether the tender is accepted or not.
11.12	The Bidder must provide any further details required for the review upon request from CMD. Failure to comply with any request by CMD for such information will result in rejection of their Offer. CMD may, in its absolute discretion suspend or disqualify a Bidder / Bidders who, at any time, is considered to have breached any of the qualification conditions or has performed in an unsatisfactory manner without assigning any reason whatsoever.

12.	<u>Tender Documents to be submitted to</u>
	Administrative Officer, CREATIVE MUSEUM DESIGNERS NCSM Campus, 33, Block-GN, Building-II Bidha Nagar, Sector –V, Kolkata – 700091 Phone No. 033 2357 6041 Email: cmd.ncsm.civil@gmail.com
13.	Bidder should submit the documents only in Hard Copy to the address as mentioned above.
(a)	Power of Attorney in favor of the person who has signed the bid.
(b)	Letter of Submission in Bidder's Letter Head as per ANNEXURE - B
(c)	No Deviation Certificate in Bidders letter head as per prescribed format (ANNEXURE - C1).
(d)	Declaration & Undertaking in Bidders letter head as per prescribed format (ANNEXURE – C2, ANNEXURE - C3 & ANNEXURE – C4)
(e)	Documents pertaining to Qualifying Criteria furnished in Clause 10 of the NIT (as per ANNEXURE – A, ANNEXURE – A1, ANNEXURE – A2 & ANNEXURE – A3).



(f)	Tender Fee: ₹ 5,900.00 (Rupees Five thousand nine hundred only) including GST in the form of <u>Demand Draft (DDs) / Pay Order / Banker's Cheque / NEFT</u> in favour of Creative Museum Designers payable at Kolkata as cost of Tender Document (Non-refundable) (in original). Tax Invoice shall be prepare by CMD, Kolkata Office for cost of tender document.
(g)	Earnest Money Deposit (EMD) : The Earnest Money Deposit will be of ₹ 3,61,133.00 (Rupees Three Lakh Sixty One Thousand One Hundred Thirty Three only) . EMD shall be submitted along with the Bid in the form of <u>Bank Guarantee/ Pay Order/ Demand Draft/ Banker's Cheque/ NEFT</u> valid for the period of 120 days. (<u>No A/c Payee Cheque / Cash shall be considered</u>).



FORMAT FOR LETTER OF SUBMISSION

SINGLE PERCENTAGE RATE Tender for SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF FIRE FIGHTING & FIRE DETECTION SYSTEM (FIRE DETECTION & ALARM, FIRE PUMP WITH EQUIPMENTS, FIRE HYDRANT, FIRE SPRINKLER & FIRE EXTINGUISHERS ETC.) IN CONNECTION WITH PROPOSED K. D. MALAVIYA NATIONAL OIL MUSEUM AT KHANAPARA, GUWAHATI, ASSAM.

T E N D E R

I/ We have read and examined the Instructions to Bidders, General Conditions of Contract (GCC), Special Condition of Contract (SCC), Technical Specification, Schedule of Quantities & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the CMD within the time specified in tender viz., schedule of quantities and in accordance in all respects with the specifications and the Conditions of contract (GCC & SCC) and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

We agree to keep the tender open for **120 days** from the due date of submission of tender thereof and not to make any modifications in its terms and conditions.

The cost of tender document of value **₹ 5,900.00 (Including GST)** has been deposited in the shape of Demand Draft (DDs) / Pay Order/ Banker's Cheque / NEFT of a Nationalised / Scheduled Bank issued in favour of Creative Museum Designers. if I/we agree that Creative Museum Designers or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money absolutely, otherwise the said earnest money shall be retained by him towards retention money to execute all the works referred to in the tender documents upon the terms and conditions of contract.

We accept that we will automatically be kept under Black Listing/Holiday List from being eligible for bidding in any contract with Creative Museum Designers during the period of bid validity from the date of occurrence, if we are in breach of our obligation(s) under the bid conditions because we:



(a) Have withdrawn our Bid during the period of bid validity specified in the letter of Bid, or

(b) Having being notified of the acceptance of our Bid by CMD during the period of Bid validity, (i) have failed or refused to execute the Contract, if required, or

(ii) have failed or refused to furnish the Performance Guarantee within prescribed period in accordance with the clause of Tender.

Further if I/we fail to commence work as specified, I/we agree that Creative Museum Designers or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the performance guarantee absolutely,

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

Date : _____

Signature of Contractor
Postal Address

Witness:

Address :

Occupation :



“ANNEXURE – C1”

Creative Museum Designers
(Section 8 Company guaranteed by National Council of Science Museums)
Govt. of India, Block- GN. Sector-V Bidhan Nagar, Kolkata-700 091

NO DEVIATION CERTIFICATE

[To be submitted in Bidder's Letter Head]

To,
Administrative Officer,
CREATIVE MUSEUM DESIGNERS
NCSM Campus, 33, Block-GN, Building-II
Bidha Nagar, Sector –V
Kolkata – 700091

Date:

Subject : No Deviation Certificate for “Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Pump with Equipments, Fire Hydrant, Sprinkler & Fire Extinguishers etc.) in connection with Proposed K D Malaviya National Oil Museum, Khanapara, Guwahati, Assam”

NIT/ Tender No. : CMD 007.12.35(WORKS)/22-23/21 Dated 21.11.2022

We hereby agree to fully comply with, abide by and accept without variation, deviation or reservation all technical, commercial and other conditions whatsoever of the Biding Documents and Amendment(s)/Addendum(s) to the biding documents, if any, for subject work issued by Creative Museum Designers.

We hereby further confirm that any terms and conditions if mentioned in our Bid (un-priced) as well as price part) shall be recognised and shall be treated as null and void.

SIGNATURE OF THE BIDDER

NAME OF BIDDER

COMPANY SEAL



“ANNEXURE – C2”

Creative Museum Designers
(Section 8 Company guaranteed by National Council of Science Museums)
Govt. of India, Block- GN. Sector-V Bidhan Nagar, Kolkata-700 091

[To be submitted in Bidder's Letter Head]

Tender No.: CMD.007.12.35(WORKS)/22-23/21, Dated 21.11.2022

DECLARATION - 1

This is to certify that neither I / We / Any of us is in anyway related to any employee in Creative Museum Designers, Kolkata & National Council of Science Museums, Kolkata.

Date:

(Signature of the tenderer)

Place:

with company seal/rubber stamp



“ANNEXURE – C3”

Creative Museum Designers

(Section 8 Company guaranteed by National Council of Science Museums)

Govt. of India, Block- GN. Sector-V Bidhan Nagar, Kolkata-700 091

[To be submitted in Bidder's Letter Head]

Tender No.: CMD.007.12.35(WORKS)/22-23/21, Dated 21.11.2022

DECLARATION - 2

We, do hereby accept the General Terms and Conditions, Special Conditions of Contract, Technical Specifications etc. as provided by the CREATIVE MUSEUM DESIGNERS, KOLKATA along with tender documents for **“Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Fire Pump with Equipments, Fire Hydrant, Fire Sprinkler, Fire Extinguishers etc.) in connection with Proposed K. D. Malaviya National Oil Museum at Khanapara, Guwahati, Assam”** and also undertake to execute the job strictly as per the specifications & drawings as provided along with the tender documents in the event of placement of any work order on us.

Signature of the tenderer / Constituted Attorney.

(With date and Official Seal)

Date:

Place:



“ANNEXURE – C4”

Creative Museum Designers
(Section 8 Company guaranteed by National Council of Science Museums)
Govt. of India, Block- GN. Sector-V Bidhan Nagar, Kolkata-700 091

[To be submitted in Bidder's Letter Head]

Tender No.: CMD.007.12.35(WORKS)/22-23/21, Dated 21.11.2022

UNDERTAKING

This is to certify that I/we have carefully gone through the drawings/specifications, etc. given in the tender document & have clearly understood the site working conditions, time schedule given and have accordingly quoted my balanced rates after going through all details.

I/we hereby give an undertaking that I/we shall carryout the work strictly as per the given specifications, and shall complete the same within the stipulated time frame.

Date:

(Signature of the tenderer)

Place:

with company seal/rubber stamp



FORMAT FOR BANK GUARANTEE BOND

(For EMD only)

1. In consideration of the (Name and address of the Company) hereinafter called the Company having stipulated under Clause 11 of the Notice Inviting tender No. for the work of (mention name of work as in NIT) at the aforesaid site agreed to accept payment of Earnest Money for due fulfillment of the terms and conditions contained in the said NIT (including appendix) for participation in the tender from (Name and address of the prospective tenderer) (hereinafter called the prospective tenderer) by production of a bank guarantee of (Mention amount of EMD in figure & words) only, we (Name and address of Bank furnishing guarantee (Br. Code)) (hereinafter referred to as “The Bank”) do hereby undertake to pay to the Company an amount not exceeding (mention EMD amount in figure & Words) only against any loss or damage caused to or suffered or would be caused to or suffered by the Company by reasons of any breach by the said prospective tenderer of any of the terms or conditions contained in the said NIT (including appendix) relating to participation in the tender.
2. We, (Name of Bank), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company under National Council of Science Museums by reasons of any breach by the said prospective tenderer of any of the terms or conditions contained in the said NIT (including appendix) or by reason of the prospective tenderer’s failure to comply with conditions contained in the said NIT relating to participation in the tender. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding (mention amount of EMD in figures and words) only.
3. We, (Name of Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period as mentioned in Clauses 23 and 24 of the said NIT (including appendix) or the period stipulated under Clause 25 for deciding the tender and that it shall continue to be enforceable till the dues of the Company under or by virtue of the said NIT (including appendix) have been fully paid and its claims satisfied or discharged or the Company certified that the terms and conditions of the said NIT (including appendix) have been fully and properly honoured and carried out by the said prospective tenderer for participation in the tender and accordingly discharges the guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the periods stipulated above, we shall be discharged from all liability under this guarantee thereafter.
4. We, (Name of the Bank) further agree with the Company that they shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to extend time of deciding the tender as may be expedient and to forbear or enforce any of the terms and conditions relating to the NIT (including appendix) and we shall not be relieved from our liability by reason of any such extension being granted to the said proposed tenderer for any forbearance, or act of omission on the part of the Company or any indulgence by the Company to the said proposed tenderer or by any such matter or thing whatsoever which under the law relating to surety.



5. We, (Name of the Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Company in writing.

Dated, the day of

For

(Authorised signatory of the Bank with Seal)



FORMAT FOR BANK GUARANTEE BOND

(For Security Deposit/ Performance Bank Guarantee only)

1. In consideration of the..... (Hereinafter called “The Company”) having agreed to exempt (Hereinafter called the “successful tenderer” from the demand, under Clause 12 of the Notice inviting tender No. dated and/or the terms and conditions of an Agreement dated Made between the Company and successful tenderer(s) for(hereinafter called “the said agreement”) of Earnest Money/Retention Money for the due fulfilment by the said Contract(s) of the terms and conditions contained in the said NIT or the conditions of (execution of work) or the agreement on production of a bank guarantee of Rs.....(Rupees..... only),
 2. We(hereinafter referred to as “The Bank”) do hereby undertake to pay to the Company an amount not exceeding Rs..... against any loss or damage caused to or suffered or would be caused to or suffered by the Company by reasons of any breach by the said successful tenderer of any of the terms or conditions contained in the said NIT, the conditions of Contract or the Agreement.
 3. We, do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company under National Council of Science Museums by reasons of any breach by the said successful tenderer of any of the terms or conditions contained in the said NIT or the conditions of contract or the Agreement or by reason of the successful tenderer’s failure to perform as per conditions contained the said NIT or the condition of contract or the Agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However our liability under this guarantee shall be restricted to an amount not exceeding Rs.....
- *Note:(Bank guarantee bond towards Retention Money/Security deposit as defined under Clause 17 of the General Conditions of Contract at the time of signing of agreement on award of work acceptable only if furnished by any of the Nationalised Banks/Scheduled Banks.)**
4. We,further agree that the guarantee herein contained shall remain in full force and effect during the period as mentioned in Clause 5 of the said NIT read with Clause 20 of the General Conditions of Contract, or the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till the dues of the Company under or by virtue of the said NIT or the conditions of contract or the Agreement



have been fully paid and its claims satisfied or discharged or the Company certified that the terms and conditions of the said NIT or the conditions of contract or the Agreement have been fully and properly honoured and carried out by said successful tenderer and accordingly discharges the guarantee.

Unless a demand or claim under this guarantee is made on us in writing on or before the

We shall be discharged from all liability under this guarantee thereafter.

1. We,..... lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Company in writing.

Dated, the day of

For

(Authorised signatory of the Bank with seal)



Creative Museum Designers
(Section 8 Company guaranteed by National Council of Science Museums)
Govt. of India Block- GN. Sector-V Bidhan Nagar, Kolkata-700 091

OFFER FORM

Tender No.: CMD.007.12.35(WORKS)/22-23/21, Dated 21.11.2022.

I/We have read, understood and accepted all the General Terms and Conditions etc. for “**K. D. Malaviya National Oil Museum at Guwahati**” as per enclosed specification by Creative Museum Designers, Kolkata. I/We hereby offer my/our rates for the said tender:-

1. Name of the Tenderer :
2. Permanent address (in case of Firm/: Company, address of the registered office including jurisdiction of the police station should be given)
3. Telephone Nos. a) Office :
b) Workshop/Factory:
c) Mobile :
4. Name of the Bankers and their address:
5. Price offer

Cost of K. D. Malaviya National Oil Museum at Guwahati, Assam as per enclosed specification by Creative Museum Designers, Kolkata:

I/We agree to carry out the work mentioned in the schedule at.....%
(.....percent) **above** the rates shown in the priced schedule of probable items with approximate quantities.

OR

I/We agree to carry out the work mentioned in the schedule at.....%
(.....percent) **below** the rates shown in the priced schedule of probable items with approximate quantities.

OR

I/we agree to carry out the work mentioned in the schedule at **par** rates shown in the priced schedule of probable items with approximate quantities

6. GST No:
- SAC/HSN code no:
- GST charged separately (%)
- Total Amount (Including GST) (Rs)**

Total amount quoted by us for (in figures) Rs..... are strictly in accordance with the Creative Museum Designers, Kolkata.

Total amount including GST(In words).....

Date:

Signature of the Tenderer/Authorised Official Seal

Place:



FORMAT FOR LETTER OF INTENT

.....
(Mention file number)

Date.....

Sub: Letter of intent for the work of

Dear Sir/Madam,

With reference to your tender dated (and further clarification vide letter number dated) # it is intended to award the aforesaid work at the tendered amount of ₹.....

You are, therefore, requested to sign an agreement as per standard format already printed in the tender documents purchased by you while tendering for this job. For this purpose, you are requested to send us a non-judicial stamp paper of appropriate value for preparing contract Agreement within a week from the date of this letter.

You are also requested to deposit Bank Guarantee (from Nationalized Bank/ Scheduled Bank) duly issued / assigned in favour of Creative Museum Designers, Kolkata of an amount of Rs..... as Security cum Performance Guarantee, which shall be submitted within 15 (fifteen) days from the date of issuing of LOI. The validity of Performance Guarantee shall be up to completion time and additional 12 (twelve) calendar months from the date of completion time.

You may avail of 15(fifteen) days mobilisation time from the date of issue of this letter of intent for mobilisation your men, materials and other necessary resources for the construction. During mobilisation period, you are requested to study all the drawings and designs annexed hereto and the Bar-Chart and obtain clarifications from the architect or this office immediately.

Please note that the work has to be completed within Weeks/months in which mobilisation time period of 15 (fifteen) days is also included. The date of commencement of work would be reckoned as the date of issue of this letter (as per Clause 24 of NIT).

Thanking you,

Yours faithfully,

Sd/-

Administrative Officer

Letter of intent is to be issued in the letter head of the of the company and a photocopy is to be maintained as office copy on which signature of the authorised representative of the successful tender is to be obtained with date at the time of issue of original letter of intent. # Delete words within brackets if not applicable in specific case.



FORMAT FOR ARTICLES OF AGREEMENT

INSTRUCTIONS (not to be typed in Agreement)

(Articles of Agreement have to be typed on non-judicial stamp paper. The value of the stamp paper varies from state to state and is to be known from the particular place. The stamp paper will be purchased by the successful tenderer and the agreement may be typed by the Company according to the format.)

ARTICLES OF AGREEMENT made at

.....
(Place)

This..... day of
(Date) (Month & Year)

Between the

Hereinafter referred to as the CMD which expression shall be include its successors and assigns on the one part and.....

.....
(name of the successful tenderer)

Trading in the name and style of.....

.....
(Name and complete address of the successful tenderer)

Hereinafter referred to as the successful tenderer which expression shall be include his/their respective heirs, executors, administrators and assigns on the other part.

WHEREAS the CMD id desirous of getting the work of

.....
..... therein done and has caused
(Name of the work)

Notice Inviting Tender (Including appendix), drawings, schedule of quantities and specifications describing the work and conditions of contract to be prepared by.....

.....
.....
.....



(Name and address of the company)

AND WHEREAS the said NIT (including appendix) drawings as per list attached, specifications and the priced schedule of quantities and conditions of contract have been signed by or on behalf of the parties hereto. AND whereas the Successful tenderer has deposited in Cash or Bank Draft a sum of ₹.....

(exact amount in words)

The amount being 2.5% of the estimated value of the tender rounded off to the nearest hundred with the Company as Initial Security for the die performance of this Agreement as provided in the said conditions.

NOW IT IS HEREBY AGREED AND DELARED BY AND BETWEEN THE PARTIES HERETO AS FOLLOWS:

1. In consideration of the payments to be made to him as hereinafter provided the successful tender shall upon and subject to the conditions herein contained execute and complete the work within **09 (Nine)** months form the date of issue of letter of intent (as defined under Appendix of NIT) and as per the said drawings and such further detailed drawings as may be furnished to him from time to time and described in the said specifications and the said priced schedule of quantities along with the progress of the building work.
2. The Company shall pay to the successful tenderer such sum as shall become payable hereunder at the time and in the manner specified in the said conditions.
3. Time is the essence of this agreement and the successful tenderer shall proceed with the work, throughout the stipulated period of his contract, strictly according to the CPM/PERT/BAR CHART for reasons directly attributable to the successful tenderer, he shall pay or allow the CMD to deduct from any money due to him a liquidated damage as per Clause 61 of the General Conditions of Contract.
4. This agreement comprises the work above and all subsidiary works connected therewith, even though such work may not be shown on the drawings, or described in the said specifications or the priced Schedule of Quantities.
5. The Company through the Engineer (As defined under Clause 3 of General Conditions of Contract) reserves to itself the right of altering the drawings and of adding to or omitting any item of work or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall not vitiate this agreement.
6. In the case of any disputes or differences arising out of or in connection with, or concerning this Agreement, it shall be settled by arbitration. The arbitration shall be conducted by an expert as Arbitrator in the field acceptable to both the parties. In case of disagreement, it shall be through three experts in the field, one to be appointed by each party and the third presiding expert to be jointly appointed by the expert referred to. The arbitration shall be as per the provision of the Arbitration and Conciliation (amendment) Act, 2015 and the decision of the panel so appointed shall be final and binding on both the parties to this



Agreement. The place of arbitration shall be normally Kolkata or any other suitable place mutually agreed.

The provisions of the Arbitration and Conciliation Act 2015 or any statutory modification or re- enactment thereof and of the rules made there under for the time being in force shall apply to arbitration proceedings under this clause.

In witness whereof the parties have set their respective hands the day and the year and the place hereinabove written.

Signed by for and on behalf of the company

.....

In the presence of

1)

Seal

2)

Signed by the said Successful tenderer.....

In the presence of

1).....

Seal

2).....



GENERAL CONDITIONS OF CONTRACT

1. DEFINITION OF TERMS:

The various terms appearing in the Tender Document shall have the following meaning unless they are repugnant to the context otherwise:

(a)	COMPANY	:	CREATIVE MUSEUM DESIGNERS – A Section 8 Company guaranteed by National Council of Science Museums, NCSM Campus, 33, Block-GN, Building – II, 6 th Floor, Bidhannagar, Sector – V, Kolkata - 700091
(b.1)	OWNER/CLIENT	:	M/S. K D MALAVIYA NATIONAL OIL MUSEUM TRUST (KDMNOMT)
(b.2)	CONSULTANT	:	M/S. LALIT KUMAR BOSE, 46/A, S.N. Roy Road, Kolkata - 700038
(c)	BIDDER/TENDERER	:	The firm/party who shall tender quotation to the company.
(d)	CONTRACTOR	:	The Bidder who's quoted offer will be accepted, either in full or in part, by the Company.
(e)	WORK(s)	:	Jobs awarded to the contractor by the Company.
(f)	LOI/ WORK ORDER/ AGREEMENT	:	The Formal letter/notification issued to the Contractor awarding the work(s) in full or in part by the Company together with the applicable terms and conditions etc. as are finally and mutually agreed to between the Company and the Contractor.
(g)	SITE/WORK SITE	:	The premises where the work will be executed by the Contractor and shall include the lands, buildings, structures etc. erected thereupon.
(h)	ENGINEER-IN-CHARGE	:	The Officer/Engineer nominated and authorized by the company for the time being for the purpose of operating the contract or any work covered thereunder.
(i)	ACCEPTING AUTHORITY	:	MANAGING DIRECTOR of the company.



2. INTERPRETATION:

The terms as used in the tender documents and agreement and named hereunder shall have the meanings herein assigned to them except where the subject or context otherwise requires: -

“This agreement” shall comprise of the Articles of Agreement along with the Appendix, General Conditions of Contract, Special Condition of Contract, Priced Schedule of Quantities, Technical Specifications and Drawings and CPM/PERT/BAR CHART attached hereto and including those to which only a reference is made herein.

“Work” or “Works” shall mean all work or works defined by bills of quantities, Drawings Specifications and such other work or works as the successful tenderer may be entrusted with for carrying out under this agreement as per Clause 5 of the Articles of Agreement.

Company shall mean Creative Museum Designers (CMD) which shall include the persons for the time being in management of the Company and its assigns.

NCSM means National Council of Science Museums, Kolkata.

KDMNOMT means K D Malaviya National Oil Museum Trust, the Owner of the Project.

PMC means Project management Consultant, engaged by Creative Museum Designers (CMD), Kolkata.

“Engineer” shall mean the representative of CMD or authorized as such by the Company or in the event of his ceasing to be Engineer for the work such other firm or persons as may be appointed by the Company as Engineer for this work. (Further elaboration given in Clause 3 below):

“Successful tenderer” shall mean **Accepted Lowest Bidder** and shall include his/their respective heirs, executors, administrators and assigns.

“Site” shall mean the site of the construction works as shown on the site plan attached hereto including any buildings and erection thereon and any other land adjoining these to (inclusive) as aforesaid allotted by the Company for the use of successful tenderer.

“Act of Insolvency” shall mean any act of insolvency as defined by the Presidency Towns Insolvency Act, or the Provincial Insolvency Act or any “Amending Statute.”

“Notice in Writing” or “Written Notice” shall mean a notice or communication in written, typed or printed or printed characters sent (unless delivered personally or otherwise proved to have been received) by registered post to the last known private or business address or the registered office



of the addressee and shall be deemed to have received when in the ordinary course of post it would have been delivered. “Virtual Completion” shall mean that the works carried out are fit for occupation in every respect including removal of scaffolding, plant, surplus material and rubbish and cleaning of dirt from work and site.

Words imputing persons include firms and corporations words imputing the singular only also include the plural and vice versa where the context so requires.

Short headlines are given to each Clause for convenience only and they will not limit the meaning or scope of the Clause in any way.

3. ENGINEER:

The plans, agreement and documents above mentioned shall form the basis of this agreement and the decision of the said Engineer for the time being as mentioned in the said conditions, in reference to all matters or dispute as to material and workmanship shall be final and binding on both the parties.

The term “Engineer” shall mean the firm or person(s) appointed by the Company to superintend the work. He/They will receive his/their instruction for the work from the Company.

The successful tenderer shall afford the said Engineer(s) every facility and assistance for examining the work and materials and for checking and measuring works and materials.

The Engineer or any Authorised Assistant of the Engineer shall have the power to give notice to the successful tenderer or to his Supervisor of non-approval of any work, or materials, and such work shall be suspended or the use of such materials shall be discontinued. The work from time to time be examined by the Engineer or the Engineers Assistant but such examination shall not in any way exonerate the successful tenderer from the obligation to remedy any defects due to materials or workmanship not in accordance with the contract which may be found to exist at any stage of the work or may appear within the defects liability period mentioned in Clause 37 of General Conditions of Contract (GCC).

4. SCOPE OF THE CONTRACT:

The successful tenderer shall carry out and complete the works in every respect in accordance with this contract and in accordance with the directions of the Engineer and to the satisfaction of the Engineer and the Company. The engineer may from time to time issue further drawings and/or written instructions, detailed directions and explanations in regard to:

- a. The variation or modification of the design, quality or quantity of works for the addition or omissions or substitution of any work.
- b. Any discrepancy in the drawings or between the schedule of quantities and/or drawing and/or specification.
- c. The removal from the site of any material brought therein by the successful tenderer and the substitution of any other materials there from.
- d. The removal and/or re-execution of any works executed by the successful tenderer.



- e. The dismissal from the works of any persons employed thereupon.
- f. The opening up for inspection of any work covered up.
- g. The amending and making good of any defects under Clause 37.
- h. The rectification and making good of any defects under clauses herein after mentioned and those arising during the maintenance period/defect liability period.

The successful tenderer shall comply with and duly execute any work comprised in such instructions, detailed directions and explanations, provided always that if the engineer's instructions involved variation from the priced Schedule of Quantities, such instruction shall be issued by the Company and the successful tenderer shall take the action stipulated in Clause 60.

If the work shown on any such further drawings or detailed drawings or that may be necessary to comply with any such instructions, directions, or explanations be in the opinion of the successful tenderer, extra to that comprised in or reasonably to be inferred from the contract he shall before proceeding with such work, give notice in writing to this effect to the Engineer, and in the event of his not doing so three days before the commencement of such work the successful tenderer shall not be entitled to any allowance in respect of any such extra work. But if such notice has been duly given and the Engineer and the "successful tenderer, fail to agree as to whether or not there is any extra, then if the engineer decides that the successful tenderer is to carry out the said work, the successful tenderer shall do so accordingly, and the question whether or not there is any extra and if so, the amount thereof shall failing agreement be settled by the Arbitration as provided in Clause 52 on a reference being made by the successful tenderer.

5. SCOPE OF WORK:

The work consists of **"Supply, Installation, Testing & Commissioning of Fire Fighting & Fire Detection System (Fire Detection & Alarm, Fire Pumps with Equipments, Fire Hydrants, Fire Sprinklers & Fire Extinguishers etc.) in connection with Proposed K. D. Malaviya National Oil Museum at Khanapara, Guwahati, Assam"** to be carried out in accordance with the technical specification, job procedure, drawings and Schedule of Quantities & Rates. It includes furnishing all materials, labour, tools and equipment and management necessary for the incidental to the construction and completion of the work. All work, during its progress and upon completion, shall conform to the code, standard, specification, approved drawings etc.

The Contractor shall forthwith comply with and duly execute any work comprised in such CMD's instructions, provided always that verbal instructions, directions and explanations given to the Contractor's or his representative upon the works by CMD shall if involving a variation be confirmed in writing to the Contractor's within seven days.

- The Client / Employer / PMC reserves the right to get the work executed in the best and most economical manner, and may add or may not operate any item(s) of work(s) as CMD may consider fit.
- The Client / Employer / PMC reserve the right to increase or decrease the scope of work and/or not to operate any one or more of the item(s) of work(s) of the Schedule of



Quantities & Rates. It is the responsibility of the Contractor to ascertain from the Engineer-in-charge, the items to be operated with their actual quantities before making any arrangement(s) for taking up work under the item(s). No claim, whatsoever, from the Contractor will be entertained for non-operation of any of the item(s) or for variation in quantity of any of the item(s).

- The payment shall be made on the basis of actual quantities executed under various item(s) and the accepted rates thereof, and not on the quantities mentioned in the Schedule of Quantities & Rates.
- The work in general consists Item Rate as per “Schedule of Quantities & Rates”.
- The Scope of Work may also include such other related works as covered in ‘Schedule of Quantities & Rates’ although they may not be specifically mentioned in the above paragraphs and all such incidental items not specified but reasonably implied and necessary for the completion of the work as a whole, shall be deemed to be directed by the Employer
- CMD also reserves the right to accept tender either for full quantity of work or part thereof or divide the works amongst more than 1 (One) Contractor without assigning any reason for any such action.
- CMD also reserves the right to take away part of initially awarded work from Contractor in case of his unsatisfactory work progress and award the same to other Agencies, in order to meet the time schedule of owner/client or for any other reason or contingency. In this regard Employer’s decision will final & binding on the Contractor.
- The Contractor shall provide a detailed schedule of work along with material and labour deployment on monthly basis.
- The Contractor shall, after completion of work, clear the site of all debris and left over materials, at his own expense to the entire satisfaction of Engineer-In-Charge or his authorized representative. In case of any failure by the Contractor, the employer will get set at risk and cost of the Contractor.
- If required, Contractor shall submit to CMD / KDMNOMT the entry challan of incoming materials for verification of Stores and record.
- It should be clearly understood that it is entirely the Contractor’s responsibility and liability to find, procure and use the required tools and plants and accessories at his own cost for efficient and methodical execution of the work. CMD / KDMNOMT shall have the right to check the sufficiency or quality of the Contractor's tools from time to time and the Contractor shall carry out all reasonable instructions of KDMNOMT in this respect.

6. SUCCESSFUL TENDERER TO PROVIDE EVERYTHING NECESSARY:

The successful tenderer shall provide everything necessary for the proper execution of the works according to the true intent and meaning of the drawings and specification and bill of quantities taken together, whether the same may or may not be particular shown on the drawings or described in the specification or included in the bill of quantities, provided that the same is to be reasonably inferred there from and if he finds any discrepancy in the drawings or between the drawings and specification and bill of quantities, he shall immediately refer the same to the Engineer who shall decide which shall be followed. Figured dimensions shall be followed in reference to scale.



The successful tenderer shall supply, fix and maintain at his cost during the execution of any works, all the necessary centering, scaffolding, staging, planking, timbering, shuttering, shoring, pumping, fencing, boarding, watching and lighting by night as well as by day required for the proper execution and protection of the public and the safety of any adjacent roads, streets, cellars, vaults, eaves, pavement, walls, houses, buildings and all erections, matters or thing, and they shall take down and remove any or all such centering, scaffolding etc. as occasion shall require or when ordered to do so and shall fully reinstate and make good all matters and all things disturbed during the executing of the works to the satisfaction of the Engineer before a Virtual Completion Certificate is issued.

The successful tenderer shall make his own arrangements for laying temporary water and electrical power lines including excavation if necessary so as not to cause any obstruction along locations approved by the Engineer. The water supply lines, hose pipes, electrical lines, underground or overhead etc. belonging to them should not cause damage to the property of the company including gardens, plants, flowers, hedges, flower pots in the campus etc. Any expenditure incurred by the company due to damage so caused shall be debited to the successful tenderer's account. It is their complete responsibility to ensure that the garden area and its approaches and other areas not allocated to them are not encroached upon by their men and materials. They have to provide a fence at their cost to confine the activities of construction, labour and materials, to the construction area as approved by the Engineer or his representative. The bitumen carpet road in front of company's office, Science and Exhibits Laboratory, Stores and Workshop or garden paths and defined areas will not be allowed to be used by their labour, materials, trucks and other modes of transport system. Their labour is allowed to use Campus grounds for baths, calls of nature etc.

The company shall on no account be responsible for the expense incurred by the successful tenderer for hired ground or electric power or water obtained from elsewhere.

7. DRAWINGS, DESIGNS ETC.

Tender drawings are diagrammatic but shall be followed as closely as actual construction permits. Any deviations made shall be in conformity with the architectural and other service drawings.

The successful tenderer shall verify all dimensions at the site and bring to the notice of the Engineer all discrepancies or deviations noticed. The Engineer's decision shall be final and binding.

All drawings issued by the Company are its own property and shall not be lent, reproduced or used on any other works than intended without the written permission of the Company.

Large scale size details and manufacturer's dimension for materials to be incorporated shall take precedence over small scale drawings.

One complete set of drawing, specifications and schedule of quantities shall be furnished by the Engineer to the successful tenderer and the Engineer shall furnish, within such time as he may consider reasonable, one copy of any additional drawing which in his opinion may be necessary for the execution or any part of work. Such copies shall be kept on the works, and the Engineer and his representatives shall at all reasonable time have access to the same and they shall be



returned to the Engineer by the successful tenderer before the issue of the certificate for the balance of this account under the contract.

Company will make all efforts to give all drawings, designs, decision etc. from time to time and the successful tenderer shall make timely requests for the same. No claim whatsoever shall however be entertained for compensation for the delay in supply of drawings, designs, decisions, running payments etc. from the successful tenderer. Drawings shown at the time of issue of tenders and forming part of the contract shall indicate the scope of work and drawings issued subsequently during the execution of work shall be deemed to be drawings elaborating the basic scheme. If any detailed drawings show an item for execution, which in the opinion of the successful tenderer is not covered under the items of the contract, he shall immediately refer it to the Engineer, for final decision. The decision of the Engineer as to whether it is an extra item or not or whether it is covered by contracts and if not what extra rate should be paid shall be final and binding on both the parties to the contract i.e. Company and the Successful tenderer.

8. REFERENCE DRAWINGS & SHOP DRAWINGS:

Reference Drawings

The Successful tenderer shall maintain one set of all drawings issued to him as reference drawing. These shall not be used at the site.

All corrections, deviations and changes made at the site shall be shown on these reference drawings for incorporation in the completion drawings. All changes to be made shall be initiated by the Engineer.

Shop Drawings

The Successful tenderer at his own cost shall submit to the Engineer as well as to the Consultant 6 copies (six) of all shop drawings related to the Fire Fighting & Detection System work etc. with foundation drawings for Fire Fighting Equipments, Fire panels, Detailed electrical panel drawings, control wiring diagrams, Hydrant Piping layout, Sprinkler layout, Smoke detector layout, Fire Extinguishers layout etc. for approval. The successful agency shall prepare all shop drawings and take the approval from Consultant/CMD before starting the work and also submit as-built drawings of all the works executed by the successful agency after completion of work.

9. SCHEDULE OF QUANTITIES & RATES (SOQR):

The quantities for various items of works as shown in the Schedule of Quantities & Rates of probable items of works are based on the basic design drawing prepared and issued by CMD. However, if quantity variations become necessary due to Design consideration / Site conditions etc. those have to be done by the Contractor at the time of execution of work at their finally accepted rates(s). No conditional rate will be allowed in any case.



10. ERROR IN SCHEDULE OF QUANTITIES, IF ANY:

If any error appears in the schedule of quantities, other than the Tenderer's prices and calculation, it shall be rectified by the engineer after informing the Company. Such variation shall constitute a deviation of the item(s)/contract and shall be dealt with as hereinafter provided.

11. NOMENCLATURE OF ITEM:

Nomenclatures of the items of works mentioned in the priced schedule are only a brief description of the work. The work shall have to execute in accordance with the specifications/ drawings for the work to the satisfaction of the Engineer of the work. Any omission in the description will not absolve the successful tenderer from his responsibilities to complete the work in a satisfactory manner.

12. METRIC UNITS:

The schedule of quantity indicate the unit of Metric system. The mode of measurement of different items of work shall be as per details contained in the specification and special conditions with the equivalent of the units mentioned therein in Metric system.

13. CPWD/PWD SPECIFICATIONS AND I S CODES:

CPWD/PWD specifications & relevant I.S Code of practice shall be applicable, for all items of work.

14. ORDER OF PRECEDENCE:

If any discrepancy is noticed between the conditions and specifications, drawing etc. the following would be the order of precedence:

- a. Schedule of Quantities.
- b. Notice Inviting Tender (NIT).
- c. General Conditions of Contract (GCC) & Special Conditions of Contract (SCC)
- d. Drawings and notes thereon.
- e. Technical Specification as provided with this document for Fire fighting System Installation.

15. SITE INSPECTION:

The work site is at Khanapara, Guwahati, K D Malaviya National Oil Museum Project, Assam. Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submission of their offer as to the nature of the site and Sub-Soil, the quantities and nature of work and materials necessary for completion of the works and the means and access to the site, accommodation they may require and all other necessary information as to the risk contingencies and other circumstances which may influence or affect their offers and work. A tenderer shall be deemed to have full knowledge of the Site whether he inspects it or not and no extra charge consequent to any misunderstanding or otherwise shall be allowed.



16. SUFFICIENCY OF QUOTATION:

The Bidder shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his quotation for the works and of the rates and prices quoted in the Schedule of Quantities & Rates in which rates and prices shall, except as otherwise provided, cover all his obligations and liabilities under the Contract and all matters and things necessary for the proper completion and maintenance of the Works.

17. SECURITY DEPOSIT/ RETENTION MONEY/ PERFORMANCE BANK GUARANTEE:

This shall mean and be 10% of the contract value awarded including the initial security deposit and shall be recovered from the running bills. In case of termination of contract, this retention money shall be forfeited and amount necessary to make up this amount shall be recovered from the money due to the successful tenderer under this contract, or any other contract. The successful tenderer can give security deposit/ retention money/ performance guarantee in the form of a Bank Guarantee from a Nationalised Bank/Scheduled Bank in approved format to the extent of 10% of the awarded contract value of work valid for a period equal to completion period plus one year (which will have to be suitably extended to cover defect liability period and extended period of contract whichever is later) plus 01 (one) year as claim period. The bank guarantee of the tenderers who have deposited earnest money in the form of Bank Guarantee along with the tender shall be returned only after the receipt of bank guarantee for the 10% of the contract value. The security deposit/ retention money/ performance guarantee in the form of Bank Guarantee will not be accepted in parts.

The successful tenderer shall have to extend the Bank Guarantee period, from time to time at least one month before the expiry of a Bank Guarantee to cover the defects liability period, reckoned from the date of virtual completion. In case they failed to extend the Bank Guarantee at least one month before its expiry, it shall be considered a breach of contract on the part of the successful tenderer and hence, the Company shall be free to demand the Guarantee money from the Bank.

18. DEVIATIONS:

The successful tenderer may when authorize and when directed, in writing by the Engineer with the approval of the company add or omit or vary the works shown upon the drawings, or described in the specifications, or included the bill of quantities but they shall make no addition, omission or variation without such authorization or direction. A verbal authority direction by the Engineer shall, if confirmed by him, in writing within 7 days , be deemed to have been given in writing.

No claim for an extra shall be allowed unless it shall have been executed under the provision of Clause 19 or by the authority of the Engineer with concurrence of the company as ther in mentioned. Any such extra if wherein referred to, as an authorize extra shall be goverened by Clause 43. No variation i.e. additions or substitutions shall be vitiate the contract.

19. PRICE FOR DEVIATIONS:

Deviation shall be valued at the net rates contained in the Tenderers original tender or where the same may not apply direct at rates analogous to the prices therein contained. If the altered,



additional or substituted work included any class of work for which no rate is specified in the contract, Then the successful tenderer shall within seven days of the date of receipt of the order to carry out the work, inform the engineer with the copy to the Company the rate which the intends to charge for such class of work with proper analysis. In the event of his not doing so, within a reasonable time before the commencement of such work, he shall not be entitled to any allowance or payment in respect of any such extra work. When such notice has been duly given, the Engineer with the consent of the Company may agree to such rate but if the engineer does not agree to this rate, the Engineer may cancel his order to carry out such class of work and arrange for it to be carried out departmentally or through any other agency or in such a manner as he may consider advisable or he may decide that the Successful tenderer shall carry out such items of work and in such case he shall only be entitled to be paid in respect of the work carried out or expenditure incurred by him according to such rate or rates as shall be fixed by the Engineer as full and final and shall be binding on successful bidder.

However, in respect of the rates for extra/new items, if there are any, the opinion of the Engineer as to whether it is an extra item or not, and if so, what rate should be paid shall be final and binding on the successful tenderer and shall be derived from contract items so far as applicable and the rates which cannot be derived from contract items will be fixed as per (i) relevant DSR items as applicable or (ii) on the basis of actual cost of materials and labour, plus 15% as successful tenderers overheads and profits on all trades except on the cost of materials supplied departmentally.

Successful tenderer shall not claim any idle and remobilization charge for interim due to late decision by the Company. Such legitimate interim delays shall however be considered for extension of time if any.

Furthermore, they shall submit analysis of rates with justifications for claiming extra on any deviation item prior to the probable date of execution of the referred item.

20. COMPLETION TIME:

Time of completion of work will be 09 (nine) months from the date of issuance of Letter of Intent (LOI).

21. TOOLS, PLANTS & EQUIPMENTS:

- The Contractor shall arrange at his own expense all necessary Tools, Plants & Equipments (hereinafter referred to as T&P) such as DG Set, Welding machine, Crane/ Lifting Equipment of required capacity, Water Tanker etc. along with all accessories, Operator(s) & Labourers required for execution of the work, will be provided by Contractor at his own cost.
Lighting DG for area lighting if required (including operator and fuel) will also be provided by Contractor within the finally accepted rate / price.

22. MATERIALS:



The Contractor shall at his own expense, provide all materials required for the work in this Tender Documents.

- All materials to be provided by the Contractor shall be in conformity with the specifications laid down in the contract and the Contractor shall, if requested by the Engineer-in-Charge, furnish proof to the satisfaction of him that the materials so comply.
- The Contractor shall, at his own expense and without delay, supply to the Engineer-in-Charge samples of materials proposed to be used in the works. The Engineer-in-Charge shall within seven days of supply of samples or within such further period as he may require intimate to the Contractor in writing/inform the Contractor whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval fresh samples complying with the specification laid down in the Contract.
- The Engineer-in-Charge shall have full powers for removal of any or all the materials brought to site by the Contractor which are not in accordance with the Contract specifications or do not confirm in character or quality to samples approved by him. In case of default on the part of the Contractor in removing rejected materials the Engineer-in-Charge shall be at liberty to have them removed by other means.
- All charges on account of transportation, octroi, GST, Excise and other duties on materials obtained for the works from any source shall be borne by the Contractor.

23. FAULTY MATERIALS AND WORK:

- a. The Engineer shall during the progress of the work has power to order in writing from time to time the removal from the work, within such reasonable time or times as may be specified in the order, to any materials and/or workmanship which in the opinion of the Engineer are not in accordance with the specifications or the instructions of the Engineer. The substitution of proper materials or any workmanship and the removal and proper re-execution of any work executed with materials or workmanship not in accordance with the drawings and specifications or instructions shall have to be forthwith carried out by the Successful tenderer at his own cost upon receiving such order. In case of default on the part of the Successful tenderer to carry out such order the CMD shall have the power to employ any other persons to carry out the same and all the expenses consequent thereon or incidental thereto shall be borne by the Successful tenderer and shall be recovered from them by the Company from any money due to or that may become due to the Successful tenderer or from the amount of retention money.
- b. Nothing in this clause shall relieve the Successful tenderer from his liability to execute the works in all respect in accordance with those terms and upon and subject to the conditions of this contract or from his liability to make good all defects.

24. ACCESS:

The Company or its representatives shall at all reasonable time have free access to the works and/or to the workshops factories or other places where materials are being prepared or constructed for



the contract and also to any place where materials are lying or from which they are being obtained and the Successful tenderer shall give every facility to them for inspection, examination and testing of the materials and workmanship. Except the representative of Public Authorities and those mentioned above, no person shall be allowed to the work site at any time without the prior written permission of the Engineer in charge of the Company.

If any work is to be done at a place other than the site of works the Successful tenderer shall obtain the prior written permission of the Engineer in charge for doing so.

25. LABOUR:

The Contractor shall employ labour in sufficient numbers to maintain the required rate of progress and quality to ensure workmanship of the degree specified in the Contract and to the satisfaction of the Engineer-in-Charge. The Contractor shall not employ in connection with the Works any person who has not completed his eighteen years of age.

The Contractor shall furnish to the Engineer-in-Charge at regular intervals as decided by Engineer-in-charge of CMD, a distribution of employees engaged by the agency according to trades. The Contractor shall also submit on the 4th and 19th of every month to the Engineer-in-Charge a true statement showing in respect of the second half of the current month (i) 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.

The Contractor shall pay to labour employed by him wages not less than Minimum Wages as defined in the Contract Labour Regulations.

The Contractor shall in respect of labour employed by him comply with or cause to be complied with the Contract Labour Regulations in regard to all matters provided therein.

The Contractor shall comply with the provisions of the payment of Wages Act, 1936, Minimum Wages Act, 1948, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, or any modifications thereof or any other law relating thereto and rules made thereunder from time to time.

The Contractor shall be liable to pay his contribution and the employee's contribution to the State Insurance Scheme in respect of all labour employed by him for the execution of the contract, in accordance with the provision of "The Employee's State Insurance Act, 1948" as amended from time to time.

The Engineer-in-Charge shall on a report having been made by an Inspecting Officer as defined in the Contract Labour Regulation have the power to deduct from the money due to the Contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reasons of non-fulfilment of the Conditions of the Contract for the benefit of workers, non-payment of wages or of deduction made from his or their wages which are not justified by the terms of the Contract or non-observance of the said Contract Labour Regulations and Acts and Rules framed there under.



In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid Contract Labour Regulations, as amended from time to time or furnishing any information of submitting or filling any Form / Register / Slip under the provisions of these Regulations which is materially incorrect then on the report of the Inspecting Office as defined in the Contract Labour Regulation, the Contractor shall without prejudice to any other liability pay to the Company a sum as applicable as per prevailing Rules as liquidated damages for every default, breach or furnishing, making, submitting, filling materially incorrect statement as may be fixed by the Engineer-in-Charge & in the event of the Contractor's default continuing in this respect, the liquidated damages may be enhanced for each day of default subject to a maximum percent of the estimated cost of the Works put to tender. The Engineer-in-Charge shall deduct such amount from bills or security deposit of the Contractor and credit the same to the Welfare Fund constituted under Regulations. The decision of the Engineer-in-Charge in this respect shall be final and binding.

The Contractor shall at his own expense comply with or cause to be complied with Model Rules for Labour Welfare framed by Government from time to time for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the Works. In case the Contractor fails to make arrangement as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the Contractor.

The Contractor shall at his own expense arrange for the safety provisions as required by the Engineer-in-Charge, in respect of all labour directly or indirectly employed for performance of the Works and shall provide all facilities in connection therewith. In case the Contractor fails to make arrangements and provide necessary facilities as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the Contractor.

Failure to comply with Model Rules for Labour Welfare, Safety Code or the provisions relating to report on accidents shall make the Contractor liable to pay to the Company as liquidated damages as applicable as per prevailing Rules for each default or materially incorrect statement. The decision of the Engineer-in-Charge in such matters based on reports from the Inspecting Officers as defined in the Contractor Labour Regulation as appended to these conditions shall be final and binding and deductions for recovery of such liquidated damages may be made from any amount payable to the Contractor.

26. POSSESSION OF SITE BY CONTRACTOR:

- The Contractor shall not be permitted to enter on (other than for inspection purposes) or take possession of the site until instructed to do so by the Engineer – In – Charge in writing. The portion of the site to be occupied by the Contractor shall be defined and / or marked on the site plan, failing which these shall be indicated by the Engineer – in – Charge at Site and the Contractor shall on no account be allowed to extend his operation beyond these areas. In respect of any land allotted to the Contractor for purposes of or in connection with the contract the Contractor shall be licensee subject to the following and such other terms and conditions as may be imposed by the licenser.
 - (i) That such use or occupation shall not confer any right or tenancy of the land to the Contractor.



(ii) That the Contractor shall be liable to vacate the land on demand by the Engineer – in – Charge.

(iii) That the Contractor shall have no right to any construction over this land without the written permission of the Engineer-in-Charge. In case, he is allowed to construct any structure he shall have to demolish and clear the same before handing over the completed work unless agreed to the contrary.

- The Contractor shall provide if necessary, or if required, on the site, all temporary access there to and shall alter, adopt and maintain the same as required from time to time and shall take up and clear them away as and when no longer required and as and when ordered by the Engineer-in-Charge and make good all damage done to the site at his cost.

27. SETTING OUT WORKS:

The successful tenderer at his own expense shall set out the works and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time any error shall appear during the progress of any part of the work, the Successful tenderer shall at his own expense rectify such error if called upon to the satisfaction of the Engineer.

28. MATERIALS OBTAINED FROM EXCAVATION:

Materials of any kind obtained from excavation on the site shall remain the property of the Company and shall be disposed of as the Engineer-in-Charge may direct.

All fossils, coins, articles of value of antiquity and structures and other remains or things of geological or archaeological interest discovered on the site shall be the absolute property of the company and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such article or thing shall immediately upon discovery thereof and before removal acquaint the Engineer-in-Charge with such discovery and carry out the Engineer-in-Charge's directions as to the disposal of the same at the expense of the Company.

29. WATCHING, GUARDING & LIGHTING:

The Contractor shall provide and maintain at his own expense all lights, guards fencing and watching when and where necessary or required by the Engineer-in-Charge for the protection of the Works or for the safety and convenience of these employed on the Works or the public.

30. WORK SUPERVISOR AND FOREMAN:

The Successful tenderer shall keep a qualified and experienced Engineer for supervision of works to ensure best quality work. He shall also give all necessary personal superintendence during the execution of the works and as long thereafter as the Engineer may consider necessary until the expiration of the "Defect Liability Period" stated in Clause 37. The Successful tenderer shall also during the whole time, the works are in progress, employ competent Foreman approved by the Engineer whose qualification must conform to the requirements specified by the Engineer. In



special cases, he shall be constantly in attendance of the building while the men are at work". Any directions, explanations, instruction or notices given by the Engineer to such Foreman shall be held to be given to the successful tenderer.

31. INSPECTION AND APPROVAL:

All works embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice to the Engineer – in – Charge of his authorized representative when each stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quality and extent thereof.

Employer's/ Client's representatives concerned with the Contract shall have powers at any time to inspect and examine any part of the works and the Contractor shall give such facilities as may be required for such inspection and examination.

Company's/Owner's representatives concerned with the Contract shall have powers at any time to inspect and examine any part of the works and the Contractor shall give such facilities as may be required for such inspection and examination.

32. POWERS OF ENGINEER-IN-CHARGE'S REPRESENTATIVE:

The duties of the representatives of the Engineer-in-Charge, are to watch and supervise the works and to test and examine any materials to be used or workmanship employed in connection with the works. He shall have no authority to order any work involving any extra payment by the Employer nor to make any variation in the works.

- The Engineer-in-Charge may from time to time delegate to his representative any of the powers and authorities vested in the Engineer-in-Charge and shall furnish to the Contractor a copy of all such written delegation of Powers and authorities. Any written instruction or written approval given by the representative of the Engineer-in-Charge to the Contractor within the terms of such delegation shall bind the Contractor and the Employer as through it had been given by the Engineer-in-Charge.
- Failure of the Representative of the Engineer-in-Charge to disapprove any work or materials shall not prejudice the power of the Engineer-in-Charge thereafter to disapprove such work or materials and to order the pulling down, removal or breaking up thereof.
- If the Contractor is dissatisfied with any decision of the Representative of the Engineer-in-Charge he shall be entitled to refer the matter to the Engineer-in-Charge who shall thereupon confirm, reverse or vary such decision.

33. REMOVAL OF WORKMEN:

The Contractor shall employ in and about the execution of the works only such persons as are skilled and experienced in their trades and the Engineer-in-Charge shall be at liberty to object to and advise the Contractor to remove from the works any person employed by the Contractor in or about the execution of the works who in the opinion of the Engineer-in-Charge misconducts himself or is incompetent or negligent in the proper performance of his duties and such person shall not be again employed upon the works without written permission of the Engineer-in-Charge.



34. WORK DURING NIGHT OR ON SUNDAYS & HOLIDAYS:

Subject to any provisions to the contrary contained in the Contract, none of the permanent works shall be carried out during night or on Sundays or on authorized Holidays without the permission in writing of the Engineer-in-Charge except when the work is unavoidable or absolutely necessary for the safety of life, property of works in which case the Contractor shall immediately advise the Engineer-in-Charge accordingly.

The Contractor would be required to carry out the work even on Sunday or any other holidays, without conferring any right on the Contractor for claiming for extra payment for working on holidays. The decision of the Engineer-in-charge in this regard will be final and binding on the Contractor. Nothing extra will be paid for doing works on Sunday or any other holidays.

35. COMPLETION CERTIFICATE:

As soon as the work is completed, the Contractor shall give notice of such completion to the Engineer-in-Charge and within a reasonable period of receipt of such notice the Engineer-in-Charge shall inspect the work and shall furnish the Contractor with a certificate of completion indicating (a) the date of completion (b) defects to be rectified by the Contractor and/or (c) items for which payment shall be made at reduced rates. When separate periods of completion have been specified for items or groups of items, the Engineer-in-Charge shall issue separate completion certificates for such item or groups of items.

No certificate of completion shall be issued, nor shall the work be considered to be complete till the Contractor shall have removed from the premises on which the work has been executed all scaffolding, sheds and surplus materials, except such as are required for rectification of defects, rubbish and all huts and sanitary arrangements required for his workmen in the site in connection with the execution of the work, as shall have been erected by the Contractor the workmen and cleaned all dirt from the parts of building(s) in upon or about which the work has been executed or of which he may had possession for the purpose of the execution thereof and cleaned floors, gutters and drains, eased doors and sashes, oiled locks fastening labelled keys clearly and handed them over to the Engineer-in-Charge or his Representative and made the whole premises fit for immediate occupation or use to the satisfaction of the Engineer-in-Charge.

If the Contractor shall fail to comply with any of the requirements of this conditions as aforesaid, on or before the date of completion of the works, the Engineer-in-Charge may at the expense of the Contractor fulfil such requirements and dispose of the scaffoldings, surplus materials and rubbish etc. as he thinks fit and the Contractor shall have no claim in respect of any such scaffolding or surplus materials except for any sum actually realized by the sale thereof less the cost of fulfilling the requirements and any other amount that may be due from the Contractor. If the expense of fulfilling such requirements is more than the amount realized on such disposal as aforesaid, the Contractor shall forthwith on demand pay such excess to the Company.

- If at any time before completion of the entire work, items or groups of items for which periods of completion have been specified, have been completed, the Engineer-in-Charge with the consent of the Contractor takes possession of any part or parts of the same then notwithstanding anything expressed or implied elsewhere in this Contract :



(a) Within ten/thirty days of the date of completion of such items or groups of items or possession of the relevant part the Engineer-in-Charge shall issue completion certificate for the relevant part as in condition above provided the Contractor fulfils his obligations under that condition for the relevant part.

(b) The Defects Liability Period in respect of such items and the relevant part shall be deemed to have commenced from the certified date of completion of such items or the relevant part as the case may be.

36. PRICE ESCALATION:

The quoted rate of the Contractor shall remain firm throughout the entire Contract period including extended Contract period if any and No Price Escalation shall be paid due to any reasons whatsoever.

37. DEFECT LIABILITY PERIOD AND DEFECTS AFTER COMPLETION:

Defect liability period shall be one year from the date of virtual completion of work, as certified by the Company. Any defect, shrinkage or other faults, which may appear within the defect liability period, in the opinion of the Engineer, arising from materials or workmanship not in accordance with the contract or from failure to take due precautions, shall upon the directions in writing of the engineer and within such reasonable time as shall be specified therein be amended and made good by the Successful tenderer at his own cost. In case of default, the Company may employ and pay any other person/persons to amend and make good such defect, shrinkage or other faults and all damage, loss and expenses consequent thereon or incidental thereto shall be made good and borne by the Successful tenderer.

Such damage, loss and expense shall be recoverable from the Successful tenderer by the Company or may be deducted by them from any money due or that may become due to the successful tenderer. The Company may also in lieu of such amendments deduct from any money due to the Successful tenderer, a sum to be determined by the Engineer equivalent to the cost of amending such works, and in the event of the amount retained under Clause 17 (the amount held as retention money) being insufficient, recover the balance from the Successful tenderer, together with expenses the Company may have incurred in connection therewith. The Successful tenderer shall remain liable under the provisions of this clause notwithstanding the signing by the Engineer of any certificate or the passing of any bills.

38. FACILITIES TO OTHER CONTRACTOR:

The Contractor shall, in accordance with the requirements of the Engineer-in-Charge, extend all reasonable facilities to other Contractor engaged contemporaneously on separate contracts in connection with the works.

39. NOTICES TO LOCAL BODIES:

(i) The Contractor shall comply with and give all notice required under any Governmental authority, instrument, rule or order made under any Act of parliament, State laws or any regulation of bye laws of any local authority relating to the works. The Contractor shall before making any



variation from the Contract drawing necessitated by such compliance give to the Engineer-in-Charge a written notice giving reasons for the proposed variation and obtain the Engineer-in-Charge's instruction therein.

(ii) The Contractor shall pay and indemnify the Company against any liability in respect of any fees or charges payable under any Act of Parliament, State laws or any Government instrument, rule or order and any regulations or bye-laws of any local authority in respect of works.

40. SUB-CONTRACT:

The Contractor shall not sublet any portion of the contract without the prior written approval of the Accepting Authority.

41. LIABILITY FOR DAMAGE, DEFECTS OF IMPERFECTION AND RECTIFICATION THEREOF:

If the Contractor or his workmen or employees shall injure or destroy any part of the building in which they may be working or any building, road, fence etc. contiguous to the premises on which the work or any part of it is being executed, or if any damage shall happen to the work while in progress the Contractor shall upon receipt of a notice in writing in that behalf make the same good at his own expenses. If it shall appear to the Engineer – in – Charge or his Representative at any time during construction or reconstruction or prior to the expiration of the Defects Liability Period, that any work has been executed with unsound, imperfect, or unskilled workmanship or that any materials or articles provided by the Contractor for execution of the work are unsound or of a quality inferior to that contract for, or otherwise not in accordance with the Contract, or that any defect, shrinkage or other faults have appeared in the work arising out of defective or improper materials or workmanship, the Contractor shall, upon receipt of a notice in writing in that behalf from the Engineer – in – Charge forthwith rectify or remove and reconstruct the work so specified in whole or part as the case may be and / or remove the materials or article so specified and provide other proper and suitable materials or articles at his own expense, notwithstanding that the same may have been inadvertently passed, certified and paid for and in the event of his failing to do so within the period to be specified by the Engineer – In – Charge in his notice aforesaid, the Engineer – In – Charge may rectify or remove and re-execute the work and / or remove and replace with other materials or articles / complained of, as the case may be, by other means at the risk of the Contractor.

42. MEASUREMENTS:

In case of dispute between the successful tenderer and the Company as to under which item a particular work is to be measured the decision of the Engineer shall be final and binding on both the parties to the contract. If for any items, the mode of measurements is not specified the decision of the Engineer about the mode of measurement shall be final and binding on both the parties to the contract.

43. PREPARATION OF RUNNING AND FINAL BILLS:



The Engineer or his representative shall take measurements in presence of Successful tenderers representative and record them in the Measurement Book from time to time and shall prepare abstract for running and final bill, including recovery statements. The bill abstract shall be prepared on standard CPWD form on the basis of abstract of quantities prepared by the Engineer in triplicate. The Successful tenderer should sign the bill and Measurement Book with the remark "Measurement and bill accepted", However, in the final bill, the successful tenderer shall have to certify "The bill is accepted in full and final settlement of all claims and demands against this work."

In case a large amount is blocked in the final bill pending technical/audit check, advance up to the extent of 75% of net final bill amount may be paid to the successful tenderer, with the approval of the Engineer at his direction even after the completion date is over.

The recovery from Running Account Bills for the materials issued by the Company shall be made on the basis of the quantity consumed in the work as assessed by the Engineer, giving a due allowance for wastage. The Successful tenderer shall submit once a month a statement showing the materials received, consumed and the balanced carried over the subsequent month so that a watch could be maintained on the material.

Final payment will be made within 03 (three) months on virtual completion of the entire work under the scope of work mentioned in the tender document and on submission of pre-receipted invoice along with all documents pertaining to warranty, test certificate etc. The payment for measurable items will be made on actual measurement basis (measurement will be taken physically by the Engineer of the Company and the authorised representative of the successful tenderer).

44. TERMS OF PAYMENT:

Supply, Installation, Testing & Commissioning of Fire Fighting & Detection Systems:

- 60% after supply of equipments, materials after successful inspection by the Consultant/CMD at site.
- 20% after installation of equipments accessories etc. as per tender & specifications on foundation/position, alignment & fixing/ grouting (wherever required).
- 10% on completion of testing and commissioning.
- 10% on completion of all works/ system in all respects and issuance of completion certificate & NOC from the concerned authority.

45. MODE OF PAYMENT:

All payment shall be made through RTGS/NEFT from Creative Museum Designers, Kolkata office and the Contractor shall submit the following details to the company :

Name of the company :



Name of Bank :
Name of Bank Branch :
City :
Account Number :
Account Type :
IFSC Code of the Bank Branch :
MICR Code of the Bank Branch :

46. RATES AND TAXES/ DUTIES:

Quoted price in the bid shall include all taxes & duties, GST, freight F.O.R. site and transit insurance and related incidentals, labour cess etc. in respect of this contract and no additional claim beyond what has been quoted in the Financial Bid shall be accepted. Accepted tender rates shall not be changed due to changes in wages of labour. **Bidder must submit challan copy of GST as a proof of GST payment.**

The rates quoted by the successful tenderer shall be paid at net rates. He should include in his rates allowance for increase or decrease in the price due to market fluctuation.

The aforesaid rates would be subject to the following deductions as and if applicable at the rates in force at the time the bill is raised:

- a. TDS under Income Tax Act.
- b. Any other state taxes as applicable, Labour cess etc.
- c. The raised bill should clearly and separately mention the following tax(es)
GST

Nota bene: Tenderer should have obtained registration under the GST Act.

47. LABOUR CESS:

Labour Cess as applicable shall be included in the quoted Price.

48. ROYALTY:

Payment of Royalty will be the responsibility of the Contractor within his quoted price every month the Contractor shall submit Royalty challan issued by the Competent Authority for Stone chips and Sand purchased by the Contractor and used in the job. It is mandatory for the Contractor to submit to the Company Royalty Certificate from the Mining Department before release of final bill payment due to him.

49. INSURANCE FOR DAMAGE TO PERSONS AND PROPERTY:



- a. To execute the work, the successful tenderer shall obtain a **Contractors All Risk (CAR) Policy** on contract value awarded to them.
- b. The Successful tenderer shall be responsible for all injury to persons, animals or things and for all damages to property, structural and decorative, whether such injury or damage arise from carelessness or accident or in any way connected therewith. This clause shall be held to include, inter alia any damage due to causes as aforesaid to buildings (whether immediately adjacent or otherwise) and to roads, streets, footpaths, bridges or ways as well as all damage caused to the buildings and works forming the subject of this contract by the inclemency of weather. The Successful tenderer indemnifies the Company and holds him harmless in respect of all expenses arising from such injury or damage to persons or property aforesaid and also in respect of any claim made in respect of Injury or damages consequent upon such claim.
- c. The successful tenderer shall reinstate all damage of every sort mentioned in this clause, so as to deliver up the whole of the contract works complete and perfect in every respect and so as to make good and otherwise satisfy all claims for damage as aforesaid to the property or third parties.
- d. The Successful tenderer also indemnifies the Company against all claim which may be made upon the Company during the currency of this contract by any employee or representative of an Employee of the agency or any sub-agency, employed by him, for any injury to or loss of life or such employees, or for compensation payable under any law for the time being in force to any workman or to the representative of any deceased or incapacitated workmen.
- e. The Successful tenderer also indemnifies the Company in respect of any costs, charges and/or expenses, including legal costs as between Solicitor and client, occurring out of any award of compensation and/or damages consequent upon such claims.
- f. The Company shall be at liberty and is hereby empowered to deduct the amount of any damages, compensation cost, charges and/or expenses arising or ascertaining from or in respect of any such claim and/or damages as aforesaid from any sum, or sums due to, or become due to the Successful tenderer.

50. WATER & ELECTRICITY:

Service water shall be provided by CMD without any cost implication. The drinking water is to be arranged by the vendor themselves. Power cannot be provided by CMD for construction. However, commissioning power shall be arranged by CMD. Contractor shall arrange for construction power from available resources at site at their own cost.

51. LAND FOR SITE OFFICE, WORKSHOP & LABOUR COLONY:



CMD will provide land/ space for contractor's temporary office/ godown/ store within project premises, subject to availability. But no land for labour/ worker hutment shall be provided by CMD.

52. ARBITRATION:

In the case of any disputes or differences arising out of or in connection with, or concerning this Agreement, it shall be settled by arbitration. The arbitration shall be conducted by an expert as Arbitrator in the field acceptable to both the parties. In case of disagreement, it shall be through three experts in the field, one to be appointed by each party and the third presiding expert to be jointly appointed by the expert referred to. The arbitration shall be as per the provision of the Arbitration and Conciliation (amendment) Act, 2015 and the decision of the panel so appointed shall be final and binding on both the parties to this Agreement. The place of arbitration shall be normally Kolkata or any other suitable place mutually agreed.

The provisions of the Arbitration and Conciliation Act 2015 or any statutory modification or re-enactment thereof and of the rules made there under for the time being in force shall apply to arbitration proceedings under this clause.

53. JURISDICTION:

In regard to all disputes or claims arising out of the contract of whatever nature, the place of jurisdiction shall be at Kolkata only.

54. OPENING OF WORK:

- a. All works under or in course of execution or executed in pursuance of the contract shall at all times be open to the supervision of the Company, Engineer or their representatives.
- b. The successful tenderer shall notify the Engineer in writing immediately after the trenches or excavations, as shown in the drawings, are executed or as soon as any ground is cut into which from the unexpected cause, appears to need immediate attention. After notifying the Engineer he shall await instructions which shall be given within seven days of receipt of such notice. If the successful tenderer puts in, any part of the foundations before he has notified the Engineer and received instruction, he shall be liable to reinstate all work that may subsequently at any time, be damaged on account of any defect or insufficient foundations. The Successful tenderer shall at the request of the Engineer, within such time as indicated by the Engineer, shall open up for inspection any other work and should the successful tenderer refuse or neglect to comply with such request, the Company through the Engineer may employ other workmen to open up the same. If the work has been covered up in contravention of Engineer's instruction, or if on being opened up, be found not in accordance with the drawings and specifications or the instructions of the Engineer, the expenses of opening up and covering it up again, whether done by the Successful tenderer or such other workmen shall be borne by or which may become due to the Successful tenderer or from the amount held as retention money. If the work has not been covered up in contravention of such instructions, and be found in accordance with said drawings and specifications or instructions, the expenses



aforesaid shall be borne by the Company and shall be added to the contract sum provided always that in the case of foundations or of any other urgent work so opened up and requiring an immediate attention, the Engineer shall within seven days after receipt of written notice from the Successful tenderer that the work has been so opened, make or cause to make the inspection thereof and at the expiration of such time if such inspection shall not so have been made, the Successful tenderer may cover the same and shall not be required to open it up again, except at the expense of the Company.

55. HEIGHTS:

Successful tenderer's rates shall include the cost of lifting the materials upto all heights given in drawings or as required during execution.

56. SCAFFOLDING:

The successful tenderer shall use external scaffolding to ensure true line in vertical and horizontal planes. Scaffolding required for execution of this work may vary from single floor height to multi floor heights, which may require multiple staging, scaffolding, centering and shuttering. Since the payments will be made to the successful tenderer at net quoted rates, irrespective of the heights involved the tenders must see and study the drawings carefully before tendering their rates. Contractor's quoted rates for concreting item shall deemed to be inclusive of all cost for RCC, Reinforcement steel, scaffolding, centering & shuttering, labour, supervision etc. as may be required for successful completion of the work. No extra payment will be made for the above mentioned works.

57. SITE CLEARANCE AND CLEAN UP:

The Successful tenderer shall, from time to time clear away all debris and excess materials accumulated at the site.

After all fixtures, equipment and appliances have been installed and commissioned, they shall clean up the same and remove all plaster, paints, stains, stickers and other foreign matter of discolouration leaving the construction in ready to use condition.

On completion of all works, they shall demolish all temporary storages put up by them, remove all surplus materials and leave the site in a broom clean condition.

58. QUANTITY VARIATION:

All the quantities given in schedule of quantities are provisional.

The tenderers shall be deemed to have given Balanced Rates for each item, irrespective of the quantities given. Also irrespective of variation in quantities to any extent either positive or negative, the tenderer shall be paid at acceptable contract rates only. The Company reserves the right to increase or decrease quantities to any extent either positive or negative.

59. AUTHORITIES, NOTICES AND PATENTS:



The successful tenderer shall confirm to the provision of any Act of the Legislature relating to the works, the Regulations and Bye-Laws of any corporation and of any electric and other Companies and/or authorities with whose systems the structure is proposed to be connected, and shall, before making any variation from the drawings or specifications that may be necessitated by so confirming, give to the engineer written notice, specifying the variation proposed to be made and the reason for making it and apply for instruction thereon. If compliance with this clause involves any extra work not included in this contract, he shall specify these items of work and the allowance or extra payment required on their account. In case he shall not, within seven days, received such instructions, shall proceed with the work, conforming to the provision and/or regulations of bye-laws in question.

The amount claimed as an extra or whether there is an extra or not shall be decided by the Engineer and will be subject to arbitration clause is so required.

The successful tenderer give all notices required by the said regulations or bye-laws to be given to any authority and pay to such authority or to any public office all fees that may be properly chargeable in respect of the works and lodge the receipts with the bill.

The successful tenderer shall indemnify the Company against all claims in respect of patent rights, and shall defend all action arising from such claims and shall himself pay all royalties, license fees, damages, cost and charges of all and every short that may be legally incurred in respect thereof.

60. CERTIFICATES AND PAYMENTS:

- a. The Engineer may from time to time intimate in writing to the Successful tenderer that he requires the works to be measured and they shall attend or send qualified agent to assist the Engineer or the Engineer's representative in taking such measurements, and calculations and to furnish all particulars or to give all assistance required by the Engineer. Should they not attend or neglect or omit to send such agent then the measurement taken by the Engineer or approved by him shall be taken to be correct measurements of the work unless objected to within one month of their being recorded in the measurement book or books. Such measurements shall be taken in accordance with the mode of measurements mentioned in the specifications.
- b. The Successful tenderer or his agents may at the time of measurement take such notes of measurements as they may require.
- c. The Engineer or his authorised representative will issue on the basis of necessary measurement interim valuation certificates to the Successful tenderer in respect of items of work, rates for which exist in the priced schedule of quantities or have been subsequently agreed upon between the parties, and shall send the measurement books and the valuation certificates to the Company, The Successful tenderer shall be entitled under these certificates of the Engineer to payments, within 15 days from the date of each certificate, unless objected as provided in sub-clauses (a) &(b) at the rate of maximum 90% (ninety percent) of the value of work so executed and the balance being retained towards retention money. The engineer shall issue



such certificates within fifteen days of notice from the Successful tenderer provided measurements have been taken and the value of the work done since last payment exceeds the amount stated in the appendix and not more than one certificate is required in a fortnight, provided always that the issue by the Engineer of any certificate during the progress of the work or after their completion shall not have any effect as a certificate of satisfaction or relieve the Successful tenderer from his liability under Clauses 37 and 54. Provided all defects are removed and the retention money is not forfeited or has not become liable to be forfeited under this contract, entire amount under retention money shall be refunded without interest after the completion of defect liability period or the final bill is passed for payment whichever is later.

- d. All intermediate payments shall be recorded as payments by way of advance against the final payment only and not as payment for work actually done and completed. The final bill shall be submitted by the Successful tenderer within 3 months of the date fixed for completion of the work. The measurement of the work taken by the Engineer or his representatives after one week's notice to the Successful tenderer shall be final and binding on him unless objected to within one month of their being recorded in the measurement books.
- e. The Successful tenderer agrees that before final payment shall be made on the contract, he will sign and deliver to the Company either in the measurement books or otherwise as required, a valid release and discharge certificate from any and all claims and demands whatever from the company for all matters arising out of or connected with the contract.

61. TIME AND DAMAGES FOR NON-COMPLETION OF WORK IN TIME:

- a. All the construction works shall progress strictly as per the enclosed CPM/PERT/BAR CHART. If however, the Successful tenderer desires some minor modification time and before execution of the agreement indicating the reasons for which changes are required. The Company may after scrutiny, agree to the modifications suggested if the reasons Cited by the successful tenderer are reconsidered valid. The decision of the consideration of the company in this respect will be final and binding. The modifications, if any, are to be incorporated in the CPM/PERT/BAR CHART and this will form a part of the agreement.
- b. The starting time specified for carrying out of the work as entered in the CPM/PERT/BAR CHART shall be reckoned from the date of issue of the Letter of Intent. The date of completion or such date as is duly extended under Clause 62 shall be strictly observed by the Successful tenderer. The work shall, throughout the stipulated period of the contract, be proceeded with all diligence (Time being deemed to be the essence of this Contract) by the successful tenderer strictly according to the CPM/PERT/BAR CHART which is a part of this agreement.
- c. At any stage during the execution of the work if the work lags behind the target indicated in the CPM/PERT/BAR CHART for reasons directly attributable to the Successful tenderer, he shall be liable to pay as agreed liquidated damages equivalent to half percent of the total cost of work awarded every week for the period the work lags behind the CPM/PERT/BAR CHART subject to a maximum of 10% of the contract value awarded or gross value of work done, whichever is greater.



- d. In the event of Successful tenderer's inability to complete the SITC of Firefighting & Detection System work by the scheduled date of completion, the Company shall have the right to terminate the contract as per Clause 65 or allow the successful tenderer to continue and complete the work within specific date. In the latter case, during the period of continuation, the successful tenderer shall pay as agreed liquidated damage equivalent to one per cent of the total cost of work awarded for every week that the work remains unfinished subject to a maximum of 10% of the contract value awarded or gross value of work done, whichever is greater.

62. EXTENSION OF TIME:

If the successful tenderer shall desire an extension of time for completion of the work on the grounds of his having been unavoidably hindered in its execution and for reasons not attributable to him on the following grounds:

- a. by reason of any exceptionally inclement whether like Cyclone, severe flood etc., normal monsoon shall not be considered a valid reason for extension of time,
- b. by reason of proceedings taken or threatened by, or legal disputes with adjoining or neighbouring owners,
- c. due to delay in the work of other agencies or tradesman engaged or nominated by the Company: if such delay is directly responsible for delay in execution of this work,
- d. by reason of any general strike or lockout affecting the building made, strike or any kind of labour trouble in successful tenderer's own organisation shall not be a valid reason for extension.
- e. in the event of delay in execution of work wholly attributable to delay in supply of drawings by Architect or the Company in spite of request from the successful tenderer well in advance, he shall apply in writing to the Engineer within seven days of the date of the hindrance on account of which he desires such extensions as aforesaid and the engineer, with the consent of the Company may if the reasonable ground be shown therefore allow such extension of time, if any, be necessary or proper,
- f. in case of the total value of the work exceeds the contract value owing to deviation in quantities or extra items, the successful tenderer will be entitled to ask for extension of time in proportion to the increased value of work.
- g. No extension of time shall be given to the successful tenderer for non-supply or delay in supply of of materials/ equipment. The successful tenderer hereby agrees that extension of time requested for by him and granted by the Company shall be treated as an extension of time allowed to them without any claim for compensation or damages for any reasons whatsoever including those for which the extension is granted.

If the works be delayed by:

- a. Force majeure or
- b. Abnormally bad weather, or
- c. Serious loss or damage by fire, or
- d. Civil commotion, local combination of workmen, strike or lock out affecting any of the trades employed on the work, or



- e. Delay on the part other Sub-Contractors of tradesman engaged by Company in executing work not forming part of the contract, or
- f. Non-availability or break-down of tools & plants to be supplied or supplied by company, or
- g. Any other cause which in the absolute discretion of Engineer-in-charge is found as beyond the Sub-Contractor's control, then upon the happening of any such event causing delay, the Sub-Contractor shall immediately give notice thereof in writing to the Engineer-in-charge but shall nevertheless use constantly his best Endeavour's 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.

63. SUSPENSION OF WORK BY THE SUCCESSFUL TENDERER:

If the successful tenderer suspends the works without obtaining extension of time or in the opinion of the Engineer neglects or falls to •proceed with due diligence in executing his part of the contract or if he makes default more than once in the manner mentioned in Clause 37 above the Company or the Engineer shall have the power to give notice in writing to the successful tenderer requiring that the work be proceeded with reasonable speed and output must be commensurate with the CPM/PERT/BAR CHART. Such notice shall specify the act of default on the part of the successful tenderer. After such notice has been given the Successful tenderer shall not be at liberty to remove from the site of work or from any ground continuous thereto any plant or materials belonging to him which had been placed thereon for the purpose of the work, and the Company shall have a lien upon all such plants and materials to subsist from the date of such notice being given, until the notice have been complied with. Provided always that such lien shall not under any circumstances subsist after the expiration of thirty-one days from the date of such notice being given, unless the Company has entered upon and taken possession of the works and site and of all such plants and materials until the works have been completed under the power hereinafter conferred upon it. If the Company exercises the above power it may engage any other agency to complete the works or finish the works departmentally and exclude the successful tenderer, his agents and servants from entry upon or access to the same except that the successful tenderer or any one person appointed in writing by him and accepted by the Company may have access at all reasonable' times during the progress of works to inspect, survey and measure the works. Such written appointments marked with the Company consent or a copy thereof shall be delivered to the Engineer before the person so appointed comes to the works. The Company shall take such steps as. in the opinion of the Engineer may be reasonable and necessary for completing the works without undue delay & expense, using that purpose the plants and materials above mentioned, in so far as they are suitable and adopted to such use. Upon the completion of the work the Engineer shall certify the amount of expenses properly incurred, consequent on the Incidental to the default of the successful tenderer as aforesaid, in completing the works by other persons. Should the amount so certified as the expenses properly incurred, including the Company overhead if the works were carried out departmentally, be less than the amount which would have been due to the Successful tenderer upon the completion of the works by him, the difference shall be paid to the Successful tenderer by the Company. Should the amount of the former exceed the later, the difference shall be paid by the Successful tenderer to the Company. The Company shall not be liable to make any further payment or compensation to the Successful tenderer for or on account



of the proper use of the plants for the completion of the works under provisions hereinbefore contained other than such payment as is included in the contract price. After the works have been so completed by persons other than the successful tenderer under the provisions hereinafter contained, the Company shall give notice to the Successful tenderer of such completion and may require him from time to time, before and after such completion, to remove his plants and likewise all such materials as aforesaid as may not have been used in the completion of the works, from the site. If such plants and materials are not removed within such reasonable time, the Company may remove and sell the same, holding the proceeds, less the cost of the removal and sell, to the credit of the successful tenderer. The Company shall not be responsible for any loss sustained by the successful tenderer from the sale of plants in the event of the successful tenderer not removing it after notice, or for any damage thereto or deterioration thereof in any event.

64. DETERMINATION OF CONTRACT BY THE CMD:

If the successful tenderer goes into liquidation, whether voluntary or compulsory or shall make an assignment or a composition for the benefit of the greater part, or shall enter into a Deed of Agreement with its creditors or if the Receiver of the Successful tenderer shall be unable, within fourteen days after notice to him requiring him to do so, to show to the reasonable satisfaction of the Company that he is liable to carry out and fulfil the contract and if so required by the Company to give reasonable security therefore or if the successful tenderer shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors or the Successful tenderer or shall assign, charge or encumber this charge or encumber this contract thereunder or shall neglect or shall fail to proceed to perform all or any of the act, matters or things by the contract, to be observed and performed by the successful tenderer for three clear days after written notice shall have been given the successful tenderer in manner, matter hereinafter mentioned, requiring the successful tenderer to observe perform the same or shall use improper material or workmanship in carrying on the works or shall in the opinion of the Engineer not exercised such due progress as stipulated in the enclosed CPM/PERT/BAR CHART forming part of this contract which would enable the works to be completed within the time agreed upon or shall abandon the contract, then, and in any of said case the Company may notwithstanding any previous waiver, determine the contract by a notice In writing in which case the retention money (Including the earnest money and the initial security deposit) and whether paid in one sum or deducted by installment shall stand forfeited and be absolutely at the disposal of the Company. The Successful tenderer shall have no claim or compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made advances on account of or with a view to the execution of the work or the performance of the contract. The successful tenderer shall not be entitled to recover or be paid any sum for any work actually performed under the contract unless and until the Engineer will have certified in writing the performance of such work and the value of work payable in respect thereof and the successful tenderer shall only be entitled to be paid the value so certified, The certificate of the Engineer shall be based on measurements taken by him or under his supervision and with due notice to the Successful tenderer and on rates in the priced schedule or as subsequently communicated by the Engineer with the approval of the Company, under this agreement except for arithmetical errors, shall be final and conclusive. The Successful tenderer must remove his plant, materials, scaffolding



etc. from the site within 10 days (ten days) of the receipt of the notice from the Company after which they will vest in the Company who may dispose them off as per Clause 63 by sale or auction on account of and at the risk of the successful tenderer who will have no claim for loss or compensation on this account.

65. TERMINATION OF CONTRACT BY SUCCESSFUL TENDERER:

If payment of the amount payable by the Company under the certificate of interim payment issued by the Engineer in accordance with Clause 60 shall be in arrears and unpaid for sixty days after notice in writing requiring payment of the amount shall have been given by the Successful tenderer to the Company in manner hereinafter mentioned or if work be stopped for six months under the order of the Company for any reason not connected with any default on the part of the Successful tenderer or by any injunction or other order of any court of law made for any reasons not connected with any such default on the part of the successful tenderer then and in any of the said cases the successful tenderer shall be at liberty to terminate the contract by notice in writing to the Company and he shall be entitled to recover from the Company payment for all works executed and for useful materials (but not plants) purchased for the purpose of the contract and is brought to the site. In arriving at the amount of such payment, the net rates contained in the successful tenderer's tender shall be followed, or where the same may not apply, rates proportional to the prices therein contained. Rates for materials may be determined by the Engineer on actual vouchers produced by the successful tenderer and/or prevailing market rates at the discretion of the Engineer. The Successful tenderer shall not be entitled to recover or be paid any sum for any work actually performed under the contract, unless and until the Engineer has certified in writing the performance of such work and the value payable in respect thereof and the successful tenderer shall only be entitled, to be paid the value so certified. The certificate of the Engineer shall be based on measurements taken by him or under his supervision after due notice to the successful tenderer and shall be final and conclusive except for arithmetical errors. The successful tenderer must remove his plant, materials, scaffolding etc. from the site within ten days or such time as may be extended by the Company in writing, from the receipt of the notice from the Company after which they will vest in the Company who may dispose them off as per Clause 64 by sale or auction on account of and at the risk of the successful tenderer who will have no claim for loss or compensation on this account.

66. COMPENSATION:

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

67. DISMISSAL OF WORKMEN ETC.:

The Successful tenderer shall on the request of the Engineer immediately dismiss from the works any person employed thereon who may, in the opinion of the Engineer be unsuitable or incompetent or who may in the opinion of the Company or the Engineer misconduct himself and such person shall not be again employed or allowed on the works without the permission of the Engineer and/or the Company.

68. ASSIGNMENT OR SUBLETTING OR BRIBES:



- a. This contract shall not be assigned or sublet without the written approval of the Company. If the Successful tenderer shall assign or sublet this contract, or attempts to do so or become insolvent or commence insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, pre-requisite award, reward or advantage pecuniary or otherwise, shall either directly or indirectly be given, promised or offered by the Successful tenderer any of his servants or agents to any officer of the Company or to persons who shall become in any way directly or indirectly interested in the Contract, the Company may thereupon by notice in writing rescind the contract and the retention money of the Successful tenderer shall thereupon stand forfeited and be absolutely at the disposal of the Company, and the same consequences shall ensure as if the contract had been rescinded under Clause 64 thereof and (in addition) the Successful tenderer shall not be entitled to recover or to be paid for any work therefore actually performed under the contract.
- b. The whole of the works including the contract shall be executed by the Successful tenderer and he/they shall not directly or indirectly transfer or assign or underlet the contract or any part, share or interest therein nor shall he take a new partner without the written consent of the Company and no subletting shall relieve the Successful tenderer from the full and entire responsibility of the contract or from active superintendence of the works during the progress.

69. NOTICE:

Notice from the Company, to the Engineer of the Successful tenderer may be served personally or sent by registered post or by email addressed to the office of the Company or the last known place of business of the Engineer or the Successful tenderer.

70. APPOINTMENT OF APPRENTICES AS PER APPRENTICES ACT:

The Successful tenderer shall during the currency of the contract when called upon by the Engineer engage and also ensure engagement by sub-agencies and other employed by the successful tenderer with the works such number of apprentices in categories mentioned below and for such periods as may be required by the Engineer. The Successful tenderer shall train them as required under the Apprentices Act 1961 and the Rules made thereunder and shall be responsible for all obligations of the Company under the said act including the liability to make payments to apprentices as required under the said Act.

- In respect of Civil Works

Building Construction : One apprentice for every 7 persons
engaged in this category

- In respect of Electrical Works



Wireman

: One apprentice for every 7 persons

engaged in this category

The Successful tenderer shall comply with the provision of Apprentices Act 1961 and Rules and Orders issued hereunder from time to time.

If the Successful tenderer fails to do so, his failure will be deemed to be a breach of contract and the Company reserves the right to cancel the contract. The Successful tenderer also shall be liable to any pecuniary liability arising on account of any violation by him of the provisions of the Act.

71. QUALITY MANAGEMENT SYSTEM:

The contractor shall prepare and submit draft Project quality plan/quality assurance plan, based on relevant I.S. Codes, contract specifications etc. as applicable for successful completion of the work, for the Engineers review, comments (if any) and approval within 21 days on award of the contract. The Engineer shall review Project quality plan/ quality assurance plan and provide any comments to the contractor within 14 days after receipt of such draft. Within 7 days after receipt of Engineer's comments the contractor shall implement such comments and resubmit the Project quality plan/ quality assurance plan to the Engineer for approval. These procedures shall repeat till obtaining the approval from the Engineer.

The contractor shall follow and comply with the approved Project quality plan/ quality assurance plan and shall not amend it without prior written consent of the Engineer. The Engineer or his representative at any time during performance of the work, may conduct a compliance audit with respect to the Project quality plan/ quality assurance plan. If such audit demonstrates non-compliance with any aspect of the quality assurance plan, the Engineer may notify the contractor of such non-compliance and the contractor shall promptly undertake appropriate remedial action, at contractors sole risk, cost and expense.

72. NEGOTIATION:

CMD, Kolkata will not enter into any negotiations even with the Lowest Tenderer.

73. AGREEMENT:

The successful Tenderer has to enter into an Agreement with CMD, Kolkata in Nonjudicial Stamp Paper of Rs. 100/- (Rupees Hundred only) before commencement of

All documents forming the Contract are to be taken as mutually explanatory of one another. In case the bidder requires any clarifications or further information, may contact

**Administrative Officer,
CREATIVE MUSEUM DESIGNERS
NCSM Campus, 33, Block-GN, Building-II**



Bidha Nagar, Sector –V, Kolkata – 700091

Phone No. 033 2357 6041

Email: cmd.ncsm.civil@gmail.com

SPECIAL CONDITIONS OF THE CONTRACT

1.0 INTRODUCTION:

1.1 These Special Conditions of Contract shall be read in conjunction with the General Conditions of Contract, specifications of works, drawings and any other document forming part of this contract wherever the context so requires.

1.2 Notwithstanding the sub-division of the document into these separate sections and volumes, every part of each shall be deemed to be supplementary of every other part and shall be read with and into the contract so far as it may be practicable to do so.

1.3 The workmanship shall satisfy the relevant Indian Standards, the Technical Specifications contained herein and codes referred to. Where the job specifications stipulate requirements in addition to those jobs contained in the standard codes and specifications, these additional requirements shall also be satisfied. In absence of any standards/ specifications/ codes of practice for detailed specifications covering any part of the work covered in this tender, the instructions/ directions of Engineer-in-charge will be binding on the Contractor.

1.4 Where any portion of the General Conditions of Contract (GCC) is repugnant to or at variance with any provisions of the Special Conditions of Contract, then unless a different intention appears, the provision(s) of the Special Conditions of Contract shall be deemed to override the provision(s) of General Conditions of Contract (GCC) only to the extent that such repugnancies of variations in the Special Conditions of Contract are not possible of being reconciled with the provisions of General Conditions of Contract (GCC).

1.5 Without prejudice to the provisions of the General Conditions of Contract, whenever in the Bidding documents it is mentioned or stated that the Contractor shall perform certain work or provide certain facilities it is understood that the Contractor shall do so at his own cost and the Contract price shall be deemed to have included cost of such performance and/or provision, as the case may be.

1.6 In the absence of any Specifications covering any work(s), the same shall be performed /executed in accordance with standard Engineering Practice as per the instructions/directions of the Engineer-in-Charge, which will be binding on the Contractor

2.0 LOCATION AND ACCESS OF SITE:

The Project Site is located at K D Malaviya National Oil Museum, Khanapara, Guwahati, Assam. The Site is well connected by Rail and Road from other parts of India. Nearest Airport is at Guwahati.

3.0 These 'Technical Specification and Special Conditions' shall be read in conjunction with other provision including General Conditions of the Contract and are supplementary to & complementary with each other. However, in the event of any provisions of General Conditions



are repugnant to or at variance with any provisions of 'Technical Specification and Special Conditions', then unless a different intention appears between the two, the provision given in 'Technical Specification and Special Conditions' shall be deemed to over-ride that provision of General Conditions and shall to the extent of such repugnancy or variation prevail & govern the Contract.

4.0 TIME SCHEDULE:

4.1 The work shall be executed strictly as per Time Schedule as provided in Clause 20 of General Conditions of Contract (GCC).

4.2 CONTRACTOR shall furnish a daily report on category wise labour deployed along with the progress of work done on previous day in the proforma prescribed by the Engineer-in-Charge.

5.0 SEQUENCE OF WORK:

Contractor shall plan the sequence of all works so as to achieve the desired progress keeping in mind overall safety and stability at all points of time.

If due to a particular design or specification or availability of machines or any other reason, a particular sequence of operation is demanded by the engineer due to which some interruptions are inherent to any one or more types of work or items of execution, then no claim for such interruption shall be entertained and contractor shall have to follow the sequence as instructed by the engineer.

6.0 PREPARATION OF BID:

Bidder is advised to visit and examine the site and its surrounding and shall familiarize himself of the existing facilities and environment and shall collect all other information which he may require for preparing and submitting the bid and entering into the contract. Claims and objection due to ignorance of existing conditions or inadequacy of information will not be considered after submission of the bid and during implementation.

7.0 SCOPE OF WORK:

7.1 The scope of work in general includes scope of work specified in various Technical Specifications/ sections provided in Part-I (Technical) and Schedule of Rates (SOR) enclosed in the Bidding Document. Further, it includes any other work not specifically mentioned but required to complete the work as per specifications, drawings and instructions of Engineer-in-Charge.

7.2 Scope of work shall be read in conjunction with item description of Schedule of Rates and Contractor's scope shall include all activities of work specified in the item description of Schedule of Rates.

7.3 Rates shall include all cost for the performance of the item considering all parts of the Bidding Document. In case any activity though specifically not covered in description of item under 'Schedule of Rates' but is required to complete the work which could be reasonably implied/ informed from the content of Bidding Document, the cost for carrying out such activity of work shall be deemed to be included in the item rate.

7.4 The scope of work under fabrication & Erection shall include the following but not limited to these:

- a) i) All Transportation including loading unloading of materials



- ii) Laying of instrumentation/ signal / control /power cables, cable Tray ,termination of instrumentation/ signal / control cables/ motor cable
- iii) Supply,Installation, testing, commissioning of all equipments & panels viz. DG Set, RMU Unit, APFC Panel etc.
- iv) Supply, Installation of GI flat, earth electrode, etc
- v) Structural support, if any.
- vi) Manpower assistance including supply of tools tackles required in pre commissioning & commissioning activity.
- vii) House keeping

Note : any other items which are not covered above & separately in the schedule of rates but required to complete the work in all respect as per approved drawing, ITP , procedure, specification, standard are in bidder's scope. All works required as per drawings, specification and instruction of engineer-in- charge.

- b) Carrying out required scaffolding works: wherever required at all level and height for execution of the above works.
 - c) Returning of all surplus cable, cable tray , structural steel and all piping and structural scraps from the project premises, as per the instructions of Engineer-in-charge.
 - d) To deploy skilled, semi-skilled and unskilled personnel in required number as per Scheduled Program so as to complete the work as per overall project schedule.
 - e) To deploy suitably qualified supervisors in required numbers to assure quality of work to the full satisfaction of KDMNOMT/ CMD.
 - f) To carry out all repairs arising out of defective works done by the contractor.
 - g) Cleaning of job sites and transporting all surplus material, debris, scrap, construction equipment etc. as per direction of Engineer-in-charge.
 - h) Contractor shall be responsible for proper coordination with other agencies operating at the site of work so that work may be carried out concurrently, without any hindrance to others. The Engineer-in-Charge shall resolve disputes, if any, in this regard, and his decision shall be final and binding on the Contractor.
 - i) All works shall be done to the entire satisfaction of the Engineer-in-Charge. Any work not carried out in accordance with the instructions shall be dismantled and made good without any extra cost and time implication to the KDMNOMT .
 - j) If and when required for the coordination of the works with other agencies involved at site, the Contractor shall within the scope of work, re-route and/or prepare approaches and working areas as may be necessary.
 - k) The Contractor shall within the scope of work observe in addition to specifications, all national and local laws, ordinances, rules and regulation and requirements pertaining to the work
- 7.5 The entire work under this specification shall be completed within stipulated period from the date of placement of order. After award of contract, a final program shall be prepared well in advance.



8.0 SITE CLEANING:

1. The Contractor shall clean and keep clean the work site from time to time to the satisfaction of the Engineer-in-Charge for easy access to work site and to ensure safe passage, movement and working.
2. If the work involves dismantling of any existing structure in whole or part, care shall be taken to limit the dismantling up to the exact point and/or lines as directed by the Engineer-in-Charge and any damage caused to the existing structure beyond the said line or point shall be repaired and restored to the original condition at the Contractor's cost and risks to the satisfaction of the Engineer-in-Charge, whose decision shall be final and binding upon the Contractor.
3. The Contractor shall be the custodian of the dismantled materials till the Engineer-in-Charge takes charge thereof.
4. The Contractor shall dispose off the unserviceable materials, debris etc. out of the project premises.
5. The Contractor shall sort out, clear and stack the serviceable materials obtained from the dismantling/ renewal at places as directed by the Engineer-in-Charge.
6. No extra payment shall be paid on this account. The rates quoted in SOQR are deemed to be inclusive of all the costs towards all the above activities as well.
7. The tenderer shall note that no Sub-Contractor shall be engaged by them for the above work.
- 8.1 If due to a particular design or specification or availability of materials or any other reason, a particular sequence of operation is demanded by the engineer due to which some interruptions are inherent to any one or more types of work or items of execution, then no claim for such interruption shall be entertained and contractor shall have to follow the sequence as instructed by the Engineer-in-Charge.
- 8.2 The Contractor may work beyond normal working hour, and also on Sunday and Holidays (with prior approval from CMD / Consultant) as desired by CMD to maintain progress of work as per schedule without any additional liability to CMD. The Contractor shall give priority or redeploy the work force for a particular work as instructed by CMD.
- 8.3 All materials shall be stored and stacked properly ensuring that place is properly drained and is free from dirt. It shall be ensured that no damage is caused due to improper stacking.
- 8.4 The CMD / Consultant shall have free access at all times to those parts of Contractor's area of work which are concerned with their works. Also he shall be afforded all reasonable facilities at all stages of preparation, fabrication for satisfying himself that the fabrication is being undertaken in accordance with the provisions of relevant specification.

9.0 SECURITY DEPOSIT/ PERFORMANCE BANK GUARANTEE:

Please refer Clause 17 of General Conditions of Contract (GCC).

10.0 QUOTATION:



10.1 The contractor shall indicate his price as per Scope of Work and SOQR given in Tender Document.

10.2 The enclosed bid documents are deemed to be sufficient for the bidder to assess the nature and quantity of work involved and to quote his prices for the above job. No deviations from the bid documents will be admissible.

11.0 PROGRAMME:

A monthly time bar chart for various activities like supply, fabrication, transportation to site, welding, Installation, Fixing & Laying, Testing & Commissioning etc. giving starting and completion dates of all activities, shall be submitted after awarding of the job for approval of CMD.

12.0 RULES & REGULATIONS OF SAFETY, ELECTRICITY BOARDS ETC.:

The Contractor shall at all times comply with all relevant acts, electricity rules, safety regulations etc. as per statutory regulations of Central / State Government & Plant Authorities.

13.0 EXTRA ITEMS:

Please refer Clause 19 of General Conditions of Contract (GCC).

14.0 Following Points to be considered by the Contractor while quoting his offer

Any additional work, if required, will be undertaken by them after getting instruction in writing from the Engineer-in-Charge. For settlement of their claims on any additional work, the contractor will keep joint record of the measurements of such work duly certified by the Engineer-in-Charge.

15.0 MAINTENANCE & GUARANTEE:

Commencing from the date of issue of final acceptance/completion certificate to the Contractor shall stand guarantee for a period of 12 calendar months, from the date of handing over the total job in all respect to CMD / Consultant. The Contractor shall replace/rectify all parts/components which become defective due to bad fabrication or due to any act of oversight or omission. All such rectification or replacements of defective workmanship shall be done free of cost by the Contractor.

16.0 RESPONSIBILITY OF CONTRACTOR:

16.1 It shall be the responsibility of the Contractor to obtain the approval for any revision and/or modifications decided by the Contractor from CMD / Consultant Engineer-in-Charge before implementation. Also such revisions and/or modifications if accepted/ approved by CMD / Consultant Engineer-in-Charge shall be carried out at no extra cost to CMD / Consultant. Any change required during functional requirements or for efficient running of system, keeping the basic parameters unchanged and which has not been indicated by the Contractor in the data/drawings furnished along with the offer will be carried out by the Contractor at no extra cost to CMD / Consultant.



16.2 All expenses towards mobilization at site and demobilization of work force, Contractor's materials, clearing the site etc. shall be deemed to be included in the prices quoted and no separate payments on account of such expenses shall be entertained.

17.0 SITE ORGANISATION:

The Contractor shall without prejudice to his overall responsibilities and liabilities to provide adequate qualified and skilled personnel on the work. For site organization and augment the same as decided by the Engineer-in-Charge depending on the exigencies of work. In addition to this Contractor shall deploy Safety Supervisors to ensure safe working conditions at site.

18.0 CONSTRUCTION:

18.1 The Contractor shall within the scope of work observe in addition to specifications, all national and local laws, ordinances, rules and regulation and requirements pertaining to the work.

18.2 Various procedures and methods to be adopted by Contractor during the construction as required in the respective specifications shall be submitted to CMD / Consultant in due time and well in advance of the specific work for approval.

18.3 The Contractor shall carry out required supervision as per Quality Assurance Plan and furnish all assistance required by CMD / Consultant in carrying out inspection work. CMD / Consultant will have authorized representatives present who shall have free access to the work at all times. If an CMD / Consultant representative notifies the Contractor's representative of any deficiency in any work or in the supervision thereof, the Contractor shall make every effort to carry out such instructions consistent with best industry practice.

19.0 EMPLOYEES PROVIDENT FUND & EMPLOYEES STATE INSURANCE CORPORATION:

19.1 The Contractor undertakes to discharge his responsibility under the Employees Provident Fund Scheme as an immediate employer, for employees engaged or employed by him for execution of contracted work.

19.2 The Contractor undertakes that all employees, either employed by him, or permitted assigns, would be covered under the above scheme from the date of commencement of work. The Contractor further undertakes to pay employee's contribution as well as employer's contribution at appropriate rate to the office of Regional Provident Fund Commissioner within the stipulated time period for the same.

19.3 The Contractor acknowledges the right of the Company to recover deducts or claims any amount, which the company is required to pay.

19.4 Agency must have individual P.F. & ESIC code, copy of P.F. & ESIC code no allotted to the agency to be furnished by the agency.

19.5 The Contractor shall be liable to pay his contribution and the Employee's contribution to the State Insurance Scheme in respect of all labour employed by him for the execution of the



Contract, in accordance with the provision of “The Employee’s State Insurance Act, 1948” as amended from time to time. In case the Contractor fails to submit full details of his account of labour employed and the contribution payable, the Engineer-in-Charge shall recover from the running bills of Contractor and amount of contribution as assessed by him. The amount so recovered shall be adjusted against the actual contribution payable for Employees State Insurance.

20.0 MEASUREMENT OF WORK:

Please refer Clause 42 of General Conditions of Contract (GCC).

21.0 BUILDING AND OTHER CONSTRUCTION WORKER’S ACT:

In order to govern welfare and working conditions of labourers engaged in construction activities, the Building and other Construction Workers’ (Regulation of Employment and Conditions of Service “RE & CS”) Act, 1996 came into force. RE & CS Act’1996 is applicable in respect of building and other construction work. The Contractor shall strictly comply with the following provisions pertaining to RE & CS Act’1996.

- a. The Contractor must be registered with the concerned authorities under the Building and Other Construction Workers’ (RE&CS) Act, 1996 or in case of non-registration; the Contractor should obtain registration within one month of the award of contract.
- b. The Contractor shall be responsible to comply with all provisions of the Building and Other Construction Workers’ (RE&CS) Act, 1996, the Building and Other construction Workers’ Welfare Cess Act, 1996, the Building and other Construction Workers’ (RE&CS) Rules, 1998 and the Building and other Construction Workers Welfare Cess Rules, 1998
- c. Cess as per the prevailing rate, shall be deducted at source from bills of the Contractor by the Engineer-in-charge of the contract and remitted to the “Secretary, Building and Other Construction Workers Welfare Board” of the concerned state. The Contractor shall be responsible to submit final assessment return of the cess amount to the assessing officer after adjusting the cess deducted at source.

22.0 LABOUR RELATIONS:

22.1 In case of labour unrest/ labour dispute arising out of non-implementations of any law the responsibility shall solely lie with the Contractor and he shall remove/ resolve the same satisfactorily at his cost and risk.

22.2 The Contractor shall deploy only duly qualified and competent personnel for carrying out the various jobs as assigned by the Engineer

23.0 EMPLOYMENT OF LOCAL LABOUR:

The Contractor shall ensure that local labour, skilled and/or unskilled, to the extent available shall be employed for this work. In case of non-availability of suitable labour in any category out of the above persons, labour from outside may be employed.



24.0 The Contractor shall not recruit personnel of any category from among those who are already employed by the other agencies working at site but shall make maximum use of local labour available.

- i) Contractor's Labourers to leave site on completion of the work.
- ii) The labourers of Contractor must leave the location of the Plant/township/project site after the work is tapered off/ completed.

25.0 TESTS AND INSPECTION OF WORKS:

25.1 The Contractor shall carry out the various tests as enumerated in the bidding document and as per direction of Engineer-in-charge either on field concerning the execution of work. All the expenses shall be borne by the Contractor and shall be considered as included in the quoted price. The inspection shall be done by followings:

- I. Representative deputed by Engineer-in-charge.
- II. Representative deputed by Statutory Authority.

25.2 Contractor shall give prior notice sufficiently ahead of time to the Engineer-in-charge and also to the authorities to conduct Inspection/ to witness such tests.

25.3 The work is subject to inspection at all times by the Engineer-in-charge. The Contractor shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to technical specifications of this bidding document and guidelines of local fire authority. The technical documents that will be furnished to him during performance of work and the relevant codes of practice furnished to him during the performance of the work.

25.4 Any work not conforming to the execution drawings, specifications, guidelines of local fire authority or codes shall be rejected forthwith and the Contractor shall carry out the rectifications at his own cost.

25.5 All results of inspection and test will be recorded in the inspection reports, proforma of which will be approved by the Engineer-in-charge. These reports shall form part of the Completion Documents.

25.6 Inspection and acceptance of the work shall not relieve the Contractor from any of his responsibilities under this contract.

25.7 Cost towards repeat tests and inspection due to failures, repairs etc. for reasons attributable to the Contractor shall be borne by the Contractor.

26.0 FINAL INSPECTION:

After completion of all tests as per specification the whole work will be subject to a final inspection to ensure that job has been completed as per requirement. If any defects noticed in the work are attributable to Contractor these shall be attended by the Contractor at his own cost.

27.0 TEMPORARY WORKS:

All Temporary and ancillary works including enabling works connected with the work shall be responsibility of the Contractor and the price quoted by them for construction shall be deemed to



have included the cost of such works, which shall be removed by the Contractor at his cost, immediately after completion of his work.

28.0 SAFETY:

The Contractor shall ensure that the safety requirements are met in respect of men, materials, adjoining structures, equipment etc. and shall be totally responsible in case any mishap occurs due to negligence or otherwise. In this connection the contractor shall strictly adhere to the rules norms and regulations as applicable.

29.0 HEALTH, SAFETY AND ENVIRONMENT (HSE) MANAGEMENT:

During construction the contractor shall strictly follow the safety procedures, precautions & norms as per the safety code. The contractor shall submit safety procedure prior to start of construction activities. The procedure should include safety measures to be taken during construction work, firefighting etc. All workmen, supervisors engaged at site shall be equipped with PPE's (Helmet, Shoes, Safety belts, Goggles, Handgloves, Apron etc.)

All the staff/ workers engaged by the agency should follow COVID appropriate behaviour as per Govt. directive i.e. Wearing Masks, maintaining physical distance & washing hands frequently.

The contractor shall take all possible measures to avoid accidents to the contractor's labourers and shall adopt all safety measures as will be directed by CMD's Engineer. Contractor shall provide adequate FIRST AID facility at site and also arrange for necessary medical facilities for proper treatment of laborers, if required. Contractor shall ensure & arrange at his own cost fire & safety provisions as per prevailing practice.

30.0 PERSONAL SAFETY:

All necessary personal safety equipments as considered adequate by the Engineer shall be available for use of persons employed at site and maintained in a condition suitable for immediate use and the contractor shall take adequate steps to ensure proper use of PPE's by all the concerned at site.

31.0 TAXES & DUTIES :

Please refer Clause 46 of General Conditions of Contract (GCC).

32.0 MATERIALS AND EQUIPMENT:

All materials and equipment shall conform to the relevant standards and shall be of the approved make and design. The materials and equipment shall conform to relevant Indian Standards. The Contractor shall be responsible for approval of the equipment, as may be required from local fire Authority . The Contractor shall be responsible for the safe custody of all the materials and shall insure them against theft, damage by fire, earthquake etc. A list of items of materials and equipment, together with sample of each shall be submitted to the CMD / Consultant within 10



days of the award of the contract. Any item which is proposed as a substitute, shall be accompanied by all technical detail giving sizes, particulars of materials and the manufacturer's name and shall be submitted along with the tender. At the time of the submission of proposed substitute the Contractor shall state the credit, if any due to the CMD. In the event the substitution is approved, all changes and substitutions shall be requested in writing and approvals obtained in writing from CMD / Consultant. CMD's decision in the matter shall be final.

All materials of the same kind of service shall be identical and made by the same manufacturers. Any deviation to this rule shall be got approved from CMD/ Consultant. Top priority shall be given to the products that have a permanent agent providing spare parts and maintenance facilities in the same city where the project is situated. The make of electrical equipments, components, accessories, etc. has been mentioned in order of priorities. The tenderer has to quote for the first priority as mentioned above after ascertaining that the first preference materials are available. If at a later stage during executing the work, material of the first preference make are not available, the contractor has to get approval from the CMD/ Consultant to use other make of material prior to procurement. Any rate difference for the first preference make and the one approved will be passed on to the CMD.

33.0 MANUFACTURERS:

Where manufacturers have furnished specific instructions relating to the materials used in this job, covering points not specifically mentioned in these documents, these instructions shall be followed in all cases. Where manufacturer's names and/or catalogue numbers are given, this is an indication of the quality, standards and performance required. When interfacing occurs, equipment shall be mutually compatible in all respects.

34.0 TEST CERTIFICATES:

The contractor shall submit test certificates for all the installed equipments at site including cable etc.

35.0 INSTRUCTION MANUAL:

The contractor shall prepare and produce instruction, Installation, operation and maintenance manuals in English for the use, operation and maintenance of the complete equipment and installations, and submit 3 sets to CMD, at the time of handing over.

36.0 SAMPLES AND CATALOGUES:

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



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

37.0 CONSULTANT'S DRAWINGS:

The tender drawings indicate only the general scheme of requirement and the extent of work covered in this contract. It is the Contractor's responsibility to ensure that his work co-ordinates with the work of other agencies.

The contractor shall prepare detailed working drawings in co-ordination with other architectural and services drawing and get these working drawings approved by the CMD/ Consultant. The approval of such drawings by the CMD/ Consultant shall be from the point of view of assisting the contractor in co-ordination of services with other agencies and shall not absolve the contractor from his absolute and indivisible responsibility on performance of his installations.

38.0 VENDOR'S SHOP DRAWINGS:

The contractor shall prepare and submit to CMD/ Consultant, for his approval, six sets of each detail/ shop drawing of fire fighting system within 30 days on issuance of Letter of Intent (LOI). Before starting the work the contractor shall submit to CMD/ Consultant for his approval in prescribed manner, the shop/ execution drawing for entire installation. CMD/ Consultant reserve the right to alter/ modify these drawings if they are found to be insufficient or not complying with the established technical standards or if they do not offer most satisfactory performance or accessibility for maintenance.

39.0 AS BUILT DRAWINGS & DOCUMENTATION:

After completion of work and before issuance of certificate of virtual completion the contractor shall submit Six (06) sets to the Engineer-in-charge, layout drawing drawn at appropriate scale indicating the complete FIRE FIGHTING system "as installed" duly approved by CMD/ Consultant.

40.0 GUARANTEE & FREE SERVICE:

The system shall be guaranteed for performance for **12 months** from the date of satisfactory acceptance and handing over to client in all respects. The guarantee shall be for entire performance



of the system and covering intended functionalities desired for intended purpose of the design. The certificate of completion shall be issued after the necessary tests & commissioning in all respects have been carried out to the satisfaction of CMD / Consultant and the required drawings/ manuals / As Built Drawings are submitted. At the close of the work and before issuance of final certificate of **virtual completion** by CMD, the contractor shall furnish written guarantee indemnifying CMD against defective materials and workmanship for a period of **12 (twelve) calendar months after completion and handing over of site**. The contractor shall hold himself fully responsible for reinstallation or replacement, free of cost to CMD, in respect to the following:

- Any defective work or material / equipment supplied by the contractor.
- Any material or equipment damaged or destroyed as a result of defective workmanship by the contractor.
- The contractor shall give 12 (twelve) free services (one at each month) for easy and smooth operation for all equipments and materials supplied & installed by the contractor during the defect liability period. The contractor shall make good at his own cost and to the satisfaction of CMD/ Consultant, all defects of other faults arising in the opinion of CMD/ Consultant out of bad workmanship or faulty materials not in accordance with the specifications/ drawings.

During guarantee minimum uptime of 95% shall be ensured failing which guarantee period shall deem to be proportionately extended.

41.0 SITE ENGINEER AND TRAINING:

The contractor shall employ a competent fully licensed qualified, full time fire fighting engineer/ supervisor to direct the work of fire fighting installation in accordance with the drawings and specifications. The engineer shall be available all times at site to receive instructions from CMD / Consultant, in the day to day activities throughout the duration of contract. The engineer shall correlate the progress of the work in conjunction with all the relevant requirements of the authority. The engineer coordinates with other services contractor and CMD for any coordination site issues. Contractor shall give training to technical staff of client for Operating, Control and Basic maintenance for easy operation.

42.0 RESTATING & FINISHING OF CIVIL DAMAGES:

For erection/ installation of equipment etc., if any civil structure/ other agency's work is required to be broken, the same shall be done, restated and finished as original by the tenderer without any extra cost.

43.0 COMPLETION PERIOD:

Time allowed for carrying out the work, as mentioned in the GCC, shall be strictly observed by the Contractor. The work shall throughout the stipulated period of the contract be executed with



all the diligence and if the contractor fails to complete the work within the specified period, he shall be liable to pay liquidated damages as defined in the contract.

The contractor shall submit a BAR CHART for completion of the work within 15 (fifteen) days on issuance of Letter of Intent (LOI). Such chart shall include all activities like the date of supply of material at site, item wise completion of work etc., and obtain the approval of the client.

CMD may provide storage space within the project premises or in the building if available. However the responsibility and safety of the materials stored will be with the contractor. No accommodation for contractor's staff, worker, labour etc. will be provided by CMD.

44.0 OTHER ISSUES:

The Contractor shall carry out all the work strictly in accordance with the approved drawing, detailed specifications and instructions of the client's engineer. If in the opinion of the client's engineer/consultant, nominal changes have to be made to suit the site condition and with the prior approval in writing of the Employer, the Contractor shall carry out the same without any extracharge.

The tenderer must obtain for himself on his own responsibility and at his own expense, all the information which may be necessary for the purpose of making a tender and for entering into a contract and must examine the drawings, inspect the site of the work, and acquaint himself with all local conditions, means of access to the work, nature of the work and all matters appertaining thereto. The Employer's decision in such cases shall be final and shall not be open to arbitration.

A Schedule of Probable Quantities in respect of each work and specifications accompany these Special Conditions. The Schedule of Probable Quantities is liable to alteration by omissions, deductions or additions at the discretion of the Employer. Each tender should contain not only the rates but also the value of each item of work entered in a separate column and all the items should be summed up in order to show the aggregate value of the entire tender.

The rates quoted in the tender shall include all charges for scaffoldings, watching and lighting by night as well as day including Sundays and holidays, protection of all other erections, matters or things and the Contractor shall take down and remove any or all such centering, scaffolding etc. as occasion shall require or when ordered so as to do, and fully reinstate and make good all matters and things disturbed during the execution of work and to the satisfaction of the client.

The contractor shall not be entitled to any compensation for any loss suffered by him on account of delays in commencing or executing the work, whatever the cause of delays may be, including delays arising out of modifications to the work entrusted to him or in any sub-contract connected therewith or delays in awarding contracts for other trades of the project or in commencement or completion of such works. The Employer does not accept liability for any sum besides the tender amount, subject to such variations as are provided for herein.

The successful tenderer shall carry out all items of work necessary for completion of the job even though such items are not included in the quantities and rates. Schedule of instruction in respect of such additional items and their quantities will be issued in writing by the client.

The successful tenderer must co-operate with the other contractors appointed by the client so that the work shall proceed smoothly with the least possible delay.



45.0 FIRM PRICES:

The quoted price shall remain firmed and fixed and valid until completion of the contract and shall not be subjected to escalation for any reason whatsoever.

The quoted prices and unit rates shall include for the following conforming to and meeting the intents of the specifications and drawings.

- a. All equipment and accessories and materials which shall be new and of specified maker quality, or if not specified, then of the best quality conforming to IS and ISI stamped unless otherwise permitted by the Employer.
- b. Transport from the place or places of manufactures to the places of installation, loading and unloading, store and safe custody.
- c. Any and all taxes and duties applicable at the time of award of contract by way of Letter of Intent / Work order.
- d. Comprehensive Insurance against loss of materials during transit, erection and testing till the equipment/installation is commissioned and handed over.
- e. Workmen's compensation for personnel deployed by the tenderer during erection and commissioning.
- f. Third party liability arising out of action or lack of action of the tenderer or his representatives.
- g. Special tools required for erection, operation and maintenance of the equipment, scaffolding and Ladders as required.
- h. Erection, testing and commissioning based on the site conditions & facilities specified under "Tenderer Basis".
- i. Obtaining approvals from all statutory bodies and authorities wherever applicable before and/or after execution of the work.
- j. Making 'As-built' drawings and clearance of site as specified.
- k. All other items and services as pertinent to and meeting the intents of the tender documents including drawings.

The prices shall be firm till the entire installation is handed over and shall be free from any fluctuation in the cost of raw materials and labour. Rates expressed in words shall prevail over rates expressed in figures.

The quoted rates shall be self sustaining and shall remain valid for any increase or decrease in quantity. Items with quantity given as Rate Only shall also be quoted by the Vendor. Vendor shall supply the item at the quoted rate if required by Client.

46.0 LAND/ SPACE:

CMD will provide land/ space subject to availability for contractor's office/go down within project premises. But no land/ space for labour/ worker hutment shall be provided by CMD.

47.0 VARIATIONS TO BE APPROVED BY EMPLOYER:



The Contractor shall submit a statement of variations giving a quantity and rates duly supported by analysis of rates, vouchers etc. The rates on scrutiny and final acceptance by the Employer shall form a supplementary tender. The Employer shall not be liable for payment of such variations until these statements are sanctioned by him.

48.0 CONTRACTOR TO PROVIDE EVERYTHING NECESSARY AT HIS COST:

The Contractor shall provide at his cost, everything necessary for the proper execution of the works according to the intent and meaning of the Drawings, Bill of quantities and Specifications taken together whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred there from, and if the Contractor finds any discrepancy in the Drawings or among the Drawings, Bill of quantities and Specifications, he shall immediately and in writing refer the same to the Employer who shall decide which is to be followed.

49.0 AUTHORITIES, NOTICES AND PATENTS:

The Contractor shall conform to the provisions of any Act of the Legislature relating to the works, and to the regulations and bye-laws of any authority, and of electric supply and other companies and/or authorities with whose systems, the installation is proposed to be connected and shall, before making any variations from the Drawings or Specifications that may be necessitated by so conforming, give to the Employer, written notice, specifying the variation proposed to be made and the reason for making it and apply for instructions thereon. In case the Contractor shall not receive such instructions within ten days, he shall proceed with the work conforming to the provisions, regulations or bye-laws, in question, and any variation so necessitated shall be dealt with the client as required.

The Contractor shall bring to the attention of the Employer, all notices required by the said Acts, regulations or bye-laws to be given to any authority and pay to such authority, or to any public office, all fees that may be properly chargeable in respect of the works, and lodge the receipts with the Employer.

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

50.0 SETTING OUT OF WORKS:

The Contractor shall set out the works and shall be reasonable for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions, and alignment of all parts thereof. If at any time any error in this respect shall appear during the progress of the works within a period of one year from the completion of the works, the Contractor shall, if so required, at his own expense, rectify such error to the satisfaction of the Employer.

51.0 CONTRACTOR'S SUPERINTENDENCE AND REPRESENTATIVE ON THE WORKS:

The Contractor shall give all necessary personal superintendence during the execution of the



works, and as long thereafter as the Employer may consider necessary until the expiration of the “Defects Liability Period” stated in the Appendix hereto. The Contractor shall also during the whole time the works are in progress, employ a competent representative who shall be constantly in attendance at the works while the men are at work. Any directions, explanations, instructions or notices given by the Employer to such representative shall be held to be given to the Contractor.

52.0 BILL OF QUANTITIES:

The Bill of Quantities, unless otherwise stated, shall be deemed to have been prepared in accordance with the Standard Method of Measurement.

Any error in description or in quantity or in omission of items from the Bill of quantities shall not vitiate this contract but shall be rectified and the value thereof shall be ascertained, shall be added to, or deducted from, the Contract Amount (as the case may be) provided that no rectification of errors, if any, shall be allowed in the Contractor’s Schedule of Rates.

53.0 SUFFICIENCY OF BILL OF QUANTITIES:

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of the tender for the works and of the prices stated in the Bill of quantities and/or the Schedule of Rates and Prices which rates and prices shall cover all his obligations under the Contract, and all matters and things necessary for the proper completion of the works.

54.0 QUANTITY VARIATION:

Quantity as shown in BOQ is tentative only and may vary up to any extent either positive (+) or negative (-) and for which bidders quoted rate will remain same.

55.0 UNFIXED MATERIALS WHEN TAKEN INTO ACCOUNT TO BE THE PROPERTY OF THE EMPLOYER:

Where in any Certificate (of which the Contractor has received payment) the Employer has included the value of any unfixed materials intended for and/or placed on or adjacent to the works, such materials shall become the property of the Employer and they shall not be removed except for use upon the works, without the written authority of the Employer. The Contractor shall be liable for any loss of or damage to such materials.

56.0 REMOVAL OF IMPROPER WORK:

The Employer shall, during the progress of the works, have power to order in writing from time to time the removal from the works within such reasonable time or times, as may be specified in the order, of any materials which in the opinion of the Employer are not in accordance with the Specifications or the instructions of the Employer, the substitution of proper materials, and the removal and proper re-execution of any work executed with materials or workmanship not in accordance with the Drawings and Specifications or instruction, and the Contractor shall forthwith carry out such order at his own cost. In case of default on the part of the Contractor to carry out such order, the Employer shall have the power to employ and pay the other persons to carry out



the same, and all expenses consequent thereon, or incidental thereto shall be borne by the Contractor, or may be deducted by the Employer from any moneys due, or that may become due, to the Contractor.

57.0 LABOUR LICENSE:

Contractor will have to obtain labour license for the laborers engaged / to be engaged for their entrusted job from the appropriate authority. Necessary Form V will be issued from CMD office upon receipt of written request from the contractor. Contractor will have to submit the labour license to CMD.

Contractor will have to maintain all records & registers as per requirement of 'Contract Labour Act, 1970' and furnish the documents as required by Labour Enforcement Officer (LEO)/ Assistant Labour Commissioner (ALC) during their inspection. Contractor should also furnish the details to CMD's representative periodically.

Further Contractor will have to provide necessary facilities at site as per 'Contract Labour Act, 1970'.

58.0 CALIBRATION OF INSTRUMENTS AND METERS:

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

59.0 HANDING OVER REQUIREMENTS:

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

1. Detailed equipment data in the approved proforma
2. Manufacture's maintenance and operating instructions
3. Set of as built drawings, layouts, piping, ducting, cable routing, cable schedules etc
4. Approved test readings of all equipment and installations
5. Inspection certificates
6. Certificates of approval from statutory or Local Authorities for the operation and maintenance of the installations, wherever such approval or certification is required. (This shall include Application filed along with enclosures and receipts of fees paid and deposits made).
7. List of recommended spares
8. Certificate from the contractor that he has cleared the site of all debris and litter caused by him without violating the EHS norms during the construction. However, contractor has also to periodically clear the site from all the debris which is generated during execution of work.
9. Undertaking from the contractor that all the materials supplied by him at site are fully tax paid and shall produce all documentation for satisfaction of CMD / Consultant or taxation authorities.
10. **Submission of Final NOC from local fire authority for the public usage of the building.**



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

60.0 STATUTORY APPROVALS & INSPECTION:

The contractor shall be fully responsible for meeting all the statutory obligations and local inspectorates wherever applicable to the works carried out by them. The contractor should prepare all working drawings and obtain approval of competent authorities (Fire & Emergency Service, Guwahati, Assam) and also have the equipment and installation inspected and got approved by them. All the original receipts of official fees paid and deposits made against the demand in writing from the appropriate authority shall be submitted to CMD.

61.0 CARE OF WORKS:

From the commencement to the completion of the works, the Contractor shall take full responsibility for the care thereof and of all Temporary works and in the case any damage, loss or injury shall happen to the works or to any part thereof or to any Temporary works from any cause whatsoever, shall at his own cost, repair and make good the same, so that at completion, the Permanent works shall be in good order and condition and in conformity in every respect with the requirements, of the contract and the Employer's/ Consultant's instructions.

62.0 NUISANCE:

- (i) The Contractor shall not at any time, do, cause or permit any nuisance on the site or do anything which shall cause unnecessary disturbance or inconvenience to Employers, tenants, or occupants of other properties near the site of work and to the public generally.
- (ii) The Contractor shall indemnify the Employer in respect of all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of or in relation to any such nuisance in so far as the Contractor is responsible thereof.



TECHNICAL SPECIFICATION FOR FIRE HYDRANT AND SPRINKLER SYSTEM

1.0 INTENT OF SPECIFICATION:

This specification is intended to cover design, engineering, manufacture, testing and inspection at works, delivery to site properly packed for transportation, erection, testing, commissioning, performance demonstration at site and handing over to purchaser of Fire Detection & Alarm System, Water based Fire Fighting System only as indicated in the schedule of requirement and scope of work and as required for reliable and effective fire protection & automatic fire detection measure for **PROPOSED K.D. MALAVITA NATIONAL OIL MUSEUM, GUWAHATI.**

1.1 This specification also includes complete earthwork, i.e. excavation and back filling for the entire buried cabling for FDA, piping for hydrant and water sprinkler system.

1.2 The specification also includes supply of erection and commissioning spares as specified and special tools and tackles.

1.3 This specification also makes it obligatory for the contractor for arranging and obtaining necessary clearance / approval from all Local / statutory authorities.

1.4 It is not the intent to completely specify all the details of design and construction herein. Never the less the equipment and installation shall conform to high standard of design, engineering and workmanship in all respects and shall be capable of performing continuous satisfactory operation acceptable to the purchaser as well as to the various statutory authorities. In case of any violation of the above contract, the purchaser reserves the right to change / reject / modify the equipment / system during detail engineering.

1.5 Wherever material or article is specified or described by the name of particular brand, manufacturer or vendor, the specific item mentioned shall be understood as established type, function and quality desired. Other manufacturer's product may be considered provided sufficient information is furnished to allow the purchaser to determine that the product proposed is equivalent to the specified brands.

1.6 The entire system shall be designed and engineered by the Bidder based on the guidelines furnished in the specification, applicable codes & standards, Bidder's experience and also good engineering practice. Items and quantities, which have been furnished in this specification, are tentative and indicative only. During quoting, the Bidder shall vet the above Bill of Material and shall furnish additional items, as necessary, for satisfactory operation of the system. Such items, if any, shall be detailed out with justification and separately described and quantified in an annexure to the BOQ.



1.7 Supplies and services to be covered under this tender specification and the conditions thereof are detailed in the subsequent sections of the specifications. In case of conflict among various sections, subsections, documents or drawings the same shall be referred to purchaser whose decision shall be final and binding to the Bidder. In all cases, the best advantages will go to the purchaser.

1.8 Bidder to note that no technical deviation shall be permitted for the system.

2.0 DESIGN PHILOSOPHY:

2.1 CODES AND STANDARDS:

The Water based Fire Fighting System for **PROPOSED K.D. MALAVITA NATIONAL OIL MUSEUM; GUWAHATI** shall be designed and installed as per this tender specification, tender drawings and the following codes and standards:

- National Building Code (NBC) of India 2016, Part – 4, Fire and Life safety.
- IS 3844 - Code of practice for installation and maintenance of internal fire hydrant and hose reels on premises.
- IS 13039 – Code of practice for provision and maintenance of external hydrant system.
- IS 15105 – Design and installation of fixed automatic sprinkler fire extinguishing system.
- IS 2190 – Code of practice for selection, installation and maintenance of portable first-aid fire extinguishers.
- Other applicable IS Codes and specifications related to fire safety of buildings and materials to be used for fire protection systems.
- Assam Fire & Emergency Services recommendations.

2.2 CLASSIFICATION:

The **PROPOSED K.D. MALAVITA NATIONAL OIL MUSEUM, GUWAHATI** project comprises one lower ground floor, one upper ground floor, mezzanine upper ground floor, first floor & mezzanine first floor. As per NBC norms on building classification for occupancy, proposed Oil Museum has been classified as Assembly building, Group – D, above 15 mtrs in height.

2.3 TYPE OF SYSTEMS PROPOSED:

In accordance with NBC, applicable IS Codes & Standards and Assam Fire & Emergency Services requirements, the following Fire Protection systems need to be implemented for the project:

- Centralized firewater tank and Fire pump room equipment
- Wet riser cum down comer system
- Yard hydrants
- Automatic Sprinkler System
- Fire extinguishers and Signage (Fire safety plans)
- Fire Alarm System



2.4 FIRE WATER STORAGE TANKS:

- Fire Water Tank capacity at ground level near fire pump house is 150 CuM.

2.5 FIRE WATER PUMPS:

- Electrically driven main pumps one each for hydrant & sprinkler system.
- Diesel Engine driven common standby pump for both systems
- Electrically driven common Jockey pump.
- All pumps are connected to Fire alarm system control panel for monitoring the status of Fire pumps

2.6 FIRE HYDRANT SYSTEM:

- A ring main considered around entire premises.
- Wet risers cum down comers.
- Landing Hydrants on all floors near staircases inside the dedicated shaft.
- Fire Brigade Inlet connection for filling the firewater tank as well as wet riser system.

2.7 WET RISER CUM DOWN COMER SYSTEM:

- Wet riser cum down comer for every 1000 Sq Mtrs floor area for all buildings.
- Landing hydrants on all floors with single-headed hydrant valve, 2 x 15Mtrs. of firehoses, Hose reel with 40 Mtrs. rubber hose and nozzle.

2.8 YARD HYDRANTS:

- Yard Hydrants around the periphery of the Building with single headed Hydrant valve, 2 x 15 mtrs long fire hoses and Branch pipe with Nozzle.

2.9 AUTOMATIC SPRINKLER SYSTEM:

- Sprinklers at all floor area.
- Coverage per sprinkler is 9 – 12 sq. mtrs and sprinklers are Pendant/ Sidewall /Upright (as suitable at site) type with 68°C temperature rating.
- Flow Switches provided on the sprinkler mains at all floor levels for supervising at FireAnnunciation Panel.

2.10 PORTABLE FIRE EXTINGUISHERS:

Portable fire extinguishers are provided at locations mentioned below-

- Dry chemical powder type fire extinguisher conforming to IS 2171 near car parking



lots, main switch board room, transformer, generator room, pump room, AHU rooms, lift machine room and each staircase landing on every floor.

- Water expelled carbon-dioxide type fire extinguisher conforming to IS 940 located near each staircase landing on every floor.
- Carbon dioxide type fire extinguishers conforming to IS 2878, located in electrical panel room, pump room, lift machine room and each staircase landing on every floor.
- Mechanical foam type fire extinguishers at HSD Yard, D.G. Rooms, Fire water pump house and near oil filled Transformers.

3.0 APPLICABLE CODES AND STANDARDS:

Unless specifically mentioned otherwise and notwithstanding the codes mentioned in Section -2, all the applicable Codes and Standards published by the Bureau of Indian Standards and their subsequent revision / BS Standards shall govern in respect of design, workmanship, quality and properties of materials and method of testing; standards listed below shall be applicable, in particular:

IS-1239 / IS 3589	: Specification for MS / GI Pipes
API 600 / BS 5163	: Specifications for Gun Metal gate, globe & IS778/780/2906 check Valves for water supply.
IS-800	: Specifications for Structural steel
IS-814	: Specifications for covered electrodes for metal arc welding of structural steel.
BS-5155	: Specifications for C. I. butterfly valve.
IS-4927	: Specifications for Canvas Hose Pipes.
IS-903	: Specifications for Branch pipes Fire hose couplings and auxiliary equipment
IS-5290	: Specifications for hydrant landing valves.
IS-1200	: Method of measuring of building & civil Engineering Works (water supply, plumbing drain & sanitary fittings)
IS-4853	: Recommended practice for radiographic inspection of fusion welded butt joints in steel pipes.
IS-636	: Synthetic,jacketed hose pipes.
IS-2198	: Control Panels.
IS-2159	: Hot dip galvanizing of iron and steel
IS-5	: Specification for painting
IS-9137	: Specification for horizontal end suction centrifugal pump
BS-1965 Part I	: Specification for butt-welded Pipe Fittings.



IS 8423	: Controlled percolating hose for firefighting.
IS 2871	: Branch pipe, universal for firefighting purposes.
IS 884	: First aid hose reel for fire fighting
IS 937	: Specification for washers for water fittings for firefighting system.
IS 9972	: Specification for automatic sprinkler heads.
IS 2171	: Dry chemical powder type Fire extinguishers
IS 940	: Water type CO2 Fire extinguishers
IS 2878	: Carbon – di – oxide type Fire extinguishers
IS-694	: Copper wire
IS-9968 (Pt-1)	: Rubber Insulated Braided Wire
IS-1554 (Pt-1)	: PVC Insulated Cables
IS-5	: Paint Shade for main Equipment/accessories

4.0 SCOPE OF WORK:

4.1 INTRODUCTION:

The scope of work includes complete design, engineering with necessary design calculations, Fit – up details, supporting details, manufacture / fabrication, supply, storing, installation / erection, testing and commissioning and obtaining statutory approval of the Water based Fire Fighting System as detailed in the tender documents. The quoted rates shall also include complete earth works i.e. excavation and back filling for the buried pipes, wherever applicable, with all necessary accessories as per specifications for the project.

4.2 DRAWINGS AND DESIGN CALCULATIONS:

The drawings enclosed herewith are for the general guidance to the Bidder. The contractor shall upon the award of the work, furnish detailed working drawings necessary to carry out the work at site with detailed design calculations. These shall be submitted to the Employer/consultant for the approval and the work shall be commenced only after the approval of drawings and calculations by the Employer/consultant.

4.3 INSPECTION AND APPROVAL:

The contractor shall obtain approval of the installation from the **Assam State Fire & Emergency Services**. Successful Bidder shall be responsible for preparation of documents / applications / drawings & hydraulic calculations and follow-up action at all stages, (Drawing / completion) arranging inspections, revisions / modifications for obtaining approval from **Assam State Fire & Emergency Services** within the overall completion period stipulated in the Tender. The Contractor shall also make payment of all statutory payments like payment for **Assam State Fire & Emergency Services** approval etc. The quoted rates shall take care of such contingencies.



The contractor shall guarantee both the material and workmanship of first class quality corresponding to standard engineering practice. Any defective materials/workmanship shall be rejected and the contractor has to rectify/ replace the rejected material / work at his own cost. Original guarantee certificate for all the materials supplied shall be handed over to the clients as part of the handover documentation. Final work completion certification shall be given only after receipt of all necessary documents as part of the handover process.

4.4 DOCUMENTS TO BE SUBMITTED ALONG WITH BID:

List of data / documents / drawings to be submitted along with bid shall be as mentioned below:

- 1) Preliminary Overall dimensions of pump sets / motors / engines.
- 2) List of Deviations (Technical) if any, as an Annexure.
- 3) Technical parameters of all equipment offered (catalogues, G.A. drawings etc).
- 4) Technical Particulars data sheet provided in the tender duly filled in.

Preliminary pump house layout confirming adequacy of space provided for firewater pumps.

4.5 DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT:

List of data / documents / drawings to be submitted after the award of contract shall be as stated below:

- 1) Material submittals for all the material proposed with manufacturer's original catalogue / literature / data sheets.
- 2) Detailed shop drawings showing floor-wise piping plan layouts, sections, elevations, typical details etc. Drawings shall generally be in minimum 1:100 scale but details and sections shall be in 1:50 scale for better clarity
- 3) P&ID for piping systems.
- 4) Isometric layout and hydraulic calculation for validation of pump and piping selection.
- 5) Fire pump room plan layout and sections in minimum 1:50 scale.
- 6) Project Time Schedule for the complete activities and milestones up to minimum Level 3.
- 7) Manpower deployment schedule and histogram.

4.6 INSTRUCTION MANUAL/COMPLETION DRAWING/TRAINING

The contractor shall be responsible for training of the Employer's personnel in the operation and maintenance of the system and conduct Fire drill. Site Training Manual shall be submitted at least 2 months prior to the completion of work and readiness of the systems for testing and commissioning. The rates quoted shall be inclusive of submitting 6 sets of the following documents (HARD COPIES) along with CDs (Soft copy):

1. Operation and Maintenance Manuals giving detailed description of the installed systems, operating and periodic maintenance instructions, manufacturers operating and maintenance manuals, recommended maintenance schedules, recommended spares list, manufacturers/suppliers contact details etc.
2. Set of as built drawings, layouts, piping, ducting, cable routing, cable schedules etc
3. Factory Test Certificates, Material Test Certificates in original.
4. Inspection certificates
5. Site Pre-commissioning and Commissioning Test certificates in original.



6. Certificates of approval from statutory or Local Authorities for the operation and maintenance of the installations, wherever such approval or certification is required. This shall include Application filed along with enclosures and receipts of fees paid and deposits made.
7. Warranty / guaranty certificate for all equipment
8. Certificate from the main civil contractor that he has cleared the site of all debris and litter caused by him.
9. Undertaking that all the materials supplied by him at site are fully tax paid and shall produce all documentation for satisfaction of the Employer/ consultants / Architects /PMC or taxation authorities.

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

5.0 EQUIPMENT SPECIFICATIONS:

5.1 FIRE HYDRANT SYSTEM:

5.1.1 GENERAL:

Without restricting to the generality of the foregoing, the fire hydrant system shall include the following:

- Pumps, suction / delivery pipes, Valves, control panel and Instrumentation and pump set shall be automatic start, manual stop.
- MS Class "C" (heavy grade) ring mains / riser main within the building and outside the building.
- Landing valves, external hydrant valves, hose reels, hose pipes, branch pipe and nozzle, fire duct shutters / hose cabinets, fire brigade connections and connections to pumps and appliances.
- All materials shall be of the best quality and brand new, conforming to these specifications / standards and subject to the approval of the Client / consultant.
- Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.
- Pipes with fittings shall be fixed to walls and ceilings by suitable clamps at intervals specified. Only approved types of anchor fasteners shall be used for RCC ceilings and walls.
- Pipes with fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat manner.
- The pipes shall be supported by structural steel fabricated (like channel / angle / flat / plate etc) supports with suitable anchor fasteners, bolts and washers or with hangar clamps suspended by thread rods not less than M12 in size for pipes up to 100mm and M16 for pipes 150mm and above.
- Valves and other appurtenances shall be so located that they are easily accessible for operation, repairs and maintenance. Valves / other equipments fitted above the false ceiling shall be provided with trap / access doors.



- Pipes for wet risers within the Building shall be MS ERW conforming to IS 1239 (heavy duty 'C' class) with flanged/welded joints.
- Fittings for steel pipes shall be forged fittings with screwed / welded joints.
- Inter connection between sprinkler and hydrant pumps shall be carried out at discharge side with Check valve.
- Technical data sheet for all equipment shall be furnished along with bid.
- Construction of Fire water tanks, Fire water pump house, Fire Pump foundations, Puddle flanges at water tanks for suction / delivery / test lines and core cutting / opening if required on floor / wall is exempted from the scope of works by Fire protection contractor.

5.1.2 PIPING:

All pipes inside the building and where specified, outside the building shall be MS ERW conforming to IS: 1239, heavy duty for sizes up to 150mm and for 200mm and above shall conform to IS:3589, 6.35 mm thick. Fittings for pipes shall be as per IS: 1239, Part II (heavy grade / as per data sheet).

Pipes shall be carefully laid to the alignment, levels and gradients shown on the plan and sections and great care shall be taken to prevent any sand, earth or other matter from entering the pipes during lying. Pipes shall be kept thoroughly clean during the course of lying. The ends of pipes shall be blocked with wooden plugs wedged home, at the end of each day's work to prevent dirt and rodents, insects etc., entering the pipe.

For pipes up to 50mm dia, tapered screwed or socket welded type jointing only shall be adopted, while for pipes above 50mm dia butt welded type joints or flanged connections shall be used. Flanged joints shall be made with 3 mm thick insertion rubber washer / Gaskets. All bolt holes in flanges shall be drilled & making hole by using drill machine, gas cutting is not acceptable. The drilling of each flange shall be in accordance with relevant Bureau of Indian Standards. All fittings and flanges shall be from reputed manufacturers as per the approved vendor list. Fabricated fittings shall not be acceptable.

Flanged joints shall be used for connections to vessel equipment, flanged valves and also on suitable straight lengths of pipeline at strategic points to facilitate erection and subsequent maintenance work. **The Bolts / Nuts / Washers used in the system shall be Galvanized as per IS1367 and suitable length & not more than 15mm beyond the Nut.**

5.1.2.1 PIPE PROTECTION:

➤ ABOVE GROUND PIPES:

All pipes above ground and in exposed locations shall be painted with two coat of Etching type primer and two or more coats (each of 75 microns) of synthetic enamel paint of approved shade. The pipes should be initially brushed to remove all foreign matter before applying paint / primer.

➤ UNDER GROUND PIPES:

The pipes (buried) should be initially brushed to remove all foreign matter and apply the bituminous based primer over the pipe. Primer is allowed to dry until the solvent evaporates and surface becomes tacky. The tape 4mm thick and 150/250mm wide shall then be wound in a spiral fashion

and bonded completely to pipe by thermo fusion process. The overlap is to be maintained at a minimum of 15mm.

5.1.2.2 EXCAVATION OF TRENCHES:

- Excavation for pipelines shall be in open trenches to line and grade or as required at site including disposal outside of site at approved dumping yard with the prior approval of concerned authorities. Pipelines shall be buried to a minimum depth of 1M (top of the pipe) from the finished ground level. Trenches shall be kept open till completion of pressure testing of the pipelines. Excavated trenches shall be provided with a bedding of sand 200mm thick and suitably graded and leveled. Pipes shall be laid on this bedding in proper alignment and linearity.
- The contractor shall support all trenches or adjoining structures with adequate timber supports wherever required.
- On completion of pressure testing of the pipelines, trenches shall be refilled with sand in 20cm layers up to a total depth of 70cms. Above this excavated fine earth in 20cms layers shall be added and consolidated by compacting and watering to achieve a 95% Proctor density.

5.1.2.3 THRUST BLOCKS:

Contractor shall provide PCC blocks of suitable dimensions at all change-in-direction and regular intervals of 6 meters to support the pipes. Minimum Size of Blocks shall be 600mmx600mmx450mm.

5.1.2.4 PIPE SUPPORTS:

- Supports for above ground pipes of 65 mm dia and above shall be fabricated by structural steel of suitable sections with suitable fasteners. The spacing of supports shall be 3mts minimum and painted two coats of enamel paint of approved color over a coat of primer.
- Suitable type's hangers shall support pipes 50 mm dia and below with clamps, anchor fasteners and suspended rods etc.
- In any case fasteners shall not be less than 12 mm in size.

5.1.3.0 VALVES:

5.1.3.1 BUTTERFLY VALVES:

Butterfly valves shall be wafer type with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 The valves shall be PN 1.6 rating with working pressure of 16 bars, body/disc test pressure of 24 bars and seat test pressure of 16 bars. Valves up to 150mm size shall be lever operated and 200mm and above shall be gear operated. For butterfly valves installed as zone control valves in sprinkler systems, the operating handle shall have a supervisory switch for OPEN/CLOSE status monitoring.



5.1.3.2 GATE VALVES:

Gate valves shall be as per IS: 14846 / 780, with cast iron body and bronze / brass internal parts and shall be installed as indicated on drawings and as required. Valve shall be flanged end type, PN 16, non-rising spindle type with C.I hand wheel etc. Valve body shall be hydro- tested to 24 bars and seat shall be pressure tested to 16 bars. Valve shall be ISI marked.

5.1.3.3 NON – RETURN VALVES:

Non – return valves shall be swing check type as per IS: 5312 with cast iron body and bronze /brass internals. Valve shall be PN-1.6 rated suitable for working pressure of 16 bars. Valve body shall be hydro-tested to 24 bars and seat shall be hydro-tested to 16 bars. Valve shall be ISI marked.

5.1.3.4 EXTERNAL HYDRANTS:

External (yard) hydrant valves shall be single headed as per IS: 5290 (Type A). The valves shall be of stainless steel construction and should be complete with hand wheels, quick coupling connections, springs and blank caps. The hydrants shall be fixed to stand posts of 80mm dia for single headed hydrants at 1.0M from ground level. External hydrant valves shall be provided with 2 Nos. RRL fire hoses 63mm dia, 15m length and 1No. Stainless steel Branch pipe with Nozzle. The hoses and branch pipe shall be housed in a 16 SWG. M.S fabricated hose cabinet. The cabinet shall be mounted (next to stand post) on free standing support fabricated by suitable structural steel / pipe of not less than 80 mm dia.

5.1.3.5 HOSE REEL:

Hose reel shall be swinging type for 180 deg with mounting base plate. Hose reel shall consist with 19mm dia high-pressure rubber braided hose of 40 mts length with gunmetal nozzle. Hose reel water shall be tapped off from the wet riser with ball valve. The hose reel shall be installed in fire hose duct inside the building.

5.1.3.6 LANDING HYDRANT VALVE:

The landing valve (internal) shall be single-headed type conforming to IS: 5290 Type A with inlet flange size of 80mm and outlet size of 63mm. Material of construction shall be stainless steel for body and internals and outlet connections shall be instantaneous female type. Valve shall be painted Fire Red shade 536 as per IS: 5. Valve shall be complete with cast iron hand wheel, spring and blank cap and shall be ISI marked. Hand wheel shall have the direction of operation engraved on the top.

5.1.3.7 FIRE HOSE:

Fire hoses shall be Reinforced Rubber Lined (RRL) type as per IS: 636 & 63 mm dia and 15 mts long. Hoses shall be bounded by G.I wire to heavy-duty instantaneous stainless steel couplings as per IS 903. Hose end connections shall be a pair of male/female couplings. Hoses shall be proof pressure tested to minimum 21 bar and shall have a burst pressure of minimum 35 bar. Hoses and couplings shall be ISI marked.

5.1.3.8 BRANCH PIPE WITH NOZZLE:

Branch pipe shall be stainless steel, 63 mm dia with Nozzle of 19 mm dia made as per IS: 903 and



suitable fitted with hoses as specified elsewhere in this specifications. Branch pipe and nozzle shall be ISI marked.

5.1.3.9 HOSE CABINET:

Hose cabinet shall be fabricated of 16swg M.S. sheet and size shall be 750mm x 600mm x 250mm. Hose cabinet shall have glass fronted door fitted with 4mm thick clear glass & powdercoated finish of red outside & white inside. Cabinet shall be suitable for stand mounting and shall have built in breakable glass type feature to keep key.

5.1.3.10 SHUTTERS FOR FIRE SHAFT:

Fire shaft shall have shutter fabricated of 16swg M.S. sheet or anodized aluminum sheet 2mmthick with glass-fronted door (glass shall be 4mm thick) and size of the shutter shall be 900mmx 1500mm minimum. The door shall be in two leaves with necessary stiffeners. Shutter shall be powder coated finish of red out side and white inside and on the glass a label "FIRE" shall be etched or screen printed and the letter size shall be min. 75 mm height. Also there shall be built in breakable glass type feature to keep key.

5.1.3.11 FIRE BRIGADE INLET CONNECTIONS (FBIC):

FBIC shall be as per IS 5131 with a 4-way connecting head comprising of 4 x 63 mm dia instantaneous type inlets with built in stainless steel check valve and 150mm dia flange outlet connection. The FBIC shall be connected to the fire main grid with 150mm dia butterfly valve and non-return valve. Valve body shall be tested to 21 bars and valve seat shall be tested to 14bars. The complete FBIC assembly shall be ISI marked and shall be as per approved vendor list. The fire brigade inlet shall feed water in to the system as well as to the fire water tank

5.1.3.12 AIR RELEASE VALVES:

Air release valve is 25mm screwed inlet gunmetal single acting type and shall be fixed on all high points in the system (wet riser) with Ball valves or as shown on drawings.

5.1.3.13 DRAIN VALVES:

Gun metal Gate / Ball / Globe valve of 15 / 25 / 40 / 50mm dia as per IS; 778 with fittings as required for instruments / draining any water in the system / Risers in low points.

5.1.3.14 PRESSURE SWITCH:

Pressure switch shall be of the bellows type as the sensing element. Design of the pressure switch shall be such that the unit performs well in applications where shock and vibrations are present and shall be weather-proof type rated to IP: 66 as per IS: 2147. The pressure switch range shall be selected according to the system operating pressure requirements and shall be field adjustable.

5.1.3.15 PRESSURE GAUGE:

Pressure gauge shall be bourdon type as per IS: 3624. Material of construction for bourdon & block shall be SS316 and for the movement shall be SS304. Pressure gauge body shall be dust and damp proof die-cast aluminum with screwed inner bezel of ABS plastic. Accuracy shall be $\pm 1\%$ and range selection shall be such that normal operating pressure is displayed in the mid-range. Dial size shall be minimum 100mm. Pressure gauge shall be mounted with a siphon and gauge cock



5.1.3.16 VALVE CHAMBERS:

Contractor shall provide suitable brick masonry chambers in cement mortar 1:5 (1 cement: 5 Coarse sand) on cement concrete foundations 150mm thick 1:5:10 mix (1 cement: 5 fine sand: 10 graded stone aggregate 20mm nominal size) 15mm thick cement plaster inside and outside finished with a floating coat of neat cement inside with cast iron surface box (OR top cover fabricated by M.S. chequered plate of 6 mm thick with frame / stiffeners etc) approved by local fire brigade including excavation, back filling and additional iron rungs for entering in to valve chamber etc, complete.

Valve chambers shall be 1200mm x 1200mm x 1500mm depth.

5.1.3.17 PUMPS AND ACCESSORIES:

The pumps shall be exclusively used for fire fighting purposes and shall be BIS approved as mentioned in the BOQ. One set main pump each for hydrant & sprinkler system with electrical motor driven direct coupled centrifugal pump of adequate discharge & head and in addition common standby diesel engine driven direct coupled centrifugal pump of adequate discharge and head shall be provided. Also there shall be a booster pump on the terrace near each Fire Water Tank. The pumping capacity of main and stand by hydrant / sprinkler system pumps shall be as mentioned in the specimen BOQ. The suction / delivery pipes, valves, instrumentation and control panel shall be considered accordingly.

➤ GENERAL REQUIREMENT

The pumps shall be horizontal multistage centrifugal back pull out type or end suction type, designed for continuous operation and shall have a continuously dropping head characteristic without any zone of instability. The power capacity characteristic shall be non-over loading type. The head vs. capacity, input power vs. capacity characteristics, etc., shall match to ensure load sharing and trouble free operation throughout the range. In case of accidental reverse flow through the pump the driver shall be capable of bringing the pump to its rated speed in the normal direction from the point of maximum possible reverse speed. The contractor under this specification shall assume full responsibility in the operation of the pump and the drive as one unit. The pump shall be capable to discharge 150 percent of rated capacity at a total head of not less than 65 percent of the total rated head. The total shut off head shall not exceed 120 percent of total rated head on the pump. An automatic air release valve shall be provided to vent air from the pump discharge and also to admit to the pump to dissipate the vacuum there, upon stopping of the pump.

This valve shall be located at the highest point in the discharge line between the pump and the discharge check valve. Pump coupled with motor or engine on a common base plate shall perform smoothly without any excessive noise or vibration. Also pump shall be provided with re-circulation piping with valves.

➤ PUMP CASING

The casing shall be cast iron to IS 210 and capable of withstanding to the maximum pressure developed by the pump at the pumping temperature.

➤ IMPELLER



The impeller shall be of standard bronze. The impeller shall be secured to the shaft with hydraulically balanced and shall be retained against circumferential movement by keying, pinning or lock rings. All screwed fasteners shall tighten in the direction of normal rotation.

➤ **SHAFT**

Shaft size shall be selected on the basis of maximum combined shear stress. The shaft shall be of stainless steel AISI-410 ground and polished to final dimensions and shall be adequately sized to withstand all stresses from motor weight, hydraulic loads, vibrations and torque's coming in during operation. Pump Shaft-Motor Shaft Coupling shall be connected with adequately sized flexible couplings with spacer of suitable approved design. Necessary guards shall be provided for couplings. Pump shall be consisting with Gland plate for gland packing.

➤ **BASE PLATE**

A common base plate for mounting both the pump and drive shall be provided. The base plate shall be of rigid construction and shall be fabricated of M.S. channels. Base plate and pump supports shall be so constructed that the pumping unit shall be mounted so as to minimize misalignment caused by mechanical forces such as normal piping strain, hydraulic piping thrust etc.,

➤ **VIBRATION AND BALANCING**

The rotating elements shall be so designed as to ensure least vibration during start and throughout the operation of the equipment. All rotating components shall be statically and dynamically balanced at workshop. All the components of pumps of identical parameters supplied under these specifications shall be interchangeable.

➤ **INSTRUCTION MANUAL AND TOOLS/SPARES**

A comprehensive instruction manual shall be provided by the sub-contractor indicating detailed requirements for operation, dismantling and periodic operation and maintenance procedures. Recommended tools/spares shall be provided along with the Pump set.

5.1.3.18 DIESEL ENGINE:

➤ **GENERAL**

The diesel engine shall be multi-cylinder type four-stroke cycle with mechanical (airless) injection, cold starting type. The engine shall be manufactured as per IS 10000 and shall be ease of maintenance, repair, cleaning and inspection. This will also provide interchangeability of parts. All parts susceptible to temperature changes shall have tolerance for expansion and contraction without resulting in leakage, misalignment of parts or injury to parts.

➤ **STARTING**

The engine shall be capable of both automatic and manual start. Generally the engine shall start automatically but in case of the auto-start system failure the engine shall be capable of manual start. Engine shall be able to start without any preliminary heating of combustion chamber; cranking mechanism shall also be provided. All controls/ mechanisms, which have to be operated



in the starting process, shall be within easy reach of the operator. A DC motor charged by battery shall initiate automatic start of diesel engine. The battery shall hold adequate retainable charge to provide the starting of the diesel engine. Starting power will be supplied from two sets of storage batteries. One set of battery is for automatic starting of the engine and the other provided for manual starting. A selector switch will be provided at automatic starting control panel to select any of the two sets of battery for manual / auto starting of the engine. The battery capacity shall be adequate for ten consecutive starts without recharging with a cold engine under full compression. The battery banks shall be used for no other purpose other than starting of the engine and shall be fully charged at all times with provision for trickle and boost charges. After start of the engine the charger shall be disconnected, the battery being fed from the engine dynamo. The two-battery charger of air-cooled type shall be able to charge one battery bank at a time. The D/E starting panel along with the battery chargers should be of reputed approved makes.

➤ **GOVERNING SYSTEM**

The engine shall have a speed control device which will control the speed under all conditions of load, the governor shall be suitable for operation without external power supply. The governor shall offer following features: An adjustable governor to regulate engine speed within a range of 10% between shut-off and maximum load conditions of the pumps. The governor shall be set to maintain rated pump speed at maximum pump load.

➤ **FUEL SYSTEM**

The diesel engine is to run on high-speed diesel, the tank provided being enough to hold the volume required for 6 hours (minimum) continuous operation. Fuel tank shall be double wall type, so that over flow of the fuel shall be collected in the secondary tank. Fuel supply and return piping shall be metal with necessary valves. Fuel tank shall be mounted on the fabricated base plate or separately on adequate supporting legs and shall be complete with air vent, over flow, drain, filling and return connections, level gauge/indicator, manhole etc.

➤ **COOLING WATER SYSTEM**

Direct cooling system shall be employed for the diesel engine. Water shall be tapped from the fire pump discharge. This water shall be led through duplex strainer, pressure breakdown orifice and then after passing through the engine, the outlet water shall be taken directly to the sump through an elevated funnel. Re-circulating thermo siphon system of cooling using a fan cooled radiator or indirect cooling system using heat exchanger shall not be accepted.

➤ **ACCESSORIES**

The engine shall be mounted on a base plate of fabricated steel construction. Adequate access shall be provided for the big end and main bearings, camshaft and governor drives, water jackets etc., The engine shall have a base plate made from MS sections. There shall be reasonable space at the big end, camshaft, water jackets, governor drives and main bearings. The engine shall be provided with intake and discharge ductwork, inlet filter and silencer, outlet industrial type muffler, expansion joints, dampers etc., as necessary for efficient operation. Intake air should be taken from inside the building in which the engine is located, but the exhaust should be discharged outside the building and exhaust duct shall be adequately sized for minimum pressure drop as per relevant code/standard, and shall be housed clearing man height. The flywheel shall have graduated marking around the periphery to facilitate checking of valve and fuel pump timings. Full set of



diesel engine spares as per standard requirement to be provided along with tool kit.

➤ INSTRUMENTATION

The diesel engine shall be provided with adequate instrumentation. The gauges etc., as required are provided for in the Engine Panel. Also Bidder shall supply one set of spare parts recommended by the manufacturer for maintenance purposes.

5.1.3.19 TESTS AT SITE:

➤ PIPING

All piping in the system shall be pressure tested to hydrostatic pressure of 1.5 times of the system working pressure or 14 bar, whichever is greater, without drop in pressure for at least 2hrs. The test shall be done in the presence of and to the satisfaction of the Employers / consultants representatives. Any defects / leakage should be repaired or if necessary defective works / equipment should be replaced with new work / equipment. Tests should be repeated until work is done to the satisfaction of concerned representatives. **After testing, all pipes shall be flushed with potable water at system flow and pressure to remove foreign materials.**

Under ground Pipes after lowering in to trenches shall be subjected to Holiday tests for damages of the anticorrosion treatment. Damages, if any, should be brought to the notice of the Engineer-in-Charge of site and rectified in accordance to his directions before closing the trenches.

For welded pipe jointing WPS and welder's qualification shall be submitted for approval prior to start of work. 10% of all welded joints shall be radiography tested and the test results and films shall be submitted for approval. Any defects found in the welding process shall be rectified by the contractor without any extra cost or time extension to the clients.

➤ PUMPS

On completion of installation works at site the complete system shall be tested for satisfactory performance in line with specifications as per Tender / requirements of Employer / Consultants. Pumps shall be tested for performance as well as sequential autostart in case of using the Hydrants / on actuation of sprinklers. Also pump shall deliver minimum required flow & pressure at top most hydrant point. All instruments for testing should be arranged by the Contractor. The performance test includes commissioning spares like, diesel oil, engine oil, coolant, grease, gland packs and spare refills for Fire extinguishers etc complete.

A test assembly shall be provided in the fire pump room for system testing. The test assembly shall essentially consist of a manifold with tap-off connections for pressure switches and a drain valve for test purposes. A calibrated pressure gauge shall be provided on the manifold for recording the pressure settings. The pressure switches shall be connected to the fire pumps control panel and drain facility shall be piped to the nearest drain.

In addition a pump test line shall be separately provided for performance testing of the fire pumps. The pumps test line shall be tapped from the delivery header and shall consist of isolation valves. The pumps test line shall be run as return to the fire water tank at a high level.

5.2 AUTOMATIC SPRINKLER SYSTEM:



5.2.1 SPRINKLER HEADS:

The sprinkler heads shall be UL listed fixed temperature type with a quartzoid bulb containing liquid having high vapor pressure held in position by a forged GM yoke and deflector. The rated temperature of quartzoid bulb shall be 68 deg. C for complete building. The spacing shall however conform to the detailed drawing, in co-ordination with electrical and other allied services at the ceiling level. Contractor shall supply spare sprinkler heads and spanners neatly installed in a steel box with glass shutter at an appropriate position approved by the Engineer-in-Charge.

Sprinklers for below false ceiling (where applicable) shall be fixed with recessed (two piece) type Rosette plate fabricated by M.S. sheet of 2mm thick with Powder coated finish of approved color.

Sprinklers for ceiling void shall be upright and for below false ceiling shall be recessed type.

5.2.2 SPRINKLER ALARM VALVE:

Sprinkler alarm check valve or Installation control valve serves as a system control valve which also prevents reverse flow from the downstream system piping. The valve body is of ductile iron construction with a rubber faced internal clapper. The valve shall be complete with all necessary trims and with a water motor alarm gong and alarm pressure switch. The trim package shall be fully galvanized and the assembly shall be rated for 17.2 bar working pressure. The valve shall be hydrostatically tested to 34.5 bars. The valve shall be UL listed and shall be from the approved makes.

5.2.3 ZONE CONTROL VALVE STATION:

Zone control valve station (ZCVS) comprises of a wafer type butterfly valve, non-return valve, flow switch and a test & drain valve. Typical arrangement of ZCVS shall be as shown on drawings. The butterfly valve shall be as specified in Clause 5.1.3.1 The flow switch shall be paddle type SPDT and shall be suitable for the flow range in the zone. The flow switch shall be suitable for operating pressure of 10 bar and shall have a withstand pressure of 17.5 bar. The valve shall be of approved make.

5.2.4 PIPES AND FITTINGS:

Pipes for the sprinkler system shall refer to the Fire Hydrant System, above.

5.3 ELECTRICAL WORKS:

5.3.1 GENERAL:

The CONTRACTOR shall supply and install the electrical equipment and services necessary for the efficient and safe operation of the fire protection systems detailed elsewhere in the specification including:

- (a) Motors for Fire water pumps.
- (b) MCC cum control panel housing the starters for all motors and complete with the switches, relays, push buttons, indicating lamps, etc necessary for the control of the fire protection



system.

- (c) Power and control cabling between the MCC, motors, pressure switches, etc including accessories like conduits, cable trays, etc.
- (d) To carry out the electrical installation works in accordance with specifications and as required by the local statutory departments.
- (e) To include the preparation of shop drawings and construction drawings for submission to the Consulting Engineers to review prior to construction as well as final As-Built drawings after commissioning of the Fire Protection System.

5.3.2 ELECTRIC MOTORS:

The motor shall be as per IS: 325 and with class “F” insulation, totally enclosed fan cooled, horizontal induction foot mounted type and rated not to draw starting current more than 6 times normal running current. Motor shall be capable of driving the pumps at rated discharge and head & at 150% of its rated discharge at 65 % of the rated head (in any case 15 % safetyload should be added) and shall be designed for continuous full load duty. The motor shall be capable of handling the required starting torque of the pumps. Speed of motor shall be compatible with the speed of the pump. The cooling fans shall be directly driven from motor shaft. Motor situated outdoors or exposed to the weather shall be weather protected. Motors shall be enclosed type and shall have dust tight construction with suitable means of breathing and of drainage to prevent accumulation of water from condensation. Drain holes shall exclude bodies greater than 6mm diameter. All components shall be of adequate mechanical strength and robustness and shall be constructed of metal unless otherwise approved. All motors shall be dynamically balanced.

The enclosure shall be designed to provide an effective sealing between the primary and secondary air circuits. Motor winding shall be vacuum impregnated with heat and moisture resistant varnish glass fiber insulated. Two independent earthing points shall be provided in accordance with IS:3043 on opposite sides of the motor for bolted connection. The cable boxes and termination shall be designed to enable easy disconnection and replacement of cables.

5.3.3 LT SWITCH BOARDS / SWITCH GEAR/ SUB MAIN SWITCH BOARDS:

5.3.3.1 GENERAL SPECIFICATION OF EQUIPMENT:

The switch board shall be metal clad, totally enclosed, rigid, compartmentalized design, floor mounting, air insulated, extensible cubicle type for use on medium voltage power, 3 phase 4 wire 50 cycles system. The degree of protection shall be of IP65 as detailed in BOQ. The equipment shall be designed for operation in high ambient temperature and high humidity tropical atmospheric conditions. Means shall be provided to facilitate ease of inspection, cleaning and repairs for use in installations where continuity of operation is of prime importance.

The entire logic of the fire protection system shall be built in this panel. It shall have necessary relays/contactors for accepting contacts from Pressure/limit switches and for switching ON/OFF motors accordingly. It shall have ammeter, voltmeter, start / stop push buttons, manual and automatic selector switches, pumps on, off, trip indicating lamps, relays and other control equipment necessary for the efficient indication and operation of the system. A visual and audio alarm shall also be provided to raise an alarm when any of the pumps is tripped. It shall have provision for annunciating the water tank water level high / low / overflow conditions.

Provision shall be made for interfacing with the Building Automation system. Potential free



contacts for motors ON / OFF / TRIP, MCC trouble and fire water tanks level LOW/HIGH/OVERFLOW conditions be provided in the control panel for BAS. Also provision shall be made for receiving signals from BAS.

5.3.3.2 STANDARDS:

Following equipment shall conform to the requirements of:

Complete Panel Assembly	- CPRI approved
Air Circuit Breaker (ACB)	- IS 13947-1.2 / IEC 947-1.2
Moulded Case Circuit Breaker (MCCB)	- IS 13947-1.2/ IEC 947-1&2
Contactors	- IS 13947-1.4
Miniature Circuit Breaker (MCB)	- IS 8828-1996/ IEC 898-1995
Residual Current Circuit Breaker (RCCB)	- IS 12640-1988 / IEC 1008
HRC fuse link	- IS 9224 and BS 8:8
Current Transformer	- IS 2705 and IEC 185
Potential Transformer	- IS 3156
Relay	- IS 3231 & IS 8686 (For Static Relays)
Indicating Instrument	- IS 1248

5.3.3.3 CONSTRUCTION:

The switch board shall be:

Sheet steel enclosed, indoor floor mounted free standing cubicle type made up of the requisite vertical sections modular type which when coupled together shall form continuous dead front switchboards. The switchboard shall be dust, vermin and damp proof with enclosure protection not less than IP 52. Each feeder/instrument compartment shall be provided with a hinged door interlocked with MCCB/SFU inside the compartment such that door can only be opened when MCCB/SFU is in off position. The switchboard shall be readily extendable as required by the addition of vertical sections after removal of the end covers. Switchboards shall have access to the feeders, bus bars, cable termination, cable alley, etc as required.

5.3.3.4 VERTICAL SECTION:

Each vertical section shall comprise of a front framed structure of rolled/folded CRCA sheet steel angle section of minimum 3mm thickness rigidly bolted together. This structure shall house the components contributing to the major weight of the equipment such as circuit breaker cassettes, fuse switch units, main horizontal bus bars, vertical risers and other front mounted accessories. The structure shall be mounted on a rigid base frame of folded CRCA sheet steel of minimum 6mm thickness and 75mm height. The design shall ensure that the weight of the components is adequately supported without deformation or loss of alignment during transit or during operation.



A cable chamber housing the cable end connections and power/control cable terminations. The design shall ensure generous availability of space for ease of installation and maintenance of cabling and adequate safety for working in one vertical/horizontal section without coming into accidental contact with live parts of the adjacent section. A cover plate at the top of the vertical section, provided with a ventilating hood where necessary. Any aperture for ventilation shall be covered with a perforated sheet having less than 1mm diameter perforations to prevent entry of vermin. Front and rear doors fitted with dust excluding neoprene gaskets with fasteners designed to ensure proper compression of the gaskets. When covers are provided in place of doors generous overlap shall be ensured between sheet steel surfaces with closely spaced fasteners to preclude the entry of dust. The height of the panel shall not be more than 2200mm unless otherwise specified and maximum height of operating handle shall not be more than 1800mm from FFL. The total depth of the panel shall be adequate to cater to proper cabling space. Doors shall be of minimum 14 gauge sheet steel and covers/partitions of 16G sheet steel. All sheet steel work forming the exterior of switchboards shall be smoothly finished, leveled and free from flaws. The corners should be rounded. The Components in the switch boards shall be so arranged as to facilitate ease of operation and maintenance and at the same time to ensure necessary degree of safety.

Components forming part of the switchboards shall have the following minimum clearances:

Between phases	- 25mm
Between phases and neutral	- 25mm
Between phases and earth	- 25mm
Between neutral and earth	- 19mm

When, for any reason, the above clearances are not available, suitable insulation barrier/shielding shall be provided. Clearances shall be maintained during normal service conditions. Creep age distances shall comply with those specified in relevant standards. All insulating material used in the construction of the equipment shall be of non-hygroscopic material treated to withstand the effects of high humidity, high temperature and tropical ambient service conditions. Functional units such as circuit breakers, fuse switches, MCCB's, etc. shall be arranged in multitude formation except that not more than two air circuit breakers shall be housed in a single vertical section. Metallic/insulated shrouding shall be provided within vertical sections and between adjacent sections to ensure prevention of accidental contact with: Main bus-bars and vertical risers during operation, inspection or maintenance of functional units and front mounted accessories. Cable terminations of one functional unit, when working on those of adjacent unit/units. All covers providing access to live parts/circuits shall be provided with tool operated fasteners to prevent unauthorized access. Provision shall be made for permanently earthing the frames and other metal parts of the switchgear by two independent distinct connections. Only CRCA steel sheets shall be used for fabricating the cubicle. Thickness tolerance for sheets shall be as applicable in relevant IS.

5.3.3.5 METAL TREATMENT AND FINISH:

Generally the treatment and finish of the metal surface shall be as per detailed specifications enumerated elsewhere in this document.

Degreasing:

Metal surfaces should be effectively cleaned with hot alkaline degreasing solution followed by cold water rinsing to remove traces of alkaline solution.

Phosphating:

A recognized phosphate process should be used to facilitate durable coating of the paint on the metal surfaces and also to prevent the spread of rusting in the event of the paint film being mechanically damaged. This again shall be followed by hot water rinsing to remove traces of phosphate solution. Drying in dust free atmosphere.

Primer:

Primer coating with a coat of corrosion resistant primer applied on wet surface.

Finish coat:

Two finishing coats of stoving synthetic enamel paint to the specified shade of IS:5. Both the finish shall be only spray painted or powder coating. For outdoor units the finishing coat shall be of weather resistant stoving epoxy paint of specified shade of IS:5.

5.3.3.6 BUS BARS:

The bus bars shall be made of high conductivity high strength E91E aluminium alloy suitable for 415 volts, 3 phase 4 wires 50 Hz 20KA unless otherwise specified. The bus bars shall be suitably supported with non-hygroscopic supports to provide a fault withstand capacity as specified. High tensile bolts and spring washers shall be provided at all bus bar joints. Fish plates of equal type and size shall be used at all joints. The bus bars shall have uniform cross section throughout and shall be capable of carrying the rated current at 415V continuously. The bus bars shall be designed to withstand a temperature rise of 45 Deg. C above the ambient. A current density of 1.00 Amp/Sq mm shall not be exceeded for Aluminium bus bars.

The neutral bus bars shall have a continuous rating of at least 50% of the phase bus bars, unless mentioned otherwise. Bus bars shall be fully sleeved using heat shrunk PVC sleeves appropriately colour coded to identify different phases and neutral bar. An earth bus of size not less than 40 x 6 mm aluminium/GI shall run throughout the length of switch board at top or bottom as required.

5.3.3.7 MCCB - MOULDED CASE CIRCUIT BREAKER:

The Moulded Case Circuit Breaker shall be incorporated in the switch board wherever specified and shall be of the current limiting type. MCCB shall conform to IS 2516, IS 13947- 1/ IEC 947- 1 (part I & II / section 1) 1977 for general rules. It should be suitable for Horizontal and Vertical mounting and line load reversibility. MCCB shall be suitable either for Single Phase AC 230V On Three Phase 415V. The MCCB shall be available in four pole versions for neutral isolation. It shall have topicalization as standard feature.

The MCCB cover and case shall be made of high strength heat-resistant and flame-retardant thermosetting insulating material. The operating handle shall be quick make, quick break, trip - free type. The operating handle shall have suitable 'ON' 'OFF' 'TRIPPED' indicators and in order to ensure suitability for isolation complying with IS 13947-2/IEC947-2, the operating mechanism



shall be designed such that the toggle or the handle can only be in 'OFF' position: if the main contacts are actually separated.

5.3.3.8 ACCESSORIES:

MCCB shall be designed to have following accessories and it shall be fit able at site. Under voltage trip, Shunt trip, Alarm switch, Auxiliary switch, Remote operation using motor mechanism with facility of using the same in auto/manual mode.

5.3.3.9 INTERLOCKING:

MCCB shall be provided with following interlocking devices for interlocking the door of a switch board. Handle interlock to prevent unnecessary manipulations of the breaker. Door interlock to prevent door being opened when breaker is in ON position. The interlocking device to open the door even if the breaker is in ON position. In addition to the above, ant other features indicated in the Bill of Quantities shall also be provided.

5.3.3.10 BREAKING CAPACITY:

Short time with standing capacities different ratings of MCCB's shall be as follows:

<u>Ratings [Amps]</u>	<u>Breaking Capacity [KA]</u>
01. Up to 400	35
02. 630 to 800	50
03. 1000 & Above	65

5.3.3.11 CONTACTORS:

Contactor shall comply with IS 13947-1 for general rules and IS 13947 - 4.1 for Standards pertaining to Contactor and Motor Starter. The Contactors shall be capable of withstanding breaking and making capacities per following:

AC3 category

Making Current 10 x Rated

Breaking Current 08 x Rated

AC4 category

Current 12 x Rated Current

Current 10 x Rated Current

Contactor shall be capable of withstanding an impulse voltage of 8KV and have an insulation voltage of 1000V. Contactor shall be suitable for aluminium termination with a maximum permissible temperature rise of 650 C at the terminals with an ambient temperature of 500 C. The coils shall have three terminals and the insulation should be of class H type. The auxiliary contact block shall have a switching capacity of 220V, 2A. Contactor shall have one auxiliary in built and it should be possible to have additional NO/NC contacts in steps of two.



5.3.3.12 Miniature Circuit Breakers [MCB]:

MCB shall be in 1,2,3,4, pole versions. MCB casing shall be made of self- extinguishing, tropicalised material. MCB shall comply with IS 8828-1996/IEC 898- 1995. It shall be suitable for use in frequency range 40Hz to 60Hz and shall accommodate AC/DC supply according to requirements. It shall have a trip-free mechanism and toggle shall give a positive contact indication. It shall be suitable for mounting on 35mm DIN rail/surface mounting. It may be installed horizontally, vertically on the ceiling in any place without any change in electrical performance. Line supply may be connected to either top or bottom terminals i.e. There should be no line-load restriction. Degree of protection when the MCB is flush mounted, shall be IP40. MCB shall be supplied with clamping terminals fully open. Contact closing shall be independent of the speed of operator. The breaking capacity of the MCB shall be 9KA/10KA. The MCB shall be capable of being used as Incomer Circuit Breaker and shall be suitable for use as isolator. In case of multiple MCB's in a single location (DB), it should be possible to remove any MCB without having to disturb other MCB in the vicinity.

5.3.3.13 CURRENT TRANSFORMERS:

Current transformer shall comply with the requirements of IS 2705. They shall have ratios, outputs and accuracy as specified/required. All CTs shall be of resin cast type unless otherwise specifically called for. All CT's shall be of bar type primary or suitable for the cable given type and size and the CT's shall be provided with shorting links irrespective of the CT's ratio's preferably with ELMEX / PHOENIX. For all the CT's suitable type and size clamps are to be supplied for mounting in the switch boards. Polarities and terminal markings of primary and secondary shall be clearly marked on all CT's.

Specifications for CT's:

- a. Current Ratios
 - i. Primary : As per feeder ratings
 - ii. Secondary : 5A
- b. Type : Resin Cast
- c. Class : PS-Differential Protection 5P10-O/C, E/F, RPR, Class 1 for metering
- d. System Voltage
 - i. LT : 415V 3Ph 50Hz

5.3.3.14 INSTRUMENTS & METERS:

All instruments and meters shall be enclosed in dust proof, moisture resistant, black finished cases and shall be suitable for tropical use. They shall be calibrated to read directly the primary



quantities. They shall be accurately adjusted and calibrated at Works and shall have means of calibration, check and adjustment at site.

5.3.3.15 INDICATING INSTRUMENTS:

Indicating instruments shall be flush mounted with anti-parallel white circular scales with black pointer and with black numbers and lettering. Knife edge pointers shall be preferred. Unless otherwise specified, the size of all instruments shall be 96mm x 96mm type. The dials shall be free from warping, fading and discolouring. Spring controlled instruments shall be provided with front of board zero adjuster, capable of being safely handled while the instrument is in Service. Instrument covers shall also have red marks on the dial corresponding to rated values of the associated primary equipment. Synchronising instruments shall also meet the requirements of this clause. The indicating instruments shall conform to IS:1248 and shall have on an accuracy class of 1. The Ammeter and Wattmeter current coils shall withstand 200% of rated current continuously and 10 times the rated current for 0.5 seconds without loss of accuracy. Voltmeter and Wattmeter potential coils shall withstand 120% of rated voltage continuously and twice the rated voltage for 0.5 sec. without loss of accuracy.

5.3.3.16 VOLTMETER:

Voltmeter shall be suitable for operating directly on LT supply voltage 415V, 50Hz or with a PT as per the requirements. All the Voltmeters used for rated operating Voltage of 415/110V as required at 50Hz AC. With a scale as required at site.

All Voltmeters are 96 x 96 mm, suitable for mounting on the panel. Type Sl. No. accuracy class and borders of the Voltmeter shall be indicated on the dial.

5.3.3.17 AMMETER:

All the Ammeters shall be CT operated (5A) with a dial marked for line currents. Type, Sl. No., Accuracy class, Operating Current, Burden etc., shall be indicated on the dial. All Ammeters shall be of panel mounting type and shall be provided with zerosetting screw.

5.3.3.18 PUSH BUTTONS:

Push buttons shall be of momentary contact type with rear terminal connection. These shall be suitably shrouded to prevent inadvertent operation. Integral inscription plates engraved with their functions shall be provided. All push buttons shall have two Normally Closed and two Normally Open contacts comprising rivets of pure silver. The contacts shall be able to make and carry 5 A and break up one-amp inductive load at 250V DC.



5.3.3.19 CABLE TERMINATIONS:

Cable entries and terminals shall be provided in the switch board to suit the number, type and size of aluminium conductor power cables and copper conductor control cable specified in the detailed specifications. Provision shall be made for top or bottom entry of cables as required. Generous size of cabling chambers shall be provided with the position of cable gland and terminals such that cables can be easily and safely terminated. Barriers or shrouds shall be provided to permit safe working at the terminals of one circuit without accidentally touching that of another live circuit. Cable risers shall be adequately supported to withstand the effects of rated short circuit currents without damage and without causing secondary faults. Cable sockets shall be of tinned copper and of the crimping type.

5.3.3.20 CONTROL WIRING:

All control wiring shall be carried out with 1100V grade single core PVC cable having stranded copper conductors with minimum cross section of 1.5 Sq mm for potential circuits and 2.5 Sq mm for current transformer circuits. Wiring shall be neatly bunched, adequately supported and properly routed to allow for easy access and maintenance. Wires shall be identified by numbered ferrules at each end. The ferrules shall be of ring type and of non-deteriorating material. They shall be firmly located on each termination so as to prevent free movement. All control circuit fuses shall be mounted in front of the panel and shall be easily accessible.

5.3.3.21 TERMINAL BLOCKS:

Terminal blocks shall be of 500 Volts grade and of stud/screw less type. Terminal blocks shall have a minimum current rating of 10 Amps and shall be shrouded. Provisions shall be made for label inscriptions. At least 20% spare terminals shall be provided on each panel and these spare terminals shall be uniformly distributed on all terminal blocks.

Terminal blocks for current transformer and voltage transformer secondary leads shall be provided with test links and isolating facilities. Also, current transformer secondary leads shall be provided with short circuiting and earthing facilities.

There shall be a minimum clearance of 250mm between the first row of terminal blocks and the associated cable gland plate. Also, the clearance between two rows of terminal blocks shall be a minimum of 150mm.

5.3.3.22 RELAYS:

All Relays shall conform to the requirement of IS: 3231/IS 8686 or other applicable approved standards. Relays shall be suitable for flush and Semi-flush mounting on front. At with connections from the rear. All Protective Relays shall be of draw out or plug in type/Modular cases with proper



built-in test facilities. Test blocks and switches shall be located immediately below each relay for testing. The auxiliary relays shall be self-reset type. All AC Relays shall be suitable for operation at 50Hz. AC Voltage operated relays shall be suitable for 110/v3 Volts PT secondaries and Current operated relays for 5Amp. CT secondaries as specified in this specification. Voltage operated relays shall have adequate thermal capacity for continuous operation. Auxiliary Relays and Timers shall have pairs of contacts as required to complete the scheme. Contacts shall be silver faced with spring action.

All Protective Relays, Auxiliary Relays and Timers except the lockout relays and interlocking relays specified shall be provided with self-reset type contacts. All, Trip and Timers shall be provided with externally hand reset positive action provided with inscription subject to Consultant approval. Timers shall be of the electromagnetic or solid-state type.

Wherever solid-state relays are used the following requirement shall be met with:

- All Relays shall be designed for operating under or ambient temperature 55°C and 100% relative humidity. Electronic type timers shall be as far as possible avoided.
- All accessories required for correct operation of each relay shall be supported by the Sub-contractor without any extra cost. The solid-state relays shall be stable and suitably protected against transient/induced over voltages. The bidder shall state clearly in his list special requirements, if any, for DC input arrangement or cabling considered necessary for satisfactory operation of solid-state relays quoted by him.

5.3.3.23 NAME PLATE:

The panel as well as feeder compartments shall be provided with name plate of anodized aluminium with white engraving on black background. They shall be properly secured with fasteners/rivets. The panel/feeder descriptions shall be as indicated in the drawings/ by the employer.

5.3.3.24 TESTS:

The routine tests shall be conducted as per IS standards on each Power Control Centre and shall comprise:

Inspection of the Switch Boards including inspection of wiring and electrical operational/functional tests as specified.

5.3.3.25 DIELECTRIC TESTS:

Insulation resistance of the power circuit between each pole and the earth and that between the poles shall be measured. Insulation resistance of all secondary wiring between phase and earth shall be measured. Insulation test shall be carried out both before and after high voltage test. Checking of protective measures and electrical continuity of the protective circuits.



5.3.3.26 HIGH VOLTAGE TEST:

A high voltage test with 2.5 KV for power circuit and 1.5KV for Control Circuit, Duration one minute shall be applied between each pole and earth and between poles. Test certificate shall be submitted along with panel.

5.3.3.27 STORING, ERECTION AND COMMISSIONING:

STORING

The panels shall be stored in a well-ventilated dry place. Suitable polythene covers shall be provided for necessary protection against moisture, dust and vermin.

ERECTION

Switch boards shall be installed over trench/floor as required. Suitable grouting holes shall be provided in the flooring. Suitable MS base channel shall be embedded in the flooring on which the panel can directly be installed. The switch boards shall be properly aligned and bolted to the flooring by at least four bolts. Cables shall be terminated on the bottom plate or top plate as the case may be, by using brass compression glands. The individual cables shall then be led through the panel to the required feeder compartments for necessary terminations. The cables shall be clamped to the supporting arrangement. Either side, the switch board earth bus shall be connected to the local earth grid. The base channel used for erection of panels shall form part of the cost of the panel and shall not be measured or paid separately.

PRECOMMISSION TESTS

The panels shall be commissioned only after successful completion of the following tests. The test shall be carried in the presence of Architect's representative. All main and auxiliary bus bar connections shall be checked and tightened. All wiring terminations and bus bar joints shall be checked and tightened. Wiring shall be checked to ensure that it is according to the approved drawing.

All wiring shall be tested for insulation resistance by a 500-volt megger. Phase rotation tests shall be conducted. Suitable injection tests shall be applied to all the measuring instruments to establish the correctness and accuracy of calibration and working order if required by the Employer. All relays and protective devices shall be tested for correctness of settings and operation by introducing a current generator and an ammeter in the circuit or shall produce calibration/test certificate as required by the Employer / Inspectorate / consultant. Functional tests on all feeders. Makes, type and ratings of all components shall be checked/verified as per approved drawings.

5.3.3.28 GENERAL SPECIFICATIONS FOR LOW VOLTAGE CABLES:

TYPE



Low voltage cables shall be aluminium conductor, PVC insulated, PVC sheathed and steel wire armoured or steel tape armoured, FRLS- PVC out sheathed construction. The cables shall conform to IS 1554 Part I in all respects. Cables shall be laid in tray/Hume pipe/in readymade trenches etc., as required.

The FRLS outer sheath material shall meet the following requirements (if used),

- The oxygen index value shall be minimum 29 when tested at 27 °C as per ASTM-D-2863-77 and temperature index value shall be minimum 250 °C when tested as per NES 715.
- The maximum total acid gas generation as determined by titration shall be less than 20 % by weight. The test shall be conducted as per IEC- 754-1 (1994).
- The smoke density shall be 60 % maximum, when tested as per ASTM- D-2843-77 (1988).
- The finished cable shall pass the flammability test as per IEC-332-1 (1993), In addition, it shall also pass flammability test as per Class F3 of Swedish Standard SS-424-1475 (1978).

The sizes of cables shall be selected to limit the voltage drop during running and voltage dip during starting to 5% and 10% respectively. Adequate derating factors shall be considered.

RATING

The cable shall be rated for a voltage of 1100 Volts.

CORE IDENTIFICATIONS

Cores shall be provided with the following colour scheme of PVC insulation:

1 core	:	Red/Black/Yellow/Blue
2 core	:	Red and Black
3 core	:	Red, Yellow and Blue
3 1/2 / 4 core	:	Red, Yellow, Blue & Black

STORING, LAYING, JOINTING AND TERMINATIONS:

STORING

On receipt of cables at site the cables shall be inspected and stored in a safe place.

LAYING

Cables shall be laid as per the specifications given below:



CABLES IN OUTDOOR TRENCHES

Cables shall be laid in outdoor trenches wherever called for. The depth of the trenches shall not be less than 75 cm from the final ground level. The width of the trenches shall suit easy laying of cable. Where more than one cable has to be laid in the same trench, all attempts shall be made to keep the axial distance between successive cables to be at least $1d$ where 'd' is the diameter of the bigger cable. The trenches shall be cut square with vertical side walls and with uniform depth. Wherever cables are bent, the minimum bending radius shall not be less than 12 times the diameter of the cable. After the cable is laid and straightened, it shall be covered with sand cushion. Over this a course of cable protection tiles or burnt brick shall be provided on either side and above. Trench shall be back filled with earth and consolidated. Cables shall be laid in hume pipes/stoneware pipes at all road crossings & wall entries. Approved cable markers made of CI indicating the voltage, no. of cables and the direction of run of the cables shall be installed at regular intervals.

CABLE IN INDOOR TRENCHES

Cables shall be laid in indoor trenches wherever specified. Suitable angle iron brackets, clamps, hoods and saddles shall be used for securing the cable in position.

CABLE ON TRAYS/RACKS

Cables shall be laid on cable trays/racks wherever specified. Cable racks/trays shall be of perforated steel section/slotted angles suitable for the purpose. The trays/racks shall be complete with plates, tees, elbows, risers and all necessary hardware. The steel trays shall be painted. Cable trays shall be erected properly to present a neat and clean appearance. Suitable cleats or saddles shall be used for securing the cables to the cable trays. The cable trays shall comply with the following requirements:

The trays are ladder type and shall have suitable strength and rigidity to provide adequate support for all contained cables. It shall not present sharp edges, burrs or projections injurious to the insulation of the wiring/cables. If made of sheet metal, it shall be adequately protected against corrosion or shall be made of corrosion resistant material. It shall have side rails or equivalent structural members. It shall include fittings such as horizontal, vertical bends, tie rods, hooks etc., or other suitable means for changes in direction and elevation of runs, fish plates and hardware.

INSTALLATION

Cable trays shall be installed as a complete system. Trays shall be supported properly from the building structure. The entire cable tray system shall be rigid. Each run of the cable tray shall be completed before the installation of cables. In portions where additional protection is required, non-combustible covers/enclosure shall be used. Cable trays shall be exposed and accessible.



Where cables of different system are installed on the same cable tray, non-combustible solid barriers shall be used for segregating the cables. Cable trays shall be grounded by two nos. earth continuity wires. Cable trays shall not be used as equipment grounding conductors.

JOINTING AND TERMINATIONS

Cable jointing shall be done as per the recommendations of the cable manufacturer.

Jointing shall be done by qualified cable jointers. Each termination shall be carried out using brass compression glands and cable sockets. Hydraulic crimping tool shall be used for making the end terminations. Cable gland shall be bonded to the earth by using suitable size G.I. wire/tape

Suitable identification tags with the feeder designation inscribed on an aluminium/G.I. sheet shall be tied to either ends of each cable.

TESTING

Cables shall be tested at factory as per the requirements of IS 1554 Part I. The tests shall incorporate routine tests, type tests and acceptance tests. Copy of such test certificates shall be furnished to the Employer prior to dispatch.

5.3.4 FIRE EXTINGUISHERS:

Fire extinguishers shall be worked out in such a way that the Occupants shall not travel more than 15m to reach a Fire extinguisher. Also, there shall be a Fire extinguisher for every 300 Sq. Mtr of floor plate / rooms of suitable type / size. Additional to Office areas Extinguishers to be provided at Surface car parks, outdoor Transformers / electrical installations and on the landing of each Staircase of all floors.

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

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

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

TYPES OF FIRE EXTINGUISHERS:

1. Water Co2 fire extinguishers confirming to IS-940 shall be used to extinguish class A fires.
2. Chemical foam fire extinguishers confirming to IS-933 and mechanical foam extinguishers confirming to IS-10204 shall be used to extinguish class B fires.



3. Dry chemical fire extinguishers confirming to IS-2171 shall be used to extinguish class B and class c fires.
4. Carbon dioxide fire extinguishers confirming to IS 2878 shall be used to extinguish classB and class C fires.
5. Fire extinguishers filled with mono-ammonium phosphate cited with silicon and pressurized with Nitrogen, as propelling agenda shall be used to extinguish class A, classB and class C fires.

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

GUARANTEE AND MAINTENANCE:

A warranty for all equipment, materials and accessories supplied shall be submitted against manufacturing defects or under capacity fraction for a period of 12 months from handing over. During this guarantee period any defective items shall be repaired / replaced without any additional cost and without any considerable delay.

5.3.5 SIGNAGE:

Required, as per Local fire force like exit signs & Floor indication (e.g., Ground floor, 1st floor), size shall 200mm x 500mm & action chart (size shall be 600mm x 1000mm) in case of fire / emergency, Staircase location indication etc. The location / quantity shall be on each landing of every staircase on each floor.

Signs shall be made out of 3mm thick PVC foam board with PVC non – reflective self- adhesive vinyl foam board OR equivalent material with Mirror fasteners for fixing complete.

5.3.6 FIRE ALARM SYSTEM:

An Intelligent Fire Alarm System (IFAS) shall be provided in accordance with IS:2189 / NFPA (latest edition) / NBC 2016 Vol 1, Part 4 (Fire & Safety) to effect total control over the life safety services required in the building. The IFAS shall be of the digital, distributed processing, real time, multi-tasking, multi-user and multi- location type. The system shall be capable of providing maintenance/pre-alert/fault alarm status to prevent the detectors from indicating a false alarm due to dust, dirt etc. The IFAS provided shall be able to interface with Mechanical, Electrical & Low Voltage Services into an integrated system, but not limited to:

- i. Air Handling Units
- ii. Staircase pressurization fans, Lift shafts and lift lobbies pressurization fans.
- iii. Public address system.



iv. Lifts

v. Toilet Exhaust Fan

vi. Fire fighting system

- ✓ The system shall be an active/interrogative type system where each transponder and/or addressable device operates autonomously as a peer on the signalling line circuit. Devices shall process all conditions monitored and shall cause a signal to be transmitted to the main fire alarm control panel (FACP) indicating that the device and its associated circuit wiring is functional and the specific condition being processed by the device. Loss of this signal at the main FACP shall result in a trouble indication as specified hereinafter for the particular input.
- ✓ The fire alarm system shall be manufactured by an ISO 9001 certified company.
- ✓ The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall be in compliance with the UL listing.
- ✓ Salient Features:

Basic Performance:

1. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Style 7 (Class A) Signalling Line Circuits (SLC).
2. Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style D) as part of an addressable device connected by the SLC Circuit.
3. Notification Appliance Circuits (NAC) shall be wired Class A (NFPA Style Z) as part of an addressable device connected by the SLC Circuit.
4. On Style 7 (Class A) configurations a single ground fault or open circuit on the system Signalling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
5. Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.
6. The addressable and intelligent system shall be such that smoke sensors detectors, thermal sensors, manual call points, etc., can be identified with point address. The system shall be capable of:



- a) Recognize normal and alarm conditions, below normal sensor values that reveal trouble condition, and above normal values that indicate either a pre- alarm condition or the need of maintenance.
- b) Provide a maintenance/pre-alert alarm capability at smoke sensors to prevent the detectors from indicating a false alarm due to dust, dirt etc.
- c) Provide alarm verification of individual smoke sensors. Systems that perform alarm verification on a zone basis shall not be acceptable.
- d) Provide local numeric point address and LED display of device and current condition of the point. Local annunciation shall not interfere with annunciation from the Fire Control System.
- e) Provide outputs that are addressable, i.e., outputs shall have point address.
- f) It shall be possible for system to raise alarm only if a group of detectors more than a single detector reaches the alarm condition. System which does not have this functionality are not acceptable.
- g) Point displays that combine the real-time analogue value returned from a smoke or heat detector to be combined with the state of the device to improve alarm assessment and facilitate troubleshooting.
- h) Display of the operating system software versions and database versions of FACP.
- i) The following command functions will be provided for all integrated fire alarm panels: Reset, alarm silence, change sensitivity setting, audio channel select, audio message select, enable by point or zone, disable by point or zone, output on/off.
- j) The system shall display analogue values from and provide trending capability for addressable devices such as smoke and heat detectors.

7. IFAS management and control functions provided shall perform the following:

- Acknowledging, silencing, and resetting fire alarm and security event functions.
- Manually activating, deactivating, enabling, and disabling individual fire alarm and security points
- Manually activating and restoring alternate sensitivity settings for smoke detectors.
- Generating status, maintenance, and sensitivity reports for all fire alarm components.
- Collecting and historizing data.
- Generating reports.



✓ BASIC SYSTEM FUNCTIONAL OPERATION

When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

- a) The system alarm LED on main fire alarm control panel shall flash.
- b) A local piezo-electric sounder in the control panel shall be sounded.
- c) The 640-character LCD display on the main fire alarm control panel shall indicate all information associated with Fire Alarm condition including the type of alarm point and its location within the premises.
- d) System shall log the information associated each new fire alarm control panel condition, along with time and date of occurrence.
- e) All system output programs assigned via control-by-event programs that are to be activated by a particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated.
- f) The audio portion of the system shall direct the proper signal (tone or voice) to the appropriate speaker circuit.
- g) All lifts initiated through the systems will automatically be returned to Ground Floor.
- h) Air handling units on affected floors shall automatically be switched OFF and simultaneously respective fire dampers shall also be closed.
- i) Staircase pressurization fans shall be put on.
- j) Toilet exhaust fans on affected floors shall be put off.

✓ APPROVALS:

- The system shall have proper listing and/or approval from the following internationally recognized
- UL / FM Listed / Approved

✓ Design Approach

To decide the number, type and location of detectors following parameters are considered in the design of fire alarm system-

- Fire load of an area
- Ventilation ducting layout



- Height of the room / area
- False ceiling / True ceiling and the depth of false ceiling void
- Design spacing as per IS:2189 / NFPA 72 E
- Adopting diverse paths of forward path and return path
- Fail safe mode operation of output relays

✓ Types of Detectors used

- Multi-criteria detector (having smoke & heat sensors inside one housing)
- Heat Detector where fire generates more heat than smoke
- Beam Detector where height is more and multi-criteria detectors cannot detect the fire at that level.
- Duct mounted type smoke detectors which are used to monitor return air duct.
- Push button type Manual Call Point for manual signaling of fire
- Relay module for transmitting signal to AHU Panel, Lift Panel, Toilet exhaust fan panel, Staircase pressurization panel etc.
- Monitor module to receive signal from flow switch of automatic sprinkler system

✓ Location of Detectors

- Coverage area 25 sq. m to 80 sq. m depending on height and other parameters.
- Detectors should be located away from duct diffusers
- Manual call points are located on exit route preferably at exit points.
- A clear space of 750 mm radius is maintained below the detectors.

✓ **Distribution of Fire Alarm System components**

FDA SYSTEM DESIGN MATRIX						
SL. NO.	AREA DESCRIPTION	MULTI SE NSOR DETECTOR	HEAT DETECTOR	MANU AL CALL POINT	BEAM DETECTOR	HOOTER CUM STROBE
LG FLOOR LEVEL						
	Students Activity Centre	√				
	Lower Foyer	√				
	Main Entrance					
	Souvenir Shop	√				
	Store		√			
	El. Room	√				



	C. Room	√				
	INFO RM.	√				
	Staircase -1			√		√
	Staircase -2			√		√
	Corridor	√		√		√
UG FLOOR LEVEL						
	Landscaping Ramp			√		√
	Hall-1	√		√		√
	Cafeteria	√		√		√

	Auditorium			√	√	√
	Temp Exhibition Hall	√				
	Convention Foyer	√		√		√
	Lounge	√		√		√
	Admn Office	√		√		√
	Lobby	√		√		√
	Kitchen		√			
	Service Yard			√		
	Elec. Room	√				
	Upper Floor	√		√		√
	3D Theatre	√				
	Staircase			√		
UG -MAZZ FLOOR LEVEL						
	Maintenance Office	√				
	AHU Rooms	√				
	Upper Foyer	√		√		√
	Staircase			√		√
FIRST FLOOR LEVEL						
	Hall 2	√		√		√
	Atrium Void					
	Atrium walk	√		√		√
	Hall 5	√		√		√
	Hall 4	√		√		√

	Hall 3	√		√		√
	Demo Gallery				√	
	Atrium Walk lobby	√		√		√
	Utility Store		√			
	Sec & Surv	√				
	Staircase			√		
	El. Room	√				
FIRST FLOOR LEVEL						
	AHU Room	√				
	Staircase			√		√
FW PUMP HOUSE		√				√

5.4 EQUIPMENT SPECIFICATION

FIRE DETECTION AND ALARM SYSTEM:

INDEX			
Sr. No.	DESCRIPTION	Model No	Remark
1.0	Main Fire Alarm Panel	Vendor to specify	
2.0	Repeater Panel	Vendor to specify	
3.0	Multisensor Detector	Vendor to specify	
4.0	Heat Detector	Vendor to specify	
5.0	Beam Detector	Vendor to specify	
6.0	Manual Call Point (MCP)	Vendor to specify	
7.0	Response Indicator	Vendor to specify	
8.0	Input Module (Monitor Module)	Vendor to specify	
9.0	Output Module (Relay /Control Module)	Vendor to specify	
10.0	Isolator Module	Vendor to specify	
11.0	Hooter Cum Flasher	Vendor to specify	
12.0	Graphic Software	Vendor to specify	

MAIN FIRE ALARM PANEL		
Sr. No.	Description	Data
1.0	Model	Vendor to specify
2.0	Make	Vendor to specify
3.0	Module (Part Nos.)	Vendor to specify
4.0	Type	32-bit Microprocessor, 100% Power Supply redundant, Intelligent addressable type
5.0	No. of panel	1 No.
	No. of loops	10 Loops
6.0	Type of display	7-inch Touch Screen Colour 640-character LCD display
7.0	Addressable capability	YES
8.0	Intelligence capability	YES
9.0	Standalone capability	YES
10.0	Alarm verification capability	YES
11.0	Sensor self-test capability	YES
12.0	Fault tolerant writing capability	YES
13.0	Primary power supply with local rail module 230V, 50 Hz	100-240 V AC , 50HZ
14.0	Output voltage	24 VDC
15.0	Mounting requirement	Wall mounted.
16.0	Output protection	Each Output Protected with short circuit isolator
17.0	Networking between Panels	Master To Master Active network
18.0	Listing / Approval	VDS/ EN54 /UL /FM
19.0	Number of devices/detectors per loop (max capacity)	Vendor to specify. Minimum capacity is 240 devices including detectors.
20.0	Each FAP shall contain one spare loop and each occupied loop contains 10% spare capacity	YES
21.0	Loop length (max)	Vendor to specify



22.0	Self-diagnostics	YES
23.0	indications	Alarm, faults, reset, silence, acknowledgement etc. Programmable button also available
24.0	Detector/loop disable facility	YES

25.0	Sensitivity of detectors modification from panel	YES
26.0	Operator controls	YES
27.0	No. of Potential free contact NO/ NC	Vendor to specify
28.0	Contact rating	24V/2 Amps
29.0	Simulation of fire conditions to enable the testing of circuits under the test mode from FAP	YES
30.0	Open / short circuit in the wiring shall be indicated in FAP as fault	YES
31.0	Changeover from mains supply to battery supply should be separately annunciated	YES
32.0	Separate hooters with different tones shall be provided for fault alarms and fire alarms	YES
33.0	Unauthorized removal of the detector head from its base shall be indicated in FAP as fault	YES
34.0	Protection class of FAP.	IP 30
35.0	The wiring shall be style-7 as per NFPA-72 with loop/ short circuit isolator.	Yes. Class A, Style 7 wiring with integrated fault isolator in each addressable detectors/ device
36.0	Dimension of FAP	Vendor to specify
37.0	Ambient Temperature-	-5 to +50 d C

38.0	Relative air Humidity	Max. 95%, Non-Condensing
39.0	Case material	Vendor to specify
41.0	Weight	Vendor to specify

REPEATER FIRE ALARM PANEL		
Sr. No.	Description	Data
1.0	Model	Vendor to specify
2.0	Make	Vendor to specify
3.0	Module (Part Nos.)	Vendor to specify
4.0	Type	Microprocessor based Active, Networkable , Intelligent addressable type
5.0	No. of panel	1
6.0	Type of display	7-inch Touch Screen Colour LCD display
7.0	Addressable capability	YES
8.0	Intelligence capability	YES
9.0	Primary power supply	100-240 V AC , 50HZ
10.0	Mounting requirement	Wall mounted.
11.0	Networking between Panels	Master To Master Active network
12.0	Listing / Approval	VDS / EN54 /UL/FM
13.0	indications	Alarm, faults, reset, silence, acknowledgement etc. Programmable button also available
14.0	Operator controls	YES
15.0	Protection class	IP 66
16.0	Dimension of FAP	Vendor to specify
17.0	Ambient Temperature-	-5 to +50 d C
18.0	Relative air Humidity	Max. 95%, Non-Condensing
19.0	Case material	Vendor to specify
20.0	Weight	Vendor to specify

DATA SHEET FOR MULTI DETECTOR		
Sr. No.	Description	Data



1.0	Item	Multi sensor detector with Base
2.0	Manufacture	Vendor to specify
3.0	Type Of Detector	Multi sensor detector - can be used as a smoke detector, as a heat detector or as a combined smoke/ heat detector as well. Having integrated short circuit isolator.
4.0	Model	Vendor to specify
5.0	Listing / Approval	VDS / EN54 /UL/FM
6.0	Mounting	On Base (Twist & Lock), IP40
7.0	Sensing Element	Photoelectric chamber for smoke detection, Thermistorforheat detection
8.0	Sensitivity	As per EN-54.
9.0	Coverage Area for Design	As per IS: 2189 guidelines, depending upon ceilingheight.
10.0	Sensitivity Adjustment	Yes
11.0	Fixed Temperature Setting	Different 9 temperature class as per EN54 including Fixed54 / 69 ° C.
12.0	Circuit Wiring	Serial two wire technology, Class-A, Style 7 IntegratedShortCircuit Isolator in each detector.
13.0	Operating Voltage	15 to 33 VDC
14.0	IP Rating	IP-40
15.0	Addressing	Automatic
16.0	On Board Micro Processor	Yes
17.0	Current Consumption	< 0.55 mA
18.0	Short Circuit Isolator	Vendor to specify
19.0	Air Velocity Range	Max. 20 m/s
20.0	Temperature Range	-20° C to +50° C
21.0	Humidity Range	< 95 % RH non condensing
22.0	Storage Temperature	-25° C to + 80° C
23.0	Mounting Base Model No.	Vendor to specify
24.0	Listing	VDS approved, CE certified
25.0	Addressable Capability	Yes
26.0	Dimensions	Vendor to specify
27.0	Weight	Vendor to specify
28.0	Catalogue Enclosed	Vendor to specify

DATA SHEET FOR HEAT DETECTOR		
Sr. No.	Description	Data
1.0	Item	Heat detector with Base
2.0	Manufacture	Vendor to specify



3.0	Type Of Detector	Addressable Rate of Rise type.
4.0	Model	Vendor to specify
5.0	Listing / Approval	VDS / EN54 /UL/FM
6.0	Mounting	On Base (Twist & Lock), IP40
7.0	Sensing Element	Thermistor for heat detection
8.0	Sensitivity	As per EN-54.
9.0	Coverage Area for Design	As per IS: 2189 guidelines, depending upon ceiling height.
10.0	Sensitivity Adjustment	Yes
11.0	Fixed Temperature Setting	Different 9 temperature class as per EN54 including Fixed 54 / 69 ° C.
12.0	Circuit Wiring	Serial two wire technology, Class-A, Style 7 Integrated Short Circuit Isolator in each detector.
13.0	Operating Voltage	15 to 33 VDC
14.0	IP Rating	IP-40
15.0	Addressing	Automatic
16.0	On Board Micro Processor	Yes
17.0	Current Consumption	< 0.55 mA
18.0	Short Circuit Isolator	Vendor to specify
20.0	Temperature Range	-20° C to +50° C
21.0	Humidity Range	< 95 % RH non condensing
22.0	Storage Temperature	-25° C to + 80° C
23.0	Mounting Base Model No.	Vendor to specify
24.0	Listing	UL/FM/VDS
25.0	Addressable Capability	Yes
26.0	Dimensions	Vendor to specify
27.0	Weight	Vendor to specify
28.0	Catalogue Enclosed	Vendor to specify

DATA SHEET FOR BEAM DETECTOR

Sr. No.	Description	Data
1.0	Item	Beam detector with Base
2.0	Manufacture	Vendor to specify
3.0	Type Of Detector	Smoke detector - can be used Large open area, Public Place.
4.0	Model	Vendor to specify
5.0	Listing / Approval	VDS / EN54 /UL/FM
6.0	Mounting	On Base (Twist & Lock)



7.0	Sensing Element	Photoelectric chamber for smoke detection
8.0	Operating Temperature	30° C to +55° C
9.0	Coverage Area for Design	As per NFPA-72 guidelines, depending upon ceiling height.
10.0	Sensitivity Adjustment	Yes
11.0	Circuit wiring	Serial two wire technology, Class-A, Style 7.
12.0	Operating Voltage	15 to 33 VDC
13.0	IP Rating	IP-40
14.0	Addressing	Automatic/Manual
15.0	On Board Micro Processor	Yes
16.0	Humidity Range	< 95 % RH non condensing
17.0	Mounting Base Model No.	Vendor to specify
18.0	Listing	UL/FM/VDS
19.0	Addressable Capability	Yes
20.0	Dimensions	Vendor to specify
21.0	Weight	Vendor to specify
22.0	Catalogue Enclosed	Vendor to specify

DATA SHEET FOR MANUAL CALL POINT		
Sr. No.	Description	Data
1.0	Item	Addressable Manual Call Point
2.0	Manufacture	Vendor to specify
3.0	Type Of Device	Addressable Glass Break type
4.0	Model	Vendor to specify
5.0	Mounting	Surface
6.0	Sensing Element	Manual Switch
7.0	Operation	Break the glass
8.0	Addressing	Automatic
9.0	On Board Micro Processor	Yes
10.0	Circuit Wiring	Serial two wire technology, Class-A, Style 7.
11.0	Operating Voltage	15 to 33 VDC
12.0	Normal / Alarm Current	Alarm current: 0.26 mA
13.0	Protection class	IP52



14.0	Operating Temperature	-10° C to +55° C - for Indoor
15.0	Humidity	95% without condensation
16.0	Storage Temp.	-20°C to +70°C
17.0	LED Indication	RED in case of activation
18.0	Listing / Approval	VDS / EN54 /UL/FM
19.0	Dimensions	Vendor to specify
20.0	Weight	Vendor to specify.
21.0	Color	Vendor to specify
22.0	Catalogue enclosed	Vendor to specify

DATA SHEET FOR RESPONSE INDICATOR		
Sr. No.	Description	Data
1.0	Item	Response Indicator
2.0	Manufacture	Vendor to specify
3.0	Type Of Device	Remote LED Alarm Indicator with 360 Degree Viewing.
4.0	Model	Vendor to specify
5.0	Connection	Screw clips, maximum 1.4 sq. mm
6.0	Operating Voltage	15 to 33 VDC
7.0	Normal / Alarm Current	Power consumption: 3 mA
8.0	Ambient Temperature	-20° C to +65° C
9.0	Protection class	IP40
10.0	LED Indication	RED in case of Alarm
11.0	Dimension	Vendor to specify
12.0	Weight	Vendor to specify
13.0	Catalogue Enclosed	Vendor to specify

TECHNICAL DATASHEET OF ADDRESSABLE INPUT MODULE (Monitor Module)		
Sr.No.	Description	Data
1.0	Item	Input Module (Monitor Module)



2.0	Make	Vendor to specify
3.0	Type	Addressable Single Input
4.0	Model No.	Vendor to specify
5.0	Listing / Approval	VDS / EN54 /UL/FM
6.0	Rating	Can Monitor Potential Free Inputs / Line Monitoring
7.0	Circuit Wiring	Serial two wire technology, CLASS-A, Style 7.
8.0	Operation Voltage	15 - 33VDC
9.0	Current Consumption	1.9 mA
10.0	Temperature	—20° C to + 65 ° C
11.0	Humidity	96% non-condensing
12.0	Dimensions (Ø X H)	Vendor to specify
13.0	Catalogue Enclosed	Vendor to specify

TECHNICAL DATASHEET OF ADDRESSABLE RELAY / CONTROL MODULE

Sr. No.	Description	Data
1.0	Item	Addressable Relay / Control Module
2.0	Make	Vendor to specify
3.0	Type o Device	Single relay output with programmed fail-safe position
4.0	Model No.	Vendor to specify
5.0	Listing / Approval	VDS / EN54 /UL/FM
6.0	Mounting	Inside Enclosure
7.0	Contact Rating	1 Amp. @ 30 VDC
8.0	Circuit Wiring	Serial two wire technology, CLASS-A, Style 7.
9.0	Operation Voltage	15 – 33 VDC
10.0	Current Consumption	1.75 mA
11.0	Temperature	—20° C to + 55 ° C
12.0	Humidity	96% non-condensing
13.0	Colour	Vendor to specify



14.0	Material	ABS PC Blend
15.0	Dimensions (Ø X H)	Vendor to specify
16.0	Catalogue Enclosed	Vendor to specify

TECHNICAL DATASHEET OF ADDRESSABLE ISOLATOR MODULE		
Sr. No.	Description	Data
1.0	Item	Addressable Isolator Module
2.0	Make	Vendor to specify
3.0	Type o Device	Automatically open circuit when line voltage drop / short circuit.
4.0	Model No.	Vendor to specify
5.0	Listing / Approval	VDS / EN54 /UL/FM
6.0	Mounting	Inside Enclosure
7.0	Circuit Wiring	Serial two wire technology, CLASS-A, Style 7.
8.0	Operation Voltage	15 – 33 VDC
9.0	Current Consumption	Max 400 µA
10.0	Temperature	—20° C to + 55 ° C
11.0	Humidity	96% non-condensing
12.0	Colour	Vendor to specify
13.0	Material	ABS PC Blend
14.0	Dimensions (Ø X H)	Vendor to specify
15.0	Catalogue Enclosed	Vendor to specify

DATA SHEET FOR HOOTER CUM STROBE		
Sr. No.	Description	Data
1.0	Item	Hooter Cum Flasher (Strobe)
2.0	Manufacture	Vendor to specify
3.0	Type of Device	Addressable type
4.0	Model	Vendor to specify
5.0	Listing / Approval	VDS / EN54 /UL/FM



6.0	Mounting	Surface
7.0	Sound output for Hooter	92.1 dB(A) with 5 SPL
8.0	Type of Tone	Selectable 32 different tone
9.0	Addressing	Automatic
10.0	Operating Voltage	15 to 33 V DC
11.0	Alarm Current	10.25 mA
12.0	Temperature	-20° C to +70° C - Ambient Temperature
13.0	Dimensions (Ø X H)	Vendor to specify
14.0	Protection Class	IP: 42
15.0	Catalogue enclosed	Vendor to specify

DATA SHEET FOR GRAPHIC SOFTWARE		
Sr. No.	Description	Data
1.0	Item	Graphic Software
2.0	Manufacture	Vendor to specify
3.0	Type	Graphical control & Management software
4.0	Model	Vendor to specify
5.0	Supports up to how may clients	One Server and Nine clients
6.0	Installation	To be installed in computer
7.0	Purpose & Use	For simple and clear indication and operation of fire alarm systems. Graphically monitoring & controlling of the fire alarm system.
8.0	Protection	Password protected
9.0	System monitoring	All connected fire alarm systems are monitored
10.0	Logging	Continuous logging – with note and reports functions
11.0	Drawings upload	Can be imported from all current graphics and CAD programs
12.0	Data Back up	Automatic backup of data providing an online backup



5.5 EQUIPMENT TECHNICAL PARTICULARS
(To be furnished by bidders along with their bids)

TECHNICAL DATA SHEET		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: MAIN FIRE PUMP – HYDRANT & SPRINKLERJOCKEY FIRE PUMP	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type of Pump	:
5.0	Liquid Handled	:
6.0	Specific Gravity / Temperature	:
7.0	Discharge (M ³ /Hr)	:
8.0	Total Dynamic Head (MWC)	:
9.0	Pump Efficiency (%)	:
10.0	No. of Stages	:
11.0	Speed (RPM) Nominal	:
12.0	Duty Point Power (KW)	:
13.0	NPSH at Duty Point (MWC)	:
14.0	Performance at 150% - Q	
14.1	Discharge (M ³ /Hr)	:
14.2	Head (MWC)	:
14.3	Efficiency at Rated Duty Point	:
14.4	BKW (KW)	:
14.5	Recommended Driver Rating	:
15.0	Suction x Delivery (mm)	:
16.0	Type of Impeller	:
17.0	Shut-Off Head	:
18.0	NPSH Required (MWC)	:



TECHNICAL DATA SHEET			
19.0	Material of Construction		
19.1	Casing	:	
19.2	Shaft	:	
19.3	Shaft Sleeve	:	
19.4	Impeller	:	
19.5	Casing Wearing Rings	:	
19.6	Stuffing Box Packing	:	
19.7	Gland	:	
19.8	Base Plate	:	
19.9	Flexible Coupling	:	
19.10	Gland Packing	:	
19.11	Fasteners	:	
20.0	Inspection	:	
	Documents to be submitted as part of this	:	Performance Curves
21.0	Data Sheet		GA Drawing Cross-Sectional Drawing
22.0	Loading Details	:	
22.1	Static	:	
22.2	Dynamic	:	
23.0	Painting Specifications	:	
24.0	Mode of Assembly	:	Factory Site
25.0	Mode of Packing	:	



TECHNICAL DATA SHEET		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: PUMP DRIVER – DIESEL ENGINE	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type of Engine	:
5.0	Engine Rating (HP)	:
6.0	Speed (RPM) Continuous	:
7.0	Output HP Continuous	:
8.0	Type of Cooling	:
9.0	No. of Cylinders	:
10.0	Bore x Stroke (mm)	:
11.0	Mean Piston Speed (At Rated RPM)	:
12.0	SFC (g/hp/hr)	:
13.0	Governor Operation	:
14.0	Class of Accuracy	:
15.0	Lube Oil Sump Capacity (Ltrs)	:
16.0	Direction of Rotation	:
17.0	Type of Lube Oil and Grade	:
18.0	Noise Level	:
19.0	Vibration Velocity	:
20.0	Starting Battery – Capacity / Make	:
21.0	Cooling System	:
22.0	Lube Oil Cooler type	:
23.0	Lube Oil Pressure (kg/cm ²)	:
24.0	Maximum permissible suction lift for engine fuel pump	:
25.0	Silencer type	:
26.0	Minimum I.D Of Exhaust Pipe	:



TECHNICAL DATA SHEET



27.0 Back Pressure at Exhaust Manifold :

28.0 Exhaust Temperature :



29.0	Starting Method	:
30.0	Diesel Tank Capacity	:
30.1	Overall Dimensions	:
30.2	No. of Hours of Continuous Operation	:
30.3	List of Tank Accessories included	:
31.0	Inspection	: As per approved QAP Documents to be submitted as
	part of this	: Performance Curves
32.0	Data Sheet	GA Drawing
	Cross-Sectional Drawing	
33.0	Loading Details	:
33.1	Static	:
33.2	Dynamic	:
34.0	Painting Specifications	:
35.0	Mode of Packing	:



TECHNICAL DATA SHEET		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: PUMP DRIVER – ELECTRIC MOTOR (FOR BOTH MAIN & JOCKEY PUMP)	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Duty	:
6.0	Frame Designation	:
7.0	Output (KW)	:
8.0	Voltage	:
9.0	Full Load Current (Amps)	:
10.0	Full Load Speed (RPM)	:
11.0	Enclosure	:
12.0	Type of Protection	:
13.0	Mounting	:
14.0	Ambient Temp / Temp Rise (°C)	:
15.0	Full Load Torque (Kgm)	:
16.0	Applicable Code	:
17.0	Starting Torque (As % of FLT)	:
18.0	% Efficiency at 100% Load	:
19.0	% Efficiency at 75% Load	:
20.0	% Efficiency at 50% Load	:
21.0	Rotation viewed from DE	:
22.0	Bearing Type – DE / ODE	:
23.0	Type of Lubrication	:
24.0	Cable Size / Type (sq.mm)	:
25.0	Phase / Connection / No. of Terminals	:
26.0	Frequency (Hz)	:



TECHNICAL DATA SHEET		
27.0	Insulation Class	:
28.0	No. of Poles	:
29.0	Locked Rotor Current (% of FLC)	:
30.0	LR withstand time Hot / Cold	:
31.0	Stator Thermal Time Constant minimum	:
32.0	PF at 100% load	:
33.0	PF at 75% load	:
34.0	PF at 50% load	:
35.0	Pull-Out Torque (% of FLT)	:
36.0	Space Heaters (Watts / Volts)	:
37.0	Accessories	:
38.0	TB from DE	:
39.0	Starting Time at 100% V Sec	:
40.0	Type of Starting	:
41.0	Noise Level – Standard / Maximum	:
42.0	Vibration	:
43.0	No. of Sequential starts / hr (hot / cold)	:
44.0	Combined Variation of Voltage & Frequency	:
45.0	Painting Specifications / Colour Shade	:
46.0	Nett Weight	:
47.0	Inspection	: As per approved QAP
48.0	Mode of Packing	:
49.0	Documents to be submitted as part of this	: Performance Curves
	Data Sheet	GA Drawing Cross-Sectional Drawing



TECHNICAL DATA SHEET		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: HYDRANT VALVE	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Design Code & Standard	:
6.0	Head	:
7.0	Outlet Size	:
8.0	Flange Size & Drill Code	:
9.0	Bonnet	:
10.0	Stem	:
11.0	Cap	:
12.0	Outlet Connection	:
13.0	Material of Construction	
13.1	Body	:
13.2	Female Instantaneous Outlet	:
13.3	Check Nut	:
13.4	Spring	:
13.5	Stop Valve	:
13.6	Spindle Rod	:
13.7	Hand Wheel	:
13.8	Blank Cap	:
13.9	Gland Nut	:
13.10	Bonnet	:
13.11	Painting Specification & Colour Shade	:
14.0	Inspection & Testing	
14.1	Body Test Pressure	:



<u>TECHNICAL DATA SHEET</u>		
14.2	Valve Seat Test Pressure	:
14.3	Minimum Discharge	:

<u>TECHNICAL DATA SHEET</u>		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: BRANCH PIPE & NOZZLE	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Design Code & Standard	:
6.0	Inlet Branch Pipe Size	:
7.0	Outlet Nozzle Size	:
8.0	Material of Construction	
8.1	Branch Pipe	:
8.2	Nozzle	:
8.3	Washer	:
8.4	Finishing	:
9.0	Inspection & Testing	
9.1	Body Test Pressure	:
9.2	Valve Seat Test Pressure	:
9.3	Minimum Discharge	:
9.4	Certification	:



<u>TECHNICAL DATA SHEET</u>		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: HOSES WITH INDOOR & OUTDOOR COUPLINGS	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Design Code & Standard	:
6.0	Inside Diameter	:
7.0	Length	:
8.0	Type of Couplings	:
9.0	Material of Construction	
9.1	Hose	:
9.2	Binding Wire	:
9.3	Coupling & Lug	:
9.4	Spring	:
9.5	Washer	:
9.6	Hose Colour	:
10.0	Inspection & Testing	
10.1	Proof Pressure	:
10.2	Burst Pressure	:
10.3	Minimum Discharge	:
10.4	Certification	:



<u>TECHNICAL DATA SHEET</u>		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: FIRE BRIGADE INLET & DRAWOUT CONNECTOR	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Design Code & Standard	:
6.0	Inlet	:
7.0	Outlet	:
8.0	Material of Construction	
8.1	Body	:
8.2	NRV & Male parts	:
8.3	Spring	:
8.4	Washer	:
8.5	Blank Cap	:
8.6	Finishing	:
9.0	Inspection & Testing	
9.1	Body Test Pressure	:
9.2	Certification	:



TECHNICAL DATA SHEET		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: BUTTERFLY VALVE	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Design Code & Standard	:
6.0	Rating	:
7.0	Services	:
8.0	Operation	:
9.0	Supervisory Switch	: Yes No
9.1	Make	:
9.2	Model	:
9.3	Rated Insulation Voltage	:
9.4	Rated Thermal Current	:
9.5	Rated Operational Current	:
9.6	Short Circuit Protection HRC Fuses	:
9.7	Ambient Temperature (°C)	:
9.8	Degree of Protection	:
10.0	Material of Construction	
10.1	Body	:
10.2	Body Liner	:
10.3	Disc	:
10.4	Shaft	:
10.5	Painting Specification & Colour Shade	:
11.0	Inspection & Testing	
11.1	Body Test Pressure	:
11.2	Valve Seat Test Pressure	:
11.3	Working Pressure	:



<u>TECHNICAL DATA SHEET</u>		
11.4	Certification	:

<u>TECHNICAL DATA SHEET</u>		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: PRESSURE SWITCH & PRESSURE GAUGE	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Design Code & Standard	:
6.0	Range	:
7.0	Differential Range	:
8.0	Mounting	:
9.0	Electrical Rating	:
10.0	Set Point Adjustment	:
11.0	Differential Type	:
12.0	Element Type	:
13.0	Process Connection	:
14.0	Cable Connection	:
15.0	Accuracy	:
16.0	Maximum Pressure	:
17.0	Degree of Protection	:
18.0	Material of Construction	
18.1	Case Material	:
18.2	Element Material	:
18.3	Wetted Parts	:
19.0	Inspection & Testing	
19.1	Certification	:



<u>TECHNICAL DATA SHEET</u>		
Project	: K.D. Malaviya National oil Museum, Guwahati	
Package	: FIRE FIGHTING SYSTEMS	
Equipment Item	: C. I. GATE & NON-RETURN VALVE	
1.0	Manufacturer	:
2.0	Model No.	:
3.0	Quantity	:
4.0	Type	:
5.0	Design Code & Standard	:
6.0	Rating	:
7.0	Services	:
8.0	Operation	:
9.0	Material of Construction	
9.1	Body	:
9.2	Body Seat Ring & Wedge facing Ring	:
9.3	Wedge	:
9.4	Wedge Nut	:
9.5	Stem	:
9.6	Bonnet Gasket	:
9.7	Bonnet Bolts, Studs / Nuts	:
9.8	Bonnet	:
9.9	Stuffing Box	:
9.10	Gland Packing	:
9.11	Gland	:
9.12	Hand Wheel	:
9.13	Spindle	:
10.0	Inspection & Testing	
10.1	Body Test Pressure	:
10.2	Valve Seat Test Pressure	:
10.3	Working Pressure	:



<u>TECHNICAL DATA SHEET</u>	
10.4	Certification :



LIST OF APPROVED MAKES

<u>DESCRIPTION</u>	<u>MAKE</u>
01 DEISEL ENGINE	: KIRLOSKAR / GREAVES / ASHOK LEYLAND
02 FIRE PUMPS	: KIRLOSKAR / M&P / KSB/ GRUNDFOSS
03 ELECTRICAL MOTORS	: KIRLOSKAR / SEIMENS / CROMPTON / ABB
04 BOOSTER PUMP	: KIRLOSKAR / M&P / KSB/ GRUNDFOSS
05 GI / MS. PIPES ('C' CLASS)	: TATA / JINDAL (HISAR)
06 GI / MS fittings	: R' Brand / Unik / VS / MS Fittings
07 BUTTERFLY VALVES	: INTERVALVE / AUDCO / ZOLOTO
08 BALL VALVE (15-40mm dia)	: RB / ITAP / TBS / CIMBRIO / ZOLOTO
09 SLUICE VALVES	: KIRLOSKAR / H SARKAR / VENUS
10 NON - RETURN VALVE - FLAP TYPE CAST IRON	: KIRLOSKAR / H SARKAR / VENUS
11 FIRE HOSE	: JAYSHREE / NEWAGE / CRC
12 FIRE EXTINGUISHER	: SAFEX / MINIMAX / NEWAGE
13 PRESSURE GUAGE	: H - GURU / FIEBIG
14 PRESSURE SWITCH	: DANFOSS / INDFOSS
15 TERMINATION LUGS	: DOWELLS / USHA
16 PVC INSULATED COPPER WIRES	: FINOLEX / POLYCAB / UNIVERSAL / CCI / GLOSTER
17 CABLES	: FINOLEX / POLYCAB /UNIVERSAL / CCI / GLOSTER/ GEMSCAB
18 SFU's / FSU's	: SEIMENS / L&T / ABB / SCHNEIDER



19	HRC FUSES	:	SEIMENS / L&T / ABB / SCHNEIDER
20	OVER LOAD RELAYS	:	EE / L&T
21	SINGLE PHASE PREVENTOR	:	L&T / SEIMENS / MINILEC
22	INDICATING LAMPS & PUSH BUTTONS	:	L&T / TECHNIC
23	MCCB / MPCB / MCB/RCCB	:	SEIMENS / L&T / ABB / SCHNEIDER
24	STARTER	:	L&T / SIEMENS / ABB / SCHNEIDER
25	CT	:	AE / KAPPA
26	SPRINKLER HEAD	:	TYCO / RELIABLE / HD FIRE
27	SPRINKLER ICV	:	TYCO / RELIABLE / HD FIRE
28	GUN METAL BRANCH PIPE	:	NEWAGE / WINCO / MINIMAX
29	GUN METAL NOZZEL	:	NEWAGE / WINCO / MINIMAX
30	AIR RELEASE VALVE	:	RB / TBS /ZOLOTO CIMBRIO
31	RUBBER HOSE REEL WITH DRUM	:	NEWAGE / MINIMAX / WINCO
32	FIRE BUCKETS	:	SAFEX / MINIMAX / NEWAGE
33	SUCTION STRAINER 'Y'	:	KIRLOSKAR / H SARKAR / VENUS
34	BATTERY	:	EXIDE / COMTECH
35	PIPE SUPPORT	:	HI - TECH / FABRICATED AS PER SITE CONDICATION
36	HYDRANT VALVE	:	NEWAGE / MINIMAX / WINCO
37	FOOT VALVE (CAST IRON)	:	KIRLOSKAR / H SARKAR / VENUS
38	FLEXI DROPS	:	HD FIRE / NEWAGE / SAFEX
39			ADLEC / TRICOLITE / EAP / C&S / ANY OTHER CPRI APPROVED



	LT PANEL	MAKE SUBJECT : TO APPROVAL
40	FIRE ALARM PANEL	: NOTIFIER / HONEYWELL / BOSCH
41	MULTISENSOR DETECTOR	: NOTIFIER / HONEYWELL / BOSCH
42	HEAT DETECTOR	: NOTIFIER / HONEYWELL / BOSCH
43	BEAM DETECTOR	: NOTIFIER / HONEYWELL / BOSCH
44	RESPONSE INDICATOR	: NOTIFIER / HONEYWELL / BOSCH
45	MANUAL CALL POINT	: NOTIFIER / HONEYWELL / BOSCH
46	HOOTER CUM STROBE	: NOTIFIER / HONEYWELL / BOSCH
47	CONTROL / MONITOR MODULE	: NOTIFIER / HONEYWELL / BOSCH
48	CONTROL RELAY MODULE	: NOTIFIER / HONEYWELL / BOSCH
49	CABLE	: RR CABLE / POLYCAB/FINOLEX/GEMSCAB
50	GLAND	: ISI MARKED

The Tenderer shall indicate the specific make of material (any one of the make listed in “list of approved make”) proposed to be used by them for the said work against each item failing which the client reserves the right to choose any one make out of the makes of materials. In case the make of any item is not listed in the “List of approved make”, the tendered shall propose the make of the said item which they intend to use in the project.

Signature and Seal of the tenderer



“ANNEXURE –D”

SCHEDULE OF QUANTITIES AND RATES (SOQR)					
SI No.	Item Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
A	FIRE ALARM SYSTEM				
1	FIRE ALARM PANEL				
1.1	Supplying, installation, testing and commissioning of micro processor based intelligent addressable main fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 320 character graphics/ LCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5 % V, 50 hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger. The panel shall have facility to connect printer to printout log and facility to have seamless integration with analogue/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories . The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications. 10 Loop Control Panel having CPU with 640 character display including backlite LCD display qwerty programming and operating manuals, supporting 1 to 10 signalling line circuits (up to 5 extendable cards & supporting 103 network modes) complete as required.	No.	1	454896	454896
2.0	Supplying, installation, testing & commissioning of intelligent analogue addressable photothermal detector complete with mounting base and all other mounting accessories complete as required.	No.	440	2846	1252240
3.0	Supplying, installation, testing & commissioning of intelligent addressable thermal detector with rate of rise cum fixed temperature thermistor complete with base and all other mounting accessories complete as required.	No.	3	2713	8139
4.0	Supplying, installation, testing & commissioning of addressable beam detector with short circuit isolator (inbuilt or separate) complete with emitter and receiver including connections with remote test features etc. (for 30' to 330' range) and all other mounting accessories complete as required	Nos	2	74778	149556
5.0	Supplying, installation, testing & commissioning of response indicator on surface/ recessed MS Box having two LED, metallic cover complete with all connections etc as required.	Nos	175	263	46025
6.0	Supplying, installation, testing & commissioning of addressable manual call point with manual break glass point and all other accessories complete as required.	Nos	28	3859	108052
7.0	Supplying, installation, testing & commissioning of addressable horn cum strobe with all mounting accessories complete as required.	Nos	28	3494	97832
8.0	Supplying, installation, testing & commissioning of addressable fire control module for activating hooters with all the mounting accessories complete as required. One CM shall provide one activation signals.	Nos	28	2990	83720

9.0	Monitor Module : Supply, Installation, testing and commissioning of Addressable Monitor Modules as per technical specification with all the mounting accessories complete as required. One MM shall provide one activation signals.	Nos	8	2990	23920
10.0	Supplying, installation, testing & commissioning of fault isolator complete with base and all other mounting accessories complete as required.	Nos	56	3257	182392
11.0	Supplying, installation, testing & commissioning of addressable fire control module with base for tripping of AHU's & Ventilation Equipment with all the mounting accessories complete as required.	Nos	12	2990	35880
12.0	Cables				
12.1	Supplying & laying of 2x1.5 sq mm fire alarm armoured cable, 600/1000V rated with annealed copper conductor having XLPE insulation, steel wire armouring & FRLS outer sheath with Ferrules, Lugs, saddles, saddles base & other accessories complete as required. (LOOP CABLE)	Mtr	6650	141	937650
12.2	Supply, wiring, testing and commissioning of ISI Certified 2C X 2.5 sq.mm, twisted shield, FRLS type, armoured double insulated copper cable with Ferrules, Lugs, saddles, saddles base & other accessories complete as required. The cable specification shall meet FACP & other devices manufacturer requirement. (POWER CABLE)	Mtr	2650	194	514100
TOTAL FOR PART - A					3894402
B)	FIRE PUMP & EQUIPMENTS				
1.0	Supplying, installation, testing and commissioning of Electric driven Main Fire Pumps (Hydrant and Sprinkler) suitable for automatic operation and consisting of following, complete in all respects, as required :				
a)	Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal conforming to IS 1520 capable for delivering <u>2280 LPM water at 88 MWC</u> to ensure a minimum pressure of 3.5kg/cm ² at the farthest point.				
b)	Suitable HP Squirrel cage induction motor, TEFC, synchronous speed 1500 RPM, suitable for operation on 415 volts, 3 phase 50 Hz, AC supply with IP 55 protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325.				

c)	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
d)	Suitable cement concrete foundation duly plastered with anti vibration pads.	Sets	2	401738	803476
2.0	Supplying, installation, testing and commissioning of diesel engine driven main fire pump suitable for automatic operation and consisting of following, complete in all respects, as required : (Diesel Driven Pump)				
a)	Horizontal type, multistage, centrifugal pump of cast of iron body and bronze impeller with stainless steel shaft, mechanical seal conforming to IS 1520 capable for delivering <u>2280 LPM of water at 88 MWC</u> to ensure a minimum pressure of 3.5kg/cm2 at the farthest point.				
b)	Suitable HP, 1500 RPM water cooled with radiator, diesel engine conforming to relevant IS standard complete with auto starting mechanism, 12 /24 volts electric starting equipment, diesel tank, exhaust pipe extended upto 10 m outside pump house duly insulated with 50 mm thick glass wool with 1.0 mm thick aluminium sheet cladding, residential silencer, instruments and protection as per standard specification, stop solenoid for auto stop in the event of fault with audio indications, painted with post office red colour etc. as required.				
c)	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
d)	Suitable cement concrete foundation duly plastered with anti vibration pads.	Set	1	634141	634141
3.0	Supplying, installation, testing and commissioning of electric driven pressurisation pump suitable for automatic operation and consisting of following, complete in all respects, as required : (Jockey Pump)				
a)	Horizontal type, multistage, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal conforming to IS : 1520. capable for delivering <u>180 LPM of water at 88 MWC</u> to ensure a minimum pressure of 3.5kg/cm2 at the farthest point.				
b)	Suitable HP squirrel cage induction motor TEFC type suitable for operation on 415 volts, 3 phase 50 Hz AC supply with IP 55 class of protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS : 325				
c)	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
d)	Suitable cement concrete foundation duly plastered with anti vibration pads.	Set	1	126235	126235
4.0	Supplying, installation, testing and commissioning of electric driven terrace pump suitable for automatic operation and consisting of following, complete in all respects, as required: (Terrace Pump)				

a)	Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical confirming to IS : 1520				
b)	Suitable HP squirell cage induction motor TEFC type suitable for operation on 415 volts, 3 phase, 50 Hz, AC supply with IP55 class of protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325				
c)	M.S.fabricated common base plate, coupling, coupling guard, foundation bolts etc.as required.				
d)	Suitable cement concrete foundation duly plastered and with anti vibration pads				
	900 lpm at 35 m Head	Set	2	100946	201892
5.0 Control Panel for Fire pumps.					
	Fabrication, supply, Insallation testing & commissioning of Electrical control panel of cubical construction, floor mounted type, fabricated out of 2mm thick CRCA sheet, compartmentalised with hinged lockable doors, dust and vermin proof, powder coated of approved shade after 7 tank treatment process, cable alley, inter connection with suitable size copper conductor cable/solid copper strip, having switchgears and accessories, mountings and internal wiring, earth terminals, numbering etc. complete in all respect, suitable for main fire pump, pressurisation pump & diesel pump set complete as per CPWD specification with following in coming and Outgoings, suitable for operation on 415V, 3 phase, 50Hz Ac Supply with enclosure protection class IP 42 as required :	Set	1	449335	449335
INCOMING					
	630A, 50kA 4 Pole MCCB, Ics=100% Icu Rating Digital Voltmeter 0-500V with selector switch Ammeter (0-630 A) with selector swtich & CTs etc. LED type RYB phase indicating lamps, ON, OFF, trip indicating lamps Set of Copper Bus Bar 800Amps				
OUTGOING					
	(Note : All outgoing feeders for pumps should have digital Ammeter with selector switches, and LED type ON, OFF, trip indicating lamps)				
Main Fire Pump 200 Amp, 50kA TPN MCCB, Ics=100% Icu, with fully automatic Star/Delta starter suitable for 75 hp pump with overload protection, current sensing type single phase preventor complete with all acceessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation. - 2 sets					

	Jockey Pump 100 Amp, 50kA TPN MCCB, Ics=100% Icu, with Suitable HP fully automatic Star/Delta starter with overload protection, current sensing type single phase preventor complete with all accessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation. - 1 set				
	Diesel Engine Control Control for diesel engine comprising - Automatic/Manual selector switch & 3 attempts starting device, timers and relays as required, push buttons, start/stop in manual mode Indicating lamp for high/ Low Lub. Oil pressure, High Water Temp and Engine on indication Battery charger suitable for 12V/24 V DC with boost and trickle selector switch, 0-30 V DC volt meter, and 0-20 A DC Ammeter All standard relays and accessories for automatic operation of diesel engine				
	System Controller Designing, Supply, Installation, Testing and commissioning of system controller to control operation of main electric fire pump, diesel pump, Pressurization pump, Terrace pump in sequence as per specification consisting of relays, timers. Sensors, annunciation window for fault indication, complete as per specification				
	Also panel shall have sufficient (min. 50 Nos) NO/NC contacts for extending the status(annunciation) of fire pumps to the Fire alarm panel.				
6.0	Fabrication, supply, Insallation testing & commissioning of suitable starter panel including control logic for starting of terrace pump	Set	2	12490	24980
7.0	Supplying, laying, testing & commissioning of FRLS,PVC outer sheathe, steel armored, aluminum / copper conductor, 1100v grade power cables with glands etc.The cables shall be laid in tray/ Hume pipe / in trenches/on walls/ floor etc. as required. For cables laid out door the rate shall include earth excavation providing brick and sand protection, refilling and compacting the earth. The rate shall excludes tray & Hume pipes. The minimum size of the cables shall as mentioned below,				
7.1	3.5C x 90 sq.mm aluminum for main pumps	Mtr.	48	630	30240
7.2	4 C x 16 Sqmm. Aluminum Jockey pumps	Mtr.	15	191	2865
7.3	12 C x 2.5 Sqmm.copper armoured for Diesel engines	Mtr.	15	493	7395
7.4	2 C x 1.5 Sqmm copper armoured for Instrumentation	Mtr.	105	136	14280
8.0	3C X 2.5 Sq. mm copper armoured cable with all accessories for Power cable from MCC Panel to Booster Pump.	Mtr.	20	222	4440
9.0	CABLE TRAY & EARTHING				
9.1	Supplying and fixing of perforated G.I.sheet cable tray with necessary angle iron suspension supports, anchor fasteners etc. complete. Maximum height of suspension shall not exceed 500 mm.Size of the tray shall be suitable for laying the above mentioned cables. (Max cable tray size 300 mm width X 50 mm depth X 1.6 mm thickness).	Mtr.	39	621	24219

9.2	Providing and fixing 25 mm X 5 mm G.I. strip shall be run on floor / ceiling / walls, from the equipment to the nearest Earth pit with necessary accessories as required.	Mtr.	75	206	15450
10.0	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :The quoted rate shall also include for chasing / chipping walls, making bore holes in walls and making them good with filler material and finished in cement mortar etc. complete. Fittings shall be MS Forged fittings for sizes upto 50 NB and MS Butt welded fittings for sizes above 50 NB.				
10.1	250 mm dia (M.S Pipe 6.3 mm Thick)	Mtr.	18	3521	63378
10.2	200 mm dia (M.S Pipe 6.3 mm Thick)	Mtr.	8	2926	23408
10.3	150 mm dia	Mtr.	18	2064	37152
10.4	100 mm dia	Mtr.	12	1499	17988
10.5	80 mm dia	Mtr.	24	1122	26928
10.6	65 mm dia	Mtr.	12	1004	12048
10.7	50 mm dia	Mtr.	24	787	18888
11.0	Supplying, fixing, testing & commissioning of double flanged sluice valve of rating PN 1.6 with non rising spindle, bronze/gun metal seat, ISI marked complete with nuts, bolts, washers, gaskets and conforming to IS 780 of following sizes as required :				
11.1	250 mm dia	Nos.	2	46318	92636
11.2	200 mm dia	Nos.	1	39133	39133
11.3	150 mm dia	Nos.	6	22550	135300
11.4	100 mm dia	Nos.	0	14428	0
11.5	80 mm dia	Nos.	0	10549	0
11.6	65 mm dia	Nos.	3	9084	27252
11.7	50 mm dia	Nos.	5	7094	35470
12.0	Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 (PN 1.6) complete with rubber gasket, GI bolts, nuts, washers etc.as required :				
12.1	200 mm dia	Nos.	1	29075	29075
12.2	150 mm dia	Nos.	3	17577	52731
12.3	80 mm dia	Nos.	0	7539	0

12.4	65 mm dia	Nos.	3	6274	18822
13.0	Providing, installation, testing and commissioning of stainless steel Y-strainer fabricated out of 1.6 mm thick stainless steel, Grade 304, sheet with 3 mm dia holes with stainless steel flange.				
13.1	150 mm dia	Nos.	3	10659	31977
13.2	80 mm dia	Nos.	1	4573	4573
14.0	Supply and installation of Pressure switches of suitable range for pump sets with Ball valves, Fittings like unions / colors / reducers etc.	Nos.	5	1508	7540
15.0	Supply and installation of Pressure gauges of suitable range for pumpsets with Ball valves, siphon, Fittings like unions / colors / reducers etc.	Nos.	6	1757.03	10542
16.0	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.	Sets	1	18009	18009
	Note:				
	Contractor shall include in his rates for providing level controllers, switches etc. on the reservoir and cabling from level controller to panel etc. complete as required to operate the system automatic/manual and pump shall be protected against running dry.				
	TOTAL FOR PART - B				3041798
C	FIRE HYDRANT SYSTEM				
1.0	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :The quoted rate shall also include for chasing / chipping walls, making bore holes in walls and making them good with filler material and finished in cement mortar etc. complete. Fittings shall be MS Forged fittings for sizes upto 50 NB and MS Butt welded fittings for sizes above 50 NB.				
1.1	80 mm dia	RM	39	1122	43758
1.2	100 mm dia	RM	73	1499	109427
1.3	150 mm dia	RM	216	2064	445824
2.0	Providing laying, testing & commissioning of 'C' class heavy duty MS Pipe conforming to IS 1239/3589 i/c fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. in ground including welding, excavation & providing cement concrete blocks as supports, anticorrosive treatment with coaltar/asphalt tape as per IS 10221, refilling the trench etc. of following sizes complete as required.				

2.1	80 mm dia	RM	85.9	1409.62	121086
2.2	100 mm dia	RM	32.3	1762.03	56914
2.3	150 mm dia	RM	470.7	2376	1118383
3.0	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required :				
3.1	80 mm dia	Nos.	2	4842	9684
3.2	100 mm dia	Nos.	2	6454	12908
3.3	150 mm dia	Nos.	9	8699	78291
4.0	Providing & fixing cast iron Slim seal dual type non-return valves (PN 1.6) complete with matching flanges, rubber insertion, nuts, bolts and washer complete as required.etc. of following sizes.				
4.1	100 mm dia	Nos.	2	10836	21672
4.2	150 mm dia	Nos.	0	17577	0
5.0	Providing & fixing Air release valve as per IS:14845 ISI Marked with GM gate valve, flanges/ union, Suitable for sprinkler/ wet riser system with all necessary connections.				
5.1	25 mm dia	Nos.	3	3218	9654
6.0	Supplying and fixing single headed internal / external hydrant valve with instantaneous Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Stainless Steel cap and chain as required	Each	24	5987	143688
7.0	Supplying and fixing first-aid Hose Reel with MS construction spray painted in post office red, conforming to IS 884 complete with the following as required. 20 mm nominal internal dia water hose thermoplastic (Textile reinforced) type -2 as per IS: 12585 20 mm nominal internal dia gun metal globe valve & nozzle. Drum and brackets for fixing the equipments on wall. Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket. 40 M long.	Nos.	10	10092	100920
16.0	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female stainless steel (grade 304) couplings duly bound with GI wire, rivets etc. conforming to IS 636 (type-A) as required .	Each	48	4434	212832
17.0	Supplying & fixing 63 mm dia stainless steel (grade 304) short branch pipe with 20 mm nominal internal diameter size nozzle conforming to IS 903 suitable for instantaneous connection to interconnect hose pipe coupling as required	Each	24	1648	39552
18.0	Providing and fixing standard firemans axe with heavy rubber handle.	Nos.	24	1332	31968

19.0	Supplying and fixing of 4 way fire brigade connection of cast iron body with gun metal male instantaneous inlet couplings complete with cap and chain as reqd. for suitable dia MS pipe connection conforming to IS 904 as required :	Nos.	2	13822	27644
20.0	Providing & fixing Gunmetal fire Bridge Suction hose coupling (Draw out Connection) with nut for female coupling as per 13:902- 1974 complete with 100mm dia. 1 No C.I Foot valve flanged (to be connected to static water tank)	Each	1	28637	28637
21.0	Providing and fixing weather proof cabinet of size not less than 0.75 x 0.6 x 0.25 mtr made out of M.S. sheet not less than 1.5 mm thick having central opening and 4 mm thick glazed glass doors (Two nos.) suitably marked on the outside 'with the letters "FIRE HOSE" including necessary locking arrangement and painting in red colour suitable to accommodate, external yard hydrant valve, 2 nos 15 mtr long Hose pipe, branch pipe, nozzle and fire man's axe. It shall be mounted on boundary wall complete as required.	Nos.	16	3678	58848
22.0	Providing and fixing 4mm thick glass door of size 2.1m x 0.9m with anodized aluminium frame of size 0.10 x 0.05 M with centre opening for fire hose cabinet. Suitable marked on the outside with the letters "FIRE HOSE" including locking arrangement. All aluminium work to be in Red P.O. colour.	Nos.	8	19647	157176
23.0	Providing, installation, testing and commissioning of stainless steel Y-strainer fabricated out of 1.6 mm thick stainless steel, Grade 304, sheet with 3 mm dia holes with stainless steel flange.				
23.1	80 mm dia	Nos.	2	4573	9146
24.0	Supply and installation of Pressure switches of suitable range for pump sets with Ball valves, Fittings like unions / colors / reducers etc.	Nos.	2	1508	3016
25.0	Supply and installation of Pressure gauges of suitable range for pumpsets with Ball valves, siphon, Fittings like unions / collars / reducers etc.	Nos.	2	1757.03	3514
TOTAL FOR PART - C					2844542
D	FIRE SPRINKLER SYSTEM				
1.0	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :The quoted rate shall also include for chasing / chipping walls, making bore holes in walls and making them good with filler material and finished in cement mortar etc. complete. Fittings shall be MS Forged fittings for sizes upto 50 NB and MS Butt welded fittings for sizes above 50 NB.				
1.1	25 mm dia	RM	576	471	271296
1.2	32 mm dia	RM	36	527	18972

1.3	40 mm dia	RM	522	651	339822
1.4	50 mm dia	RM	462	787	363594
1.5	65 mm dia	RM	288	1004	289152
1.6	80 mm dia	RM	138	1122	154836
1.7	100 mm dia	RM	48	1499	71952
1.8	150 mm dia	RM	228	2064	470592
2.0	Providing laying, testing & commissioning of 'C' class heavy duty MS Pipe conforming to IS 1239/3589 i/c fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. in ground including welding, excavation & providing cement concrete blocks as supports, anticorrosive treatment with coaltar/asphalt tape as per IS 10221, refilling the trench etc. of following sizes complete as required.				
2.1	150 mm dia	RM	78	2376	185328
3.0	Providing, fixing, testing & commissioning of installation control valve of cast iron body, brass/bronze working parts comprising of water motor alarm, bronze seat clapper, clapper arm and hydraulically driven mechanical gong bell to sound continuous alarm when the wet riser/sprinkler system activates, pressure gauges, emergency releases, strainer, pressure switch, cock valve complete with drain valve and bypass, test control box, ball valves, MS pipe of required size, flanges, orifice plate, gasket etc of following sizes as required :				
3.1	150 mm dia	Nos.	1	47898	47898
4.0	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required :				
4.1	40 mm dia	Nos.	1	3509	3509
4.2	50 mm dia	Nos.	1	3671	3671
4.3	65 mm dia	Nos.	1	4149	4149
4.4	80 mm dia	Nos.	1	4842	4842
4.5	100 mm dia	Nos.	0	6454	0
4.6	150 mm dia	Nos.	4	8699	34796
5.0	Providing, fixing, testing & commissioning of 15mm dia quartzoid bulb type sprinklers of rating 68 degree centigrade with required accessories :				
5.1	Pendent Type	Nos.	479	484	231836
5.2	Upright Type	Nos.	487	484	235708
5.3	Side wall Type	Nos.	48	579	27792

6.0	Providing, installation, testing & commissioning of adjustable rosette plate for 15mm dia in white finish UL Listed or FM approved complete as required.	Nos.	479	207	99153
7.0	Supplying, installation, testing & commissioning of sprinkler flexible pipe (UL Listed) of stainless steel complete with 15 NPT on reducer thread with maximum working pressure of 175 PSI test pressure of 875 PSI (Burst) with branch line (Inlet) 25mm NPT male thread to sprinkler head (Outlet) 15mm NPT female thread with reducer, nipple, 2 side brackets, center bracket, stockbar of following sizes complete as required.				
7.1	700mm	Nos.	0	1341	0
7.2	1000mm	Nos.	0	1540	0
7.3	1200mm	Nos.	0	1633	0
7.4	1500mm	Nos.	479	1795	859805
8.0	Inspection Test and Drain valve with integral sight glass and 1/2" dia orifice, Threaded ends, suitable for Horizontal and Vertical installation of size 25 mm Dia.	Nos.	5	3611	18055
9.0	Providing and fixing gun metal globe valve suitable for pressure 15 Kg/Cm2 and confirming to IS: 778 of the following size including providing necessary union / flange.				0
9.1	25 mm dia	Nos.	15	1344	20160
9.2	50 mm dia	Nos.	5	2688	13440
10.0	Providing & fixing flow switch in following sizes M.S. pipe including connection etc as required in sprinkler branch line on each floor with necessary junction box installed in accessible place.				
10.1	100 mm dia	Each	3	7362	22086
10.2	150 mm dia	Each	2	8869	17738
11.0	Providing and fixing dial type pressure gauge with isolation cock and copper pipe on main header Dial diameter 100 mm	Nos.	5	1,757.03	8785
	TOTAL FOR PART - D				3818967
E	EXTINGUISHERS				
1.0	Providing and fixing Fire Extinguishers (A, B, C type powder) complete with all accessories as per manufacturers specifications.				
1.1	Capacity 2 Kg	Nos.	14	1537	21518
1.2	Capacity 5 Kg	Nos.	28	5,556.46	155581
1.3	Capacity 10Kg	Nos.	2	11,716.18	23432
2.0	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.	Nos.	28	9,849.09	275775

3.0	ISI marked (IS: 10204) portable fire extinguisher Mech. Foam type capacity 9 litres with gunmetal cap and nozzle and complete in all respects including initial fill and wall suspension.	Each	4	3,116.09	12464
4.0	Water CO2 type fire extinguisher 9 lts. Capacity, initial filling in brand new cylinder of powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge & wall mounting bracket etc. complete confirming to IS:940.	Nos.	6	2,628.19	15769
5.0	Providing and fixing four bucket stand including four nos. buckets and sand for internal fire protection Complete as required.	Sets	18	4717	84906
	TOTAL FOR PART - E				589445
F	CIVIL				
1.0	Construction of brick masonry valve chamber 120x120x100 cms (inside) with 75 class designation brick work in cement mortar 1:5 (1 cement : 5 coarse sand) for valves with C.I.surface box 60 x 45 cms.(inside) with locking arrangement and RCC roof slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement as per standard design.	Nos.	3	16334.65	49004
2.0	Supply and installation of RCC hume pipes of 300 mm dia & NP 2 Class with collars for road / below floor crossing of Fire water pipes. The rate shall includes excavation, PCC (1:4:8 100 mm thick)bed and ends shall be closed with Brick masonry work as directed by site engineer.	Mtr.	60	1,960.06	117604
3.0	Brick Pedestal with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 with plastering including net cementing and necessary clamping accessories for laying Over ground pipe at terrace floor. Cement mortar 1:4 (1 cement : 4 coarse sand).	cum	2	6376.25	12753
4.0	Sealing of Fire shafts at all floor levels by using M.S. angle lorn frame around the shaft M.S. chequered plate of 6mm thick and PCC of 1:2:4 (100mm thick) on the plate for whole shaft area as per drawings and engineer - in - charge.	Sq.Mtr.	10	5180	51800
	TOTAL FOR PART - F				231160
G	APPROVAL				
1.0	Charges for liasoning with CFO and getting all approvals and permissions & NOC 's required for fire fighting at various stages & after completion of the project.	Lot	1	25000	25000
	TOTAL FOR PART - G				25000
	TOTAL AMOUNT(A+B+C+D+E+F+G)				14445315
	TOTAL AMOUNT (INCLUDING GST)				14445315





BAR CHART FOR FIRE FIGHTING & DETECTION SYSTEM AT K D MALAVIYA NATIONAL OIL MUSEUM AT GUWAHATI, ASSAM																																							
SL. NO.	ACTIVITY	PERIOD (WEEKS)																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
1	PREPARATION OF SHOP DRAWINGS AND SUBMISSION OF DATA SHEETS WHERE NEEDED																																						
2	SUPPLY OF MATERIALS AND SUBMISSION OF TEST CERTIFICATES WHERE NEEDED																																						
3	ERECTION AND TESTING																																						
4	COMMISSIONING & HANDING OVER AND SUBMISSION OF AS BUILT DRAWINGS																																						
Note: This is an indicative bar chart only. Successful vendor shall prepare their own bar chart for completion of work within the stipulated time as per tender conditions.																																							

“ANNEXURE – E”

SUMMARY OF PRICE

Sl. No.	Description	Amount/ Remarks
A	Total Estimated Cost for the Work as per SOQR (including GST)	Rs. 1,44,45,315/-
B	Percentage above / below / at par on total estimated cost as stated above (A) , applicable uniformly on all items of SOQR	In figure (+) / (-) / at par% In word.....Percent
Total Quoted Price including GST (in figures) =		Rs.
Total Quoted Price including GST (in words) =		Rupees

Note:

1.The bidders shall quote percentage above / below / at par under Sl. B as above, maximum upto two decimal places.

2.If the percentage is not quoted in Sl. B above or ‘NIL’ is not indicated, it shall be considered ‘NIL’ for price evaluation / award.

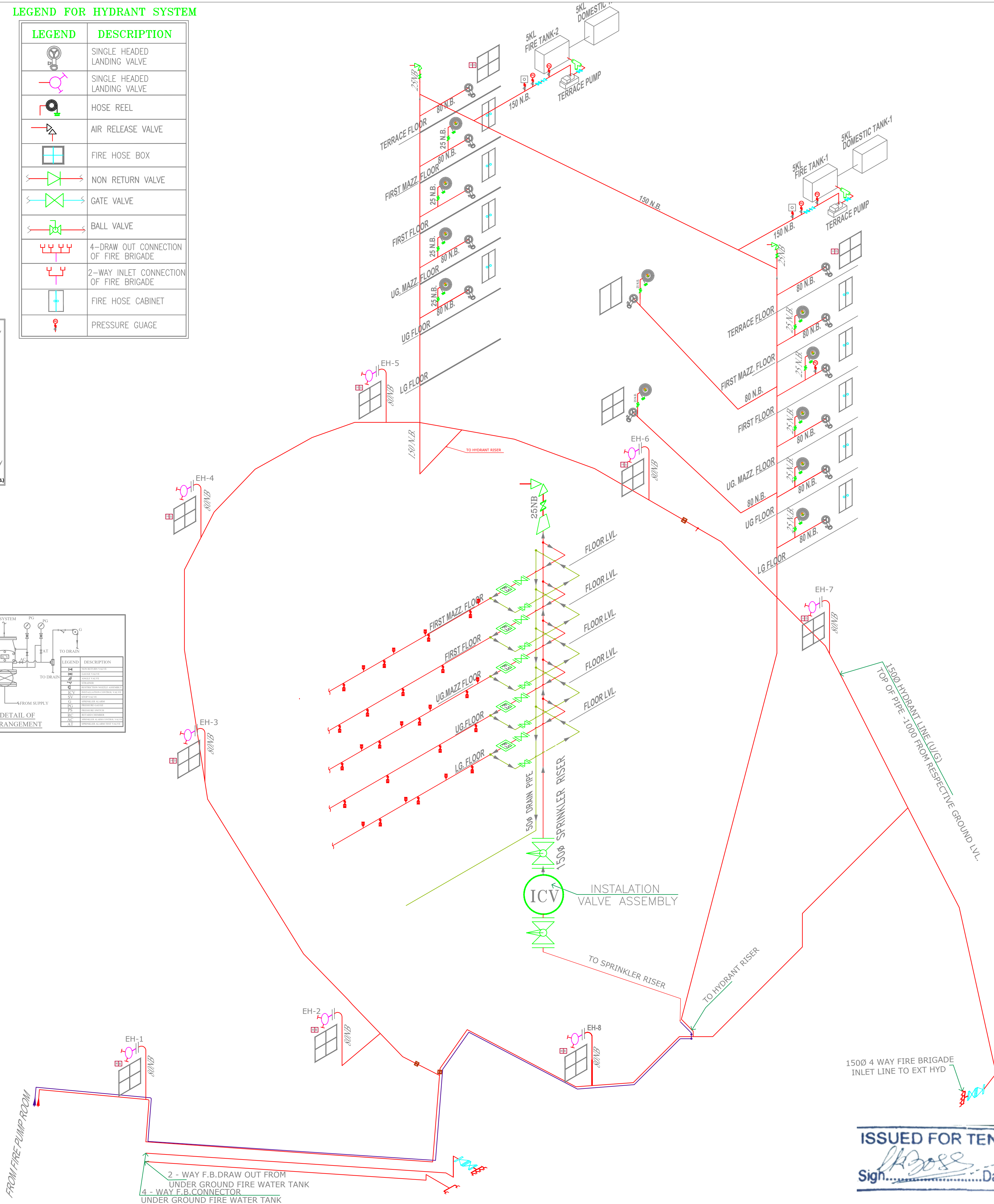
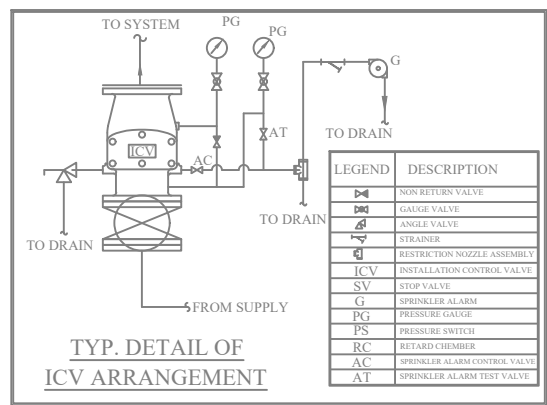
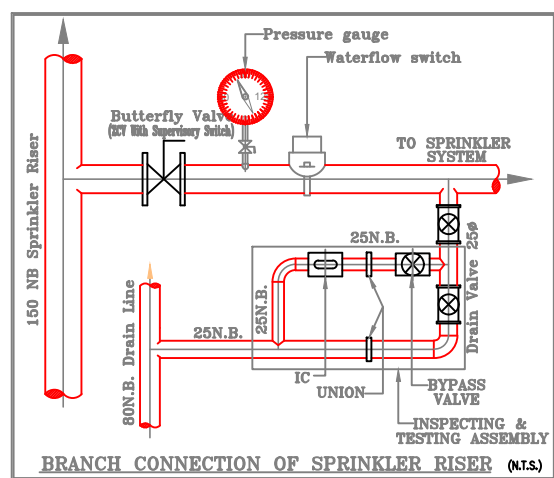
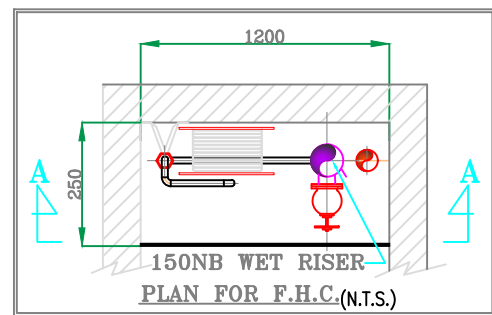
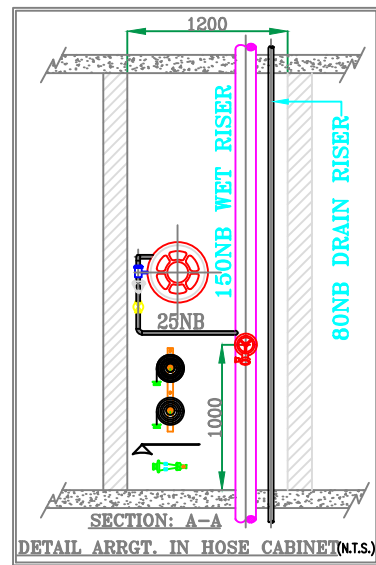
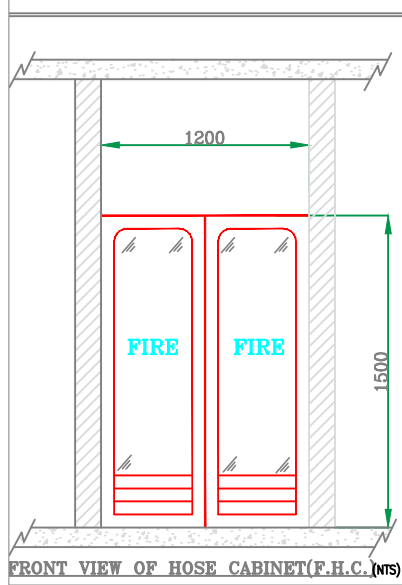
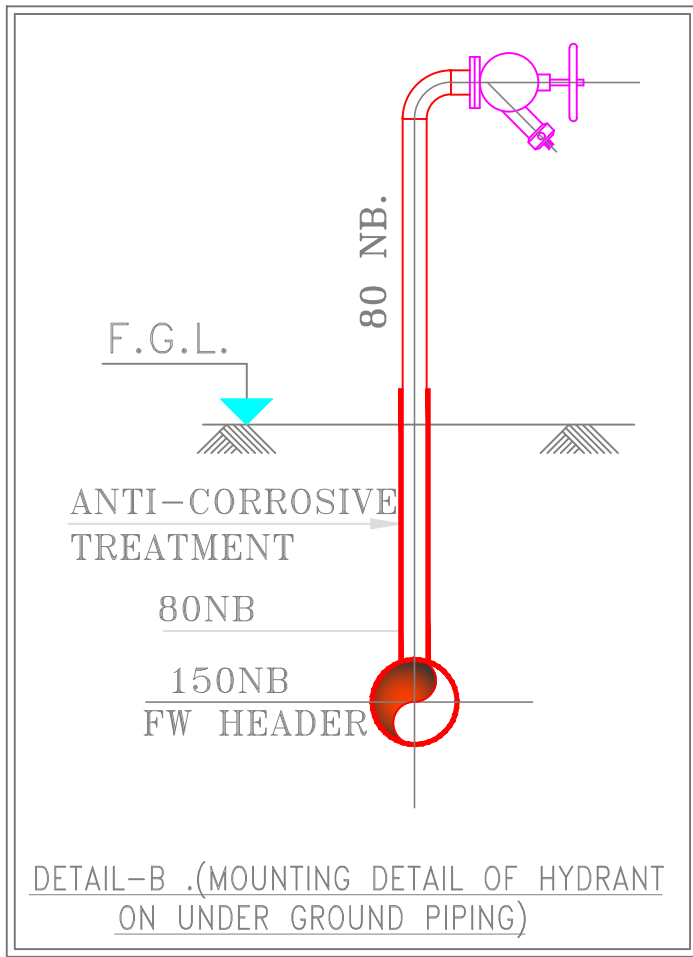
3.Bidders to strike out (+) or (-) above, as applicable.

(Signed & Stamped by the Bidder)



LEGEND FOR HYDRANT SYSTEM

LEGEND	DESCRIPTION
	SINGLE HEADED LANDING VALVE
	SINGLE HEADED LANDING VALVE
	HOSE REEL
	AIR RELEASE VALVE
	FIRE HOSE BOX
	NON RETURN VALVE
	GATE VALVE
	BALL VALVE
	4-DRAW OUT CONNECTION OF FIRE BRIGADE
	2-WAY INLET CONNECTION OF FIRE BRIGADE
	FIRE HOSE CABINET
	PRESSURE GAUGE



LEGEND FOR SPRINKLER SYSTEM

LEGEND FOR FIRE FIGHTING	
	INSPECTION GLASS
	AIR RELEASE VALVE
	NON RETURN VALVE
	FLOW SWITCH
	SPRINKLER
	GATE VALVE
	INSTALLATION CONTROL VALVE
	'Y' STRAINER
	SPRINKLER PIPE
	SPRINKLER DRAIN PIPE

REF DWG	DWG TITLE	DWG NO
	PIPING LAYOUT OF HYDRANT AND SPRINKLER PIPING	LKB - OMG-MB - AR - 1010
	EXTERNAL LAYOUT OF SPRINKLER SYSTEM, HYDRANT SYSTEM & EXTINGUISHERS AT LOWER GROUND FLOOR	LKB - OMG-MB - AR - 1010
	PIPING LAYOUT OF SPRINKLER SYSTEM, HYDRANT SYSTEM & EXTINGUISHERS AT UPPER GROUND FLOOR	LKB - OMG-MB - AR - 1011
	PIPING LAYOUT OF SPRINKLER SYSTEM, HYDRANT SYSTEM & EXTINGUISHERS AT UPPER GROUND MEZZANINE FLOOR	LKB - OMG-MB - AR - 1012
	PIPING LAYOUT OF SPRINKLER SYSTEM, HYDRANT SYSTEM & EXTINGUISHERS AT 1ST FLOOR	LKB - OMG-MB - AR - 1013
	PIPING LAYOUT OF SPRINKLER SYSTEM, HYDRANT SYSTEM & EXTINGUISHERS AT 1ST FLOOR MEZZANINE	LKB - OMG-MB - AR - 1014
	PIPING LAYOUT OF HYDRANT SYSTEM & EXTINGUISHERS AT ROOF PLAN	LKB - OMG-MB - AR - 1015

REV	MKD	DATE	DESCRIPTION	DEALT	CHKD	APVD
-----	-----	------	-------------	-------	------	------

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE :: GOVERNMENT OF INDIA
PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM AT GUWAHATI : ASSAM

ARCHITECT
INDRANIL SEN
ARCHITECTURE INTERIOR URBANISM LIFESTYLE
E-MAIL - indranilsen.net@gmail.com :: WEBSITE - arindranilsen.in

PLB & FF CONSULTANT
LALIT KUMAR BOSE
46/A, S. N. Roy Road, Kollata-700038
E-MAIL - lalit267bose@gmail.com :: (M) - 9903111760

FIRE FIGHTING (SPR)	FOR TENDER ONLY
DEALT : B&B UNICON	SCALE : 1 : 150
CHECKED : B&B UNICON	SIZE : A1
APPROVED : L.K.BOSE	DATE : 26.06.2021
JOB NUMBER :	DRG CODE : OMG - 33004
FILE NAME : LKB - OMG - MB - FF - 1004-sch hyd spk	

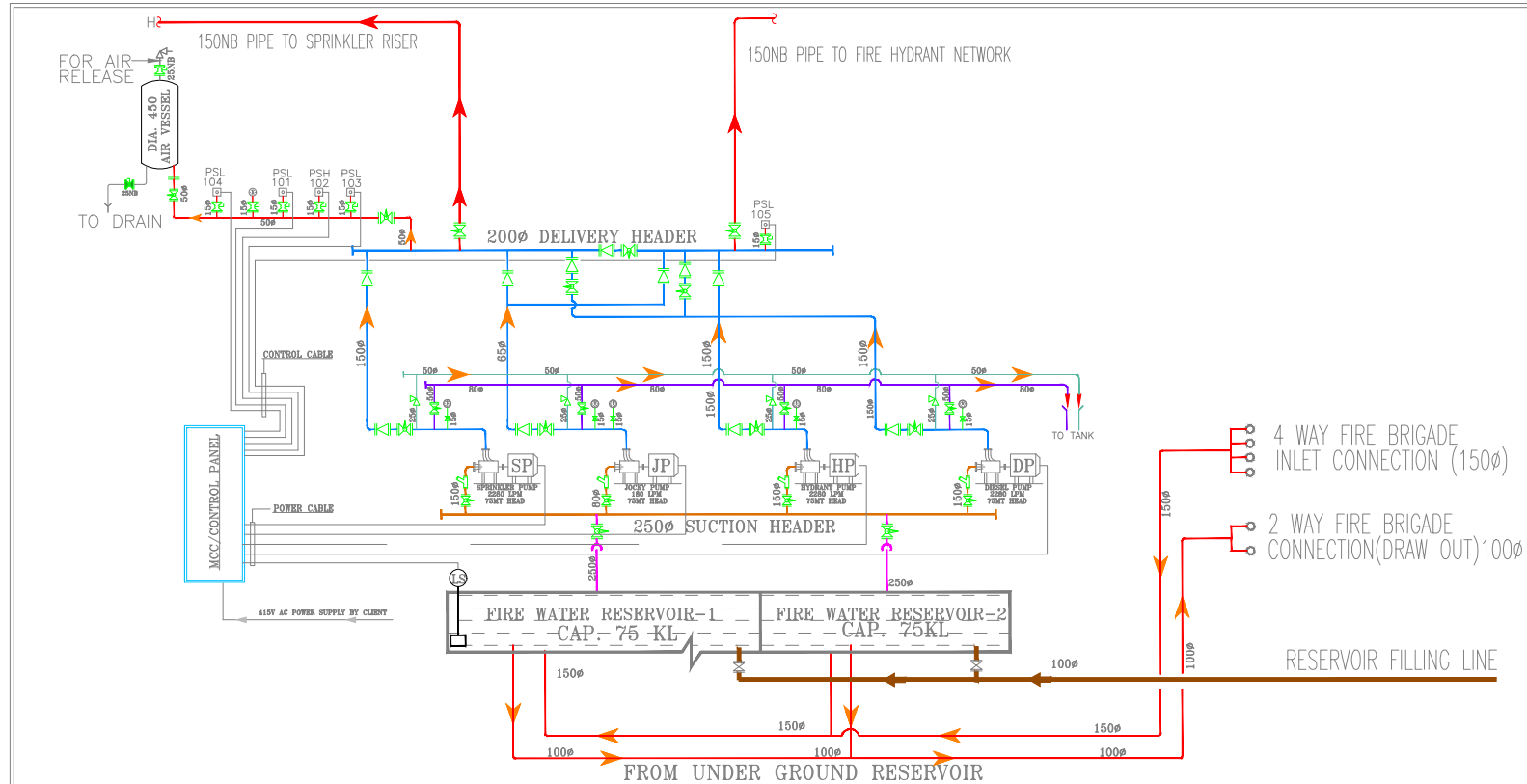
DRAWING TITLE	REVISION
SCHEMATIC DIAGRAM OF HYDRANT & SPRINKLER SYSTEM	
DRAWING NUMBER	
LKB - OMG - MB - FF - 1004	TO

THIS DRAWING IS THE PROPERTY OF PLB & FF CONSULTANT LALIT KUMAR BOSE (LKB) AND LKB SHALL RETAIN OWNERSHIP OF ALL "COPYRIGHT" TO THESE DOCUMENTS INCLUDING OWNERSHIP OF DESIGN. THESE DRAWINGS ARE ISSUED ON THE CONDITION IT IS NOT REPRODUCED, RETAINED OR DISCLOSED TO ANY UNAUTHORIZED PERSON, EITHER WHOLLY OR IN PART WITHOUT THE SPECIFIC WRITTEN CONSENT OF THE OWNER NAMELY PLB & FF CONSULTANT LALIT KUMAR BOSE.



ISSUED FOR TENDERING
Sign: *LK Bose* Date: 05/11/22

PUMP HOUSE



P & I DIAGRAM OF FIRE WATER PUMPING SYSTEM

LEGEND:-		
Sl.No.	SYMBOL	DESCRIPTION
01.		GATE VALVE
02.		NON-RETURN VALVE
03.		Y - STRAINER
04.		BALL VALVE (NORMALLY CLOSE)
05.		REDUCER
06.		BALL VALVE (NORMALLY OPEN)
07.		PRESSURE REDUCING VALVE
08.		4-WAY FIRE SUCTION CONNECTION
09.		2-WAY FIRE SUCTION CONNECTION
10.		PRESSURE GAUGE
11.		PRESSURE SWITCH
12.		LEVEL SWITCH
13.		DELIVERY PIPE
14.		SUCTION PIPE
15.		HYDRANT PIPE
16.		SPRINKLER PIPE
17.		POWER CABLE
18.		CONTROL CABLE
19.		AIR VESSEL

FIRE PUMP DETAIL		
CAPACITY	DESCRIPTION	HP
1500 LPM @ 150M	SPRINKLER PUMP (ELECTRIC MOTOR DRIVEN)	150
1500 LPM @ 150M	JOCKEY PUMP (ELECTRIC MOTOR DRIVEN)	150
1500 LPM @ 150M	HYDRANT PUMP (ELECTRIC MOTOR DRIVEN)	150
1500 LPM @ 150M	DIESEL PUMP (DIESEL ENGINE DRIVEN)	150

REV	NO	DATE	DESCRIPTION	DEALT	CHKD	APVD

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
 NATIONAL COUNCIL OF SCIENCE MUSEUMS
 MINISTRY OF CULTURE - GOVERNMENT OF INDIA

PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM
 AT GUWAHATI : ASSAM

ARCHITECT
INDRANIL SEN
 ARCHITECTURE INTERIOR URBANISM LIFESTYLE
 84001-1000000@gmail.com : 983022-1000000

PLB & FF CONSULTANT
LALIT KUMAR BOSE
 46/A, S.N. Roy Road, Kolkata-700038
 E-MAIL: -lakb08@gmail.com : 91011-980111700

FIRE FIGHTING (SPR) FOR TENDER ONLY

DEALT : B&B UNICON SCALE : 1 : 150

CHECKED : B&B UNICON SIZE : A1

APPROVED : L.K. BOSE DATE : 26.06.2021

JOB NUMBER : **DRG CODE : OMG - 33005**

FILE NAME : LKB - OMG - MB - FF - 1005 - pld ph

DRAWING TITLE
P & I DIAGRAM OF PUMP HOUSE (WATER WORKS)

DRAWING NUMBER
LKB - OMG - MB - FF - 1005

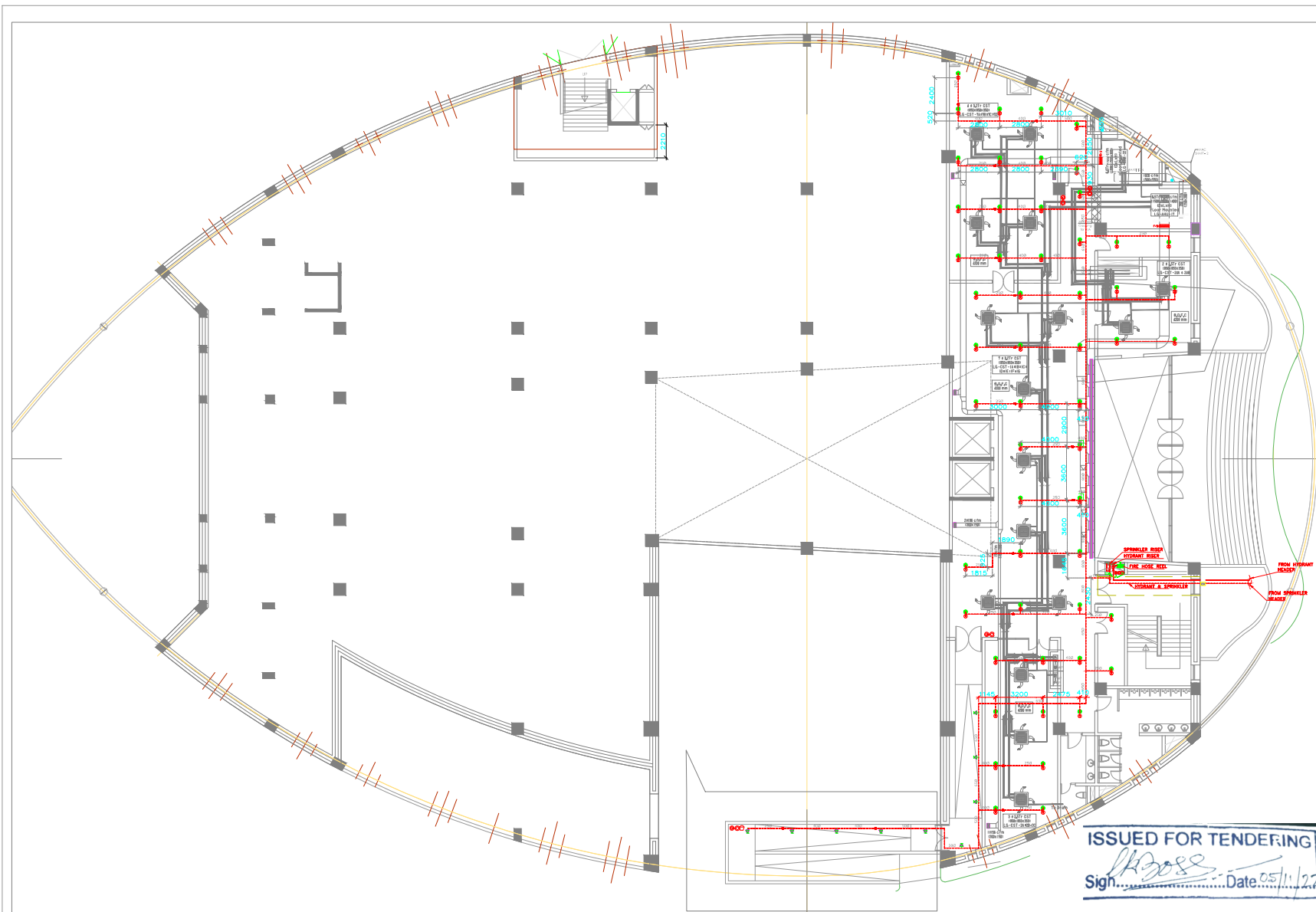
REVISION
TO

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ISSUED FOR TENDERING

Sig. *LKB* Date *05/11/22*





FIRE FIGHTING LEGEND	
	PENDENT SPRINKLER WITH ROSETTE PLATE
	UPRIGHT SPRINKLER
	SIDE WALL SPRINKLER
	FLOW SWITCH
	REDUCER
	BUTTERFLY VALVE
	BALL VALVE (DRAIN)
	NON RETURN VALVE
	LANDING VALVE
	FIRE HOSE/BRANCH PIPE WITH NOZZLE/AXE
	FLEXIBLE PIPE
	HOSE REEL
	HOSE BOX
	SPRINKLER PIPE
	HYDRANT PIPE
	DRAIN PIPE
	4.5 KG CO2
	6 KG ABC
	SAND BUCKET
	9 LTR WATER CO2

- GENERAL NOTE :-
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
 2. ALL PIPE SIZES ARE IN mm & NOMINAL DIA ONLY.
 3. FITTINGS FOR MS PIPE OF SIZES 50 NB AND ABOVE SHALL BE BUTT WELDED TYPE AS PER IS:1239 (PART-II) HEAVY GRADE. FITTINGS OF SIZES BELOW 50 NB SHALL BE SOCKET WELD TYPE.
 4. FLANGES SHALL BE AS PER IS: 6392 TABLE- 17 FOR MS PIPES
 5. UNDER GROUND PIPES SHALL BE TREATED WITH ANTI-CORROSION TREATMENT AS PER IS: 10221
 6. OVER GROUND PIPES SHALL BE PAINTED WITH TWO COATS OF RED OXIDE PRIMER & TWO COATS OF PO RED SYNTHETIC ENAMEL PAINT.
 7. PIPE TO BE PAINTED BEFORE INSTALLATION AT CORE CUTTING AREA
 8. MINOR MODIFICATIONS MAY BE CARRIED AT SITE TO SUIT SITE CONDITION.
 9. ALL LANDING VALVES SHALL BE FIXED WITHIN 1 M FROM RESPECTIVE FINISHED FLOOR LEVEL FOR ALL 1/2" & 1/2" PIPING FLANGES TO BE PROVIDED AT SUITABLE LOCATIONS.
 10. ALL PIPES ARE MS HEAVY GRADE AS PER IS:1239 UP TO 150 MM DIA AND IS: 3559 FROM 200 MM DIA AND ABOVE WITH 6.35 MM WALL THICKNESS.
 11. SECTIONS & TYPICAL DETAILS ARE SHOWN AS GUIDE LINES ONLY.

REF DWG	DWG TITLE	DWG NO
LOWER GROUND FLOOR PLAN	OMG - MB - AR - 1001	

REV NO	DATE	DESCRIPTION	DESIGNER	APPROVED

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
 NATIONAL COUNCIL OF SCIENCE MUSEUMS
 MINISTRY OF CULTURE :: GOVERNMENT OF INDIA

PROJECT NAME
**K D MALAVIYA NATIONAL OIL MUSEUM
 AT GUWAHATI : ASSAM**

ARCHITECT
INDRANIL SEN
 ARCHITECTURE INTERIOR URBANISM LIFESTYLE
 E-MAIL - indranil.sen@gmail.com : 9338572 - indranil.sen@gmail.com

PLB & FF CONSULTANT
LALIT KUMAR BOSE
 46/A, S.N. Roy Road, Kolkata-700008
 E-MAIL - latitkumarbose@gmail.com : 943-986311760

FIRE FIGHTING (SPR) FOR TENDER ONLY

DEALT : B&B UNICON SCALE : 1 : 125

CHECKED : B&B UNICON SIZE : A1

APPROVED : LK-BOSE DATE : 26.04.2021

JOB NUMBER : DRG CODE : OMG - 33010

FILE NAME : LKB - OMG - MB - FF - 1010-ig hyd spk xtr

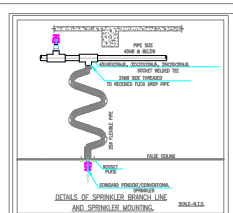
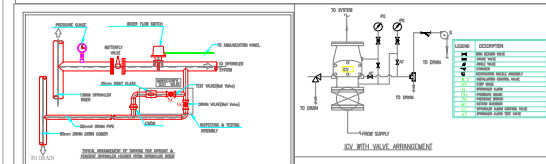
DRAWING TITLE	REVISION
LAYOUT OF SPRINKLER HYDRANT SYSTEM & EXTINGUISHERS AT LOWER GROUND FLOOR.	
DRAWING NUMBER	

LKB - OMG / MB - FF - 1010 TO

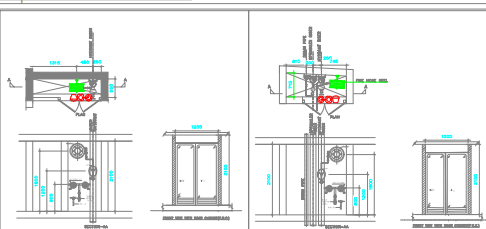
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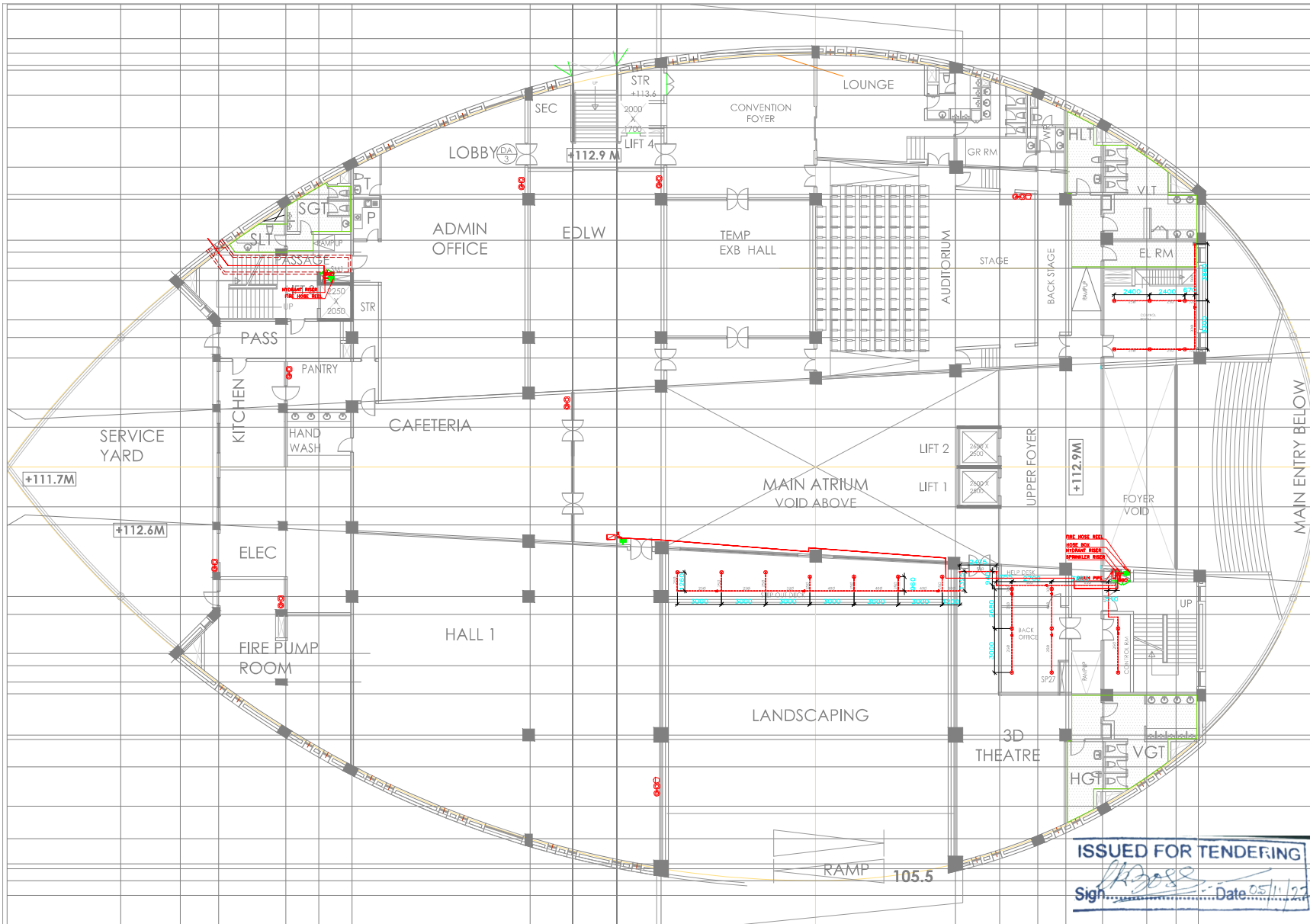
ISSUED FOR TENDERING

Sign... Date 05/11/24



TYPE	DESCRIPTION	SIZE OF PIPE	SIZE OF HANGER
1	UPRIGHT SPRINKLER	150 NB	150 NB
2	PENDENT SPRINKLER	150 NB	150 NB
3	BUTTERFLY VALVE	150 NB	150 NB
4	REDUCER	150 NB	150 NB
5	NON RETURN VALVE	150 NB	150 NB
6	LANDING VALVE	150 NB	150 NB
7	FIRE HOSE/BRANCH PIPE WITH NOZZLE/AXE	150 NB	150 NB
8	FLEXIBLE PIPE	150 NB	150 NB
9	HOSE REEL	150 NB	150 NB
10	HOSE BOX	150 NB	150 NB
11	SPRINKLER PIPE	150 NB	150 NB
12	HYDRANT PIPE	150 NB	150 NB
13	DRAIN PIPE	150 NB	150 NB
14	4.5 KG CO2	150 NB	150 NB
15	6 KG ABC	150 NB	150 NB
16	SAND BUCKET	150 NB	150 NB
17	9 LTR WATER CO2	150 NB	150 NB





FIRE FIGHTING LEGEND

	PENDENT SPRINKLER WITH ROSETTE PLATE
	UPRIGHT SPRINKLER
	SIDE WALL SPRINKLER
	FLOW SWITCH
	REDUCER
	BUTTERFLY VALVE
	BALL VALVE (DRAIN)
	NON RETURN VALVE
	LANDING VALVE
	FIRE HOSE/BRANCH PIPE WITH NOZZLE/AXE
	FLEXIBLE PIPE
	HOSE REEL
	HOSE BOX
	SPRINKLER PIPE
	HYDRANT PIPE
	DRAIN PIPE
	4.5 KG CO2
	6 KG ABC
	SAND BUCKET
	9 LTR WATER CO2

- GENERAL NOTE :-**
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 10. ALL PIPES ARE MS HEAVY GRADE AS PER IS:1239 UP TO 150 MM DIA AND IS: 3559 FROM 200 MM DIA AND ABOVE WITH 6.35 MM WALL THICKNESS.
 11. SECTIONS & TYPICAL DETAILS ARE SHOWN AS GUIDE LINES ONLY.

REF DWG	DWG TITLE	DWG NO
	UPPER GROUND FLOOR PLAN	AB - OMG/MB - AR - 1002

REV	NO	DATE	DESCRIPTION	DRAWN	CHKD	APVD

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
 NATIONAL COUNCIL OF SCIENCE MUSEUMS
 MINISTRY OF CULTURE & GOVERNMENT OF INDIA

PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM AT GUWAHATI - ASSAM

ARCHITECT
INDRANIL SEN
 ARCHITECTURE INTERIOR URBAN LIFESTYLE
 E-MAIL - indranil.museum@gmail.com ; WEBSITE - arindranil.in

KB
 PLB & FF CONSULTANT
 LAJIT KUMAR BOSE
 46/1, S. N. Roy Road, Kolkata-700038
 E-MAIL - lajibose@gmail.com ; MO - 9862117269

FIRE FIGHTING (SPR) FOR TENDER ONLY

DEALT: B&B UNCON SCALE: 1:125

CHECKED: B&B UNCON SIZE: A1

APPROVED: LK.BOSE DATE: 26.06.2021

JOB NUMBER: DRC CODE: OMG - 33011

FILE NAME: LK8-OMG/MB-FF - 1011-ug hyd spk xtr

DRAWING TITLE	
PIPING LAYOUT OF SPRINKLER, HYDRANT SYSTEM & EXTINGUISHERS AT UPPER GROUND FLOOR.	
DRAWING NUMBER	REVISION

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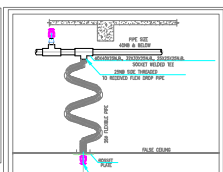
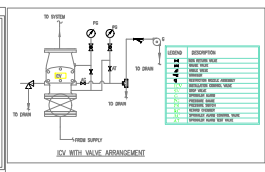
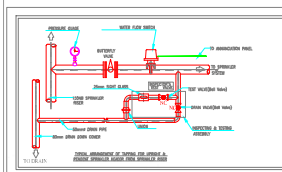
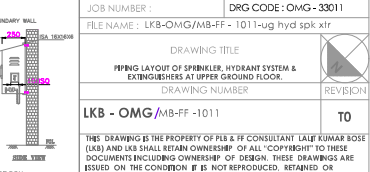
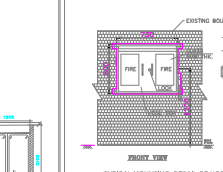
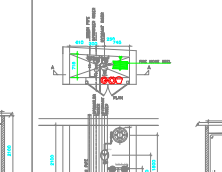
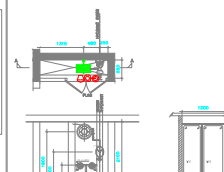
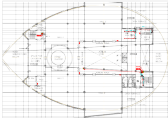


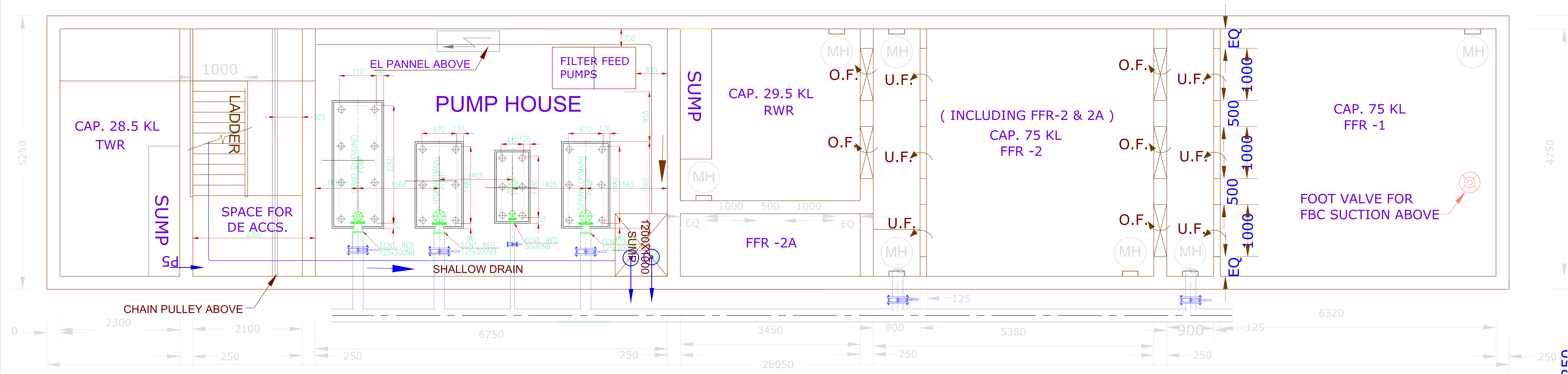
TABLE - A

PIPE SIZE	PIPE WEIGHT (KG)	PIPE WEIGHT (KG)
150	1.20	1.20
175	1.50	1.50
200	1.80	1.80
225	2.10	2.10
250	2.40	2.40
275	2.70	2.70
300	3.00	3.00
325	3.30	3.30
350	3.60	3.60
375	3.90	3.90
400	4.20	4.20
425	4.50	4.50
450	4.80	4.80
475	5.10	5.10
500	5.40	5.40
525	5.70	5.70
550	6.00	6.00
575	6.30	6.30
600	6.60	6.60
625	6.90	6.90
650	7.20	7.20
675	7.50	7.50
700	7.80	7.80
725	8.10	8.10
750	8.40	8.40
775	8.70	8.70
800	9.00	9.00
825	9.30	9.30
850	9.60	9.60
875	9.90	9.90
900	10.20	10.20
925	10.50	10.50
950	10.80	10.80
975	11.10	11.10
1000	11.40	11.40

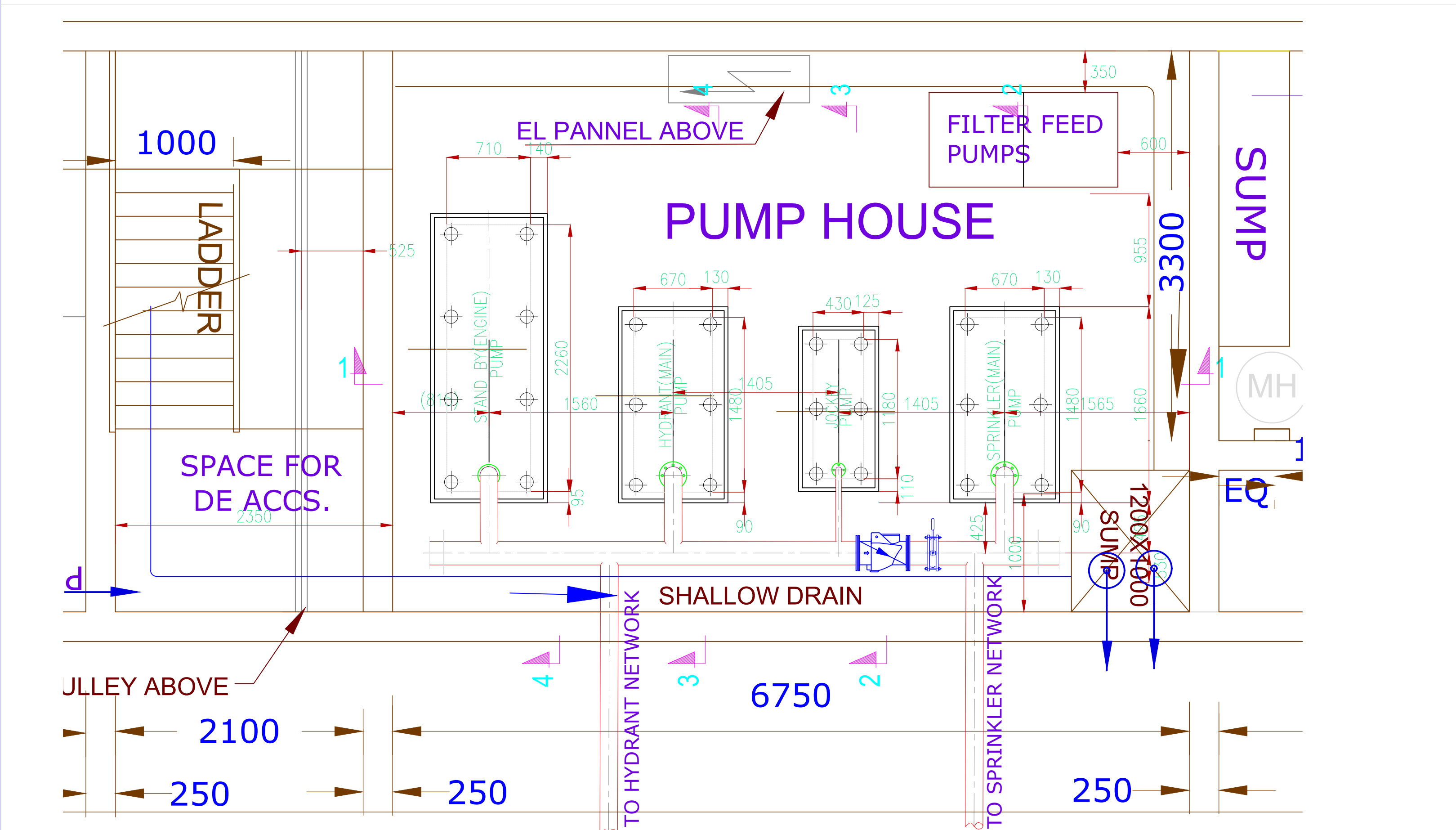




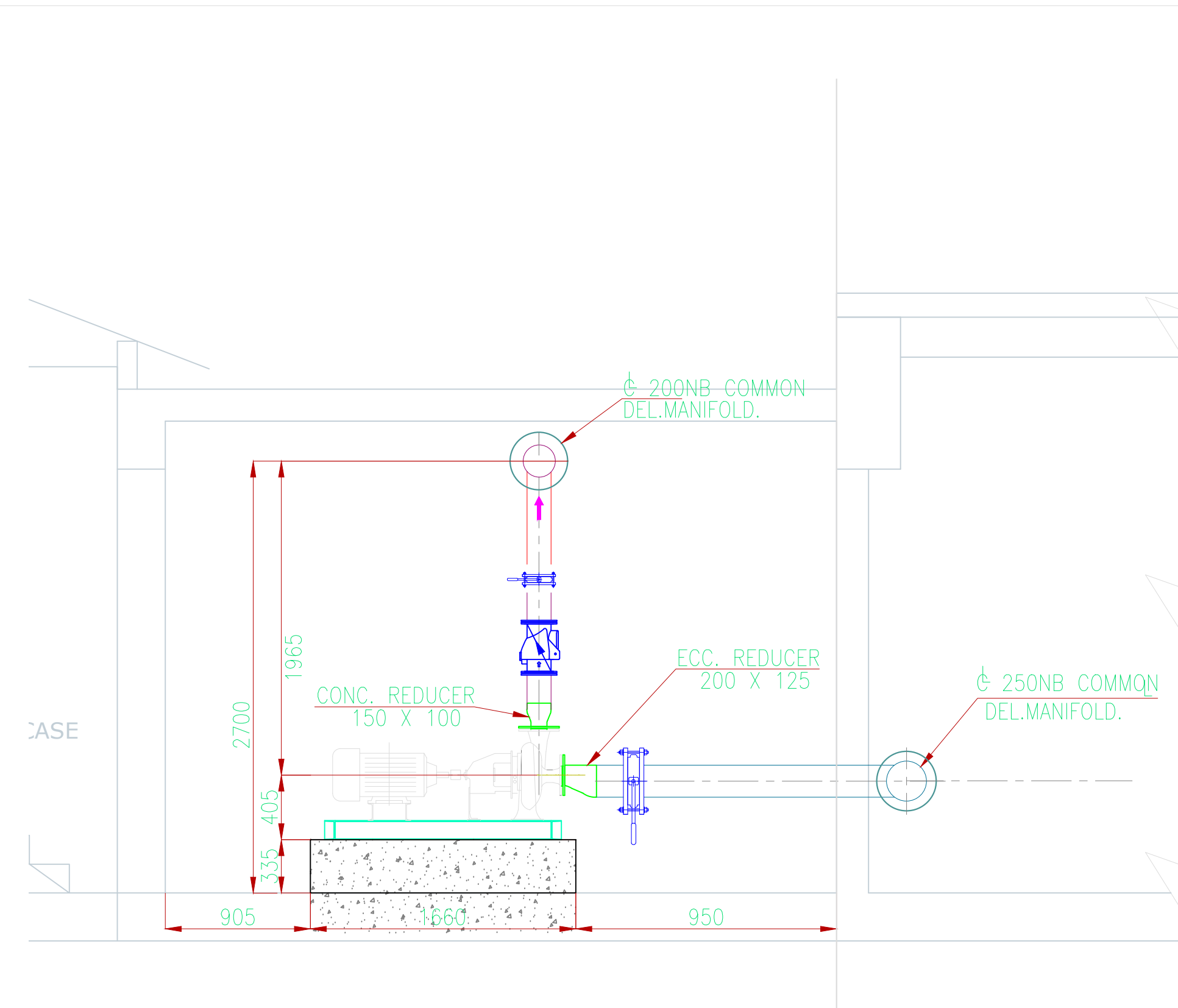
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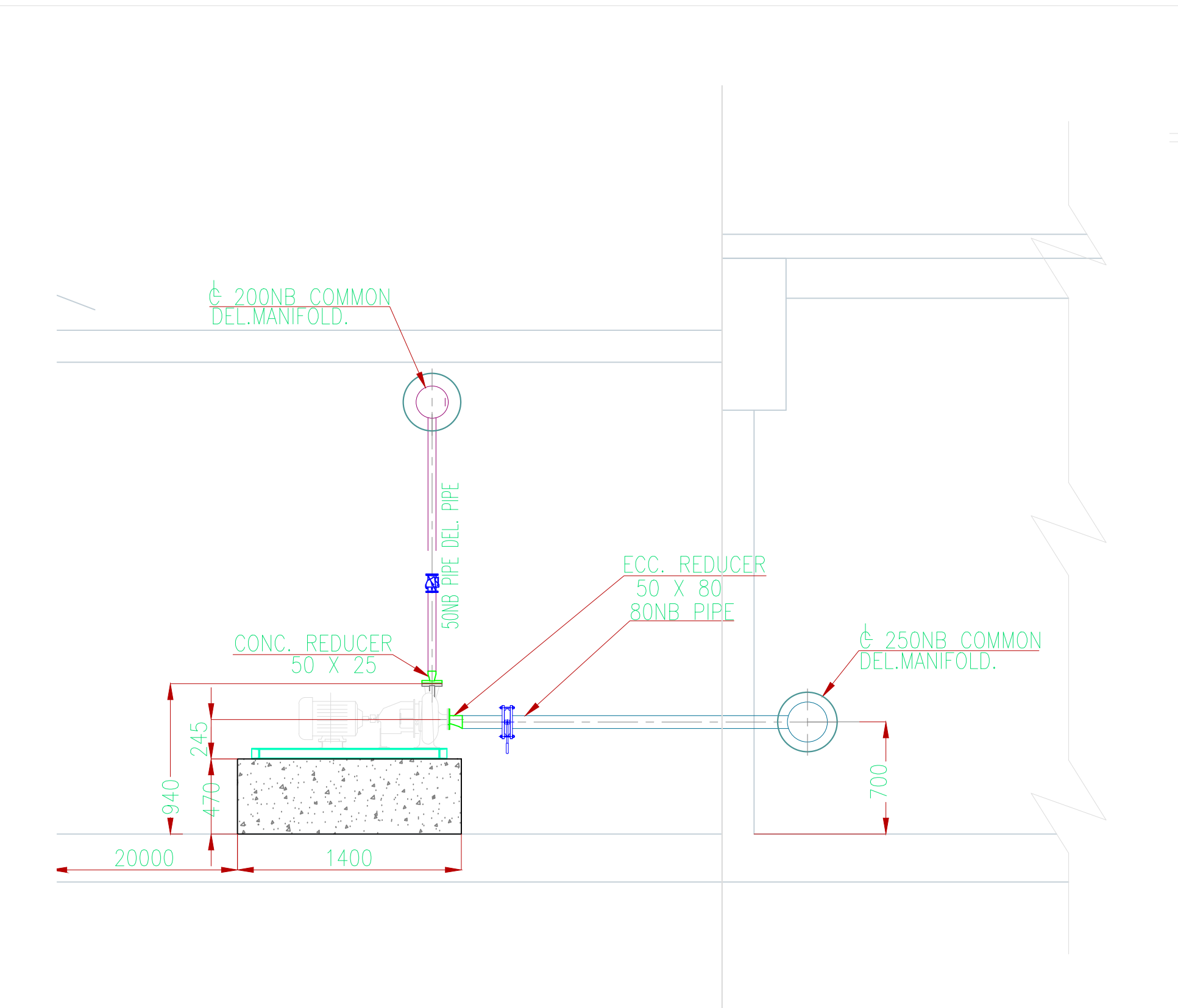
PLAN OF PUMP HOUSE (-7.500m. LVL.)
SUCTION PIPING LAYOUT (SCALE-1:40)



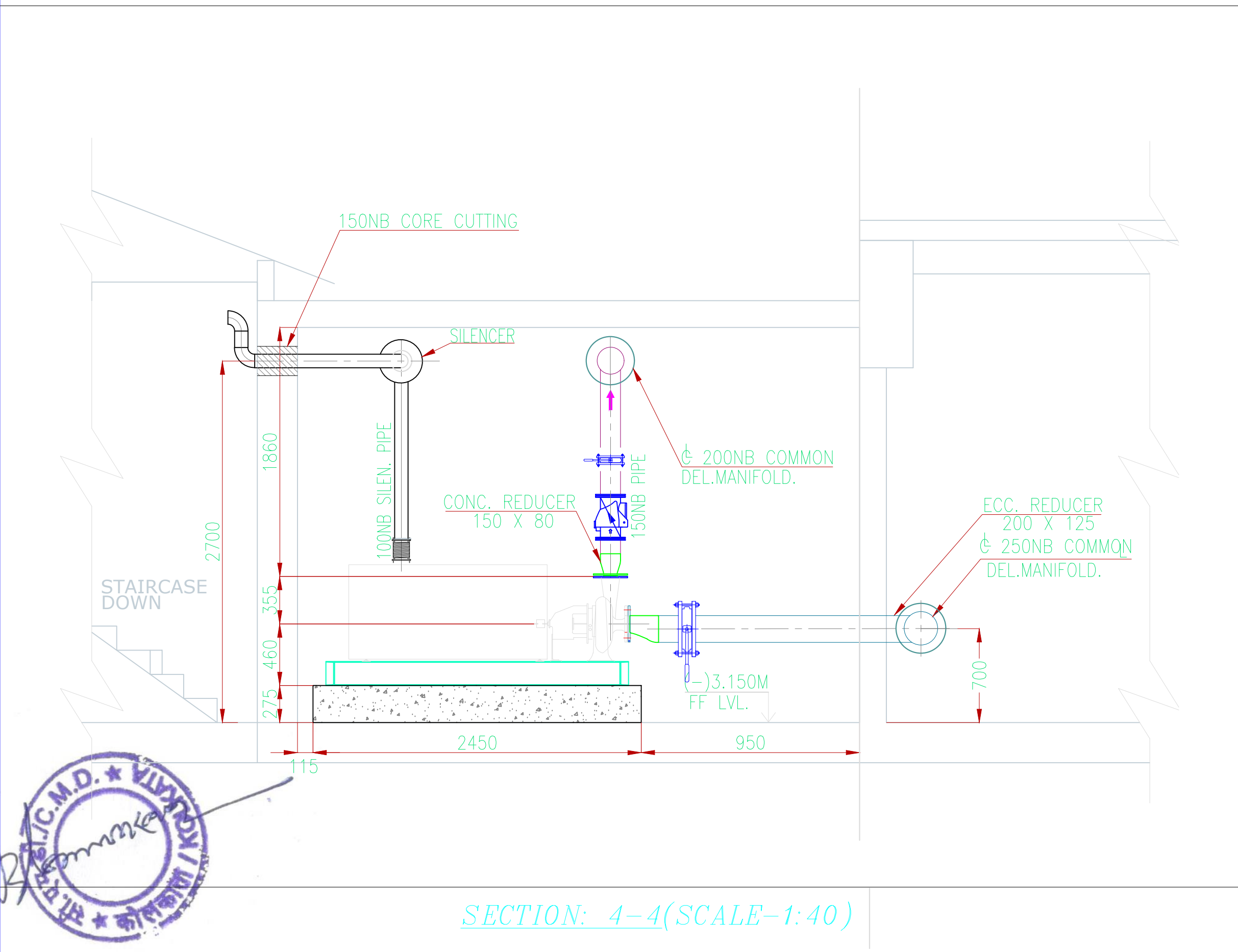
PLAN OF PUMP HOUSE (-7.500m. LVL.)
DELIVERY PIPING LAYOUT (SCALE-1:40)



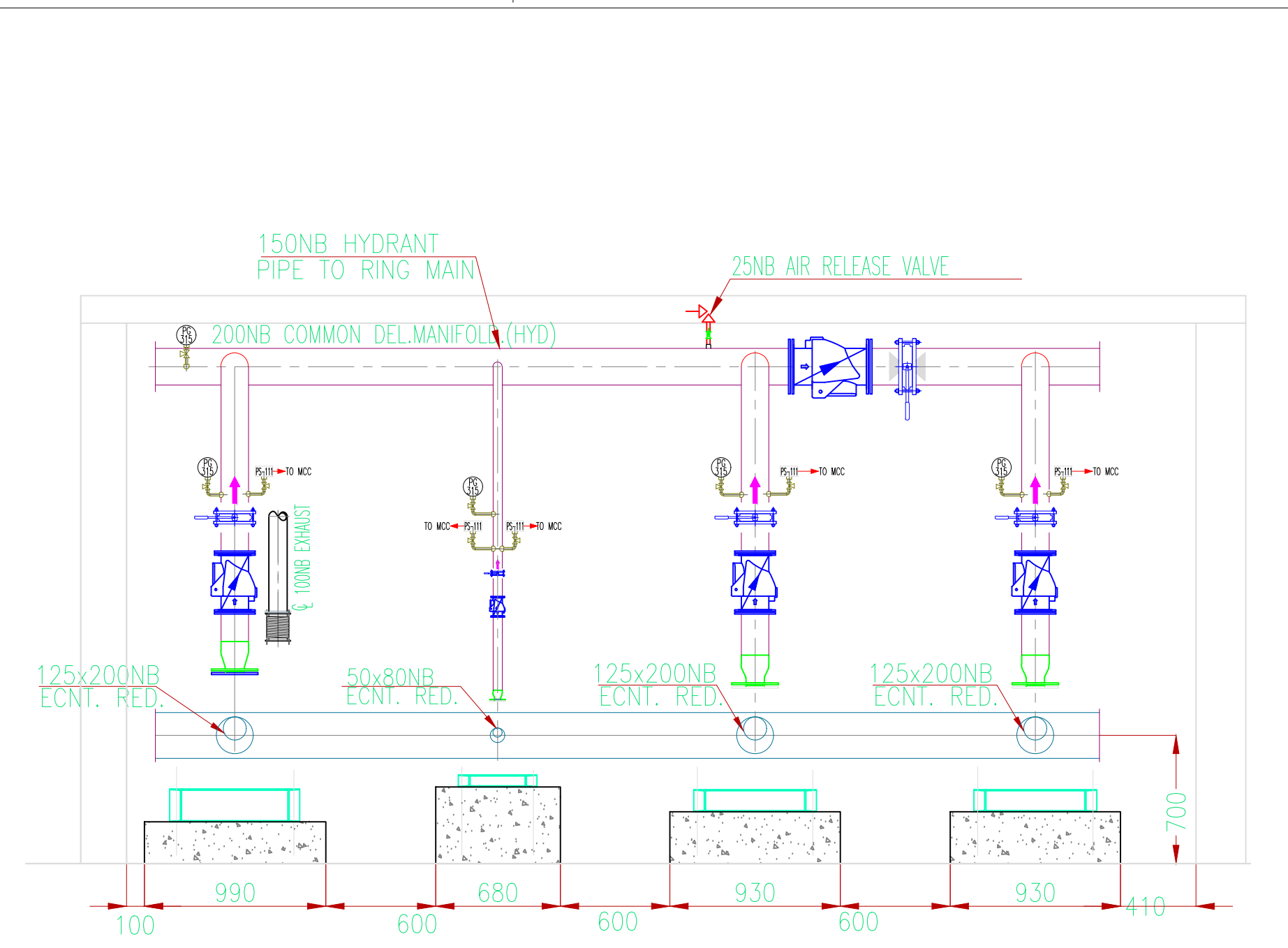
SECTION: 2-2 (SCALE-1:40)



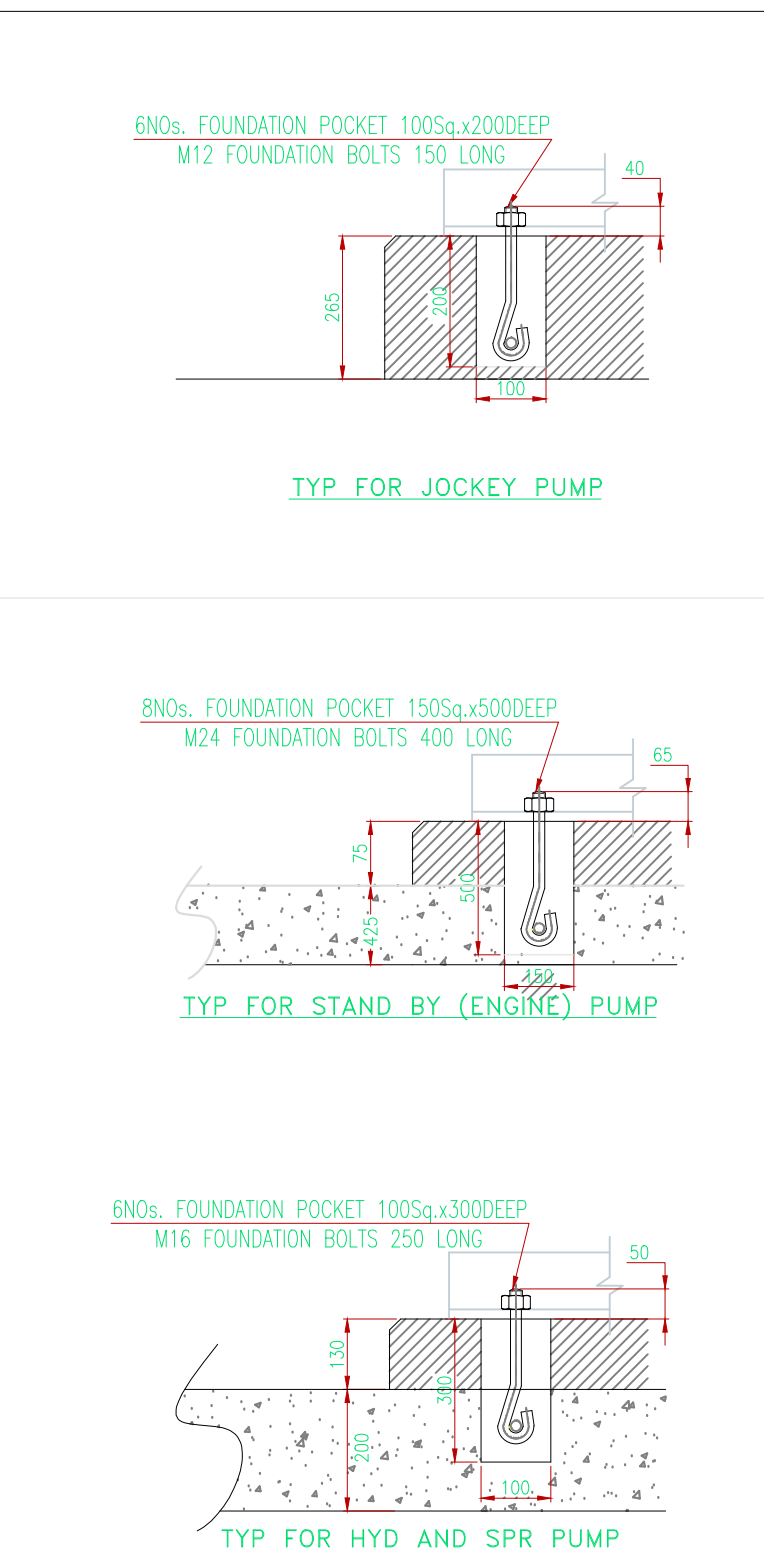
SECTION: 3-3 (SCALE-1:40)



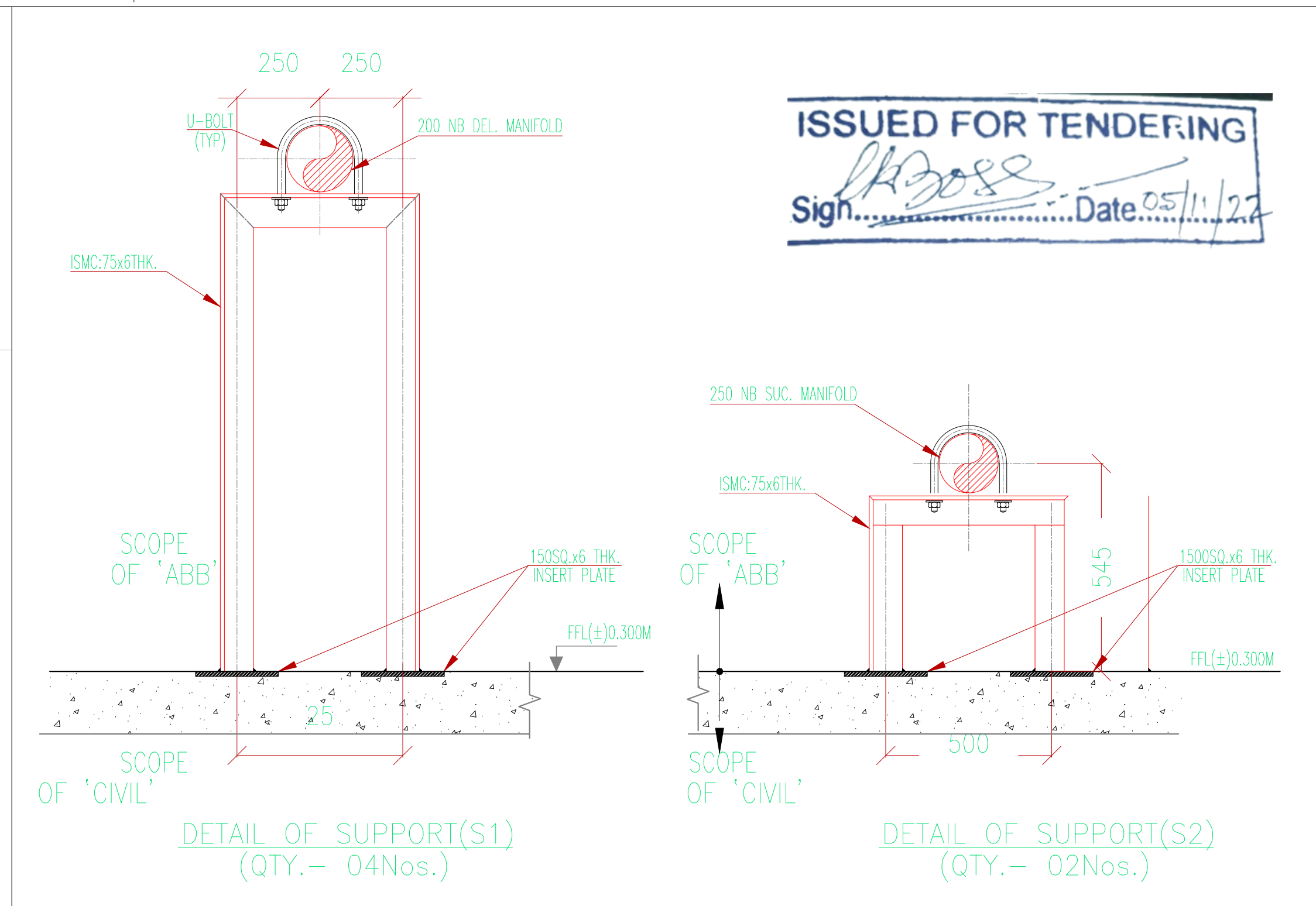
SECTION: 4-4 (SCALE-1:40)



SECTION: 1-1 (SCALE-1:40)



DETAIL OF FOUNDATION BOLTS



NOTES:-

- ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN Mtr.
- INPUT DRG. NOS. :
2.1. STRUCTURAL DRG NO - KA-OM/CMD/WD-ST-19, REV R1.
2.2. ARCHITECTURAL DRG NO - AIS-OMG-MB-AR 1007, REV R7.
- THE SLEEVES WHETHER MS OR PVC SHOULD BE FIRMLY SECURED IN POSITION AT RIGHT ANGLES TO THE BEAM SURFACE, SO THAT IT SHOULD NOT BE MOVED DURING THE COMPACTION OF THE CONCRETING.

LEGEND	
SYMBOL	DESCRIPTION
1.	PIPE
2.	BUTTERFLY VALVE (NORMALLY OPENED)
3.	BUTTERFLY VALVE (NORMALLY CLOSED)
4.	NON RETURN VALVE
5.	GM BALL VALVE
6.	Y STRAINER
7.	EXPANSION BELOW
8.	PRESSURE GAUGE
9.	PRESSURE SWITCH

TYPICAL MOUNTING DETAIL OF PRESSURE GAUGE/SWITCH

REV MKD	DATE	DESCRIPTION	DEALT	CHKD	APVD

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE :: GOVERNMENT OF INDIA

PROJECT NAME
**K D MALAVIYA NATIONAL OIL MUSEUM
AT GUWAHATI : ASSAM**

ARCHITECT
INDRANIL SEN
ARCHITECTURE INTERIOR URBANISM LIFESTYLE
E-MAIL - indranilsen.net@gmail.com :: WEBSITE - anindranilsen.in

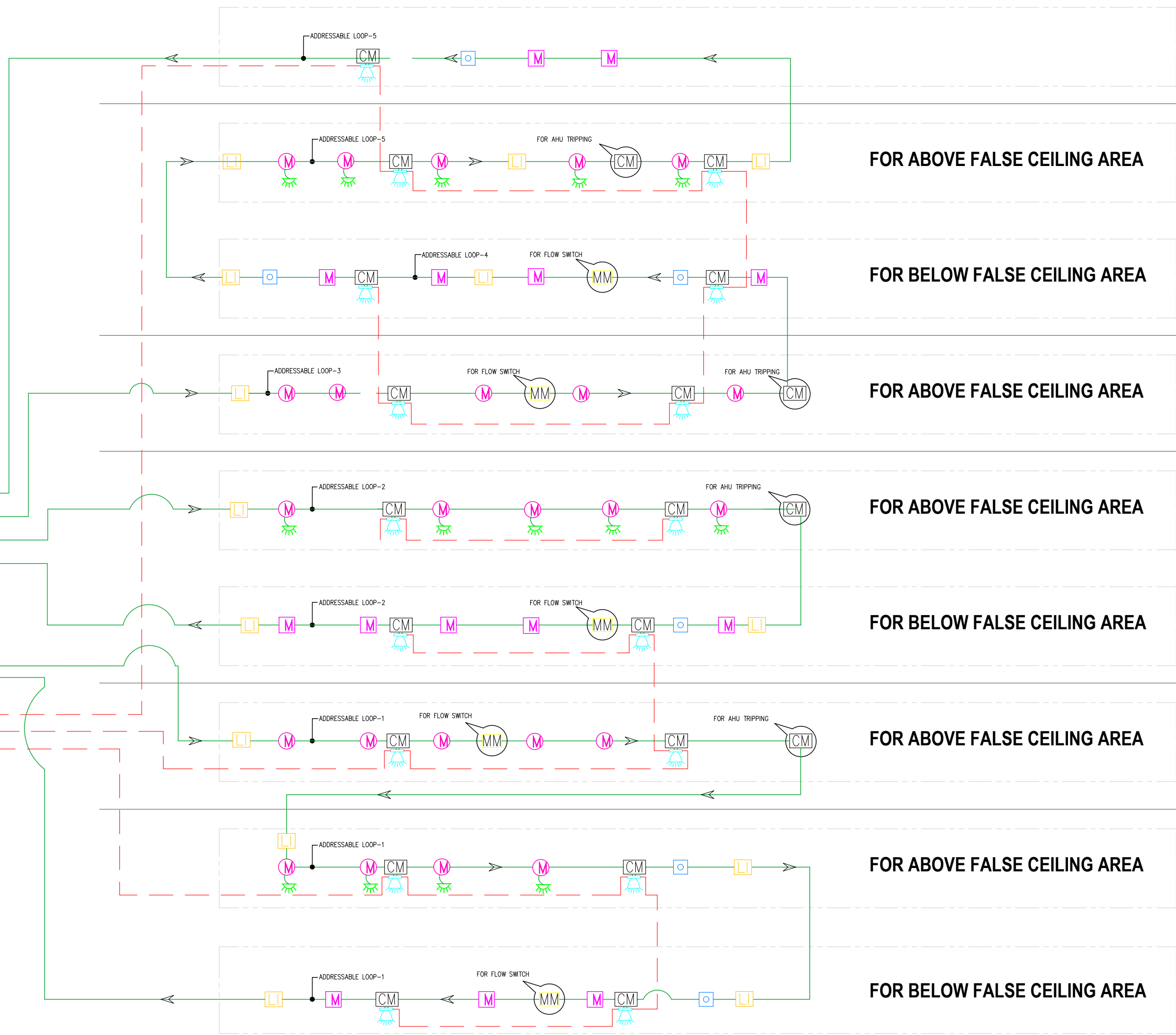
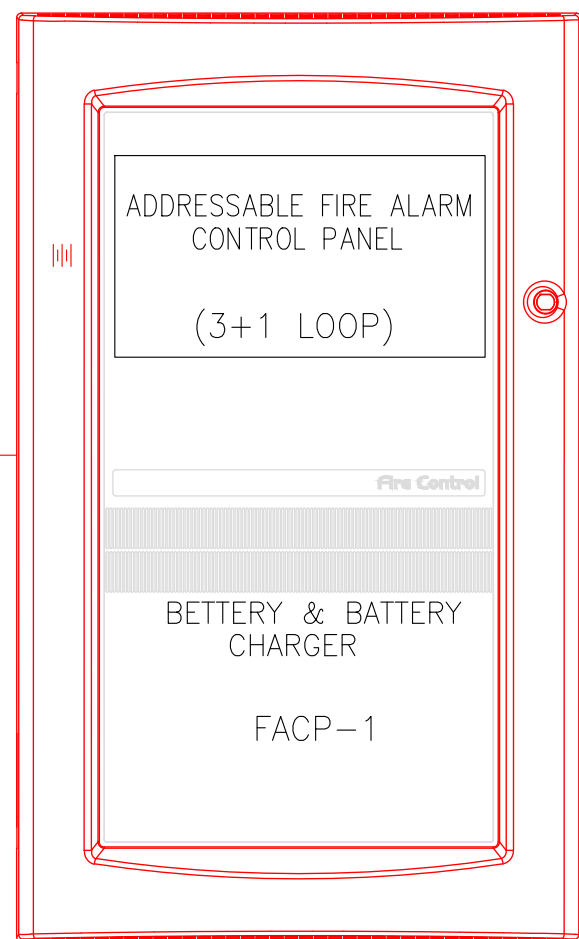
PLB & FF CONSULTANT
LALIT KUMAR BOSE
14 B CAMAC STREET : KOLKATA - 700 017

FIRE FIGHTING (SPR) FOR TENDER PURPOSE

DEALT:	B&B UNICON	SCALE:	1 : 200
CHECKED:	B&B UNICON	SIZE:	A1
APPROVED:	L.K.BOSE	DATE:	26.06.2021
JOB NUMBER:	XXXX	CODE NO	OMG-33021
FILE NAME: LKB-OMG-MB-FF-1021-det ph			
DRAWING TITLE DETAIL PIPING LAYOUT DRAWING AT PUMP HOUSE (Water Works)			
DRAWING NUMBER LKB - OMG - MB-FF-1021			
REVISION TO			

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230V POWER SOCKET
NEARBY FIRE ALARM PANEL
(TO BE SUPPLIED BY CLIENT)



TERRACE FLOOR

FOR ABOVE FALSE CEILING AREA

FOR BELOW FALSE CEILING AREA

FIRST MAZZ. FLOOR

FOR ABOVE FALSE CEILING AREA

FIRST FLOOR

FOR ABOVE FALSE CEILING AREA

FOR BELOW FALSE CEILING AREA

UG. MAZZ. FLOOR

FOR ABOVE FALSE CEILING AREA

UG FLOOR

FOR ABOVE FALSE CEILING AREA

FOR BELOW FALSE CEILING AREA

LG FLOOR

SCHEMATIC DIAGRAM OF FDA SYSTEM

NOTES:

- FIRE ALARM & DETECTION SYSTEM WILL BE DESIGNED AS PER IS :2189 / TAC GUIDELINES.
- THE FIRE ALARM PANEL SHALL BE PROVIDED WITH 24V DC BATTERY BACK UP (24 HOURS IN NORMAL CONDITION AND 30 MINUTES IN ALARM CONDITION), BATTERIES ARE 24V DC SEALED MAINTENANCE FREE TYPE
- ALL DETECTORS/ DEVICES SHALL BE ADDRESSABLE TYPE.
- ALL DETECTORS/ DEVICES' LOOP WILL BE WIRED IN CLASS-A CONFIGURATION.
- 240V AC POWER SUPPLY TO FAP TO BE ARRANGED BY CLIENT.
- AT LEAST ONE SPARE LOOP SHALL BE PROVIDED IN EACH FAP.
- 10% OF LOOP CAPACITY SHALL BE KEPT FREE IN EACH OF THE LOOP FOR FUTURE USAGE.
- RESPONSE INDICATORS WILL BE PROVIDED FOR STATUS INDICATION OF ABOVE FALSE CEILING DETECTORS.
- 2Cx1.5 SQ.MM. FRLS ARMoured CABLE SHALL BE USED FOR CONTROL CABLE FOR LOOP.
- 2Cx2.5 SQ.MM. FRLS ARMoured CABLE SHALL BE USED FOR 24V DC POWER SUPPLY.

LEGEND

Sl.No.	SYMBOL	DESCRIPTION
1.		FIRE ALARM CONTROL PANEL
2.		LOOP CABLE
3.		POWER CABLE
4.		MULTI SENSOR DETECTOR (BFC)
5.		MULTI SENSOR DETECTOR (AFC)
6.		CONTROL MODULE (FOR AHU TRIPPING)
7.		MONITOR MODULE (FOR FLOW SWITCH)
8.		MANUAL CALL POINT
9.		HOOTER CUM STROBE
10.		LINE ISOLATOR
11.		RESPONSE INDICATOR

ISSUED FOR TENDERING
Sign.....Date 05/11/22

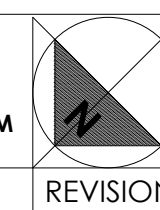
REV	MKD	DATE	DESCRIPTION	DEALT	CHKD

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE :: GOVERNMENT OF INDIA
PROJECT NAME
**K D MALAVIYA NATIONAL OIL MUSEUM
AT GUWAHATI : ASSAM**

 **ARCHITECT**
INDRANIL SEN
ARCHITECTURE INTERIOR URBANISM LIFESTYLE
E-MAIL - indranilsen.net@gmail.com :: WEBSITE - arindranilsen.in

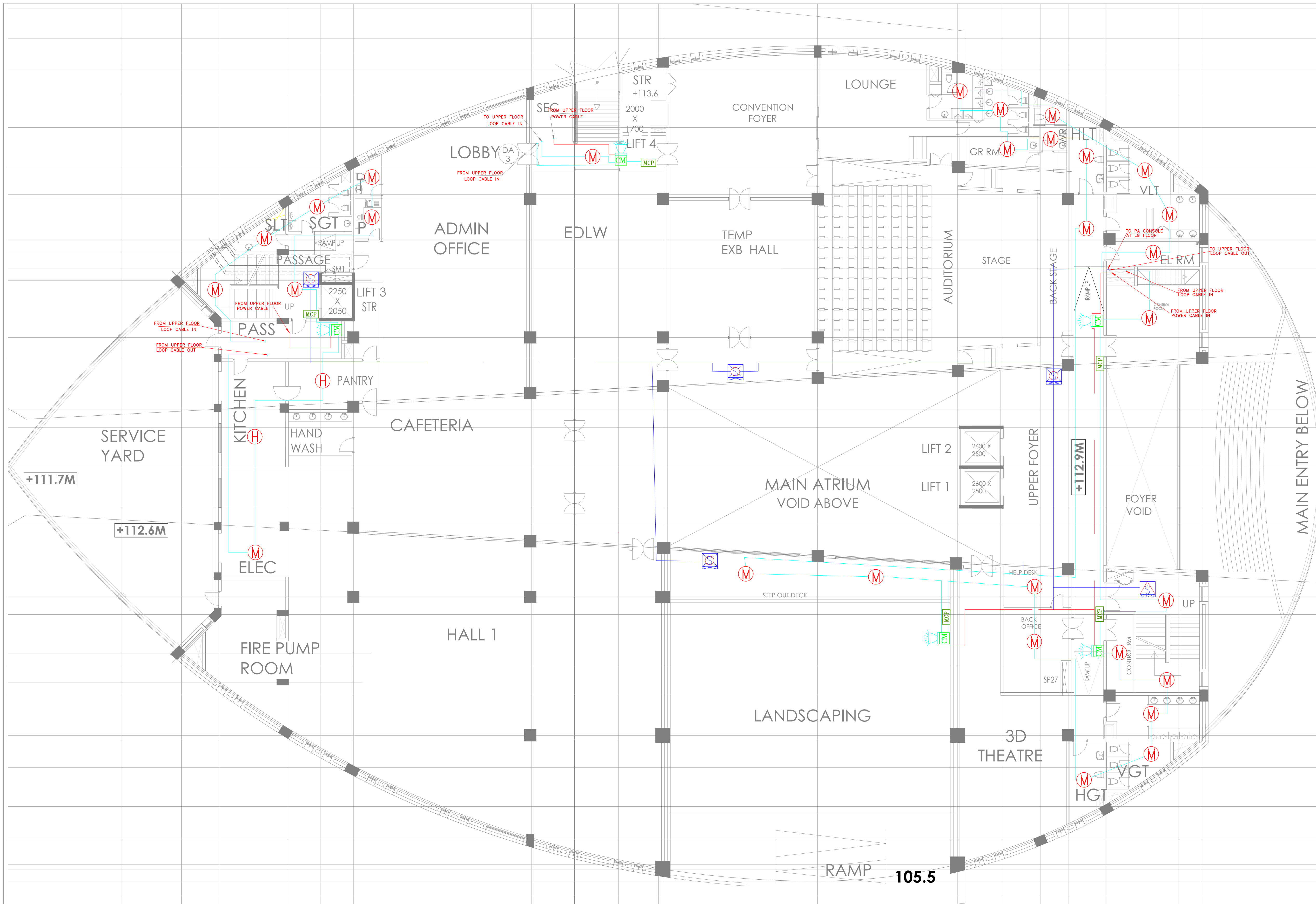
 **PLB & FF CONSULTANT**
LALIT KUMAR BOSE
46/A, S. N. Roy Road, Kolkata-700038
E-MAIL - lalit267.bose@gmail.com :: (M) - 9903111760

FIRE DETECTION (FDA)		FOR APPROVAL	
DEALT:	B&B UNICDN	SCALE:	1 : 150
CHECKED:	B&B UNICDN	SIZE:	A1
APPROVED:	L.K.BOSE	DATE:	16.06.2022
JOB NUMBER:		DRG CODE:	OMG - 33026
FILE NAME : LKB - OMG - MB - LV - 1026-sch fda			

DRAWING TITLE		
SCHEMATIC DIAGRAM OF FIRE DETECTION & ALARM SYSTEM		
DRAWING NUMBER		REVISION

LKB - OMG - MB - LV - 1026 **P0**

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FIRE FIGHTING LEGEND	
	LOOP CABLE (2cx1.5 sq.mm)
	POWER CABLE (2cx2.5 sq.mm)
	P.A. CABLE (2cx1.5 sq.mm)
	MULTI-SENSOR DETECTOR(AFC)
	MULTI-SENSOR DETECTOR(BFC)
	CONTROL RELAY MODULE
	MONITOR MODULE
	FIRE ALARM PANEL
	CONTROL MODULE
	HOOTER CUM STROB
	MANUAL CALL POINT
	RESPONSE INDICATOR
	CEILING MOUNTED SPEAKER
	WALL MOUNTED SPEAKER
	WALL MOUNTED LOUD SPEAKER
	BEAM DETECTOR
	BEAM DETECTOR (REFLECTOR)

- GENERAL NOTE :-
1. FIRE ALARM & DETECTION SYSTEM IS DESIGNED AS PER IS:2189 / NFPA 72E GUIDE LINES.
 2. AREA COVERAGE OF MULTI SENSOR DETECTOR SHALL NOT EXCEED THE VALUE AS SPECIFIED IN IS:2189.
 3. MCP. SHOULD BE SITED AT 1200 MM ABOVE FFL.
 4. ALL DETECTORS/ DEVICES SHALL BE ADDRESSABLE TYPE.
 5. RELAY MODULE, MONITOR MODULE & HOOTER SHOULD BE INSTALLED ON THE SIDEWALL AT 2200 MM ABOVE FFL.
 6. DETECTOR LOCATIONS ARE SUBJECT TO MINOR CHANGE TO AVOID FOULING WITH EXISTING SUPPORT, LIGHTING, FIXTURES BASED ON ACTUAL SITE CONDITION.
 7. EVERY EXIT & STAIRCASE PROVIDED WITH MANUAL CALL POINT AS SHOWN ON DRAWING.
 8. THE CABLE ROUTING IS INDICATIVE & IS SUBJECT TO CHANGE AS PER SITE CONDITION.
 9. SHORT CIRCUIT ISOLATOR SHALL BE PROVIDED IN THE LOOP AFTER EVERY TWENTY DETECTORS / DEVICES.
 10. ALL THE DETECTORS ARE MULTI-SENSOR DETECTORS.
 11. 2CX1.5 SQ.MM. FRLS ARMoured COPPER CABLE SHALL BE USED FOR CONTROL CABLE FOR LOOP.
 12. 2CX2.5 SQ.MM. FRLS ARMoured COPPER CABLE SHALL BE USED FOR 24V DC POWER SUPPLY.

REF DWG	
DWG TITLE	DWG NO
Schematic Diagram of Fire Detection & Alarm System.	LKB - OMG - MB - LV - 1026
Schematic Diagram of Public Address System	LKB - OMG - MB - LV - 1027

REV	MKD	DATE	DESCRIPTION	DEALT	CHKD	APVD

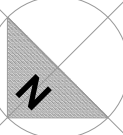
NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE :: GOVERNMENT OF INDIA

PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM AT GUWAHATI : ASSAM

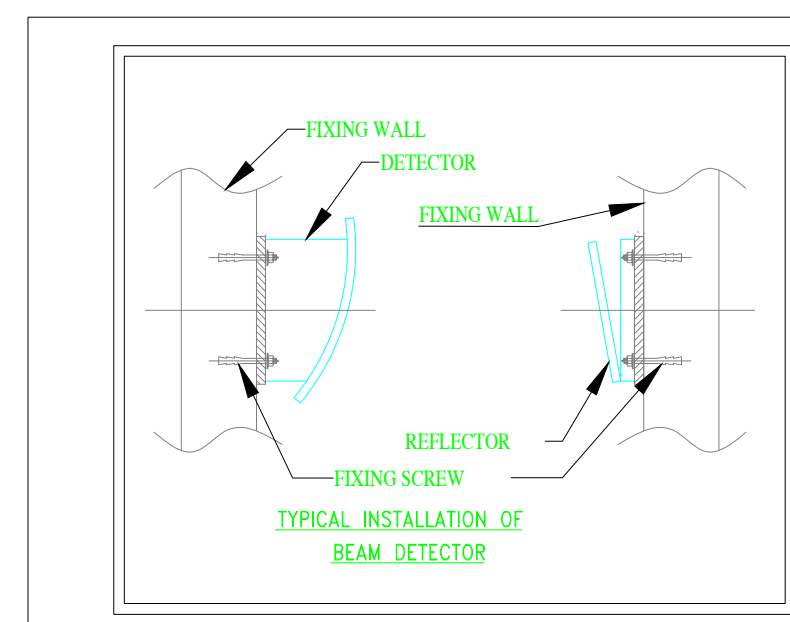
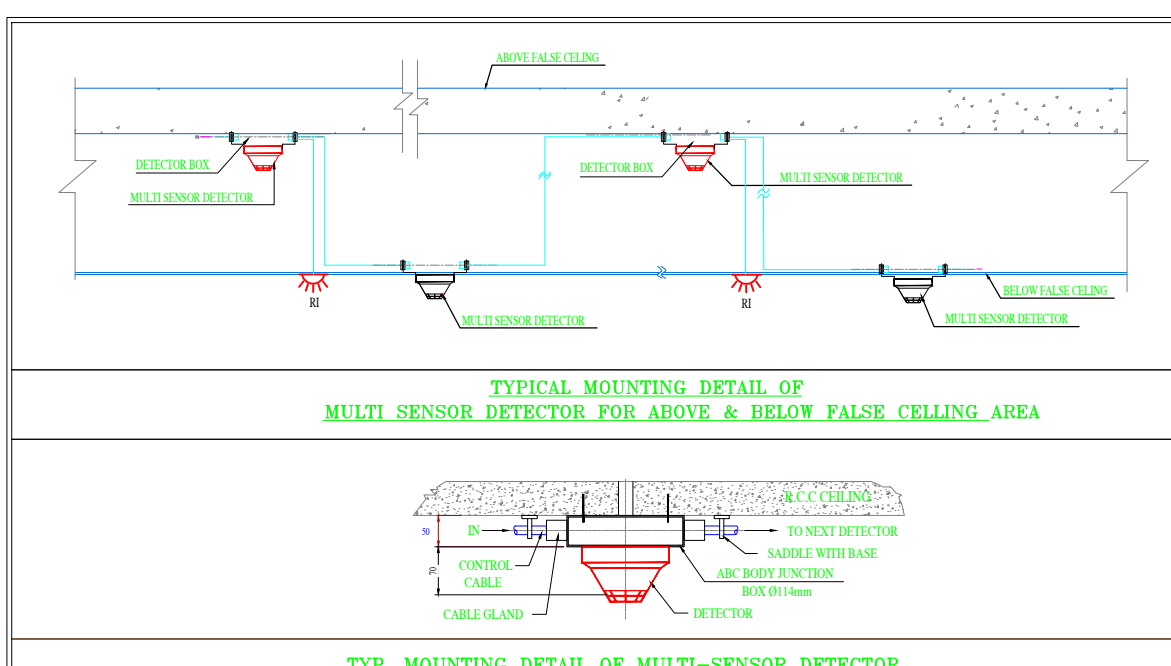
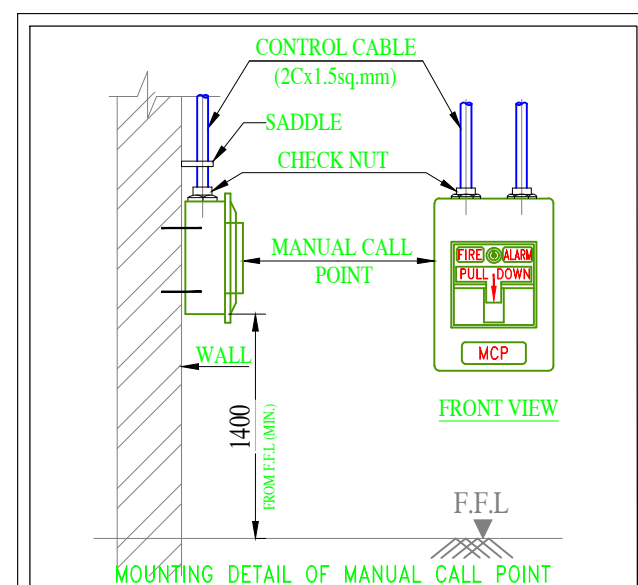
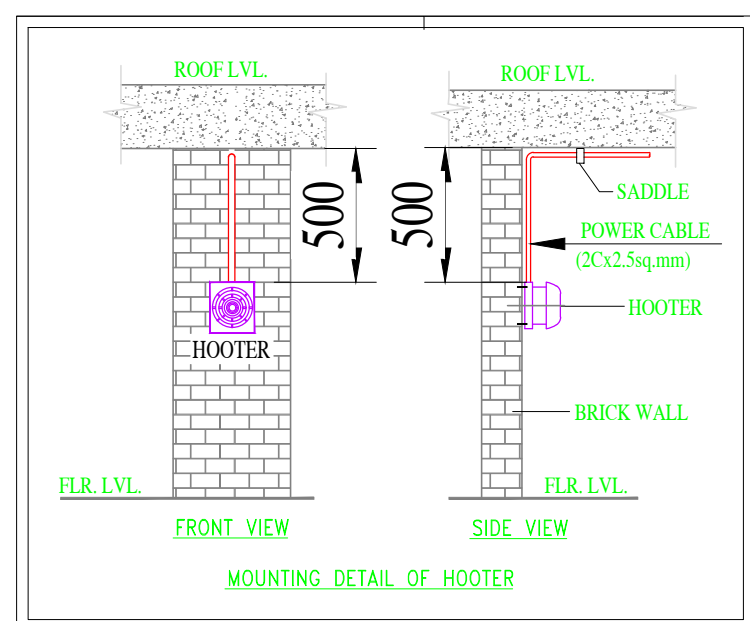
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 **PLB & FF CONSULTANT**
LALIT KUMAR BOSE
46/A S. N. Roy Road, Kolkata-700038
E-MAIL - lkb2577.bose@gmail.com :: (M)-9903111760

LOW VOLTAGE (FDA & PA)		FOR TENDER ONLY	
DEALT :	B&B UNICON	SCALE :	1 : 125
CHECKED :	B&B UNICON	SIZE :	A1
APPROVED :	L.K. BOSE	DATE :	26.06.2022
JOB NUMBER :	DRG CODE : OMG - 33030		
FILE NAME :	LKB-OMG/MB-LV-1030-ug fda pa		

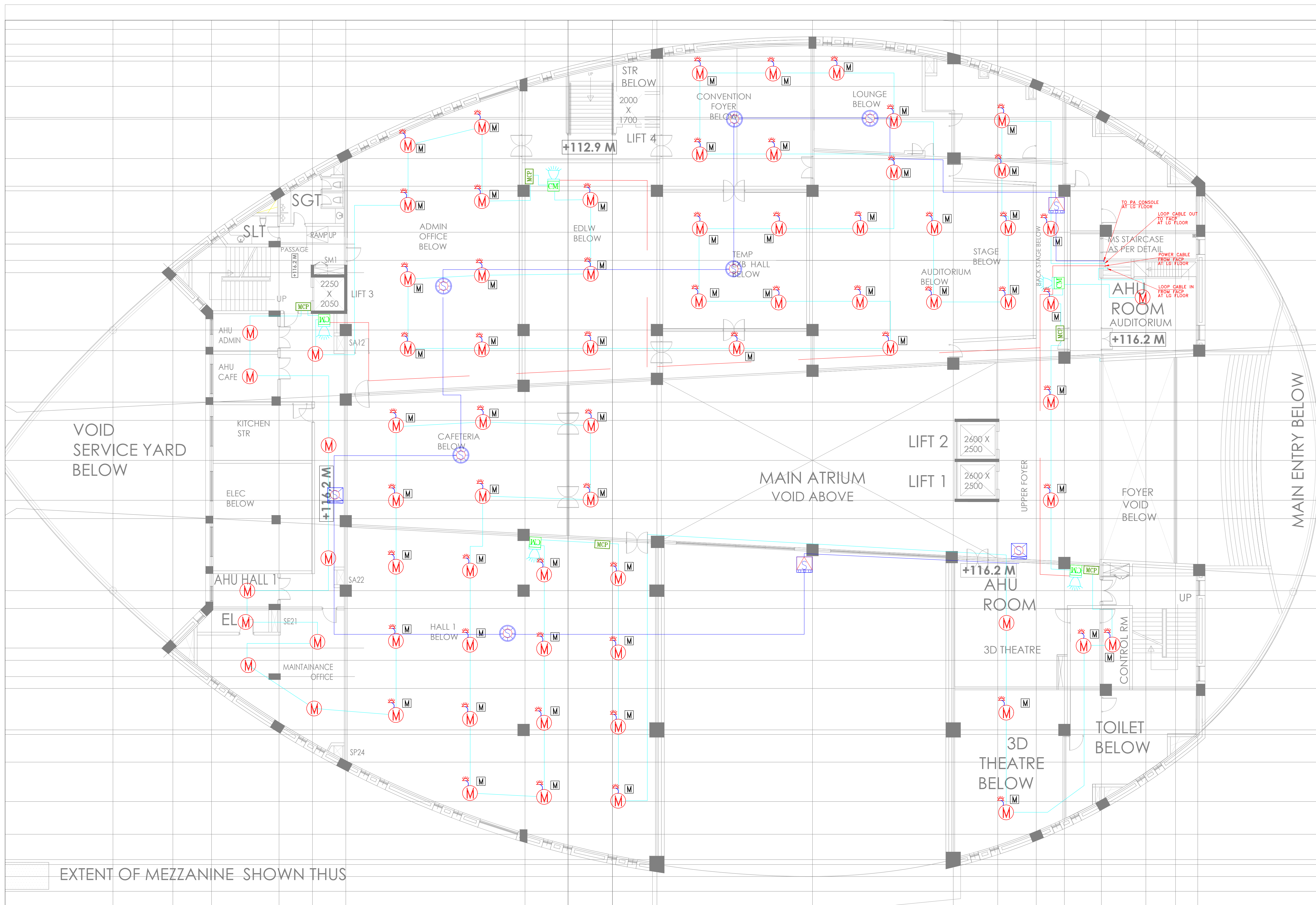
DRAWING TITLE	
LAYOUT OF FDA AND PA SYSTEM AT UPPER GROUND FLOOR	
DRAWING NUMBER	REVISION
LKB - OMG/MB-LV-1030	P0

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ISSUED FOR TENDERING
Sign:  Date: 05/11/22





FIRE FIGHTING LEGEND	
	LOOP CABLE (2cx1.5 sq.mm)
	POWER CABLE (2cx2.5 sq.mm)
	P.A. CABLE (2cx1.5 sq.mm)
	MULTI-SENSOR DETECTOR(AFC)
	MULTI-SENSOR DETECTOR(BFC)
	CONTROL RELAY MODULE
	MONITOR MODULE
	FIRE ALARM PANEL
	CONTROL MODULE
	HOOTER CUM STROB
	MANUAL CALL POINT
	RESPONSE INDICATOR
	CEILING MOUNTED SPEAKER
	WALL MOUNTED SPEAKER
	WALL MOUNTED LOUD SPEAKER
	BEAM DETECTOR
	BEAM DETECTOR (REFLECTOR)

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 - ALL THE DETECTORS ARE MULTI-SENSOR DETECTORS.
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 - 2CX2.5 SQ.MM. FRLS ARMoured COPPER CABLE SHALL BE USED FOR 24V DC POWER SUPPLY.

REF DWG	
DWG TITLE	DWG NO
Schematic Diagram of Fire Detection & Alarm System.	LKB - OMG - MB - LV - 1026
Schematic Diagram of Public Address System	LKB - OMG - MB - LV - 1027

REV	MKD	DATE	DESCRIPTION	DEALT	CHKD	APVD


NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE :: GOVERNMENT OF INDIA

PROJECT NAME
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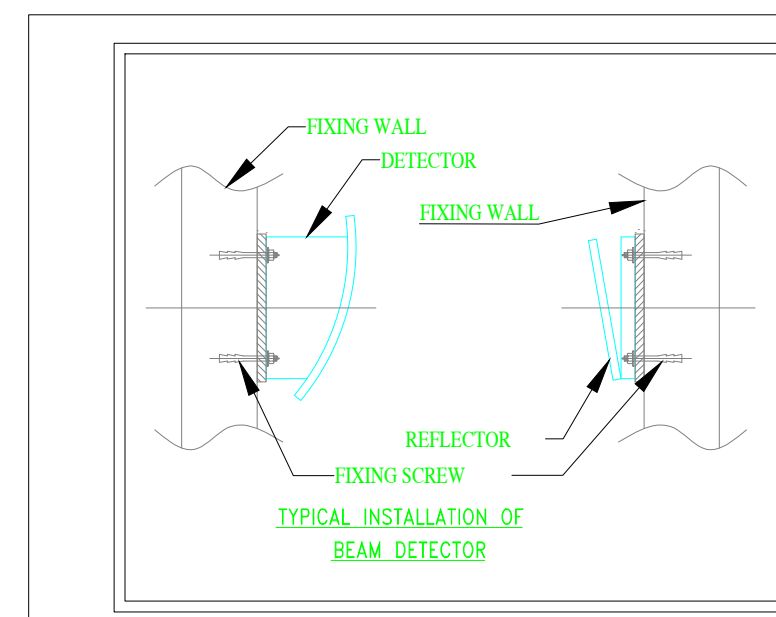
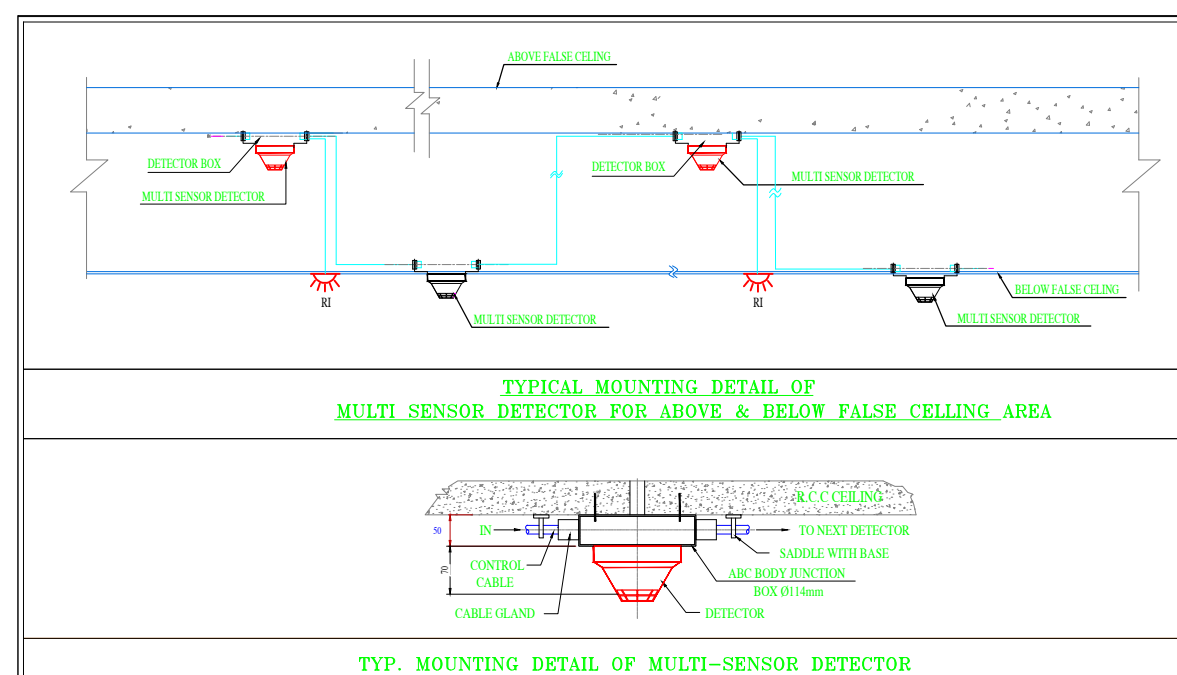
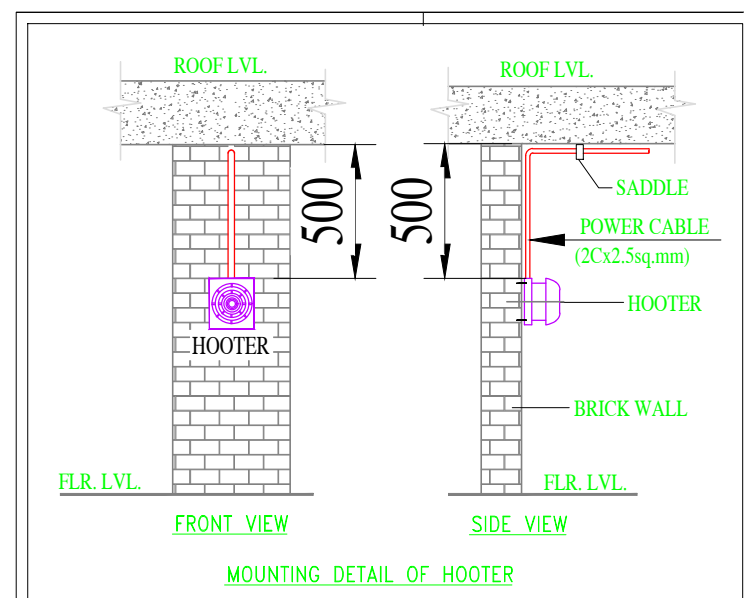
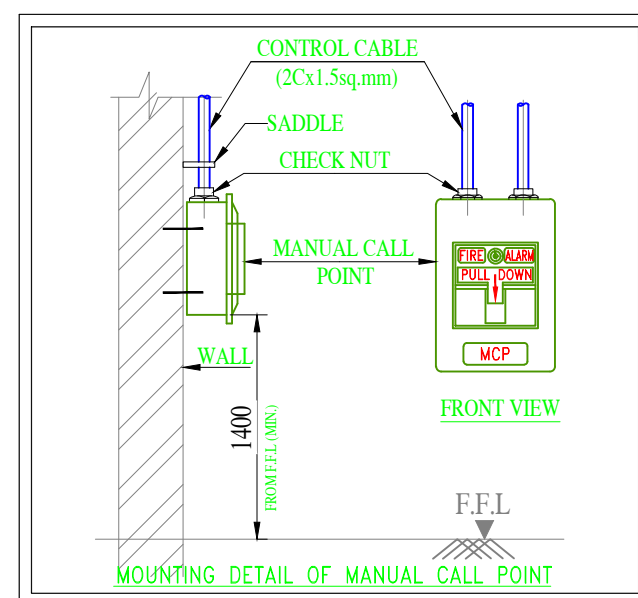
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PLB & FF CONSULTANT
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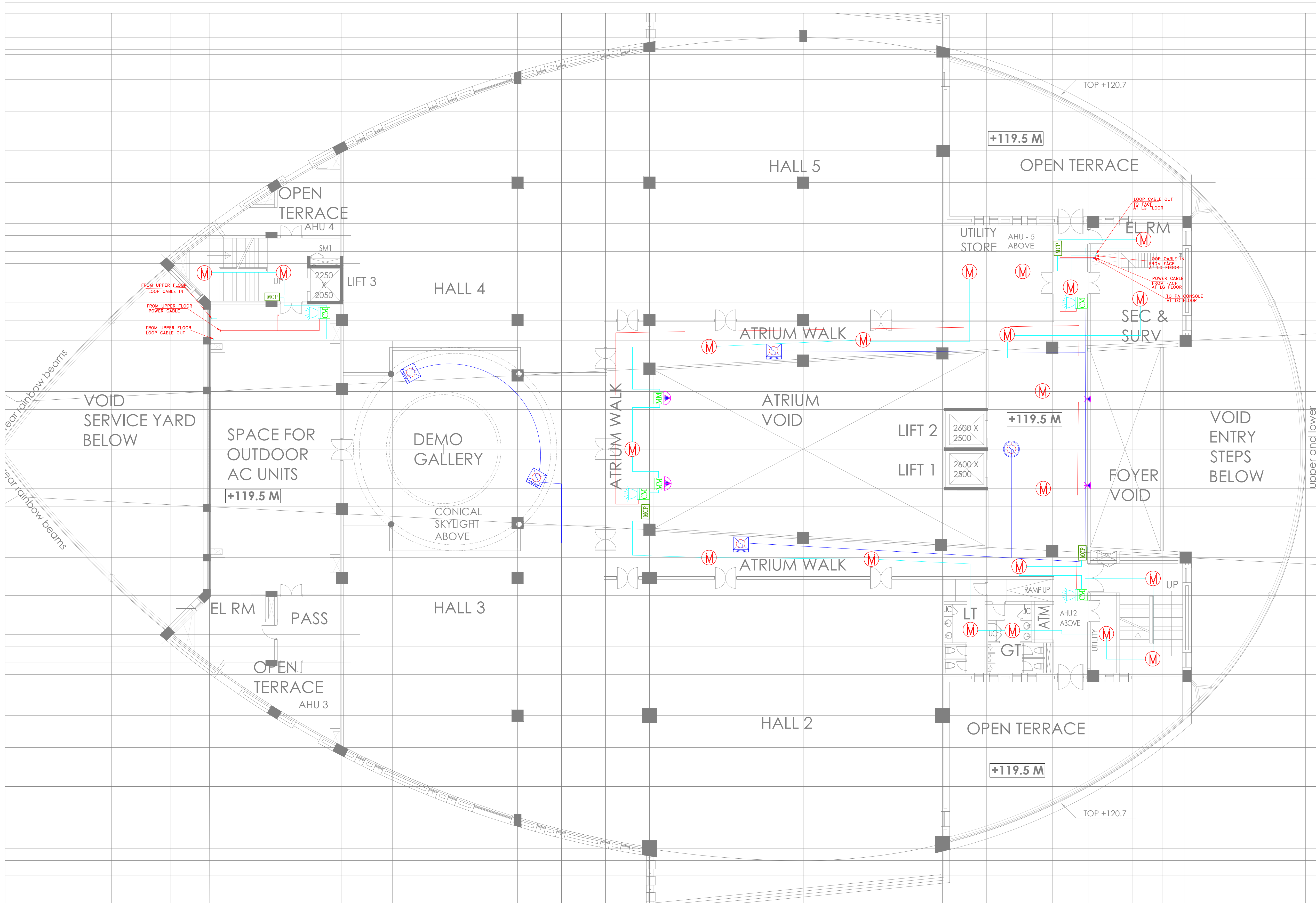
LOW VOLTAGE (FDA & PA)		FOR TENDER ONLY	
DEALT :	B&B UNICON	SCALE :	1 : 125
CHECKED :	B&B UNICON	SIZE :	A1
APPROVED :	L.K. BOSE	DATE :	26.06.2022
JOB NUMBER :	DRG CODE : OMG - 33031		
FILE NAME :	LKB - OMG - MB - LV - 1031-ugm fda pa		

DRAWING TITLE		
LAYOUT OF FDA AND PA SYSTEM AT UPPER GROUND MEZZANINE FLOOR		
DRAWING NUMBER		REVISION
LKB - OMG/MB-LV -1031		P0

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Sign: Date: 05/11/22



FIRE FIGHTING LEGEND	
	LOOP CABLE (2cx1.5 sq.mm)
	POWER CABLE (2cx2.5 sq.mm)
	P.A. CABLE (2cx1.5 sq.mm)
	MULTI-SENSOR DETECTOR(AFC)
	MULTI-SENSOR DETECTOR(BFC)
	CONTROL RELAY MODULE
	MONITOR MODULE
	FIRE ALARM PANEL
	CONTROL MODULE
	HOOTER CUM STROBE
	MANUAL CALL POINT
	RESPONSE INDICATOR
	CEILING MOUNTED SPEAKER
	WALL MOUNTED SPEAKER
	WALL MOUNTED LOUD SPEAKER
	BEAM DETECTOR
	BEAM DETECTOR (REFLECTOR)

- GENERAL NOTE :-
- FIRE ALARM & DETECTION SYSTEM IS DESIGNED AS PER IS:2189 / NFPA 72E GUIDE LINES.
 - AREA COVERAGE OF MULTI SENSOR DETECTOR SHALL NOT EXCEED THE VALUE AS SPECIFIED IN IS:2189.
 - MCP SHOULD BE SITED AT 1200 MM ABOVE FFL.
 - ALL DETECTORS/ DEVICES SHALL BE ADDRESSABLE TYPE.
 - RELAY MODULE, MONITOR MODULE & HOOTER SHOULD BE INSTALLED ON THE SIDEWALL AT 2200 MM ABOVE FFL.
 - DETECTOR LOCATIONS ARE SUBJECT TO MINOR CHANGE TO AVOID FOULING WITH EXISTING SUPPORT, LIGHTING, FIXTURES BASED ON ACTUAL SITE CONDITION.
 - EVERY EXIT & STAIRCASE PROVIDED WITH MANUAL CALL POINT AS SHOWN ON DRAWING.
 - THE CABLE ROUTING IS INDICATIVE & IS SUBJECT TO CHANGE AS PER SITE CONDITION.
 - SHORT CIRCUIT ISOLATOR SHALL BE PROVIDED IN THE LOOP AFTER EVERY TWENTY DETECTORS / DEVICES.
 - ALL THE DETECTORS ARE MULTI-SENSOR DETECTORS.
 - 2CX1.5 SQ.MM. FRLS ARMOURD COPPER CABLE SHALL BE USED FOR CONTROL CABLE FOR LOOP.
 - 2CX2.5 SQ.MM. FRLS ARMOURD COPPER CABLE SHALL BE USED FOR 24V DC POWER SUPPLY.

REF DWG	
DWG TITLE	DWG NO
Schematic Diagram of Fire Detection & Alarm System.	LKB - OMG - MB - LV - 1026
Schematic Diagram of Public Address System	LKB - OMG - MB - LV - 1027

REV	MKD	DATE	DESCRIPTION	DEALT	CHKD	APVD

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE :: GOVERNMENT OF INDIA

PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM AT GUWAHATI : ASSAM

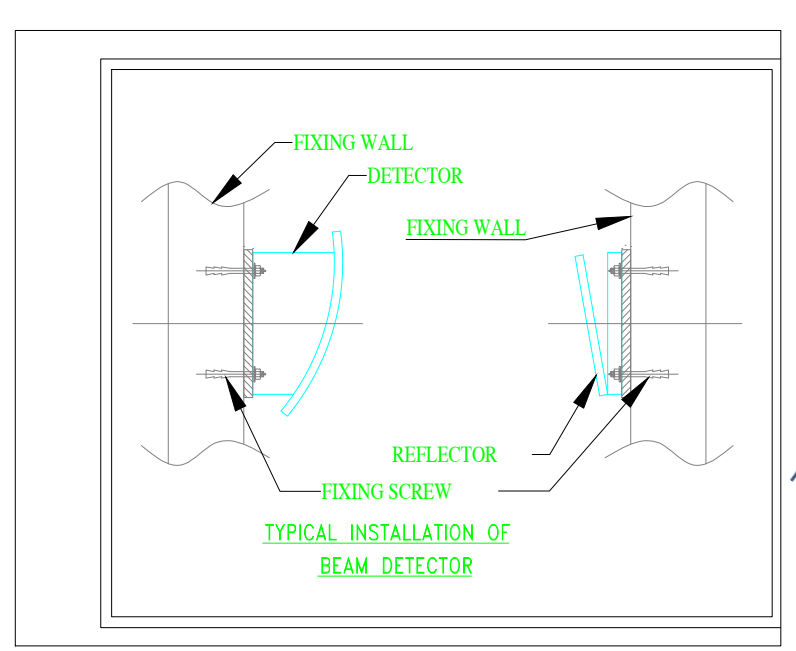
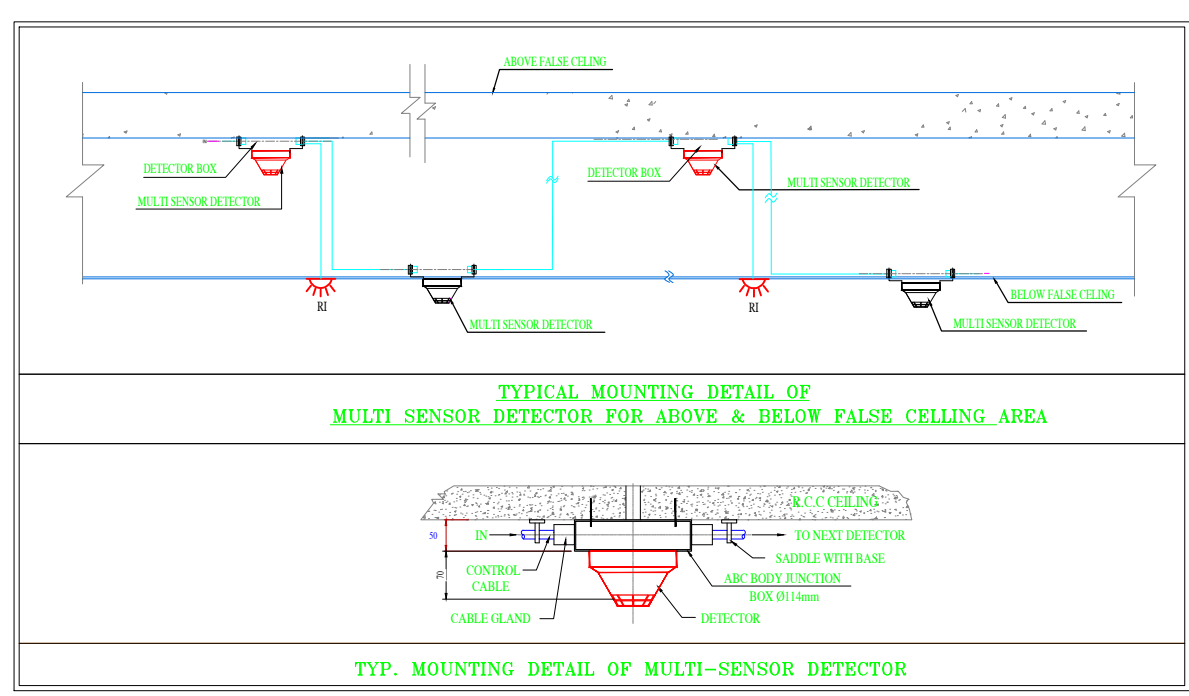
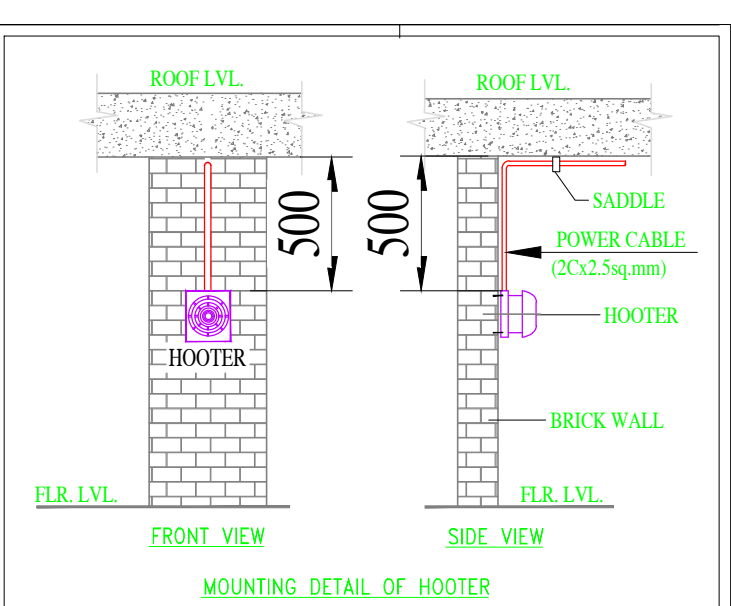
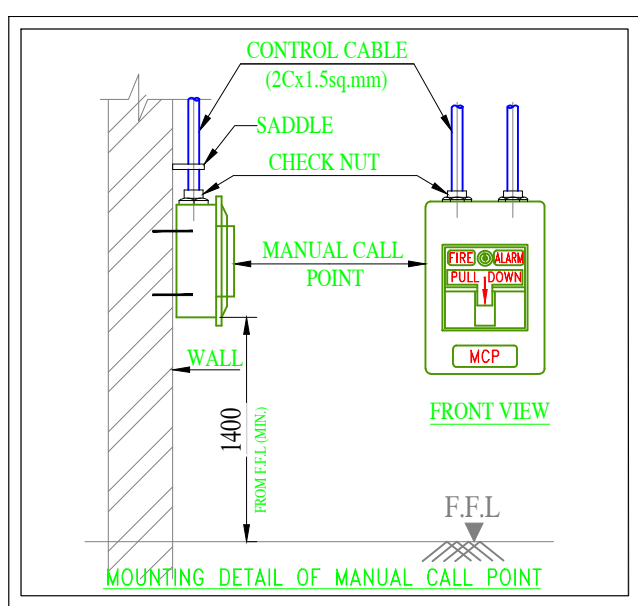
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LOW VOLTAGE (FDA & PA)		FOR TENDER ONLY	
DEALT :	B&B UNICON	SCALE :	1 : 125
CHECKED :	B&B UNICON	SIZE :	A1
APPROVED :	L.K. BOSE	DATE :	26.06.2022
JOB NUMBER :	DRG CODE : OMG - 33032		
FILE NAME :	LKB - OMG - MB - LV - 1032-ff fda pa		

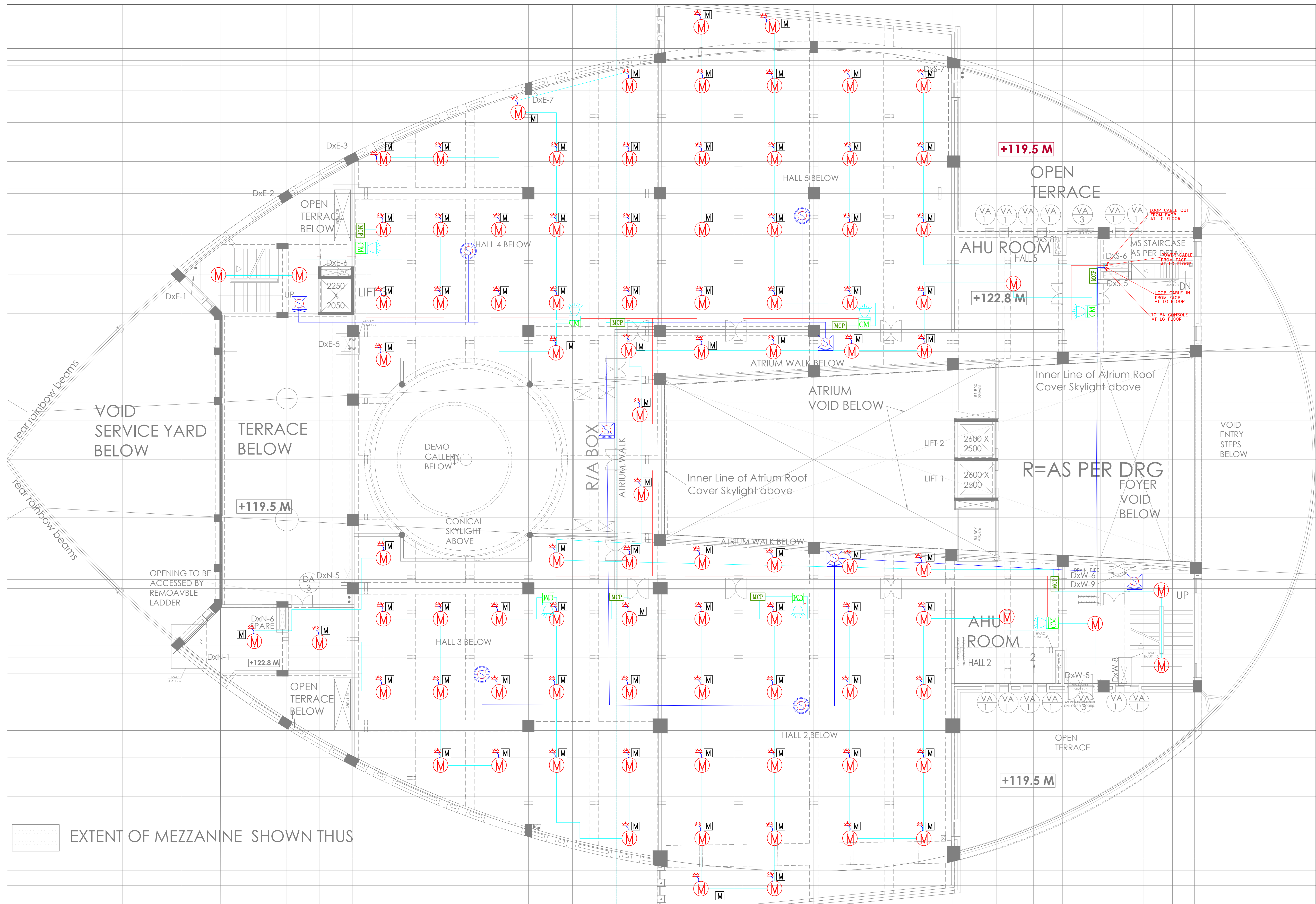
DRAWING TITLE	
LAYOUT OF FDA AND PA SYSTEM AT FIRST FLOOR	
DRAWING NUMBER	REVISION
LKB - OMG/MB-LV -1032	P0

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ISSUED FOR TENDERING
Sgt. 1032-ff fda pa
Date: 26.06.2022





FIRE FIGHTING LEGEND	
	LOOP CABLE (2cx1.5 sq.mm)
	POWER CABLE (2cx2.5 sq.mm)
	P.A. CABLE (2cx1.5 sq.mm)
	MULTI SENSOR DETECTOR(AFC)
	MULTI SENSOR DETECTOR(BFC)
	CONTROL RELAY MODULE
	MONITOR MODULE
	FIRE ALARM PANEL
	CONTROL MODULE
	HOOTER CUM STROBE
	MANUAL CALL POINT
	RESPONSE INDICATOR
	CEILING MOUNTED SPEAKER
	WALL MOUNTED LOUD SPEAKER
	BEAM DETECTOR
	BEAM DETECTOR (REFLECTOR)

- GENERAL NOTE :-
- FIRE ALARM & DETECTION SYSTEM IS DESIGNED AS PER IS:2189 / NFPA 72E GUIDE LINES.
 - AREA COVERAGE OF MULTI SENSOR DETECTOR SHALL NOT EXCEED THE VALUE AS SPECIFIED IN IS:2189.
 - MCP. SHOULD BE SITED AT 1200 MM ABOVE FFL.
 - ALL DETECTORS/ DEVICES SHALL BE ADDRESSABLE TYPE.
 - RELAY MODULE, MONITOR MODULE & HOOTER SHOULD BE INSTALLED ON THE SIDEWALL AT 2200 MM ABOVE FFL.
 - DETECTOR LOCATIONS ARE SUBJECT TO MINOR CHANGE TO AVOID FOULING WITH EXISTING SUPPORT, LIGHTING, FIXTURES BASED ON ACTUAL SITE CONDITION.
 - EVERY EXIT & STAIRCASE PROVIDED WITH MANUAL CALL POINT AS SHOWN ON DRAWING.
 - THE CABLE ROUTING IS INDICATIVE & IS SUBJECT TO CHANGE AS PER SITE CONDITION.
 - SHORT CIRCUIT ISOLATOR SHALL BE PROVIDED IN THE LOOP AFTER EVERY TWENTY DETECTORS / DEVICES.
 - ALL THE DETECTORS ARE MULTI-SENSOR DETECTORS.
 - 2cx1.5 SQ.MM. FRLS ARMoured COPPER CABLE SHALL BE USED FOR CONTROL CABLE FOR LOOP.
 - 2cx2.5 SQ.MM. FRLS ARMoured COPPER CABLE SHALL BE USED FOR 24V DC POWER SUPPLY.

REF DWG	
DWG TITLE	DWG NO
Schematic Diagram of Fire Detection & Alarm System.	LKB - OMG - MB - LV - 1026
Schematic Diagram of Public Address System	LKB - OMG - MB - LV - 1027


NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE :: GOVERNMENT OF INDIA

PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM AT GUWAHATI : ASSAM

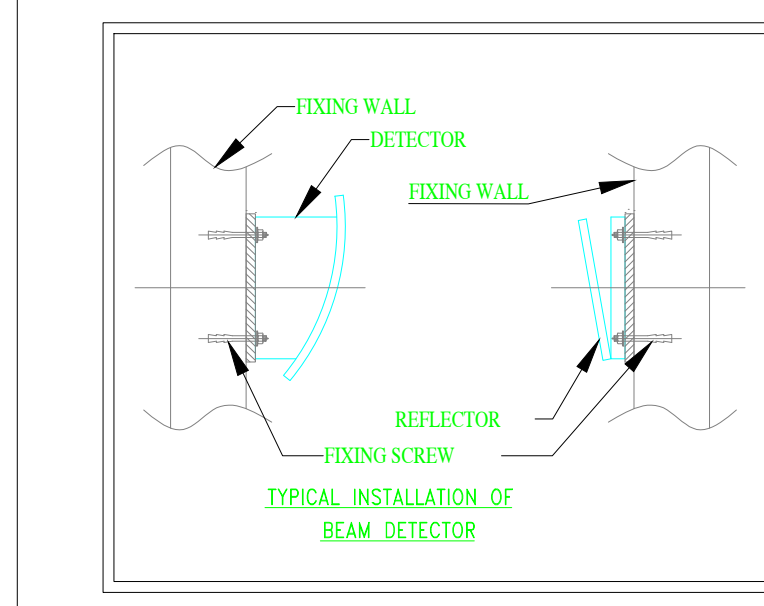
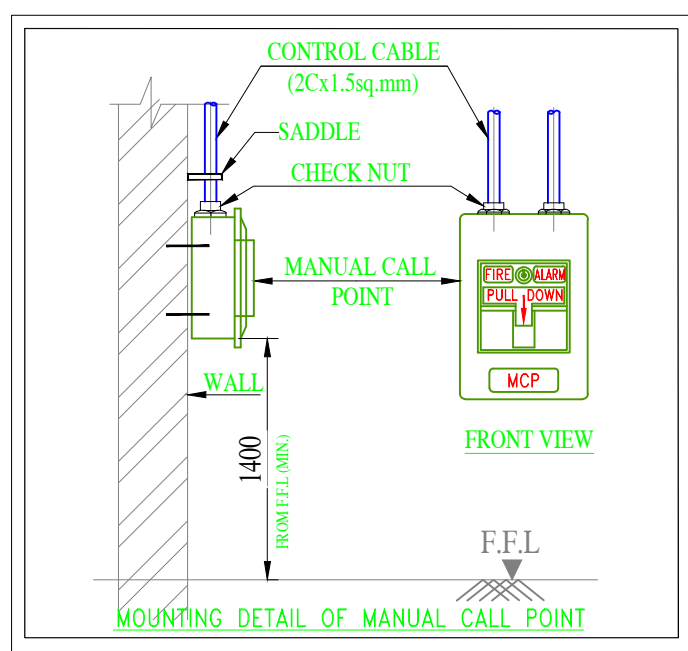
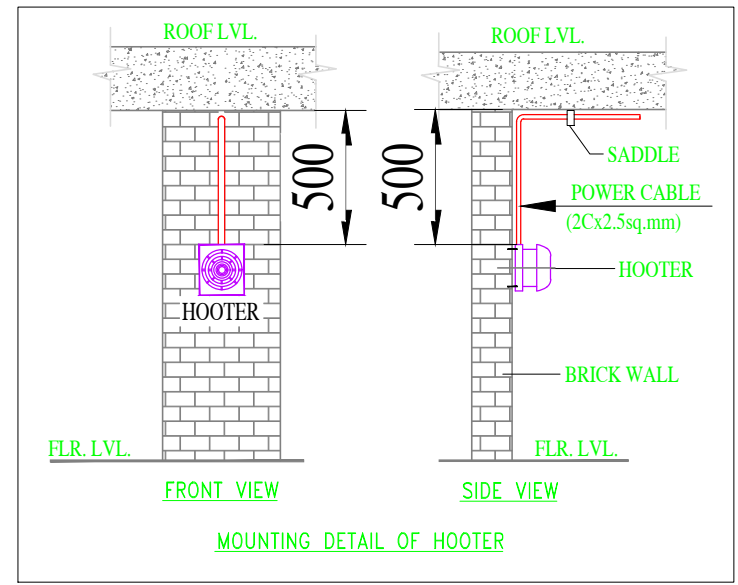
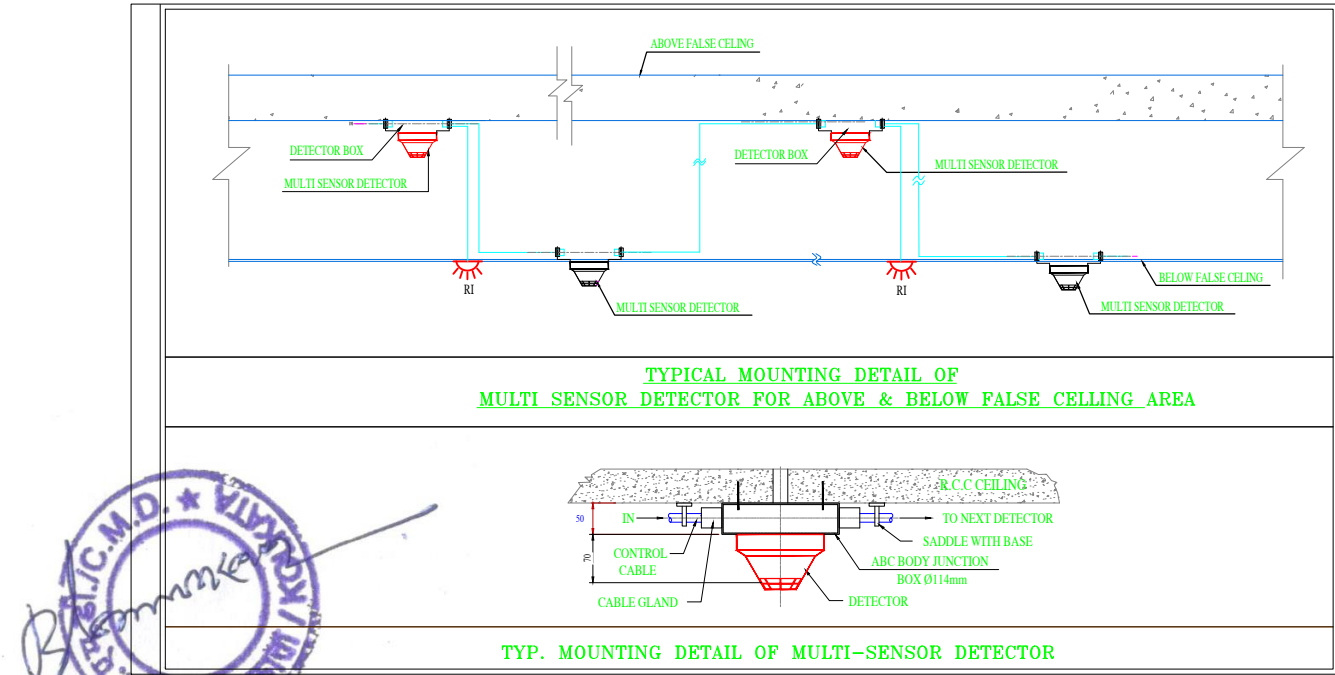
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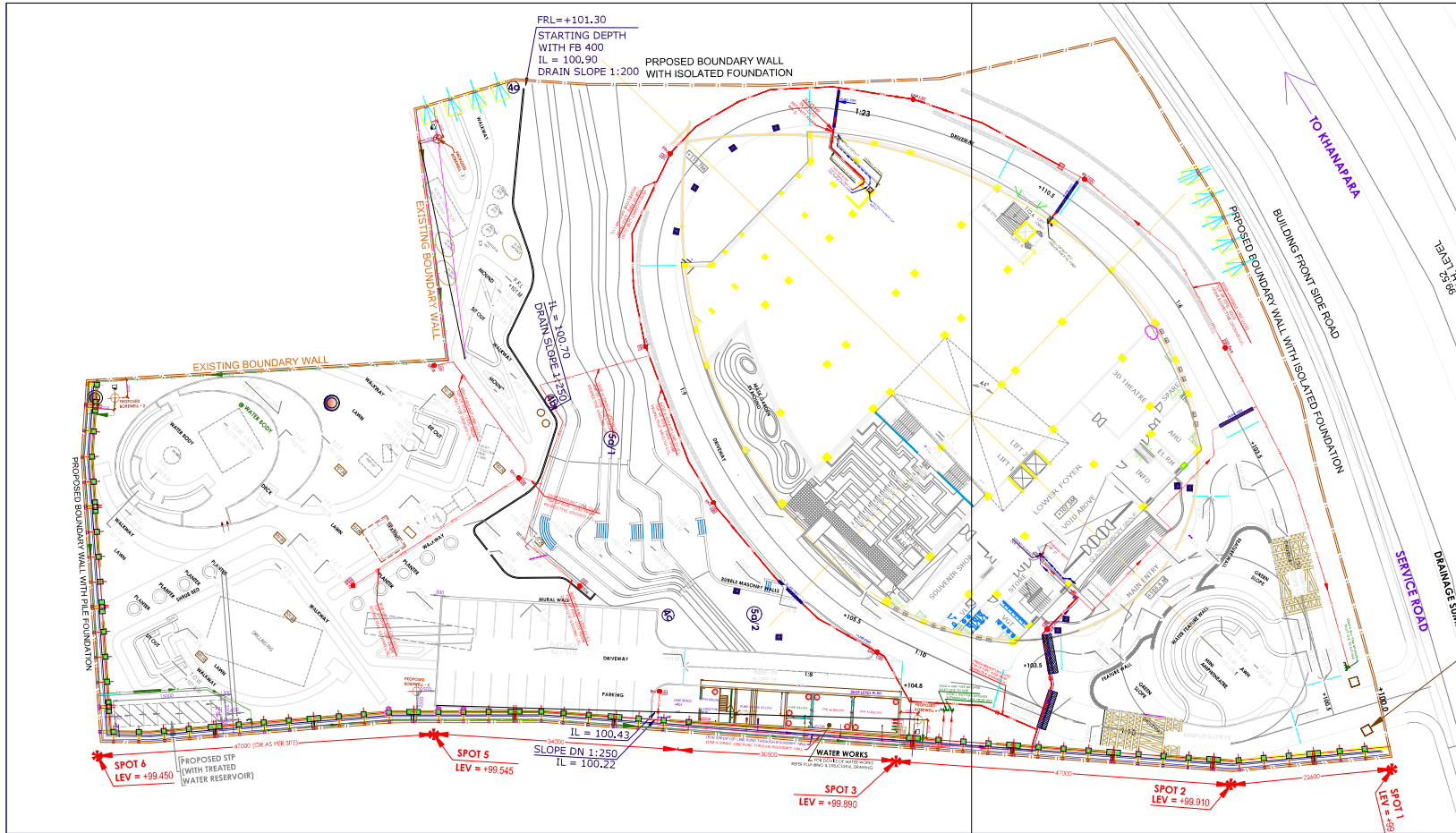
LOW VOLTAGE (FDA & PA)		FOR TENDER ONLY	
DEALT :	B&B UNICON	SCALE :	1 : 125
CHECKED :	B&B UNICON	SIZE :	A1
APPROVED :	L.K.BOSE	DATE :	26.06.2022
JOB NUMBER :	DRG CODE : OMG - 33033		
FILE NAME :	LKB - OMG - MB - LV - 1033-fm fda pa		

DRAWING TITLE		
LAYOUT OF FDA & PA SYSTEM AT FIRST FLOOR MEZZANINE		
DRAWING NUMBER		REVISION
LKB - OMG/MB-LV -1033		P0

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ISSUED FOR TENDERING
Sign.....Date 05/11/22



FIRE LEGEND	
	HYDRANT LINE
	SPRINKLER LINE
	HYDRANT VALVE
	HOSE BOX
	4 WAY BRIGADE INLET
	1 WAY WITHDRAWAL
	BUTTERFLY VALVE
	GATE VALVE
	VALVE WITH VALVE CEMBER
	HUME PIPE

- NOTE :-
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
 2. ALL PIPE SIZES ARE IN mm & NOMINAL DIA ONLY.
 3. FITTINGS FOR MS PIPES WILL BE AS PER IS: 1239 (PART-II), HEAVY GRADE, FITTING OF SIZES BELOW 50 mm NB SHALL BE SOCKET WELD TYPE.
 4. FLANGES SHALL BE AS PER IS: 4392 TABLE- 17 FOR MS PIPES
 5. UNDER GROUND PIPES SHALL BE TREATED WITH ANTICORROSION TREATMENT AS PER IS: 10221.
 6. OVER GROUND PIPES SHALL BE PAINTED WITH TWO COATS OF RED OXIDE PRIMER & TWO COATS OF P.O. RED SYNTHETIC ENAMEL PAINT.
 7. MINOR MODIFICATIONS MAY BE CARRIED OUT AT SITE TO SUIT SITE CONDITION.
 8. ALL LANDING VALVE SHALL BE FIXED WITHIN 1.0M RESPECTIVE GROUND LEVEL.
 9. ALL PIPES ARE MS HEAVY GRADE AS PER IS:1239 UP TO 150 MM DIA AND IS: 5589 FROM 200 MM DIA AND ABOVE WITH 6.35 MM WALL THICKNESS.

ISSUED FOR TENDERING
 Sign: *[Signature]* Date: 05/11/22

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
 NATIONAL COUNCIL OF SCIENCE MUSEUMS
 MINISTRY OF CULTURE :: GOVERNMENT OF INDIA
 PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM
AT GUWAHATI : ASSAM

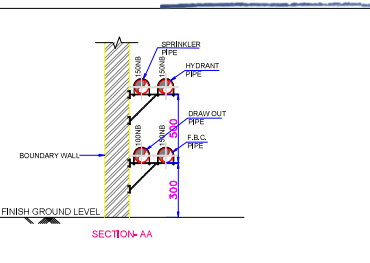
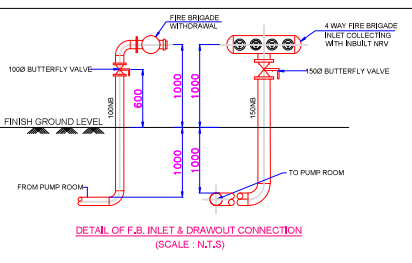
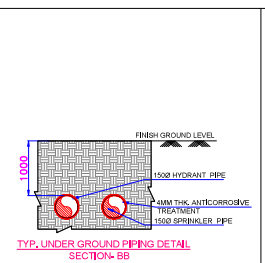
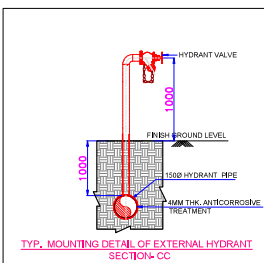
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 E-MAIL: indranil.sen@gmail.com ; WEBSITE: www.indranil.in

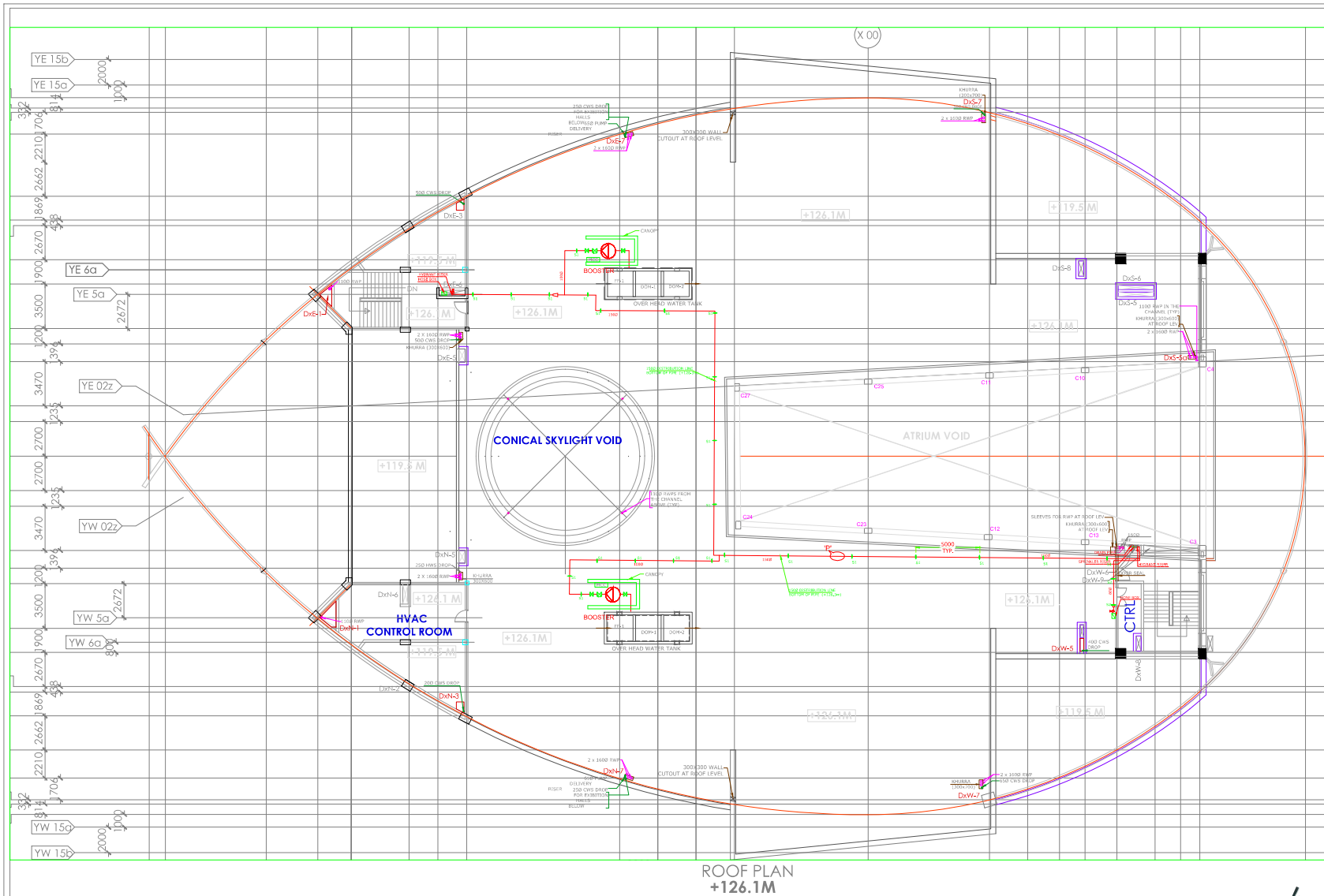
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FIRE FIGHTING (SPR)		FOR TENDER ONLY
DEALT:	8&8 UNICON	SCALE: 1:300
CHECKED:	8&8 UNICON	DATE: A1
APPROVED:	L.K. BOSE	DATE: 05.06.2021
JOB NUMBER:	DRG CODE: OMG-33020	
FILE NAME:	LKB - OMG - MB - FF - 1020-ext hyd spk	

DRAWING TITLE	REVISION
EXTERNAL LAYOUT OF HYDRANT AND SPRINKLER PIPING	
DRAWING NUMBER	
LKB - OMG / MB-FF-1020	

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FIRE FIGHTING LEGEND	
	BOOSTER PUMP
	REDUCER
	BUTTERFLY VALVE
	BALL VALVE (OPEN)
	NON RETURN VALVE
	LANDING VALVE
	HOSE BOX
	HYDRANT PIPE

- GENERAL NOTE :-
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
 2. ALL PIPE SIZES ARE IN mm & NOMINAL DIA ONLY.
 3. FITTINGS FOR MS PIPE OF SIZES 50 NB AND ABOVE SHALL BE BUTT WELDED TYPE AS PER IS:1239 (GRATE-1) HEAVY GRADE. FITTINGS OF SIZES BELOW 50 NB SHALL BE SOCKET WELD TYPE.
 4. FLANGES SHALL BE AS PER IS: 6392 TABLE- 17 FOR MS PIPES
 5. UNDER GROUND PIPES SHALL BE TREATED WITH ANTICORROSION TREATMENT AS PER IS: 10221
 6. OVER GROUND PIPES SHALL BE PAINTED WITH TWO COATS OF RED OXIDE PRIMER & TWO COATS OF PO RED SYNTHETIC ENAMEL PAINT.
 7. MINOR MODIFICATIONS MAY BE CARRIED AT SITE TO SUIT SITE CONDITION.
 8. ALL LANDING VALVES SHALL BE FIXED WITHIN 1 M FROM RESPECTIVE FINISHED FLOOR LEVEL. FOR ALL U/G & A/G PIPING FLANGES TO BE PROVIDED AT SUITABLE LOCATIONS.
 9. ALL PIPES ARE MS HEAVY GRADE AS PER IS:1239 UP TO 150 MM DIA AND IS: 3589 FROM 200 MM DIA AND ABOVE WITH 6.35 MM WALL THICKNESS.
 10. SECTIONS & TYPICAL DETAILS ARE SHOWN AS GUIDE LINES ONLY.

REF DWG : DWG NO :
DWG TITLE : MB - PLS - 1005

REV	NO	DATE	DESCRIPTION	DEALT	CHKD	APVD
PO						
REV	NO	DATE	DESCRIPTION	DEALT	CHKD	APVD

NAME OF OWNER
CREATIVE MUSEUM DESIGNERS
NATIONAL COUNCIL OF SCIENCE MUSEUMS
MINISTRY OF CULTURE - GOVERNMENT OF INDIA

PROJECT NAME
K D MALAVIYA NATIONAL OIL MUSEUM AT GUWAHATI : ASSAM

ARCHITECT
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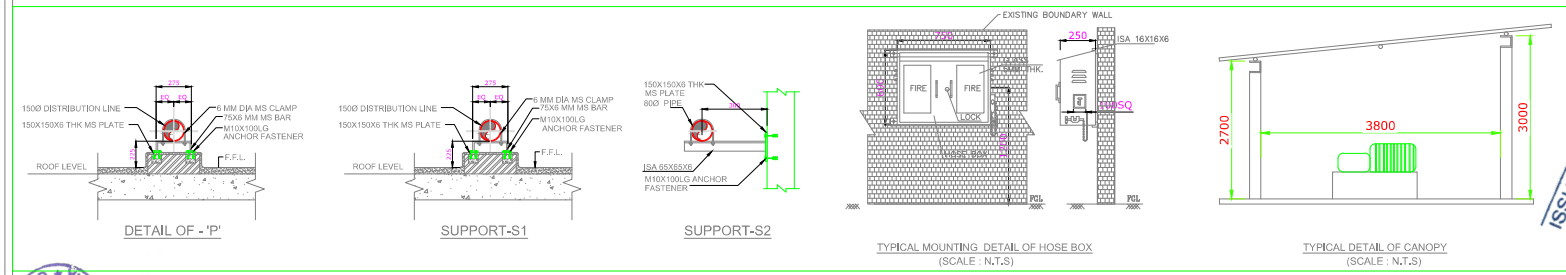
PLB & FF CONSULTANT
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4B/A.S.N. Roy Road, Kolkata-700008
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FIRE FIGHTING (SPR) FOR TENDER ONLY

DEALT: B&B UNICON SCALE: 1 : 200, N.T.S.
CHECKED: B&B UNICON SIZE: A1
APPROVED: L.K. BOSE DATE: 26.06.2021
JOB NUMBER: DRG CODE: OMG - 3301S

DRAWING TITLE	REVISION
PILING LAYOUT FOR SPRINKLER, HYDRANT SYSTEM & EXTINGUISHERS AT ROOF PLAN.	
DRAWING NUMBER	REVISION
LKB - OMG /MB-FF-1015	T0

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ISSUED FOR TENDERING
Sign: *[Signature]* Date: 26.06.2021