Central Pollution Control Board
(Ministry of Environment & Forests, Govt. of India)
Parivesh Bhawan, East Arjun Nagar
Delhi – 110032

Corrigendum

The NIT published for "Renovation of Air and Treatability Laboratory" in Central Pollution Control Board, Parivesh Bhawan, on 21.10.2010 is hereby amended as details given below:-

Amended date of sale of all documents	**Amended date of receiving of tender documents**	**Amending date of opening of tender documents**
29.11.2010 to 30.11.2010 from 10.00 a.m. to 5.00 p.m.	02.12.2010 up to 3.00 p.m.	02.12.2010 at 3.30 p.m.

The firm those had already purchased the tender documents needs not to purchase it again and they will submit their offer before 3.00 p.m. on 02.12.2010.

The corrigendum and tender document can be seen on CPCB website www.cpcb.nic.in. The other terms and conditions will remain unchanged.

Member Secretary
Central Pollution Control Board

Central Pollution Control Board
(Ministry of Environment & Forests, Govt. of India)
Parivesh Bhawan, East Arjun Nagar
Delhi – 110032.

Notice inviting Tender

Member Secretary, Central Pollution Control Board invites sealed tenders for the following works:-

Name of Work : - "Renovation of Air and Treatability Laboratory" in Central Pollution Control Board, Parivesh Bhawan,

Description of Tenders	**Estimated cost (Rs.)**	**EMD (Rs.)**	**Cost of tender (Rs.)**
Civil, Electrical and Networking work	97,59,762/-	1,95,195/-	1000/-
Air Conditioning, Exhaust and Ventilation work	94,24,314/-	1,88,486/-	1000/-
Seating system and Modular furniture	33,61,775/-	67,236/-	1000/-
Lab furniture	44,46,240/-	88,925/-	1000/-
Fume Hood	51,24,176/-	1,24,049/-	1000/-
Fire detection system	14,65,736/-	29,315/-	500/-

Cost of tender : - Non refundable demand draft/FDR in favour of Central Pollution Control Board, Delhi as detailed above.

Sale of tender :- 15.11.2010 to 17.11.2010 from 10.00 am to 5.00 p.m in the office of I/c, Building.

Last date of receipt of tender : - 19.11.2010 up to 3.00 p.m.

Opening of tender :- 19.11.2010 at 3.30 p.m.

The eligibility criteria and other details can be seen from CPCB website i.e. www.cpcb.nic.in

Note: The tender will be issued to the firms/contractors those meeting the eligibility criteria laid down in respective tender.

Member Secretary
Central Pollution Control Board

CONTENTS

NOTICE INVITING TENDER

1. The Central Pollution Control Board (CPCB) invites sealed tenders from the manufacturer or authorized dealers of fire detection panels for "Renovation of Air and Treatability Lab-Fire detectioon system " at 4th floor in Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi-110032. The total estimated costs of the works is given below:

   Estimated Cost Rs. 14,65,736/-
   Earnest Money Rs. 29,315/- (to be submitted as Demand Draft/FDR in favour of the Central Pollution Control Board, Delhi)

2. The tender document will be available for sale from 15.11.2010 to 17.11.2010 from 10.00a.m. to 5.00 p.m. The tenders, which should always be placed in sealed cover with "Renovation of Air and Treatability Lab- Fire Detection system" written on the envelopes, will be submitted upto 3.00 p.m. on 19.11.2010 in the Tender box lying at Ground floor near reception in Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032 and will be opened on the same day at 3.30 p.m. at the same address.

3. The tender will be issued to the authorised dealers/manufacturers fulfilling the following requirements:-

(i) Should have manufacturer or authorised dealer of fire detection panel.
(ii) Should have completed atleast one work of similar nature not less than Rs.15.0 lacs in the last five year. (list to be enclosed)
Or
Completed two works of similar nature not less than Rs.10 Lakh each during last five years (list to be enclosed).
(iii) Should have authorized service center in Delhi or NCR.
(iv) Should have valid Income Tax Clearance certificate & Sale Tax registration certificate as well as sale tax clearance certificates.

4. The tender document can be seen from CPCB website *www.cpcb.nic.in*.

5. MODE OF SUBMISSION OF TENDER

I. The tender shall be submitted in two separate sealed covers, duly completed in all respects viz. one for "earnest money", the second for "price bid". The name of the work and the words "earnest money" and "price bid only", as the case may be shall be clearly written on the top of the respective sealed covers. All the two bids, along with the letter for submitting tender shall be put in a sealed cover and the name of the work "Renovation of Air and Treatability Lab- Fire detection system" shall be clearly written on top of the sealed cover.

II. The technical bid shall be complete in following:-
a) Complete tender document as purchased from CPCB should be duly signed (each page) for acceptance of all terms and conditions.
b) All the documents as mentioned above point 3 (i) to (iii) of the tender document for fulfilling the eligibility criteria.

6. Earnest money amounting to Rs. 29,315/- (Rupees Twenty Nine Thousand Three Hundred Fifteen only) as Demand Draft/FDR in favour of the Central Pollution Control Board, Delhi must be accompanied in each tender application.

7. The site for the work is available/or the site for the work shall be made available for inspection on all working days except on Saturday, Sunday and Public Holidays.

III. a) The contractor should quote in figures as well as in words the rate, and amount tendered by them. The amount for each item should be worked out and the requisite totals given.
b) Special care should be taken to write the rates in figures as well as in words, and the amounts in figures only in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, "Rs." should be written before the figures of rupees and "P" after the decimal figures, e.g. Rs. 2.15 P and in case of words, the word 'Rupees' should precede and the word "Paise" should be written at the end. Unless the rates is in only rupees and followed by the words 'only' it should invariably be upto two decimal place. While quoting the rate in schedule of quantities, the words 'only' should be written closely following the amount and it should not be written in the next line.
c) Rates quoted by the contractor in item rate tender in figures and works shall be accurately filled in so that there is no discrepancy in the rates figures and words. However, if a discrepancy is found the rates which correspond with an amount worked out by the contractor shall be taken as correct.
d) If the amount of an item is not worked out by the contractor it does not correspond with the rate written either in figure or in words than the rate quoted by the contractor in words shall be taken as correct.
e) Where the rates quoted by the contractor in figures and in words tally but the amount is not worked out correctly the rate quoted by the Contractor will be taken as correct and not the amount.

IV. The contractor, whose tender is accepted (unless exempted) will be required to furnish by way of security deposit for the fulfillment of his contract such sum as will amount at the rate of 10% of the estimated cost put to tender subject to a maximum upto Rs. 1.50 lakhs.

The security deposit will be collected by deductions from the running bills of the contractor at the rate of 10%. The earnest money deposited at the time of tenders will be released after completion of work, no interest will be paid on it. The security deposit will be released after the 'defects liability period' subjects to verification of defects. However, the security will be released if the firm/contractor submits the FDR of the said security amount in favour of Central Pollution Control Board valid upto defect liability period.

V. The acceptance of a tender rests with the CPCB, which does not bind itself to accept the lowest tender and reserves itself the authority to reject any or all of the tenders received without assigning any reason. All tenders in whom any of the prescribed conditions are not fulfilled or are incomplete in any respect are liable to be rejected.

CPCB reserves itself the right to accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.

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

VII. All rates to be quoted in the proper form in the tender.

VIII. Any item rate tender containing percentage below/above will be summarily rejected. However, where a tenderer voluntarily offers rebate or payment within a stipulated period, this may be considered.

IX. On acceptance of the tender, the name of the accredited representative (s) of the contractor who would be responsible for taking instructions from CPCB shall be communicated to the CPCB.

X. Sales Tax or any other tax or liability in respect of this contract shall be payable by the contractor and CPCB will not entertain any claim whatsoever in this respect.

XI. The tender for works shall remain open for acceptance for a period of 3 months from the date of opening of tenders. If any tenderer withdraws his tender before the said period or marks any modifications in the terms and conditions of the tender which are not acceptable to CPCB, without prejudice to any other right or remedy, CPCB will be at liberty to go for forfeiting the said earnest money absolutely.

XII. It will be obligatory on the part of the tenderer to tender and sign the tender documents for all the components or parts and that after work is awarded, he will have to enter into an agreement for each component or part with CPCB.

XIII. The contractor should see the site and understand the work requirements and in case of doubt, obtain required particulars, which may in any way influence his tender, from the CPCB as no claim whatsoever will be entertained for any alleged ignorance thereof.

XIV. If it is found that the tender is not submitted in proper manner or contains too many corrections or absurd rates or amounts, it would be summarily rejected by CPCB.

XV. Before submitting the tender, the contractor should visit the site and satisfy himself as to the conditions prevalent there.

XVI. The Contractor shall comply with the provision of the Apprentices Act, 1961, and the rules and orders issued there under from time to time. If fails to do so, his failure will be breach of the contract and the CPCB may in his discretion cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the Act.

XVII. The contractor's responsibility for the contract shall commence from the date of issue of orders of acceptance of tender.

XVIII. Unsealed tenders shall be summarily rejected.

XIX. Before tendering, the contractor shall inspect the site to fully acquaint himself about the condition in regard to accessibility of site and nature of ground, working condition including stacking of materials, installations of T & P etc. conditions affecting accommodation and movement of labour etc. required for the satisfactory execution of the work contract. No claim whatsoever on such account shall be entertained by the department in any circumstances.

XX. The contractor shall submit list of works which have been handled by him in the previous financial year and on the works in hand (progress) in the forms given below.

Works Handled in the Previous Financial Year (2009-10)

Name of work	**Name and particulars of place where work was done**	**Value of work**	**Position of works (In progress/completed)**	**Remarks**
1	2	3	4	5

Works in Hand in the Present Financial Year (2010-11)

Name of work	**Name and particulars of place where work was done**	**Value of work**	**Position of works (In progress/ completed)**	**Remarks**
1	2	3	4	5

LETTER SUBMITTING TENDER

To
Member Secretary
Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar
Delhi – 110 032

Sir,

With reference to the tender invited by you for "Renovation of Air and Treatability Lab-Fire detection system" in 4th floor at the Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi, I/We do hereby offer to execute the works under 'contract at the respective rates' mentioned in the Bill of Quantities. I/We have seen the site and read the articles of agreement, conditions of contract, specifications and special clauses forming part of the Bill of Quantities. I/We agree to finish the whole of the works within two months as specified in the tender.

I/We have deposited as Earnest Money Rs……. (Rupees …….. Only) by a Bank draft in favour of CPCB, which amount is not to bear any interest. I / We do hereby agree that this sum shall be forfeited by you in the event our tender is accepted and I /We fail to commence the contract when called upon to do so, within a period of one month after award of work.

I/We understand that you are not bound to accept the lowest or any tender that you receive.

Yours faithfully,

Name of partners of the firm.

Name of Bankers

Tenders submitted on ……..

BILL OF QUANTITIES

BILL OF QUANTITY FOR AIR LABOROTARIES (FIRE)						
S. N	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
A	**PART -1 (FIRE ALARM SYSTEM)**					
1.0	**CONTROL PANELS.**					
	Supply, Installation, testing & commissioning of Addressable fire alarm panel. The panel should consist of 2 x 40 character LCD display battery supervision, flash emprommemory single walk test, 4 operator access levels, 600 event historical log, zon / point selectable alarm varification. Automatic sensor self test and should be UL listed. with 38 AH Maintenance Free SMF Battery.					
	Addressable Fire alarm panel - 2 Loop.					
	Suppy	Nos.	1			
	Installation	Nos.	1			
2.0	**GRAPHIC SOFTWARE**					
	Supply, Installation, Testing and Commissioning of graphic software package.(required PC to be provided by client. However, PC specification to be indicated by vendor) .					
	Supply	Nos.	RO			
	Installation	Nos.	RO			
3.0	**REPEATER PANEL. / INTEGRATION WITH BUILDERS PANEL**					
	Integration with Builders existing panel with required control modules. The builder will give Zonal panel at each floor level. The required Control / Monitoring module to be considered in part of Scope. (Vendor need to collect the necessary information from Site for the same in consultation with project manager.)					
	Suppy	Ls	RO			
	Installation	Ls	RO			
4.0	**SMOKE DETECTORS**					
	Supply, Installation, testing & commissioning of Inteligent Addressable, UL listed smoke detector complete with base, locking etc.					
4.1	Above False ceiling					
	Supply	Nos.	56			
	Installation	Nos.	56			
4.2	Below false ceiling					
	Supply	Nos.	56			
	Installation	Nos.	56			
4.3	Heat detectors					
	Supply	Nos.	1			

	Installation	Nos.	1			
4.4	Below false floor (IDF Room)					
	Supply	Nos.	RO			
	Installation	Nos.	RO			
4.5	Duct detector for AHU rooms					
	Supply	Nos.	RO			
	Installation	Nos.	RO			
5.0	**POWER SUPPLY UNIT**					
5.1	Supply, Installation, testing and commissioning of required power supply units to be provided for hooter cum strobe. (Instead of external power unit, providing additional power supply modules inside the panel is acceptable)					
	Supply	Set	2			
	Installation	Set	2			
6.0	**JUNCTION BOXES**					
	Supply & Installation of Junction Boxes to fix the smoke detectors					
	Supply	Nos.	114			
	Installation	Nos.	114			
7.0	**RESPONSE INDICATORS:**					
	Supply, installation, testing and commissioning of Response Indicators with Single LED.					
	Supply	Nos.	56			
	Installation	Nos.	56			
8.0	**MANUAL CALL POINT**					
	Analogue addressable pull down type manual call point with address selection through dip-switch. UL listed.					
	Supply	Nos.	5			
	Installation	Nos.	5			
9.0	**LOOP SOUNDERS**					
	Supply, Installation, testing & commissioning of addressible loop sounder.(Stob cum loop sounder) (Alternatively providing control module for addressing the same instead of loop sounder is acceptable)					
	Supply	Nos.	5			
	Installation	Nos.	5			
10.0	**WIRE / CABLE**					
10.1	Supply, Installation, testing & commissioning of **2Cx1.5** sq.mm Armoured Copper conductor cable. The rate shall include all necessary cable glands, lugs etc.					
	Supply	Nos.	1310			
	Installation	Nos.	1310			

10.2	3 Runs x 1.5 sq.mm Copper conductor wire in MS Conduit.					
	Supply	m	RO			
	Installation	m	RO			
10.3	1' x 1' cable termination box with Wago connectors & Din rail arrengment for terminating of cables in different floors					
	Supply	Nos.	1			
	Installation	Nos.	1			
10.4	Supply, Installation, testing & commissioning of **8Cx1.5** sq.mm Armoured Copper conductor cable. The rate shall include all necessary cable glands, lugs etc.					
	Supply	m	50			
	Installation	m	50			
11.0	**FAULT ISOLATION MODULE**					
	Fault isolation module suitable for above detectors.					
	Supply	Nos.	6			
	Installation	Nos.	6			
12.0	**ANALOGUE INDOOR HOOTER**					
	Analogue Indoor type Electronic hooter. The DB level should not be less than 110DbA					
	Supply	Nos.	R0			
	Installation	Nos.	R0			
13.0	**RELAY MODULES / MONITOR MODULES**					
	Relay / Monitor modules to shut down the AHU and Electrical panels, Sprinkler flow switch activation signal, Preaction system panel activation, Builders panel signal etc to BMS room.					
	Supply	Nos.	4			
	Installation	Nos.	4			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
A	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
S. N	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
B	**PART - 2 (PUBLIC ADDRESS SYSTEM)**					
1.0	36 U, 19 " width x 24" Depth standard alluminium Rack with front Acrylic door and lock , rear door with lock , two fans for Ventilation with side panel louvered , castor wheels, pre - wired power and signal Channel duly powder coated with Seimens Gray paint					
	Make : Philips / Vero President or Approved Equivalent make					
	Supply	No	RO			

	Installation	No	RO			
2.0	Monitor Unit with Monitoring speaker with Volume Control, Monitoring amplifier Selector switch with Digital display , Normal / standby amplifier Selector switch etc.					
	Supply	No	RO			
	Installation	No	RO			
3.0	Priority module having anouncement from the console - I level , Siren From Evacuation Unit as II level , and Music as the III level of Pririty .					
	Supply	No	RO			
	Installation	No	RO			
4.0	Music System					
	DVD player					
	Make : Philips					
	Supply	No	RO			
	Installation	No	RO			
5.0	400 Watts, Amplifier unit with Mic inputs etc as required.					
	Make : AHUJA					
	Supply	No	1			
	Installation	No	1			
6.0	2 x 6 Zone Digital anouncing Console with gooseneck Microphone to make Zonal anouncement as well as all Zone anouncement .					
	Supply	No	RO			
	Installation	No	RO			
7.0	Preess - Talk anouncement console with required necessary modules / controlleres as required to make the system to work. (For cafeteria)					
	Supply	No	RO			
	Installation	No	RO			
8.0	5 watt Celing Ring Speakers with LMT with SPL 95 dB , having the frequency range 70 - 10000 Hz , off white color grill, clamp type mount (overall dimension - 180 mm)					
	make : Philips :model : LBD 8352/10 or Equivalent					
	Supply	No	54			
	Installation	No	54			
9.0	6 watt, wall Mounting Speaker for Stair cases (Indor & Cafiteria)					
	Make : Philips, Model : LBD 8372 or Equivalent					
	Supply	No	3			
	Installation	No	3			

10.0	6 watt, wall Mounting type Speaker - Cafeteria					
	Supply	No	RO			
	Installation	No	RO			
11.0	Volume Control for cabins with face Plate					
	Make : MK / Anchor with necessary Circuits to attenuate.					
	Supply	No	RO			
	Installation	No	RO			
12.0	24 / 0.2 mm twin twisted multistrand, speaker wire in FRLS conduit					
	Make : doorvani or equivalent					
	Supply	Mtr	730			
	Installation	Mtr	730			
13.0	Main junction Box to Teminate field cables with necessary tags Etc					
	Supply	No	1			
	Installation	No	1			
14.0	Digital Voice Recorder Of Max 4 minutes to play in case of Emergency. This will Get activated on breaking the glass at Manual call Points located in varios places. The Customer will provide the potentiol free Contact.					
	Supply	No	RO			
	Installation	No	RO			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
B	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
S. N	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
C	**PART - 3 (SIGN BOARD)**					
1.0	Supply, Installation & Testing of LED Based directional 11'' x 7" exit signage boards of Altras Electronics make or equivalent along with mounting brackat and 2Hrs, self maintained Battery backup.					
1.1	Single direction type					
	Supply	Nos	5			
	Installation	Nos.	5			
1.2	Double direction type					
	Supply	Nos	RO			
	Installation	Nos.	RO			

2.0	Preparation of drawing and providing, Fire escape route map indicating direction, Key plan, contact numbers etc. (The sample of the same need to be presented for approval before execution)…. (Maximum size of the board A2)					
	Supply	Nos.	1			
	Installation	Nos.	1			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
C	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
S. N	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
D	**PART - 4 (FM200 SYSTEM)**					
1.1	EC/OC-1					
	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	2			
	Installation	Nos.	2			
1.2	GC-2 ROOM					
	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	2			
	Installation	Nos.	2			
1.3	GC-3 ROOM					
	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	2			
	Installation	Nos.	2			
1.4	GC-4 & 5 ROOM					
	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	2			
	Installation	Nos.	2			
1.5	IC-1 ROOM					
	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	2			
	Installation	Nos.	2			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
D	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
S. N	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
E	**PART - 5 (FIRE EXTINGUISHERS)**					

1.0	Supplying, installing and commissioning Portable Fire extinguishers of following type & capacity.					
1.1	Carbon-di- oxide type fire extinguisher of 4.5 kgs. Capacity, CO2 gas filled in brand new seamless cylinder with powder coated finish, made out of Manganese steel, with wheel type valve, discharge nozzle, bend & horn, wal mounting bracket etc. complete, confirming to IS: 2878.	Nos.	0			
1.2	Dry chemical powder type fire extinguisher of 2 Kgs. Capacity, with initial filling in brand new cylinder with powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge, discharge hose, wall mounting bracket etc. complete, confirming to IS:2171.	Nos.	5			
E	**TOTAL SUPPLY**					
A	**TOTAL (FIRE ALARM SYSTEM)**					
B	**TOTAL (PUBLIC ADDRESS SYSTEM)**					
C	**TOTAL (SIGN BOARD)**					
D	**TOTAL (FM 200)**					
E	**TOTAL (EXTINGUSHERS)**					
	GRAND TOTAL					

BILL OF QUANTITY FOR TREATABLITY LABOROTARIES (FIRE)

Sl. No	DESCRIPTION	Unit	Qty.	RATE	RATE IN WORDS	AMOUNT
A	**PART -1 (FIRE ALARM SYSTEM)**					
1.0	**CONTROL PANELS.**					
	Supply, Installation, testing & commissioning of Addressible fire alarm panel. The panel should consist of 2 x 40 character LCD display battery supervision, flash emprommemory single walk test, 4 operator access levels, 600 event historical log, zon / point selectable alarm varification. Automatic sensor self test and should be UL listed. with 38 AH Maintenance Free SMF Battery.					
	Addressible Fire alarm panel - 2 Loop.					
	Supply	Nos.	0			
	Installation	Nos.	0			
2.0	**GRAPHIC SOFTWARE**					
	Supply, Installation, Testing and Commissioning of graphic software package.(required PC to be provided by client. However, PC specification to be					

	indicated by vendor) .					
	Supply	Nos.	0			
	Installation	Nos.	0			
3.0	**REPEATER PANEL. / INTEGRATION WITH BUILDERS PANEL**					
	Integration with Builders existing panel with requried control modules. The builder will give Zonal panel at each floor level. The requird Control / Monitoring module to be considered in part of Scope. (Vendor need to collect the necessary information from Site for the same in consultation with project manager.)					
	Supply	Ls	RO			
	Installation	Ls	RO			
4.0	**SMOKE DETECTORS**					
	Supply, Installation, testing & commissioning of Inteligent Addressible, UL listed smoke detector complete with base, locking etc.					
4.1	Above False ceiling					
	Supply	Nos.	17			
	Installation	Nos.	17			
4.2	Below false ceiling					
	Supply	Nos.	16			
	Installation	Nos.	16			
4.3	Heat detectors					
	Supply	Nos.	1			
	Installation	Nos.	1			
4.4	Below false floor (IDF Room)					
	Supply	Nos.	0			
	Installation	Nos.	0			
4.5	Duct detector for AHU rooms					
	Supply	Nos.	RO			
	Installation	Nos.	RO			
5.0	**POWER SUPPLY UNIT**					
5.1	Supply, Installation, testing and commissioning of required power supply units to be provided for hooter cum strobe. (Instead of external power unit, providing additional power supply modules inside the panel is acceptable)					
	Supply	Set	1			
	Installation	Set	1			
6.0	**JUNCTION BOXES**					
	Supply & Installation of Junction Boxes to fix the smoke detectors					

	Supply	Nos.	35			
	Installation	Nos.	35			
7.0	**RESPONSE INDICATORS:**					
	Supply, installation, testing and commissioning of Response Indicators with Single LED.					
	Supply	Nos.	17			
	Installation	Nos.	17			
8.0	**MANUAL CALL POINT**					
	Analogue addressable pull down type manual call point with address selection through dip-switch. UL listed.					
	Supply	Nos.	2			
	Installation	Nos.	2			
9.0	**LOOP SOUNDERS**					
	Supply, Installation, testing & commissioning of addressible loop sounder.(Stob cum loop sounder) (Alternatively providing control module for addressing the same instead of loop sounder is acceptable)					
	Supply	Nos.	2			
	Installation	Nos.	2			
10.0	**WIRE / CABLE**					
10.1	Supply, Installation, testing & commissioning of **2Cx1.5** sq.mm Armoured Copper conductor cable. The rate shall include all necessary cable glands, lugs etc.					
	Supply	Nos.	460			
	Installation	Nos.	460			
10.2	3 Runs x 1.5 sq.mm Copper conductor wire in MS Conduit.					
	Supply	m	RO			
	Installation	m	RO			
10.3	1' x 1' cable termination box with Wago connectors & Din rail arrengment for terminating of cables in different floors					
	Supply	Nos.	1			
	Installation	Nos.	1			
10.4	Supply, Installation, testing & commissioning of **8Cx1.5** sq.mm Armoured Copper conductor cable. The rate shall include all necessary cable glands, lugs etc.					
	Supply	m	0			
	Installation	m	0			
11.0	**FAULT ISOLATION MODULE**					
	Fault isolation module suitable for above detectors.					
	Supply	Nos.	2			
	Installation	Nos.	2			

12.0	**ANALOGUE INDOOR HOOTER**					
	Analogue Indoor type Electronic hooter. The DB level should not be less than 110DbA					
	Supply	Nos.	RO			
	Installation	Nos.	RO			
13.0	**RELAY MODULES / MONITOR MODULES**					
	Relay / Monitor modules to shut down the AHU and Electrical panels, Sprinkler flow switch activation signal, Preaction system panel activation, Builders panel signal etc to BMS room.					
	Supply	Nos.	0			
	Installation	Nos.	0			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
A	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
Sl. No	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
B	**PART - 2 (PUBLIC ADDRESS SYSTEM)**					
1.0	36 U, 19 " width x 24" Depth standard alluminium Rack with front Acrylic door and lock , rear door with lock , two fans for Ventilation with side panel louvered , castor wheels, pre - wired power and signal Channel duly powder coated with Seimens Gray paint					
	Make : Philips / Vero President or Approved Equivalent make					
	Supply	No	0			
	Installation	No	0			
2.0	Monitor Unit with Monitoring speaker with Volume Control, Monitoring amplifier Selector switch with Digital display , Normal / standby amplifier Selector switch etc.					
	Supply	No	0			
	Installation	No	0			
3.0	Priority module having anouncement from the console - I level , Siren From Evacuation Unit as II level , and Music as the III level of Pririty .					
	Supply	No	0			
	Installation	No	0			
4.0	Music System					
	DVD player					
	Make : Philips					
	Supply	No	0			

	Installation	No	0			
5.0	400 Watts, Amplifier unit with Mic inputs etc as required.					
	Make : AHUJA					
	Supply	No	1			
	Installation	No	1			
6.0	2 x 6 Zone Digital anouncing Console with gooseneck Microphone to make Zonal anouncement as well as all Zone anouncement .					
	Supply	No	0			
	Installation	No	0			
7.0	Preess - Talk anouncement console with required necessary modules / controlleres as required to make the system to work. (For cafeteria)					
	Supply	No	-			
	Installation	No	0			
8.0	5 watt Celing Ring Speakers with LMT with SPL 95 dB , having the frequency range 70 - 10000 Hz , off white color grill, clamp type mount (overall dimension - 180 mm)					
	make : Philips :model : LBD 8352/10 or Equivalent					
	Supply	No	17			
	Installation	No	17			
9.0	6 watt, wall Mounting Speaker for Stair cases (Indor & Cafiteria)					
	Make : Philips, Model : LBD 8372 or Equivalent					
	Supply	No	RO			
	Installation	No	RO			
10.0	6 watt, wall Mounting type Speaker - Cafeteria					
	Supply	No	0			
	Installation	No	0			
11.0	Volume Control for cabins with face Plate					
	Make : MK / Anchor with necessary Circuits to attenuate.					
	Supply	No	RO			
	Installation	No	RO			
12.0	24 / 0.2 mm twin twisted multistrand, speaker wire in FRLS conduit					
	Make : doorvani or equivalent					
	Supply	Mtr	330			
	Installation	Mtr	330			
13.0	Main junction Box to Teminate field cables with necessary tags Etc					
	Supply	No	1			

	Installation	No	1			
14.0	Digital Voice Recorder Of Max 4 minutes to play in case of Emergency. This will Get activated on breaking the glass at Manual call Points located in varios places. The Customer will provide the potentiol free Contact.					
	Supply	No	0			
	Installation	No	0			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
B	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
Sl. No	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
C	**PART - 3 (SIGN BOARD)**					
1.0	Supply, Installation & Testing of LED Based directional 11'' x 7" exit signage boards of Altras Electronics make or equivalent along with mounting brackat and 2Hrs, self maintaned Battery backup.					
1.1	Single direction type					
	Supply	Nos	3			
	Installation	Nos.	3			
1.2	Double direction type					
	Supply	Nos	1			
	Installation	Nos.	1			
2.0	Preparation of drawing and providing, Fire escape route map indicating direction, Key plan, contact numbers etc. (The sample of the same need to be presented for approval before execution).... (Maximum size of the board A2)					
	Supply	Nos.	1			
	Installation	Nos.	1			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
C	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
Sl. No	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
D	**PART - 4 (FM200 SYSTEM)**					
1.0	**IDF ROOM**					
1.1	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	0			
	Installation	Nos.	0			
1.2	**UPS ROOM**	Nos.				

	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	0			
	Installation	Nos.	0			
1.3	**GC-1 ROOM**					
	10 Kg Modular Ceiling Mounted Cylinder filled with FM 200 Gas with mounting bracket					
	Supply	Nos.	2			
	Installation	Nos.	2			
	TOTAL SUPPLY					
	TOTAL INSTALLATION					
D	**GRAND TOTAL (SUPPLY + INSTALLATION)**					
Sl. No	**DESCRIPTION**	**Unit**	**Qty.**	**RATE**	**RATE IN WORDS**	**AMOUNT**
E	**PART - 5 (FIRE EXTINGUISHERS)**					
1.0	Supplying, installing and commissioning Portable Fire extinguishers of following type & capacity.					
1.1	Carbon-di- oxide type fire extinguisher of 4.5 kgs. Capacity, CO2 gas filled in brand new seamless cylinder with powder coated finish, made out of Manganese steel, with wheel type valve, discharge nozzle, bend & horn, wal mounting bracket etc. complete, confirming to IS: 2878.	Nos.	0			
1.2	Dry chemical powder type fire extinguisher of 2 Kgs. Capacity, with initial filling in brand new cylinder with powder coated finish, fitted with Gun metal union, high pressure CO2 gas cartridge, discharge hose, wall mounting bracket etc. complete, confirming to IS:2171.	Nos.	5			
E	**TOTAL SUPPLY**					
A	**TOTAL (FIRE ALARM SYSTEM)**					
B	**TOTAL (PUBLIC ADDRESS SYSTEM)**					
C	**TOTAL (SIGN BOARD)**					
D	**TOTAL (FM 200)**					
E	**TOTAL (EXTINGUSHERS)**					
	GRAND TOTAL					

The drawings are attached with the tender document and will be issued at the time of purchase of tender. However, interested bidder can see the drawings in the office of I/c, building before purchase of tender.

Specifications and other terms

1.0 SCOPE OF WORK

The contractor's scope of work covers supply, installation, testing and commissioning of complete Fire Detection and Control System as specified.

2.0 GENERAL

2.1 The Main/Local Fire Alarm Control Panel and loop devices including sensors, Manual Call points (MCP), interface modules and relay units should be sourced from the same manufacturer to ensure total compatibility between Hardware & Software.

2.2 All the equipment supplied as a part of this specification shall conform to the latest applicable Indian Standards or IEC publications and shall comply with all currently applicable Statutes, regulations and safety codes in Karnataka State.

2.3 A few major applicable standards are as given below:

a	IS: 2189: 1988	-	Code of practice for Automatic Fire Alarm System.
b	IS: 11360: 1985	-	Specification for smoke detectors for use in Automatic Electrical Fire Alarm System.
c	IS: 2176:1988	-	Heat Sensitive Fire Detectors
d	IS: 2148:1981	-	Specification for flameproof enclosure of Electrical apparatus.
e	IS: 5571:1979	-	Selection of equipment in hazardous areas.
f	IS: 694:1977	-	Copper conductor PVC insulated cables.
g	IS: 3700:1972	-	Essential ratings and characteristics of semiconductors devices
h	IS: 4237:1983	-	General requirements for switchgear and control gear.
i	IS: 6553:1971	-	Environmental requirements for semi-conductor and integrated circuits.

2.4 All basic equipment proposed and planned for use shall be formally approved by at least one internationally recognized testing lab and /or approval from all the concerned authorities for the system offered, a few of which are listed below:

UL - Under writers Laboratories, USA.

U.L.C. - Under Writers Laboratories, Canada.

2.5 A Vendor Shall obtain clearance and approval of drawings from the following Authority:

Local Fire force Authorities.

2.6 Fire Alarm Control Panels

A. The control panel shall be modular in construction and shall include, but not limited to; the hardware, software and firmware required to perform the following major system functions:

01. Steel, baked black enamel cabinet with indicator viewing window, hinged door and cylinder lock and dead front construction with the outer door open. The inner dead front doors shall be pin hinged and removable, for easy system operation by firefighters and technicians in testing and maintenance modes.

02. System power supplies, including necessary transformers rectifiers, regulators, filters and surge protection required for system operation, with the capacity to power the system in a worst case condition with all devices in alarm and all local indicating appliances active without exceeding the listed ratings. All system devices shall display normal and alarm conditions consistently whether operating from normal power or reserve (standby) power.

a. Systems not displaying an alarm indication at each detector when in a standby power mode shall include an addressable remote LED indicator to perform this required function.

03. System 16 bit core processor, with internal operating system to process incoming alarm signals and issue output commands required as a result of the alarm reception, by system programming or by manual commands. Total system response time shall not exceed 2.5 seconds on a system configured to the 240 input address maximum capacity.

a. All system processors shall be supervised by individual watchdog circuitry furnishing automatic restart after loss of activity. Systems with a single watchdog circuits for all processors shall not be acceptable unless supplied with a "hot" standby CPU**.**

04. Digital communication capabilities required for the control panel to communicate with remote annunciations, input / output drivers and displays.

05. NFPA 72 Style 4 operation with loop isolator analog signaling circuitry required to communicate with, and receive alarms up to the maximum of 240 points. A maximum of sixty intelligent analog alarm initiating and sixty intelligent controllable output devices shall be permitted on each loop. Analog loops shall be configured with loop isolators and wired in a manner that prevents a catastrophic wiring event on a floor from affecting the performance of other floors.

a. Systems allowing more than sixty devices per addressable loop shall be wired in a Style 7 configuration with raceway design configured to allow a maximum of one section of the loop within a single raceway. Loop isolation between floors shall be maintained.

06. A controllable signal module shall provide a limited energy output circuit for operation of direct current audible or visual devices, leased line or city tie.

07. Where control of operations requiring switching functions is indicated, there shall be provided a software controllable relay module.

08. Motherboards shall be provided as the system bus furnishing systems communications to the various plug in modules required for system operation and expansion.

09. Local system shall have the ability of up to three remote command control centers as indicated on the drawings.

10. The system shall include a real time link to the system database, historical event log, logic, and operating system. The system shall require no manual input to initialize in the event of a complete power down condition. It shall return to an on line state as an operating system performing all programmed functions upon power restoration. Systems requiring battery backed-up memory devices shall not be acceptable.

11. System display consisting of an 80 character backlighted alphanumeric super twist LCD display readable at any angle. Thirty-two character user defined custom messages shall describe the location of the active device. The local system display shall have the capability to display up to 6,000 vectored messages activated as a result of alarms originated at other local panels resident on the network. Systems unable to perform to this level shall supply PC based terminals displaying the required messages.

a. The system shall be capable of programming to allow troubles occurring and restored in the system to be automatically removed from the display queue.

b. As a minimum, an LED display for "ALARM", "AUDIBLES SILENCED", "SUPERVISORY", "TROUBLE", "SECURITY", "POWER ON" and "PARTIAL SYSTEM DISABLED".

c. Touch activated, audible feedback, membrane switches for "ALARM ACKNOWLEDGE", "AUDIBLE SILENCE", "SUPERVISORY ACKNOWLEDGE", "TROUBLE ACKNOWLEDGE", "SECURITY ACKNOWLEDGE", "RESET", "DISPLAY HOLD" and "DISPLAY NEXT".

d. Touch activated, audible feed-back, membrane switches, programmable to perform a minimum of twelve customs designed and programmed functions such as drill, disable, and bypass automatic control commands or other special functions as required by the system user. (01) The membrane switches shall also be used for the entry of up to 128 individual pass codes, allowing for an individual code for each operator allowed to perform security bypass functions.

e. Ten-digit keypad for pass code entry to perform programming a maintenance functions.

f. The system shall support a minimum of three supervised remote alphanumeric annunciations as full function remote control points. Each supervised annunciation shall support printers, video display terminals, color video display terminals, CRT's and connected slave annunciations as indicated on the drawings.

12. Software defined logic module as required for each alarm initiation point, capable of controlling any combination of the system output functions using as logic factors; counting, verification, time, day, holiday, type of device, "and", "or", "not", "timer", "all", "any", flip-flop, D latch, and up to 32 levels of programming shall be possible.

13. Software logic modules and system database shall be programmed using a DOS compatible program on any computer. It shall be possible to program or edit the system database off site after downloading from the control panel.

14. Selective historical log, up to 800 events of all types, shall be stored in flash memory and displayed, printed or downloaded by classification for selective event reports.

a. The system shall allow selection of events to be logged, including inputs, as; alarms, troubles, supervisory, securities, status changes, walk tests and device verification, outputs as; audible control and output activation, actions as; reset, set sensitivity, arm/disarm, override, password, set time and acknowledge.

b. Data format for downloading shall be adaptable to a data base management program allowing custom report generation to track alarms, troubles and maintenance.

c. Audible and visual indications shall be generated when memory is 80% and 90% full to allow downloading of data.

d. Systems not supporting downloading of event history or requiring segregated storage for classifications of event history shall include a PC based, dedicated historical logging terminal together with hard drive storage and necessary software for system performance analysis and report generation.

15. Environment compensating, software driven logic for adjusting the alarm threshold windows on detectors to compensate for contamination accumulation and keep detector response sensitivity constant. The software shall compensate for either over-sensitized or de-sensitized units, raising a system flag when a detector approaches the allowable limits of adjustment, indicating a requirement for servicing.

a. Environment compensation values shall be stored in non-volatile memory allowing activation of all tracking functions within 90 seconds of system initiation from a "cold boot". During the boot sequence, alarms from detectors programmed with the feature shall be suppressed. When the full data history is active all devices shall be checked and any active alarms shall be displayed.

b. The control panel shall place each detector in the system in an alarm condition, transparent to the system user, every twelve hours as a dynamic check of the accuracy of the alarm threshold setting.

c. The system shall recognize that a detector has been cleaned, initiating a series of tests to determine if the cleaning was successful and display a detector cleaned message, readjusting that detectors normal sensitivity setting reference based on a new cumulative average.

16. The local fire detection and evacuation panels shall be equipped with a computer operating system stored in "FLASH ROM". This feature is intended to allow program upgrades without the need to change or burn chips, remove and install parts, or disassemble equipment. Operating system upgrades shall be accomplished by downloading new firmware via a CPU communications port.

a. Systems not supporting firmware revisions in this manner shall furnish a five-year warranty on the CPU operating system with all upgrades to be installed as released.

17.1 Fire Alarm System Power Supplies

b. System primary power

1. Primary power for the FACP and the secondary power battery chargers shall be obtained from a dedicated emergency power circuits. Circuit breakers shall be fitted with a suitable guard, requiring removal of a screw to open, and used only for fire alarm. Each circuit used for fire alarm purposes shall be permanently labeled for function.

c. Secondary power supply

1. Provide sealed gelled electrolyte batteries as the secondary power supply for all fire alarm functions. The battery supply shall be calculated to operate loads in a supervisory mode for twenty-four hours with no primary power applied and, after that time, operate in alarm mode for 5 minutes. Batteries shall be sized at 125% of the calculated size to compensate for deterioration and aging during the battery life cycle. Battery calculations shall be submitted to justify the battery size.

2. Provide battery-charging circuitry for each standby battery bank in the system. The charger shall be automatic in design, adjusting the charge rate to the condition of the batteries. All system battery charge rates and terminal voltages shall be read using the fire alarm control channel LCD display in the service mode, indicating directly in volts and amps. Meters reading in percentage are not acceptable.

17. Intelligent Device types shall include the following:

1. Fire Detectors, application Specific:

1. Detectors shall be listed for use as open area protective coverage, in duct installation and sampling assembly installation and shall be insensitive to air velocity changes.

2. Low profile, white case shall not exceed 2.5 inches of extension below the finish ceiling.

3. The detector shall be designed to eliminate calibration errors associated with field cleaning of the chamber.

4. Detectors shall be programmable as application specific, selected in software for a minimum of eleven specific environmental fire profiles unique to the installed location. These fire profiles shall eliminate the possibility of false indications caused by dust, moisture, RFI/EMI, chemical fumes and air movement while factoring fire burn rates, ambient temperature rise, obscuration rate changes and hot/cold smoke phenomenon into the alarm decision to give the earliest possible real alarm condition report.

(1) Detection technologies using time delays to verify the existence of an alarm condition shall not be considered acceptable.

(2) The detector manufacturer shall have an installed base of a minimum of one million detectors using the technology employed to demonstrate the product acceptability.

(3) The awarding authorities will entertain an alternate bid specifying a deductive amount per detector as well as a unit cost per detector for furnishing multisensor detectors using a minimum of three sensing elements.

(4) Detectors shall be capable of reporting a pre-alarm condition, indicating a potential emergency situation, when reaching a value appropriate to the occupancy in which it is installed.

(5) Detector electronics shall utilize surface mounted techniques and be conformal coated with a substance rendering the electronics impervious to stray conduction caused by dust and moisture. The coating shall remain stable to 135 degrees F.

(6) Detector report shall incorporate information to allow the activation of three unique alarm controls by event programs based on sensing of fire profile within the programmed environment, sensing of smoke exceeding the threshold, sensing of heat exceeding the threshold and upon sensing of a pre-alarm level indicating a developing emergency situation requiring investigation. A fourth condition shall cause a different unique response to the alarm condition reported when the fire profile recognized as the result of a combination of sensory information fits the fire profile desired even though no single sensory threshold has been reached.

(7) Detector shall be listed for duct smoke sampling when mounted in a compatible housing and shall be specifically programmable as a duct smoke detector in the software database. When used as a duct detector it shall support the use of a remote test switch and LED indicator.

3. Fire Detector Bases, Universal

(1) Detector bases shall be low profile twist lock type with screw clamp terminals and self-wiping contacts. Bases shall be installed on an industry standard, 4" square or octagonal electrical outlet box.

Bases shall be supplied with the following features as required for performance to this specification:

(2) Where selective localized control of electrical devices is required for system operation, furnish and install detector base with software programmed addressable relay integral to the base. The relay shall switch electrical loads, as indicated on the drawings. Operation of the addressable control circuit shall be independent of the number of detectors and relays on the circuit or the number in an alarm state.

(3) Where indicated on the drawings for installation, furnish detector base with integral approved audible evacuation alarm signal having an output of 85 db. The audible signal shall be individually addressable and software programmed for operation.

(4) Furnish a concealed security lock, preventing unauthorized removal, installed in the base in those areas requiring tamper resistant installation as indicated on the drawings.

4. Manual Stations

(1). Provide single action manual stations where shown on the drawings, to be flush or surface mounted as required.

(2). Manual stations shall contain the intelligence for reporting address, identity, alarm and trouble to the fire alarm control

(3) Station shall be equipped with terminal strip and pressure style screw terminals for the connection of field wiring.

(4) Surface mounted stations where indicated on the drawings shall be mounted using a manufacturer's prescribed matching red enamel outlet box.

(5) System intelligent alarm initiation devices shall be furnished and installed where indicated on the drawings including features as follows:

A. General design and operational features:

01. The devices shall be protected by software in both the logic circuitry and the communication circuitry against undesirable effects from proximate electrical and electronic devices such as fluorescent light fixtures, variable frequency motor controllers and other sources of RF interference.

02. On board trapping and suppression of externally generated noise signals. Commonly induced into detector circuitry as a result of system installation and interconnection wiring

03. On board state of the art microprocessor, analog and digital circuitry, and EPROM storage, providing power for operation of the detector's error checking, detection and supervision software filters.

04. Self compensation for ambient temperature and humidity.

05. Internal alarm validation utilizing software noise filters before system alarm reports are generated.

06. Devices shall be listed by the U.L. for sensitivity testing by means of the portable programmer / tester or by readout from the control panel. Address and sensitivity assignments shall be accomplished electronically and devices requiring dipswitches, rotary switches, staples and/or jumpers are not acceptable.

a. The reading of the device sensitivity shall yield a discreet voltage level or percent of obscuration level as selected in software for logging and tracking of status to determine maintenance and cleaning requirements.

b. Detectors not listed for sensitivity testing from the control panel shall not be deemed acceptable due to the additional maintenance expense involved in the required removal, calibrated smoke generation and testing as described by N.F.P.A. 72, 7-3.2.1.

c. Sensitivity testing performed from the control panel shall be logged by the system printer if specified, as a permanent record of the performance of code mandated testing.

d. Devices shall be equipped with an LED indicator, which shall indicate alarm activation by the detection device. The LED indicator shall be operational when the system is operating from reserve power as well as normal power.

e. Detectors shall be operational with addressable relay bases, addressable audible bases and remote indicating LED's, programmable by the control panel and controlled by the detector electronics. They shall be supplied and installed with these options where indicated on the drawings or required by the operational requirements of this specification.

f. Detector shall be readily disassembled without the requirement for special tools to gain access to the detection chamber for cleaning and maintenance.

g. Detectors shall be assigned a sensitivity level for alarm threshold by the central controller based on environment, time of day or other programmable functions as required by the system user and shall respond at that level whether in the on line mode or default mode.

07. Intelligent Supervised Control Module.

a. Furnish and install for the control of supervised relays, contractors, audible signal circuits, visual signal circuits, distributed speaker circuits and two way fire fighters communication circuits, intelligent supervisory and control modules including features as follows:

(1) Modules shall be available to supervise reverse polarity supervised indicating circuits utilizing 24VDC, two way supervised fireman's communication circuits or audio circuits utilizing 25VRMS or 70.7VRMS. It shall be possible to configure the module for control of motor contractors and AC voltages to 115VAC.

(2) The module shall be suitable for semi-flush or surface mounting in a 2" deep, 4" square or double gang electrical outlet box having a depth of 3 1/2".

(3) All controlled circuits shall be power limited at 1.5A, produced by self-restoring thermal components. Units requiring circuit replacement for restoration of outputs are not acceptable.

(a) Signal outputs shall be supported in either Style"Y" or Style"Z" configuration.

(b) The module shall report a trouble condition in the event of loss of the 24VDC signal operating supply voltage.

2.01. Local Fire Alarm Control Panels

A. The control panel and all system circuit interface panels (CIP's) shall be modular in construction and shall include, but not limited to; the hardware, software and firmware required to perform the following major system functions:

1. Details the requirement for serviceability in the cabinet design, allowing technicians access to circuitry for service while protecting operating personnel from exposure to circuitry. Steel, satin black, baked enamel cabinet with indicator viewing window, removable hinged outer door with cylinder lock and dead front construction with the outer door open. The inner dead front doors shall be hinged for ease of system operation by firefighters and access by technicians for testing and maintenance modes.

2 System power supplies, including necessary transformers rectifiers, regulators, filters and surge protection required for system operation, with the capacity to power the system in a worst case condition with all devices in alarm and all local indicating appliances active without exceeding the listed ratings. All system devices shall display normal and alarm conditions consistently whether operating from normal power or reserve (standby) power.

Paragraph A.2.a.

Demands a proven technology for system protection from transients, especially the longer duration high voltage spikes that commonly destroy circuitry, and rejects the less effective and older technologies. The devices used should be listed with the circuits being protected rather than mere generic listing as protective devices, to assure compatibility.

a. Surge protection shall be supplied at the power input to each cabinet. The surge suppression shall be of the phase to neutral (normal mode suppression). Phase to ground devices, MOV based devices and pure inductive devices shall not be considered acceptable. Protection shall also be furnished for SLC and NAC circuits where exiting and entering any structure, connected prior to any system devices within the structure.

Paragraph A.2.b.

Details the differences in standby power requirements found in NFPA 72 for different classifications of systems and different modes of evacuation.

b. Standby power source shall meet the requirements for standby capacity as detailed in paragraph 1-5.2.6, NFPA 72, i.e. supervisory for 24 hours with local systems, central station and proprietary systems and 60 hours for auxiliary and remote station systems. Additionally, the supply shall be capable, at the end of this period of operating the system with all evacuation appliances active for a period of five minutes using conventional signaling or fifteen minutes using voice evacuation.

Paragraph A.2.c.

Requires that common voltages throughout the system be measurable at the control panel without the need for a multimeter. This accomplishes an obvious savings in service time for the owner equating to lower cost maintenance.

c. Control panel and CIP power supply input and output voltages, battery charging currents and terminal voltages shall be displayed on the main control panel LCD display when requested via the panel service menu. It shall not be required to be at the cabinet being interrogated to measure service voltages.

Par A.3.

Details the requirement for power limiting of all circuitry exiting the fire alarm system cabinets to comply with the requirements of NEC article 760.

3. NEC (NFPA 70) firepower limited (FPL) rating for all wiring exiting the control panel, CIP's, or notification appliance power boosters.

4. System 16 bit core processor, with internal operating system to process incoming alarm signals and issue output commands required as a result of the alarm reception, by system programming or by manual commands. Total system response time shall not exceed 4 seconds on a system configured to the 2000 input address maximum capacity. All system processors shall be supervised by individual watchdog circuitry furnishing automatic restart after loss of activity. Systems with a single watchdog circuits for all processors shall not be acceptable unless supplied with a "hot" standby CPU.

Paragraph A.5.

Deals with the local system communication network (control panel to transponders, displays, etc.) and describes the versatility required for the system by changes in building codes and owner's requirements that equipment be capable of continuing use when the changes take place and/or the system expands. Survivability is defined in the "styles" of wiring. In local networks being installed where exposed to fluorescent interference, constant velocity HVAC system controllers, and hand held communication radios and telephones, the availability of communications using fiber optics technology limits the chances of system damage due to lightning and other high voltage transients, and also induced errors due to EMI and RFI.

5. Digital communication capabilities supporting Style 4 (Class B) or Style 7 (Class A) communications using either DC digital or fiber optics technologies or combinations of both as required for the control panel to communicate with up to 64 local network nodes including CIP's, annunciators, and displays; both global displaying total external network information and local displaying only local network information.

PARAGRAPH A.5.A

Addresses the requirement for many systems to exceed the distance and node count limitations posed by the RS485 communications structure. The use of modules to expand the network allows longer system wiring when necessary.

a. Capability shall exist within the system to extend the network at any node. The system shall support a maximum of two network extension

circuits in series on any system branch, extending the inherent distance limitations for network communications.

Paragraph A.5.b

Points out the delays built into some communication protocols. These protocols, notably token ring type, require very high rates of data transfer to meet the U.L. mandated response time requirements. Other protocols such as the CS/MACD allow for much lower rates of data transfer with the resultant lower error rate in transfer.

b. Communication protocol shall be of the CS/MACD (carrier sense, multiple access, collision detect) type, eliminating delays incorporated into other protocols. Communication techniques using token passing and requiring sensing of delays and re-generation of the token to re-establish network communications in the event of a fault shall not be acceptable.

Paragraph A.6.

Deals with the external communication network (control panels to other network control panels, network command centers, building automation systems, etc.) and describes the versatility required for the system by changes in building codes and owner's requirements that equipment be capable of continuing use when the changes take place and/or the system expands. Survivability is defined in the "styles" of wiring. In networks being installed between buildings, the availability of communications using fiber optics technology limits the chances of system damage due to lightning and other high voltage transients, and also induced errors due to EMI and RFI.

6. Digital communication capabilities supporting Style 4 (Class B) or Style 7 (Class A) communications using either DC digital or fiber optics technologies or combinations of both as required for the control panels to communicate with up to 64 external network nodes including other local fire alarm systems, interface to building automation systems and Network Command Centers (NCC, s).

Paragraph A.6.a

Addresses the requirement for many systems to exceed the distance and node count limitations posed by the RS485 communications structure. The use of modules to re-generate the network allows expanded systems.

a. Capability shall exist within the system to extend the network at any node. The system shall support a maximum of two network extension circuits in series on any system branch, extending the inherent distance limitations for network communications.

Paragraph A.6.b

Points out the delays built into some communication protocols. These protocols, notably token ring type, require very high rates of data transfer to meet the U.L. mandated response time requirements. Other protocols such as the MACD allow for much lower rates of data transfer with the resultant lower error rate in transfer.

b. Communication protocol shall be of the CS/MACD (carrier sense, multiple access, collision detect) type, eliminating delays incorporated into other protocols. Communication techniques using token passing and requiring sensing of delays and re-generation of the token to re-establish network communications in the event of a fault shall not be acceptable.

Paragraph A.7.

Establishes the importance to limit the effect of faults on the alarm input circuitry to a minimum, requiring that the exposure to loss be limited to 60 input points maximum or a single floor or smoke zone whichever is smaller. It requires Style 7 (Class A) wiring for system hardware supporting more than 60 devices to furnish an equivalent survivability standard.

7. NFPA 72 Style 4 operation analog signaling circuit with isolation capability for circuit survival in a shorted circuit mode, as required to communicate with 120 points consisting of a maximum of sixty intelligent analog alarm initiating and sixty intelligent controllable output devices.

a. Analog loops shall be configured with loop isolators and wired in a manner that prevents a catastrophic wiring event in a smoke zone or on a floor from affecting the performance of other floors.

b. Systems allowing more than sixty devices per addressable loop shall be wired in a Style 7 configuration with raceway design configured to allow a maximum of one section of the loop within a single raceway.

Paragraph A.8

Requires supervised, polarity reversing, power limited notification appliance outputs as required for a variety of applications including local evacuation.

8. Limited energy output circuits as required for operation of direct current audible or visual indicating appliances, leased line or city tie, or extinguisher system release shall be provided by controllable signal modules.

Paragraph A.8.a.

Describes the necessity for the notification appliance circuits to adapt to the varied requirements f the major codes for audible and visual notification including the coding requirements for pre-signal notification, industrial and general evacuation.

a. Outputs shall be programmable as device coded, zone coded, March time coded, temporal code 3, or continuous sounding and shall be configured as required for Style Y (Class B) or Style Z (Class A). These circuits shall be listed for sprinkler pre-action, deluge and, FM-200 and Halon clean agent release and provide selection for silencable or continuous sounding.

Paragraph A.9.

Establishes the requirement for control panel mounted relay modules for the control of life safety functions which are mandated to fail to the "safe" condition and/or can not tolerate a time delay in operation as experienced in all multiplex polling sequences for both addressable and intelligent peripheral devices.

9. Control of operations requiring switching functions, where required, shall be provided a software controllable relay module.

Paragraph A.9.a.

Requires the electrical supervision of relay coils in addition to the interconnection wiring as a redundant assurance of the ability to operate in an emergency situation. Panel mounted relays are not required by U.L. to be have supervised coils or wiring. Where life safety is an issue with the operation of the relays, this feature should be required.

a. Relay coils shall be supervised when in the standby state.

Paragraph A.9.b.

Sets the minimum standards for the amount of current to be handled by the panel relays. The 2-ampere requirement will simplify the system to some extent, eliminating the complication of additional pilot relays to handle load current up to the 2-ampere minimum.

b. Relay contacts shall be rated at 2 amperes minimum.

Paragraph A.10.

Requires system architecture of mother/daughter cards, eliminating loose inter-wiring module connection and the need to disconnect field wiring during servicing, replacement or reconfiguration. Elimination of wiring

removal eliminates the requirement for system retesting after module replacement as a check for wiring errors committed in the process.

10. Mother boards shall be provided as the system bus, furnishing systems intra-cabinet communications to the various modules required for system operation and expansion.

Paragraph A.11.

And the subparagraphs describe the capabilities to be resident within the system display and include all indicators, controls keypads and alphanumeric display.

11. System display/keyboard shall be usable at any network node and shall have the following capabilities, capacities, indicators and controls:

Paragraph A.11.a

Requires a back lighted LCD super twist display, readable at any angle and under the reduced levels of emergency lighting.

a. An 80-character back lighted alphanumeric super twist LCD display readable at any angle.

(1) Thirty two character user defined custom messages shall describe the location of the active device.

(2) Display shall indicate desired message in a sequence, including; English/Spanish, English/Portuguese, English/French and English. Either of the selected languages shall be selectable as the primary display.

Paragraph A.11.b.

Requires the system display to fulfill the requirement in multi-building networks for other buildings to be informed of an emergency status in adjoining buildings.

b. The local system display shall have the capability to display a minimum of 6,000 custom messages activated as a result of alarms originated at other local panels resident on the external network.

Systems unable to perform to this level shall supply PC based terminals displaying the required messages.

Paragraph A.11.c.

Describes a feature usable on a local system which simplifies operation, restoring trouble status automatically, making it unnecessary to acknowledge each trouble and it's restoration, as is required on proprietary and other large monitored systems.

c. The system shall be capable of programming to allow troubles occurring and restored in the system to be automatically removed from the display queue.

Paragraph A.11.d.

Describes the indicators required to avoid errors by un-trained operators in interpreting the information displayed on the panel. These indicators flash to indicate the level of alarm or trouble being displayed and lead the operator through responses expected.

d. As a minimum, an LED display for "ALARM", "AUDIBLES SILENCED", "SUPERVISORY", "TROUBLE", "SECURITY", "POWER ON" and "PARTIAL SYSTEM DISABLED".

e. Touch activated, audible feedback, membrane switches for "ALARM ACKNOWLEDGE","AUDIBLE SILENCE", "SUPERVISORY ACKNOWLEDGE", "TROUBLE ACKNOWLEDGE", "SECURITY ACKNOWLEDGE", "RESET", "DISPLAY HOLD" and "DISPLAY NEXT".

Paragraph A.11.f.

Describes the requirements for a twelve-function keypad allowing the owner to pre-program a string of commands unique to his installation to perform common maintenance, bypass, sensitivity change, and convenience functions in the use of the system.

f. Touch activated, audible feed-back, membrane switch functions, programmable to perform a minimum of twelve customs designed and programmed functions such as drill, disable, bypass automatic control commands or other special functions as required by the system user.

(1) The membrane switches shall also be used for the entry of multiple key sequences to be used for pass code protection inputs into logic strings, preventing un-authorized command entry.

g. Ten digit keypad for pass code entry to perform programming and maintenance functions.

Paragraph A.11.h.

Describes the requirements for the system to support multiple full function remote annunciators in addition to the one normally positioned at the control panel. This capability allows positioning full function displays in maintenance, building management, security, etc. as required.

h. The system shall support a minimum of three supervised remote alphanumeric annunciators as full function remote control points. Each supervised annunciators shall support printers, video display terminals, color video display terminals, CRT's and connected slave annunciators as indicated on the drawings.

(1) Each system display shall be programmable, as a software function at the Fire Alarm Control Panel to be full function or display only, with it's own set of function commands, as described above. Selection in software shall also determine the display of either local only or global information.

Paragraph A.11.I

Describes the requirements for a real time clock; operating independently the system power, assuring that all historical logs are accurate and all time functions are supported upon restoration of failed.

i. Real time clock with lithium battery for the maintenance of time through a full system power down, assuring the accuracy of time labels in the historical events log.

Paragraph A.11.j.

Describes the requirements for an historical log of a size adequate to support a full logging of all critical actions and reports during a real emergency situation. It also requires the ability to designate the actions to be logged to history, allowing only the actions of interest for the system user to be logged.

j. Selective historical log, up to 800 events of all types, shall be stored in flash memory and displayed, printed or downloaded by classification for selective event reports.

(1) The system shall allow selection of events to be logged, including inputs, as; alarms, troubles, supervisory, securities, status changes, walk tests and device verification, outputs as; audible control and output activation, actions as; reset, set sensitivity, arm/disarm, override, password, set time and acknowledge.

(2) Data format for downloading shall be adaptable to a data base management program allowing custom report generation to track alarms, troubles and maintenance.

(3) Audible and visual indications shall be generated when memory is 80% and 90% full to allow downloading of data.

(4) Systems not supporting downloading of event history or requiring segregated storage for classifications of event history shall include a PC based, dedicated historical logging terminal together with hard

drive storage and necessary software for system performance analysis and report generation.

Paragraph A.12.

Requires the ability to report alarms, in all classifications and troubles to responsible parties. The alarms can be vectored to the department duty technician, security, supervisors, etc. for action allowing mobility of personnel.

12. The system shall have capabilities allowing vectored reporting of Alarms, Supervisory, Security, Troubles and Status, to dedicated Alfa-numeric radio pagers. The information displayed on the pager shall identify the system, the device address, the state of the device and the Alfa-numeric description of the device location. The system shall have capabilities of up to eight classifications of remote reports.

Paragraph 12.a.

Describes the ability of the system to use a single global interface for system alphanumeric paging, eliminating the requirement for telephone line connection at each of the network panels, saving resources. The paging function allows key response personnel to be notified immediately, regardless of their location.

a. The system shall have the ability to configure paging as a global function for High-rise and Campus style systems.

Paragraph A.13.

Describes the ability of the system to support off site diagnostics to minimize travel and maintenance time and billing. A knowledgeable technician can resolve many problems with a laptop computer displaying a remote control panel's condition.

13. Software and hardware shall be furnished to allow an authorized service provider the ability to communicate with the control panel via phone lines, running diagnostic reports, historical reports, recording system voltage levels and recording system sensitivity levels.

SPECIFICATION SHEET for ACCESSORIES / SIGNALING

Evacuation Signaling Devices shall be furnished and installed as shown on the drawings, including the following features and capabilities:

A. Visual signals shall be installed as shown on the drawings in accordance with the requirements of the U.L.1971 standard and NFPA 72. Where multiple visual signals are visible from any location, circuitry shall be incorporated for the synchronization of the flash rate.

01. UL 1971 Listed for Emergency Devices for the Hearing Impaired in all public mode installations.

02. Strobes shall meet UL 1971 and produce a flash rate of one (1) flash per second minimum over the listed input voltage (20VDC - 31VDC) range.

03. All visual signals shall incorporate a Xenon flashtube enclosed in a rugged lexan lens or equivalent with solid-state circuitry.

04. The strobe intensity shall be rated per UL 1971 for 15, 30, 75 or 110 Candela. Dual listing strobes of 15/75 intensity for UL1971/near-axis requirements shall be used where acceptable

05. The strobes shall be available for semi-flush or surface mounting and in conjunction whit audible signals as required.

A-01 Scope

1. This specification outlines the requirements for the automatic fire detection and total flooding FM-200 Extinguishing System.

2. The work described in this specification consists of all labor, materials, equipment and services necessary and required to complete and test the automatic fire detection and extinguishing system. Any material not specifically mentioned in this specification or not shown on the installation drawings but required for proper performance and operation shall be furnished and installed.

A-02 Quality Assurance, Codes & Standards

1. This system shall be designed, installed and tested in accordance with the Specifications and the following national codes and standards, (latest published edition at the time of bid date).

a. National Electrical Code (NEC), Article 760.

b. NFPA Standard No. 72, the National Fire Alarm Code.

c. NFPA Standard No. 2001, Clean Agent Fire Extinguishing Systems.

2. Underwriter's Laboratories shall list the system including all components, Handicapped accessibility standard:

Provide work conforming to Americans with Disabilities Act (ADA) Accessibility Guideline (ASAAG).

A-03 General

1. The Contractor shall furnish and install complete and ready for operation an automatic fire detection and total flooding FM-200 fire extinguishing system including charged FM-200 storage cylinders, piping, valves, nozzles, control panel, detectors, manual stations, alarm devices, wiring, components, appurtenances and accessories.

The system and components shall be supplied by one manufacturer of established reputation and experience who shall have produced similar apparatus for a period of at least three (3) years and who shall be able to refer to similar installations rendering satisfactory service.

A. The system shall be installed by an experienced firm regularly engaged in the installation of automatic fire detection and fire extinguishing systems in strict accordance with NFPA standards.

a. The contractor shall have a minimum of five- (5) years experience in design, installation and testing of fire detection and fire extinguishing systems.

b. The specifier may, at his option, reject any proposed installer who cannot show evidence of these qualifications.

A-04 Special Conditions

1. All material and equipment shall be new and unused.

2. All individual components and composite systems shall be designed for continuous operation without undue heating or change in rated values, and shall be properly fused.

A-05 System Description and Function

1. The system shall be capable of signaling an alarm prior to the development of visible smoke or flame within the protected area. The system shall provide audible and visual annunciation at its central panel upon detection of a fire condition, visually identifying the space associated with each of its individual detection devices. Upon verification of a progressing fire condition by operation of a second detection device, the automatic suppression system sequence shall activate. The suppression system shall be a total flood system and shall be designed to provide a 7% concentration by volume, at a design temperature of 60 degrees Fahrenheit.

2. The automatic fire detection and total flooding fire extinguishing system shall consist of main control panel, remote annunciation, detection devices, manual stations, charged FM-200 storage cylinders, valves, nozzles and alarm devices all wired and piped in accordance with the specifications.

3. The system shall be electrically supervised against open, short and ground wire faults in the initiating device circuits, alarm indicating device circuits and agent releasing circuits. Wiring faults occurring in these circuits shall cause both an audible and visual indication at the control panel.

4. The complete detection/suppression system shall be provided with 24-hour battery backup capability. The system shall be capable of FM-200 System discharge as well as sounding all audible devices for five (5) minutes at the end of the 24 hour standby period.

5. Sequence of Operation:

a. Activation of any one (1) automatic fire detector shall cause the following events to occur:

1) Activate audible/visual signal at the main control panel.

2) Activate the “Point LED”, at the graphic annunciation panel.

3) Activate the “1st alarm signal”, audible/visual alarm appliances.

4) Transmit “1st alarm signal”, to the building fire alarm system.

5) Print out event, on history logging printer.

b. Activation of any second (2nd) automatic fire detector shall cause the following events to occur:

1) Activate audible/visual signal at the main control panel.

2) Activate the “Point LED”, at the graphic annunciator panel.

3) Start the “discharge delay count down timer”, located on the face of the graphic annunciator panel.

4) Silence the “1st alarm” audible/visual alarm appliances and activate the second (2nd) alarm pre-discharge alarm appliances.

5) Shut-down all local A.H.U. and their associated dampers.

6) Transmit “second (2nd) alarm signal”, to the building fire alarm system.

7) Start the agent release time delay circuit. (Time delay adjustable from 15 seconds to 60 seconds.

8) Print out event, on history logging printer.

9) At the end of the pre-determined time delay period, activate all releasing circuits, thereby causing total flooding FM-200 discharge.

10) Silence the second (2nd) alarm pre-discharge alarm appliances and activate the system discharged audible/visual alarm appliances.

c. Activation of any FM-200 manual discharge station shall cause the following events to occur:

1) Activate audible/visual signal at the main control panel.

2) Activate the "point LED", at the graphic annunciator panel.

3) Start the "discharge delay count down timer", located on the face of the graphic annunciator panel.

4) Activate the second (2^{nd}) alarm pre-discharge alarm appliances.

5) Shut down all local A.H.U. and their associated dampers.

6) Transmit "second (2^{nd}) alarm signal', to the building fire alarm system.

7) Start the agent release time delay circuit. (Time delay adjustable from 15 seconds to 60 seconds.)

8) Print out event, on history logging printer.

9) At the end of the pre-determined time delay period, activate all releasing circuits, thereby causing total flooding FM-200 discharge.

10) Silence the "second (2^{nd})" alarm pre-discharged appliances and activate the system discharged audible/visual alarm appliances.

11) Note #1 Manual discharge stations are "Non-Abortable".

d. Activation of any abort station shall cause the following events to occur:

1) Activate a supervisory audible/visual signal at the main control panel.

2) Activate the "point LED", at the graphic annunciator panel.

3) Stop the "discharge delay count down timer".

4) Stop the agent release time delay circuit (only functional when agent release time, delay circuit was started by 2^{nd} automatic smoke detector).

5) Silence the second (2^{nd}) alarm pre-discharge alarm appliances.

e. Release of the spring loaded deadman type abort station shall cause the following events to occur:

1) Restart the "discharge delay count down timer", thus providing for a full-programmed amount of time delay.

2) Restart the agent release time delay circuit thus providing for a full-programmed amount of time delay.

3) Resound the second (2^{nd}) alarm pre-discharge alarm appliances.

1 2.

a. FM-200 storage cylinder and valve assembly:

b.. The cylinders shall be manufactured, tested and marked in accordance with D.O.T. Specification 4BW500 or 4BA500.

The cylinders shall be charged with FM-200 as required by the hydraulic calculations and shall be super pressurized with dry nitrogen to a total pressure of 360 psig (24.84 bars) at 70°F (21.1°C) to assure rapid discharge and reliable operation at temperatures as low as 32°F (0°C). Cylinders larger than 250 pounds capacity shall be fitted with lifting lugs for ease of handling. Cylinders shall be furnished with bracketing suitable for secure mounting.

b. Each cylinder shall be furnished with a cylinder pressure supervisory switch to cause a supervisory signal at the control panel if the pressure in the cylinder drops to approximately 320 psig. Cylinders with a capacity of 150 pounds or more shall be fitted with a liquid level indicating device for determining the weight of the FM-200

charge in the cylinders The device shall consist of a brass diptube with a stainless steel float riding on the outside of the diptube and a magnetic tape within the diptube. Both the tape and the float shall be fitted with magnets capable of coupling so as to suspend the tape with its calibrations easily read at the entry to the diptube, indicating the actual liquid level in the cylinder.

c. A graph shall be provided to translate the tape reading to pounds of FM-200 at the cylinder temperature.

9. Cylinder Valves:
The cylinder valves shall have a brass body and shall be of a pressure seated, high flow rate design incorporating a brass piston with seal, pressure releasing for valve operation, safety disc assembly, pressure actuation outlet port and pressure gauge. Cylinder valves on electrically actuated master control cylinders shall have a Marked E electric solenoid. The solenoid coil shall be easily removable from the cylinder valve to facilitate cylinder removal and servicing.

10. Nozzles:
    a. The nozzles shall be aluminum and shall be of a type specified in the UL listing and FM approval and suitable for the purpose intended. They shall be marked with the manufacturer's identifying part number, and drilled in accordance with the hydraulic calculations.

    b. The nozzles shall have a standard female pipe thread for attachment to the discharge piping. Nozzles shall be spaced in accordance with the instructions in the installation manual and as required by the UL listing and FM approved.

11. Pipe and Fittings:

    a. Ferrous piping either black or galvanized, conforming to ASTM A-40 or A-106, or other materials confirming to these strength requirements shall be used. The thickness of the pipe wall shall be calculated in accordance with ANSI-B-31.1, Power Piping Code. All fittings used shall be 300 pound or 600 pound class in accordance with NFPA Standard 2001.

    b. All pipe ends shall be thoroughly reamed after cutting, and all oil and chips shall be removed. Dry air or nitrogen shall be blown through the piping to remove chips or other debris prior to installation of the nozzles.

    c. All piping shall be securely fastened with particular attention being given to fastening near nozzles to prevent pipe movement due to the reaction force during discharge.

    d. All piping and storage cylinders shall be in a concealed space.

A-07 Execution

1. Installation:

    a. Control and other panels shall be mounted with sufficient clearance for observation and testing. All fire alarm pull boxes must be clearly marked "fire alarm" for easy identification. All wiring shall be in conduit, EMT thin-wall. Flexible connectors shall be used for all devices mounted in suspended lay-in ceiling panels. All conduit, mounting boxes, junction boxes and panels shall be securely hung and fastened with appropriate fittings to insure positive grounding throughout the entire system.

    b. No wiring other than that directly associated with fire alarm detection alarm or auxiliary fire protection functions shall be permitted in fire alarm conduits. All fire alarm conductors shall run continuous from point to point (no splices). Transposing or changing color-coding of wires shall not be permitted. Wire nut-type connections are not acceptable. All conductors in conduit containing more than one wire shall be labeled on each end with "E-Z markers" or equivalent. Conductors in cabinets shall be carefully formed and harnessed so that each drops off directly opposite to its terminal. Cabinet terminals shall be numbered and coded. All controls, function switches, etc., shall be clearly labeled on all equipment panels.

All wiring shall be checked and tested to insure that there are no grounds, opens or shorts.

2. Warranty

a. All equipment and systems shall be warranted by the contractor for a period of one (1) year following acceptance. The warranty shall include parts, labor, prompt field service, pick-up and delivery.
b. Provide two years testing and maintenance, which shall consist of:

1) Regularly and systematically examining all detectors, manual stations, panels, relays, pressure switches and accessories pertaining to the system. (6-month interval)

2) Regularly and systematically examine, adjust and clean all the electrical and mechanical components, tanks, and nozzles, piping. (6-month interval)

3) Tests and written reports which certify that all initiating devices have been tested and which indicate the result of the inspection test as required by the authority having jurisdiction. (6-month interval)

The installing Contractor shall offer a test and maintenance agreement providing the same service as described in Par b. to commence after expiration of test and maintenance included in this contract.

Acceptance Test / Training:

a. The contractor shall notify the Owner 10 days prior to the scheduling of the required acceptance test. The Owner may request that factory mutual and/or the Owner's risk management officer witness the acceptance test.

b. As a minimum each component of the system shall be tested, in accordance with NFPA standards and a "system certification report", issued to the Owner.

c. All automatic detectors shall be functionally tested and their sensitivity verified per manufacturer's requirements.

d. Interface with AHU shutdown shall be tested and coordinated with Owner's on-site maintenance staff.

e. Conduct a complete "door fan" test in accordance with NFPA standards to verify the "air tightness", of the protected space. Failure of the protected space to maintain proper air density shall be immediately brought to the attention of the Owner. Any construction elements such as conduit, piping, etc. causing a failure of the required "door fan" test, shall be repaired by the Contractor. Structural deficiencies that may cause a failure of the "door fan" test shall be the responsibility of the Owner.

f. The Contractor shall provide two (2) 4-hour training sessions with the Owner's designated staff. Training shall describe in detail system operation, preventative maintenance procedures and system diagnostics.

2. Special Alert:

a. The Contractor is reminded that this installation is taking place in a fully occupied and operating computer center. Uninterrupted service is vital to the Owner's overall operation. Adequate care must be taken by the Contractor to protect all existing equipment and operations to prevent any and all facility interruptions.

b. Electrical circuits that may be questionable as to what they might shut down shall be properly identified with the Owner prior to proceeding with the proposed work.

PUBLIC ADDRESS SYSTEM

SYSTEM DESCRIPTION

The system configured as a Two Channel open line page and party communication system wired parallel between field stations to field stations.

The Handset stations (field Stations) referred also as a indoor type and out door type provided with noise canceling type handset meant for high degree of speech intelligibility even in high ambient noise conditions normally prevails in industrial atmosphere.

The Stations are so designed to meet the Industrial requirements and confirming to IP55 degree of protection as per ISI:

2147/196.

The entire electronics assembly plug in modular type ensures ease of maintenances of the system in a period of regular interval and the modular P.C.B's can be replaced in no time without any soldering by minimizing down time failure within the system.

MASTER CONTROL STATION

Features

- Zone selection indicators (LED green)
- Incoming call register indicator Red LED from EVC from EVC stations (Visual)
- PEIZO Electric Buzzer Alarm indicator (Audio)
- All Zone selection with single switch
- Built-in pre amplifier, built in speaker (Monitor)
- Built in Paging microphone (Gooseneck type)
- Gong tone Generator prior to page selectable (Zone Selection)
- Chime tone Generator prior to page selectable (All Zone selection)
- Emergency Siren tone Generator selectable.
- Priority control (Over ride facility) to mute paging from other EVC.

Controls Provided

- Mic Gain Control.
- Monitor Amplifier Gain Control.

SYSTEMS OPERATION:

a) The system provides communications in two independent channels. Viz. Page and party Channel.

b) The selection of the page channel is though a press to page switch at the handset.

c) Page channel is for making any announcement over the system Loud Speakers. A call attention gong tone will be automatically proceeded prior to page announcements.

d) When page switch is released the conversion automatically Transfers in to PVT channel for holding conversion, including conference between two or more stations with out being heard in Loud Speakers.

e) A loud speaker associated with any station engaged in party channel conversation is free and independent to receive any paging announcement.

f) Additional Loud Speakers mute switch is provided at each hand set station to mute the Loudspeakers, if required, when engaged in party channel conversation.

g) When making page announcement, the associated loud speaker of that particular hand set stations muted of to prevent acoustical feed back with in the systems.

h) An additional switch called as a “Function” switch provided for activation siren tone, and priority control (over ride paging), if required.

If vendor is offering different system / deviation the same is subject to acceptance only after demonstrating / taking written confirmation from Client

ARTICLES OF AGREEMENT

Made at …….. this …….. day of …….. between…….. ……..(hereinafter referred to as the Employer which expression shall include his, Executors, Administrators and Assigns) of the other part WHEREAS the employer is desirous of "Renovation of Air Lab- Fire detection system" in C.P.C.B building.
WHEREAS the said drawings and the specifications and the priced schedule of quantities have been signed by or on behalf of the parties hereto and WHEREAS the contractor has agreed to execute upon and subject to the conditions at forth herein (hereinafter referred to as 'the said conditions") the work shown upon "the said Drawings" and described in "the said specifications" and the said "

Priced Schedule of Quantities"

At the respective rates mentioned in the priced Schedule of quantities attached.
and WHEREAS the contractor has deposited Rs…… Rupees …… .....……..) with the Employer for the performance of the Agreement.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the payments to be made to the contractor as hereinafter provided he shall upon and subject to the said conditions execute and complete the works shown upon the said drawings and such further detailed drawings as may be furnished to him by the said Architects and described in the specifications and the said priced schedule of quantities.
2. The employer shall pay the contractor such sums as shall become payable hereunder at the time and in the manner specified in the said conditions.
3. the plans, agreements and documents mentioned above shall form the basis of this contract and the decision of the said Employer as mentioned in the conditions of contract with reference to all matters of dispute as to the material, workmanship or account and as to the intended interpretation of clauses of this agreement or any other document attached hereto shall be final and binding on both parties and shall be made a rule of court.
4. The said contract comprises the above mentioned buildings and all subsidiary works connected there within the same site as may be ordered to be done from time to time by the said Employer even though such works may not be shown on the drawings or described in the said specifications or the priced schedule of quantities.
5. The said conditions and special conditions, specifications, schedule of quantities, wage schedule of labour and schedule of materials to be supplied by the employer and guarantee bond shall be read with construed forming part of this agreement and the parties hereto will respectively abide by and submit themselves to the conditions and stipulation and perform the agreements on their parts respectively in such conditions contained.
6. The Employer reserves to himself the right of altering the drawings and nature of the work and of adding to or omitting any items of work or of having portions of the same carried out departmentally or otherwise and such alternations or variations shall be carried out without prejudice to this contract.
7. All disputes arising out of or in any way connected with this Agreement shall be deemed to have arisen in Delhi and courts in Delhi shall have jurisdiction to determine the same.

8. The several parts of this contract have been read by us and fully understood by us. As witness our hands this ……. …….. day of ……

Signed by the said

_____ _____
in the presence of witnesses EMPLOYER

1. Signed by the said

_____ _____

2. In the presence of

SPECIAL CONDITIONS

1. Sealed tenders superscripted with "Renovation of Air and Treatability Lab-Fire detection system" should be submitted at the office of the Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi - 110 032. The tender documents will be received upto 3.00 p.m. on 19.11.2010.

2. The bids will be opened on 19.11.2010 at 3.30 p.m. at the same address.

3. No tender will be received after 3.00 p.m. on 19.11.2010 under any circumstances whatsoever.

4. Tender shall remain valid for a period of 3 months from the date of opening the tender.

5. CPCB does not bind itself to accept the lowest or any tender and reserves to itself the right to accept or reject any or all the tenders, either in whole or in part without assigning any reasons for doing so.

6. (a) Each page of tender documents is required to be signed by the person or persons submitting tender in token of his /their having acquainted himself/ themselves with General conditions of contract, General Specification, special conditions, etc., as laid down. Any tender with any of the documents not so signed will be rejected. This also applies in respect of limited and private limited companies.

   (b) the tender submitting on behalf of a firm shall be signed by all the partners of the firm or by a partner who has the necessary authority on behalf of the firm to enter into the proposed contract, otherwise the tender is liable to be rejected.

7. (a) The tender form must be filled in English or Hindi language and all entries must be made by hand written in ink. If any of the documents is missing, or unsigned, the tender will be considered invalid.

   (b) The tender shall also submit along with his tender in respect of items wherein make is not specified a list mentioning the names of manufacturers specialized items which he proposes to use in the work if his tender is accepted.

8. All erasures and alternations made while filling the tender must be attested by initials of the tenderer. Overwriting of figures is not permitted. Failure to comply with either of these conditions will render the tender void. No advice of any change in rate of conditions after opening of the tender will be entertained.

9. Intending tenderers shall pay as Earnest Money a sum of Rs 29,315/- by demand draft/FDR in favour of CPCB, Delhi.

   A tender which is not accompanied by earnest money will not be considered. The earnest money will be returned without any interest to the tenderer if his tender is not accepted.

10. Within fourteen days of issue of letter of intent from the CPCB of the acceptance of its tender the successful tenderer shall be bound to execute the contract by signing in accordance with the draft agreement and schedule of conditions but written acceptance by the Employer of a tender will constitute a binding contract between the employer and the tenderer whether such formal contract is subsequently entered into or not.

11. All compensation or other sums of money payable by the contractor to the employer under the terms of this contract shall be deducted from its earnest money and the security deposit if the amount to permits and contractor shall unless such deposit has become otherwise payable, within ten days after such deduction make good in cash the amount so deducted.

12. The contractor shall not assign or sublet any portion of the contract. He must not sublet any portion of the contract except with written consent of the Employer, failing which the employer may serve a notice in writing rescinding the contract where upon the security deposit shall stand forfeited at the absolute disposal of the employer.

13. A schedule of probable quantities in respect of such work and specification accompany these special conditions. The schedule of probable quantities are liable to alterations omission, 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 totaled up in order to show the aggregate value of the entire tender. All corrections in the tender rates shall be duly attested by the dated initials of the tenderer. Corrections which are not attested may entail the rejection of the tender. Rates should be quoted both in figures and words in columns specified. In case of discrepancy in the rates in figures and words the rates in words shall be deemed to be correct.

14. The tenderer must obtain for itself on its own responsibility and 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 and must consider and 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 pertaining thereto and influencing its rates for the work.

15. The rates quoted in the tender shall include all charges for double scaffoldings, marking out and clearing of site, Airing etc., as mentioned in the specifications. The rates quoted shall be deemed to be for the finished work. Tenderer must include in their rates royalty, sales tax, excise duty, octroi and any other tax and duty, or other levy levied by the central government or any state government or local authority if, applicable, no claim in respect of royalty, sales tax, excise duty, octroi or other tax, duty or levy shall be entertained by the Employer.

16. Time shall be considered as the essence of the contract. The entire work must be completed in 3 (three) calendar months. The attention of the tenderer is drawn to clause 10 of the conditions of contract referring to damage for non-completion. The tenderer shall before commencing work prepare a detailed work programme which shall be approved by the employer.

17. The contractor shall not be entitled to any compensation for any loss suffered by him on account of delay in commencing or executing the work whatever the course of delays may be, including delay arising out of modification of the work entrusted to him or any sub-contracts connected therewith or delays in awarding contracts for other trades of the project or in commencement or completion of such works or in procuring government controlled or other building materials or in obtaining Air and power connections for construction purposes or for any other reason, whatsoever and the employer does not accept liability for any sum besides the tender amount subject only to such variations as may be provided for herein.

18. The successful tenderer is bound to carry out any items of work necessary for the completion of job even though such items are not included in the quantities and rates. Schedule and instructions in respect of such additional items and their quantities will be issued in writing by the Employer.

19. If the Head quarters of the successful tenderers are elsewhere than Delhi he shall have a duly authorized agent in Delhi from the commencement of the work until the building is occupied by the employer. Such agent shall be authorized to act on behalf of the successful tenderer to accept service of notice of contract and to agree to extras, omissions and varied item of work and rates for the same. Such agent shall maintain on his staff a qualified Engineer approved by the Employer and such office personnel as may be required for the efficient execution of works. Any notice under the contract shall be deemed to have been served on the successful tenderer if served upon such agent or sent by registered letter to address. Such agent shall not be changed and shall not leave during the duration of the contract, unless the consent of the Employer shall have been previously obtained. If the Employer shall order the tenderer to carry out any rectifications under the terms of the contract after the building is completed, the successful tenderer shall have the same or another duly authorized agent while such rectifications are being carried out.

20. The successful tenderer must co-operate with the CPCB and its decisions so that the work shall proceed without any delay and to the satisfaction of the employer.

21. The contractor shall be supplied Air and electrical connection free of cost.

22. The security deposit of the successful tenderer will be forfeited if he fails to comply with any of the conditions of the contract.

- On completion of the work, the contractor shall clear away and remove from the site all surplus materials, rubbish and temporary works of every kind and leave the whole of site and permanent works clean and in a workman like condition into the satisfaction of employer.

- The contractor shall also submit the wage schedule for all classes of labourers required in the work, for information of the department and necessary action in case the department desires to engage its labour for minor works to be done departmentally.

S.N.	**Classification of Labour**	**Unit**	**Rate/day in figures words**
1	**Diploma holder**	**Each**	
2	Foremen Ist grade	Each	
3	Electrician Ist grade	Each	
4	Fitter Ist grade	Each	
5	Khalasi	Each	
6	Mason	Each	

CONDITIONS OF CONTRACT

1. Interpretations

In Construing these conditions, the specifications, the priced schedule of quantities, tender and agreement, the following words shall have the meanings herein assigned to them except where the subject or contact otherwise required:-
"Employer" shall mean ……..
…….. And his (their) heirs, legal representatives, assigns and successors.
" Contractor" shall mean ……..
…….. and his (their) heirs, legal representatives, assigns and successors.
"Site" shall mean the site of the contract works as shown bounded on the site plan attached hereto including any buildings and erections thereon and any other land adjoining thereto (inclusively) as aforesaid allotted by the Employer for the Contractor's use.
"This Contract" shall mean the Articles of Agreement, special conditions, these conditions, the priced schedule of quantities, the specifications, and the appendix and the drawings, additional instructions issued till the receipt of the tender and subsequently correspondence if any till the date of acceptance of tender, and the letter of acceptance of contract.
"Act of Insolvency" shall mean any act of Insolvency as defined by the Presidency town Insolvency Act, or the provincial act or any amending statute.
"Notice in writing" or written notice shall mean a notice typed or printed characters sent (unless delivered) personally or otherwise provide to have been received by registered post to the last known private or business address or registered office of the addressee and shall be deemed to have been received when in the ordinary course of post it would have been delivered.
"Virtual completion" shall mean that building is in the opinion of Employer fit for occupation.
"Words imputing persons" include firms and corporations. Words imputing the singular only also include plural and vice versa where the context so required.

2. Scope of work

The contract in brief covers civil works for the "Renovation of Air Lab-Fire detection system" in CPCB at Parivesh Bhawan, East Arjun Nagar, Delhi – 110 032.
The contractor shall carry out and complete the works in every respect in accordance with this contract and in accordance with the directions and to the satisfaction of the employer. The employer in their absolute discretion from time to time issue further drawings and / or written instructions, details, directions and explanations which are hereafter collectively referred to as the "Employer's Instructions" in regard to:-

a) The variation or modification of the design, quality of works or the additions or omission or substitution of any work.
b) The removal from the site of any materials brought there on by the contractor and the substitution of other materials therefore.
c) The removal and/or re-execution of any works executed by the contractor.
d) The dismissal from the works of any persons thereupon.
e) The opening up for inspection of any work covered up.
f) The amending and making good of any defects under clause (11)

1. Authorities, Notice and Patents

The contractor shall confirm to the provisions of any acts of the legislature relating, to the works and to the regulations and bye-laws of any authority, and of any Air, lighting and other companies and /or authorities with whose system the structure is proposed to be connected, and shall, before making any variations from the drawings or specifications that may be necessitated by so confirming 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 within in seven days receive such instruction he shall proceed with the work confirming with the provisions, regulations or bye-laws in question.
The contractor shall arrange to give all notice; required by the said acts, regulations or bye-laws to be given to any authority, and to pay to such authority, or to any public officer all fees that may be properly chargeable in respect of the works, and lodge the receipts with the employer.
The contractor shall identify the Employer against all claims in respect of patent rights and shall defend all actions arising from such claims unless he has informed the employer before any such infringement received their permission to proceed and shall himself pay all royalties license fees, damages, coasts and charge of all and every sort that may be legally incurred in respect thereof.

2. Access

The employer, their representative shall at all reasonable times have free access to the work and / or to the workshop factories, or other places where materials are being prepared or construct the contract and also to any other place where

the materials are lying or from which they are being obtained, and the contractor shall give every facility to Employer and their representative necessary for inspections and examinations and tests of the materials and workmanship. Except the representatives of public authorities no person shall be allowed on the works at any time without the written permission of the employer.
If any work is to be done at the place other than the site of works, the contractor shall obtain the written permission of the employer for doing so. The work during the progress / on completion can also be inspected by the employer.

3. Dismissal of workmen

The contractor shall on the request of the employer immediately dismiss from the works any person employer thereon who may, in the opinion of the employer, be unsuitable or incompetent or who may misconduct himself, and such person shall not be again employed or allowed on the work without the permission of Employer.

4. Date of Commencement and completion

The contractor shall be allowed admittance to the site on the "Date of commencement" stated in the Appendix, and he shall thereupon and forthwith begin the works and shall regularly proceed with and complete the same on or before the "Date of Completion" stated in the Appendix subject nevertheless to provisions for extension of time hereinafter contained.
The time being the essence of contract, the contractor will adhere to time and progress chart and will give proportionate progress in proportionate time i.e. 1/8th of work in 1/4th of the time, 3/8th of the work in ½ of the time and 3/4th of the work in 3/4th of the time and commensurate with the progress as envisaged in the bar chart based on the analogy had accepted by the employer. In case of failure on the part of the contractor to give proportionate progress in proportionate time then the employer may recover by way of liquidated damages the amount calculated as described in the appendix shall however be refunded in case the individual items and the entire works are completed by the target dates, as decided by the employer, whose decision shall be binding.

5. Assignment

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

6. Schedule of quantities

The schedule of quantities unless otherwise stated shall be deemed to have been prepared in accordance with the method of measurement mentioned in the specifications and shall be considered to be approximate and no liability shall attach to the employer for any error that may be discovered therein.

7. If in the opinion of the employer the work be delayed

a) By force of nature such as incessant rain, flood, fire and like natural calamities or
b) Reason of any exceptionally inclement of weather or
c) By reason of proceeding taken or threatened by or dispute with adjoining or neighboring owners or public authorities or
d) By the works or delays of other contractor or tradesman engaged by the employer and not referred to in the schedule of quantities and /or specification or
e) By reason of employer's instructions as per clause No.2 or
f) By reason of civil commotion, local combination of workmen or strike of lockout affecting any of the building trades or
g) By consequence of the contractor not having received in due time necessary instructions from the employer for which he shall have specially applied in writing or
h) From other causes which the employer may certify as beyond the control of the contractor or
i) In case of strike or lock out the contractor shall give written notice thereof to the employer, but the contractor shall nevertheless constantly use his endeavors to prevent delay and shall do all that may reasonably be required to the satisfaction of employer to proceed with the work. The employer shall make a fair and reasonable extension of time for the completion of the contractor work.

8. Damage for non-completion

If the contractor fails to complete the work by the date of completion stated in the appendix or within any extended time under clause 9 thereof and the employer certify in writing that in their opinion the same ought reasonably so to have been completed, the contractor shall pay or allow the employer the sum named in the appendix as "liquidated Damaged" for the period during which the said works shall so remain incomplete and the employer may deduct such damage from any moneys due to the contractor.

9. Failure by Contractor to comply with employer's instructions

If contractor after receipt of written notice from the employer requiring compliance, with such further drawings and / or employer's instructions fails within seven days to persons to execute any such work whatsoever may be necessary to give effect thereto and all costs incurred in connection therewith shall be recoverable from the contractor by the employer as a debt or may be deducted by him from any moneys due to the contractor.

10. Certificate and payment

The contractor shall be paid by the employer from time to time by installments under interim certificates to be issued by the employer to the contractor on account of the works carried when in the opinion of the employer work to the approximate value named in the appendix as value of works for interim certificates (less at the reasonable discretion of the employer) has been executed in accordance with this contract, subject however to a retention of the percentage of such value named in appendix hereto as "Retention percentage of interim certificates". The employer may in their discretion include in the interim certificate such amount as per standard CPWD procedure on account of material delivered upon the site by the contractor for use in the works.
And when the works have been virtually completed and the employer shall have certified in writing that they have been so complete the contractor shall be paid by the employer in accordance with the certificate to be issued by the employer the sum of money named in the appendix as 'Installment after virtual completion' and the contractor shall be entitled to the payment of the final balance in accordance with the final certificate to be issued in writing by the employer at the expiration of the period referred to as "Defects Liability period" in the appendix hereto from the date of virtual completion or soon after the expiration of such period as the works shall have been finally completed and all defects made good according to the true intent and meaning hereof whichever shall last happen. Provided always that the issue of the employer of any certificate during the progress of the work set or after their completion shall not relieve the contract or from his liability in case of fraud, dishonesty or fraudulent concealment relating to the works or materials or to any matter dealt. Within the certificate and in case of all defects and insufficiencies in the works or materials which a reasonable examination would not have disclosed. No certificate of the employer shall of itself be conclusive evidence that any works or materials to which it relates are in accordance with the contract.
The employer shall have power to withhold any certificate if the works or any parts thereof are not being carried out to their satisfaction.
Payments on interim certificate shall be made within the period named in the appendix "Period of honoring Certificate" after such certificate have been delivered to the employer and vetted by the CPCB.

11. Certificate of Virtual completion

The works shall not be considered as completed until the employer have certified in writing that they have been virtually completed and the defects liability period shall commence from the date of such certificate.

12. Employer delay in progress

The employer may delay the progress of the works without vitiating, the contract and grant such extension of time for the completion of contract as they may think proper and sufficient in consequence of such delay, and the contractor shall not make any claim for compensation of damages in relation thereto.

13. Restriction of work to be carried out

if at any time after commencement of the work, the employer shall for any reason what so ever not require the whole work or part thereof as specified in the tender to be carried out, the contractor shall have no claim to any payment of compensation whatsoever on account of any profit / advantage / on which he might have derived from the execution of the work in full but which he did not derive in consequence of the full amount of the work not having been carried out nor shall be have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, designs and instructions which shall involve any curtailment of the work as originally contemplated.
Provided that the contractor shall be paid the charges on the cartage only of materials actually and bonafide brought to the site of work by the contractor and tendered surplus as result of abandonment or curtailment of the work or any portion thereof and then taken back by the contractor, provided however, that the employer shall have in such cases the option of taking over all or any such materials at their purchase price or at local current rates which ever may be less.
In case of such stores having been issued from employer stores and returned by the contractor to employer stores, credit shall be given to the contractor at rates not exceeding those at which they were originally issued to him after taking in to consideration and deduction for claims on account of any deterioration or damage while in custody of the contractor and in this respect the decision of the employer shall be final.

14. Suspension

If the contractor except on account of any legal restraint upon the employer preventing the continuance of work shall suspend the works or in the opinion of the employer shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default in respect of clause No.2 the employer shall have the owner to give notice in writing to the contractor requiring that the work be proceeded within reasonable manner and with reasonable dispatch, such notice shall purport to be a notice under this clause. After such notice shall have been given the contractor shall not be at liberty to remove from the site of the work or from any ground contiguous thereto any plant and materials belonging to him which will have been placed there on for the purpose of the works and the employer shall have a lien upon all such plant and materials subsist from the date of such notice being given until the notice shall have been compiled with. If the contractor shall fail for seven days after such notice have been given to proceed with the works as therein prescribed the employer may proceed as provided in clause No.17.

15. Termination of contract by employer

Termination of contractor (being an individual or a firm) commit any "Act of insolvency" or shall be adjudged insolvent, shall make an assignment or composition for the benefit of the greater part in number or amount of his creditors or shall enter into a deed of assignment with his creditors or (being an incorporated company) shall have an order made against him or pass an effective resolution of winding up either compulsorily or subject to the supervision of the court or voluntarily or if the official assignee of the contractor shall repudiate the contractor if the official assignee or the days after notice to him requiring him to do so, to show to the reasonable satisfaction of the employer that he is able to carry out and fulfill the contract and if required by the employer to give security therefore or if the contractor (whether an individual, firm or incorporated company) shall suffer execution to be issued, or if the contractor shall suffer any payment contractor shall assign or sublet the contract, without the consent in writing of the Employer first obtained, or any payments due or which may become due to the contractor there under, of if the employer shall certify in writing that in their opinion the contractor;

I. Has abandoned the contract.
II. Has failed to commence the work, or has without any lawful excuse under these conditions suspended the progress of the work for fourteen days after receiving from the employer written notice to proceed, or
III. Has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or
IV. Has failed to remove materials from the site or to pull down and replace works within seven days after receiving from the employer written notice that the said materials or work were condemned and rejected by the employer under these conditions, or
V. Has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor to observe perform the same, or

Any other decision, opinion, direction, certificate or valuation of the employer to give any of the same shall be subject to the right of Arbitration and review in the same way in all respects (including the provision as to opening the reference) as if it were a decision of the employer.

16. Deposit

The amount deposited by the contractor along with his tender shall be retained with the employer and it shall be returned to the contractor on the virtual completion of the works. In case of default in any of the foregoing conditions the deposit amount shall be forfeited the employer.

20. The contractor undertakes to ensure due and complete compliance with all laws, regulations, rules etc. whether of the central government or the state government or of any other competent authority applicable to the workmen employed or whose services, are otherwise availed of by the contractor whether in connection with the construction work at the site or otherwise. The employer shall have the right to inspect the records maintained by the contractor concerning such workmen from time to time and contractor shall whenever required by the employer produce such records as the employer's may call upon the contractor produce for the employer inspection in order to ascertain whether or not the requirement of all such laws, regulations, rules etc., have been compiled by the contractor. In the event of any contravention of such laws, regulations, rules etc., coming to light as a result of such inspection or otherwise the employer shall have the right to require the contractor effect such.

21. The employer shall not be responsible if any accident or death is caused during the continuer of work the contractor shall be responsible to pay the compensations.

Settlement of Dispute and Arbitration

I. All disputes and differences arising out of or in connection with the contract and works of any nature assigned under the same (whether during the progress of the works or after their completion), determination, abandonment or breach of the contract shall be referred to a team of three men arbitrator appointed by the Chairman, CPCB. The arbitrators shall elect an umpire among them. In case of conflicting findings by the arbitrators, the decision of the umpire shall be final and binding. It will not be an objection to any such appointment that the arbitrators are the government servants and had any interest in the board or the contract entered into directly or indirectly. In all cases, the arbitrators shall state their decision in writing and if amount of claims in dispute is Rs.50,000/- and above, the arbitrators shall give reasons for award.
Subject as aforesaid the provisions of the arbitrations cancellation act or any statutory modification or re-enactment thereof and the rules made there under and for the time being inforce shall apply to the arbitration proceeding under this clause.

II. It is a term of the contract that the party involving the arbitration shall specify the dispute or dispute to be referred to the arbitrator under this clause together with the amount or amounts claimed in respect of each such dispute.

III. It is also a term of the contract that if the contractor's do not make any demand for arbitration in respect of any claims in writing within 90 days of receiving the intimation from the CPCB that final bill is ready for payment, the claim of the contractor's will be deemed to have been waived and absolutely barred and the board will be discharged and released of all liabilities under the contract in respect of these claims.

IV. The decision of the employer regarding the quantum of reduction as well as justification thereof in respect of rates for sub-standard work which may be decided will be final and would not be open to arbitration. Provided always that no compensation shall be payable for any loss in always that no compensation shall be payable for any loss in consequence of hostilities or war-like operation (a) unless the contractor had taken all such precautions against Air raid as are deemed necessary by A.R.P officers or the Engineers In Charge, (b) for any materials etc., not on the site of work or for any tools and plant, machinery, scaffolding temporary buildings and other things not intended for the work.
In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the employer compliance within such time as the employer may prescribe in that behalf and in the event of the contractor failing to effect such compliance within the time prescribed by the employer then the employer shall without prejudice to his other rights be entitled to withhold from the amount payable to the contractor any amount payable to the workmen under any such laws, regulations or rules and to make payment thereof to the workmen. The employer shall also have in that event the right to terminate the contract with immediate effect and to exercise powers reserved to their employer under the contract as a result of termination.

_____ _____

CPCB CONTRACTOR

Witnesses

1.

2.

APENDIX

1.	Date of Commencement	10th day from the date of issue of letter of award.
2.	Date of completion	4 months from the date of commencement.
3.	Insurance	As directed.
4.	Liquidated damages	1% of the contract value per week subject to a maximum of 10% of the contract value.
5.	Period of final measurements	Within 03 months from the date of completion.
6.	Value of work for Interim Certificate	One running payment of 80% of the work completed
7.	Security deposit	10% of the contract amount subject to a maximum upto Rs. 1.5 lakhs. The security deposit will be collected by deductions from the running bills of the contractor at the rate of 10%.
8.	Defects liability period	One year

TENDER DOCUMENT

Renovation of Air Lab and Treatability Lab Fire detection system

At

Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar
Delhi – 110 032

Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar
Delhi – 110 032