

**INDIAN INSTITUTE OF TROPICAL METEOROLOGY  
PASHAN, PUNE-411008**

**Tender No. WS/FIRE/MFTCH/2011/**

**OPEN TENDER NOTICE**

Director, Indian Institute of Tropical Meteorology, Dr.Homi Bhabha Road, Pashan, Pune- 411 008 invites sealed tenders (Part-I – Technical Bid, Part-II – Commercial Bid) in separate sealed covers from Manufacturers / Suppliers and their accredited selling agents for the Supply, Commissioning and Installation of Fire Protection System at IITM, Pune.

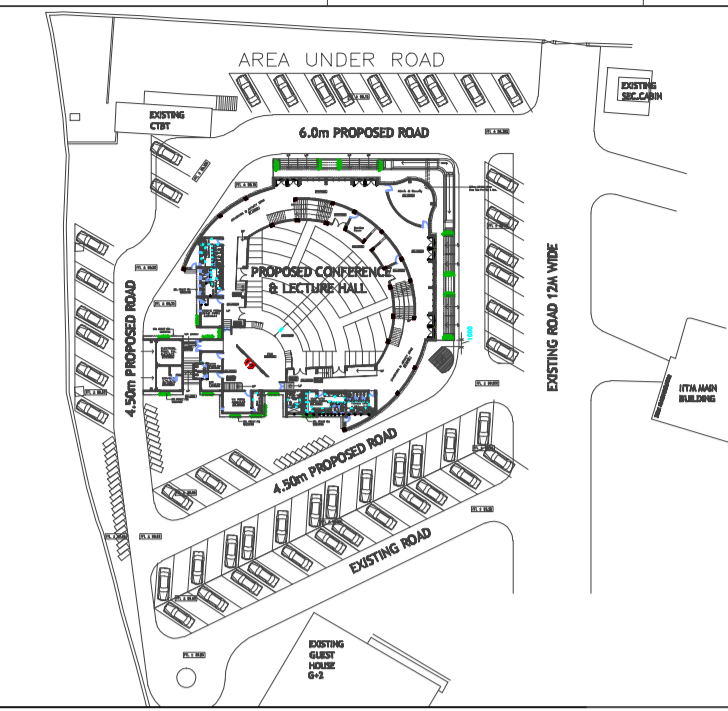
Tender documents with specifications can be obtained from Workshop of the Institute.

Last date of receipt of Tender at IITM, Pune : **16 January 2012 at 12:00 hrs.**

Opening of Tenders (Technical Bids only) : **17 January 2012 at 15:30 hrs.**

The Institute reserves the right to reject any or all tenders without assigning any reason thereof. For further details please visit our Website: [www.tropmet.res.in](http://www.tropmet.res.in)

for Director  
Email: [abraham@tropmet.res.in](mailto:abraham@tropmet.res.in)



KEY PLAN

LEGENDS

|  |                       |
|--|-----------------------|
|  | 5Kg. DRY POWDER       |
|  | 2Kg. DRY POWDER       |
|  | 9Kg. CARBON DIOXIDE   |
|  | 4.5Kg. CARBON DIOXIDE |

REVISIONS :

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**PRIDE PROJECTS & CONSULTANTS**  
  
 Gurl Tanay Apartment,  
 Navketan society,  
 Mayur Colony, Kothrud,  
 Pune-411028 Ph: 25451102  
 Email: prideprojects@gmail.com

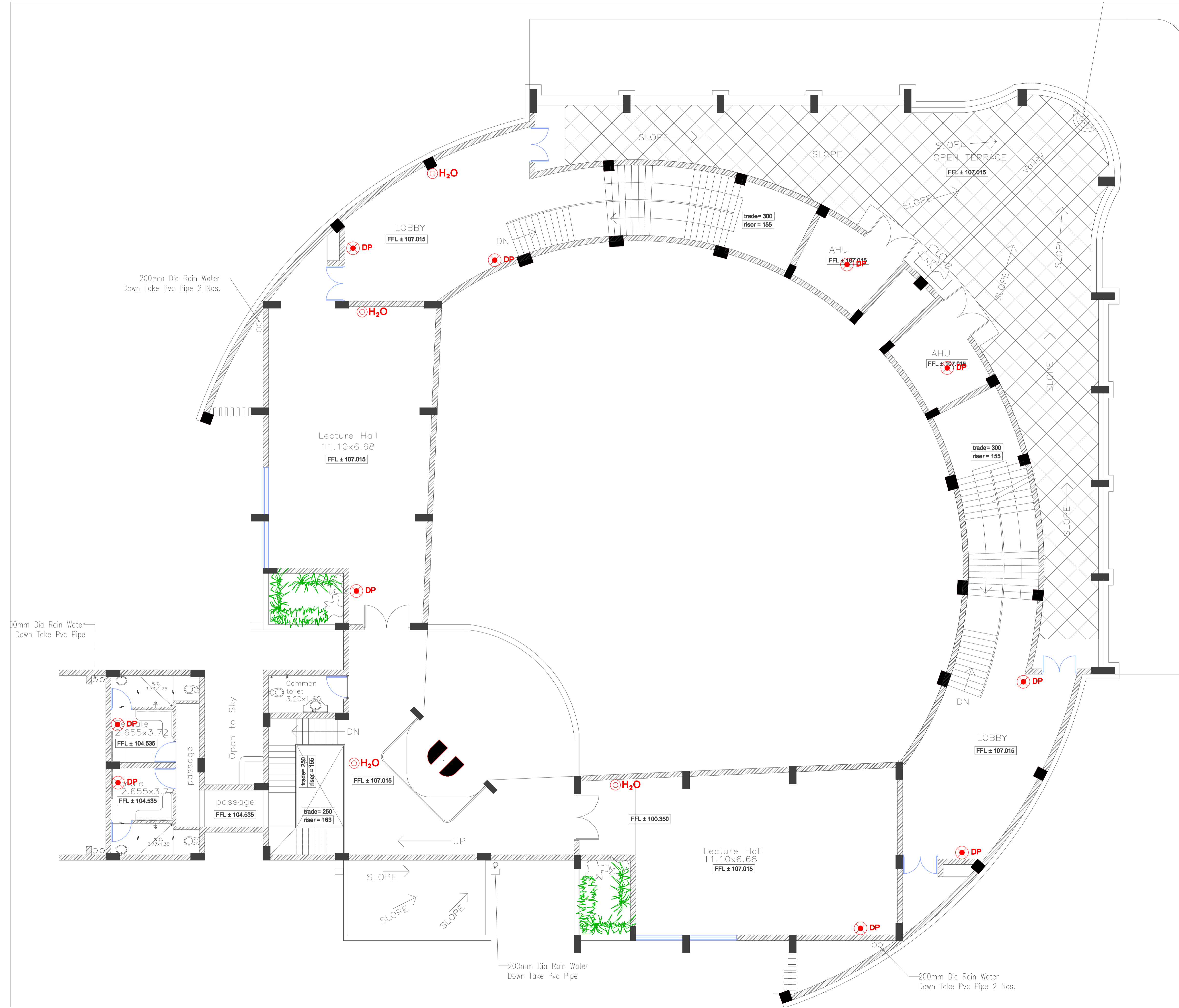
TITLE : FIRE EXTINGUISHER LAYOUT

CLIENT : IITM AUNDH

SCALE : 1:1 DATE 04.10.11

DWG.NO. REVISION DRAWN : SUWARNA  
 -- RO CHK BY : LSG

**ARCHIVISTA**  
 ENGINEERING PROJECTS PVT. LTD.  
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 OFFICE NO. 211/211/2  
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 MIDC INDUSTRIAL ESTATE  
 CHANDRAPUR, PUNE-411004

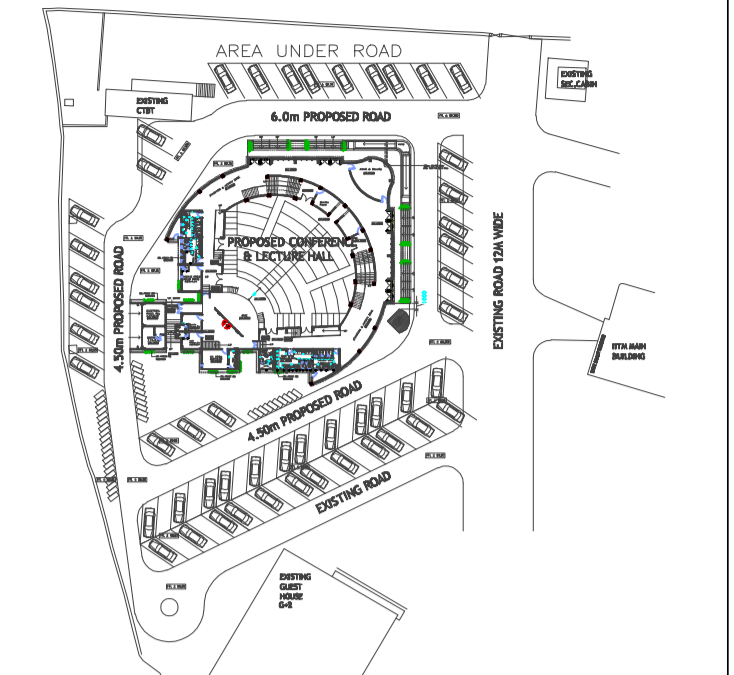


200mm Dia Rain Water  
Down Take Pvc Pipe 2 Nos.

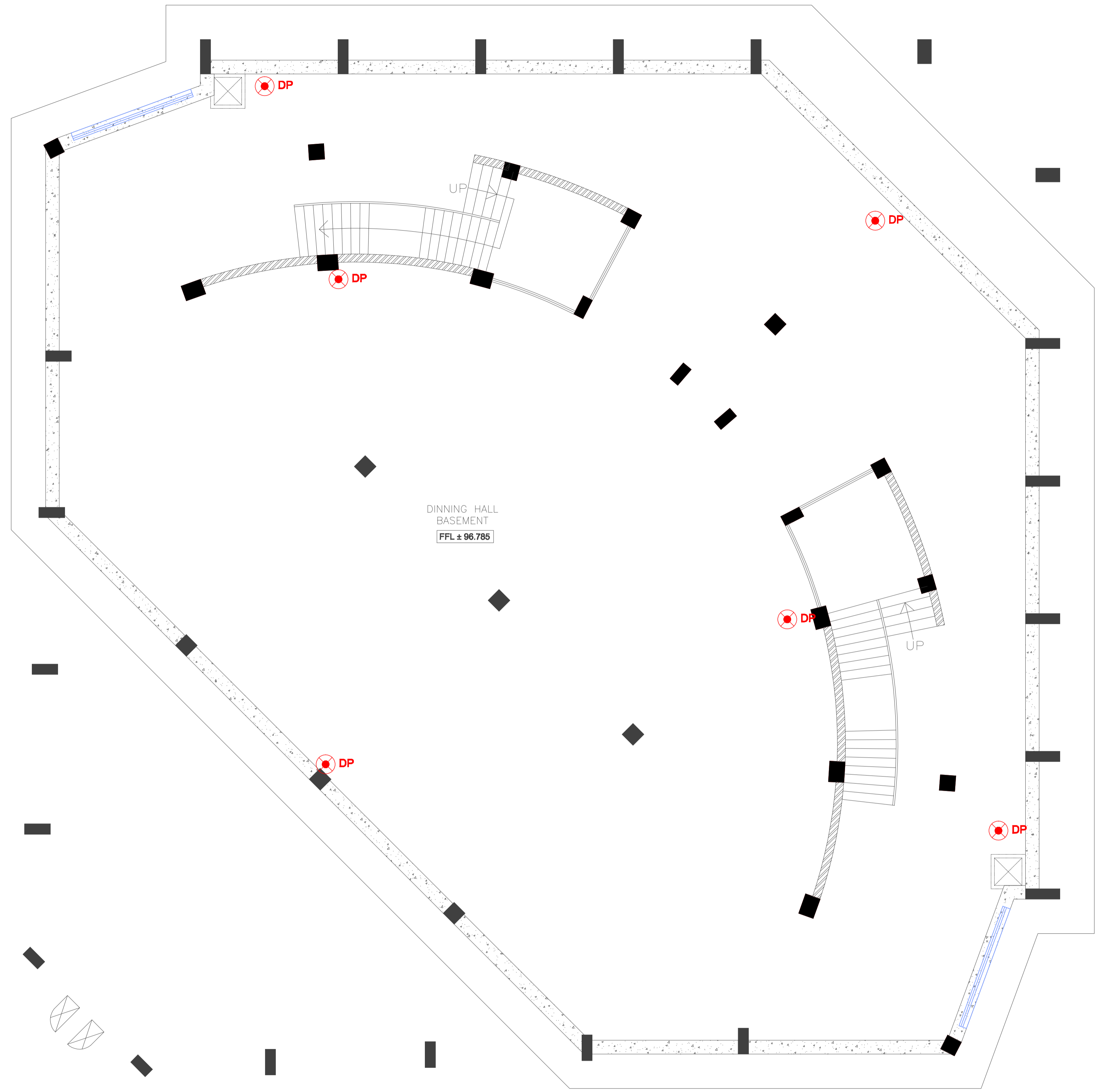
200mm Dia Rain Water  
Down Take Pvc Pipe

200mm Dia Rain Water  
Down Take Pvc Pipe

200mm Dia Rain Water  
Down Take Pvc Pipe 2 Nos.



KEY PLAN



DINNING HALL  
BASEMENT  
FFL ± 96.785

LEGENDS

|  |                       |
|--|-----------------------|
|  | 5Kg. DRY POWDER       |
|  | 2Kg. DRY POWDER       |
|  | 9Kg. CARBON DIOXIDE   |
|  | 4.5Kg. CARBON DIOXIDE |

REVISIONS :

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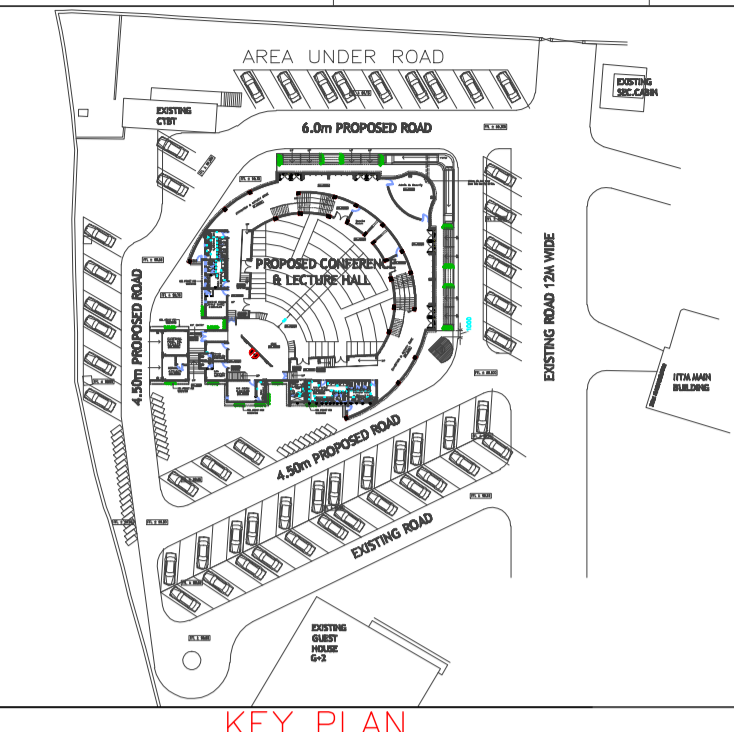
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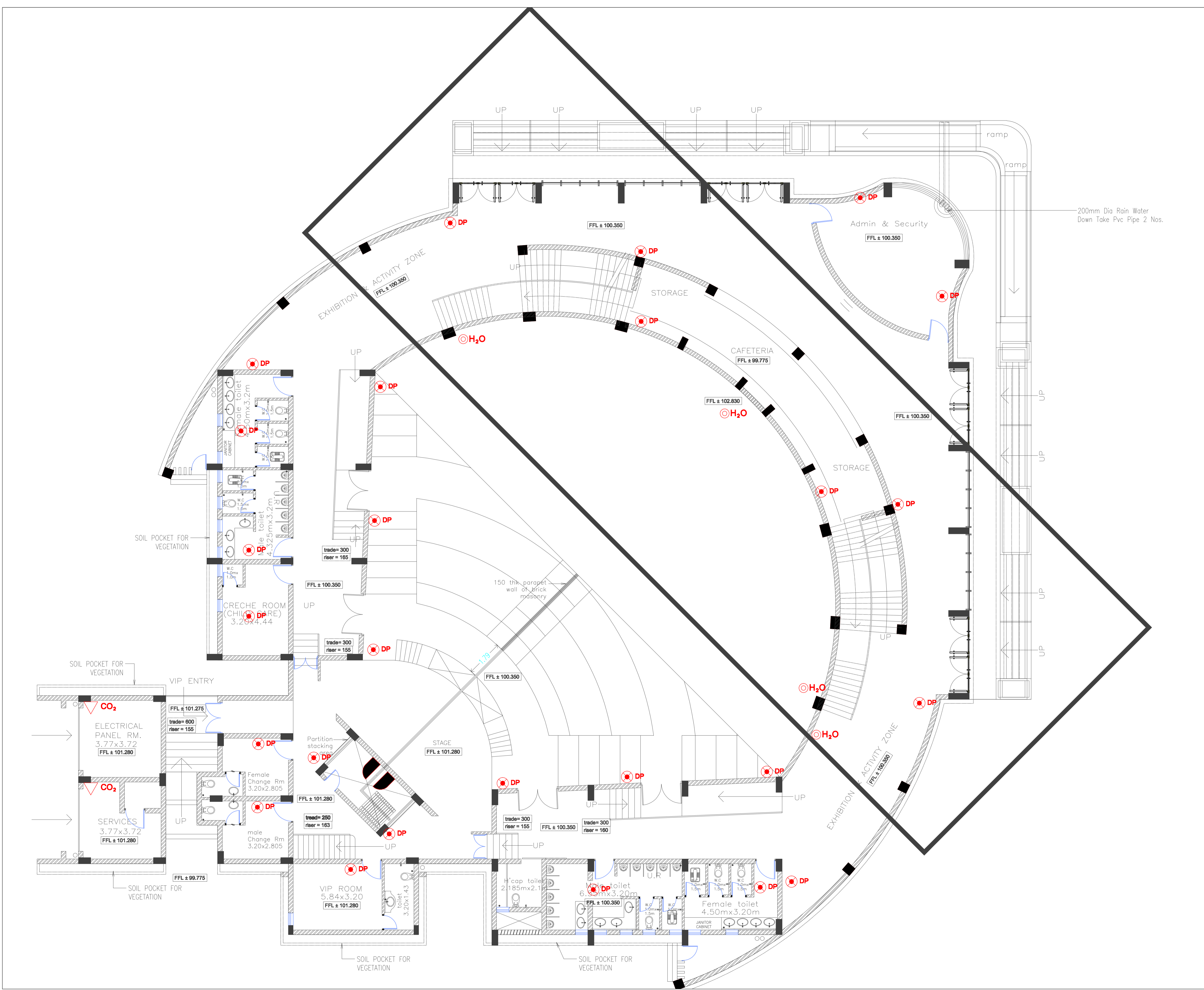
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| TITLE : FIRE EXTINGUISHER LAYOUT |               |                                 |
| CLIENT : IITM AUNDH              |               |                                 |
| SCALE : 1:1                      | DATE 04.10.11 |                                 |
| DWG.NO. --                       | REVISION RO   | DRAWN : SUWARNA<br>CHK.BY : LSG |

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 PUNE-411004  
 www.archivista.com





KEY PLAN



200mm Dia Rain Water Down Take Pvc Pipe 2 Nos.

**LEGENDS**

|  |                       |
|--|-----------------------|
|  | 5Kg. DRY POWDER       |
|  | 2Kg. DRY POWDER       |
|  | 9Kg CARBON DIOXIDE    |
|  | 4.5Kg. CARBON DIOXIDE |

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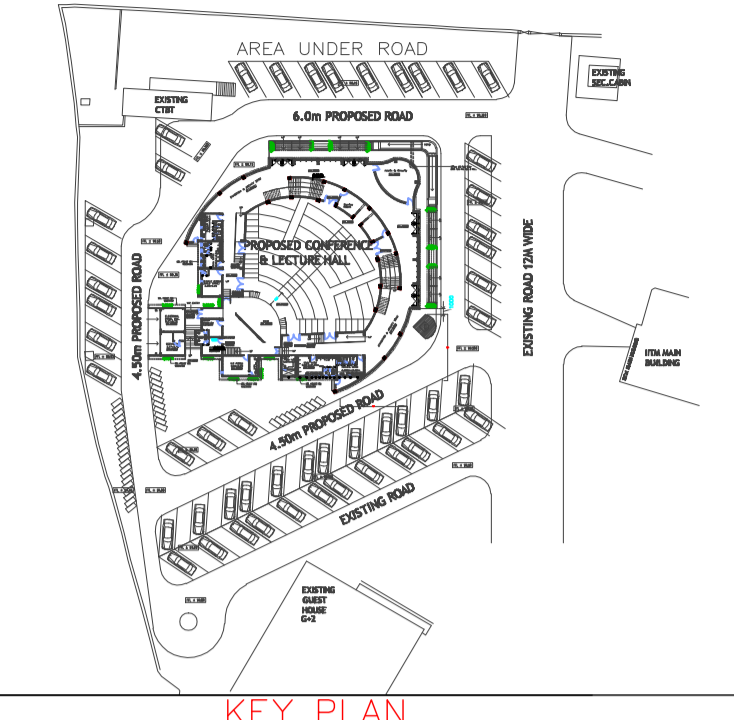
**PRIDE PROJECTS & CONSULTANTS**  
 Gurj Tanay Apartment,  
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 Pune-411029. Ph: 25451102.  
 Email: prideprojects@gmail.com

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CLIENT : IITM AUNDH

SCALE : 1:1      DATE : 04.10.11

DWG.NO. : --      REVISION : RO      DRAWN : SUWARNA  
 --      RO      CHK BY : LSG



**LEGENDS**

|  |                       |
|--|-----------------------|
|  | HYDRANT MAIN          |
|  | SINGLE HEADED HYDRANT |
|  | HOSE BOX              |
|  | BUTTERFLY VALVE       |
|  | DOWNCOMER             |
|  | HOSE REEL             |
|  | PUMPS                 |

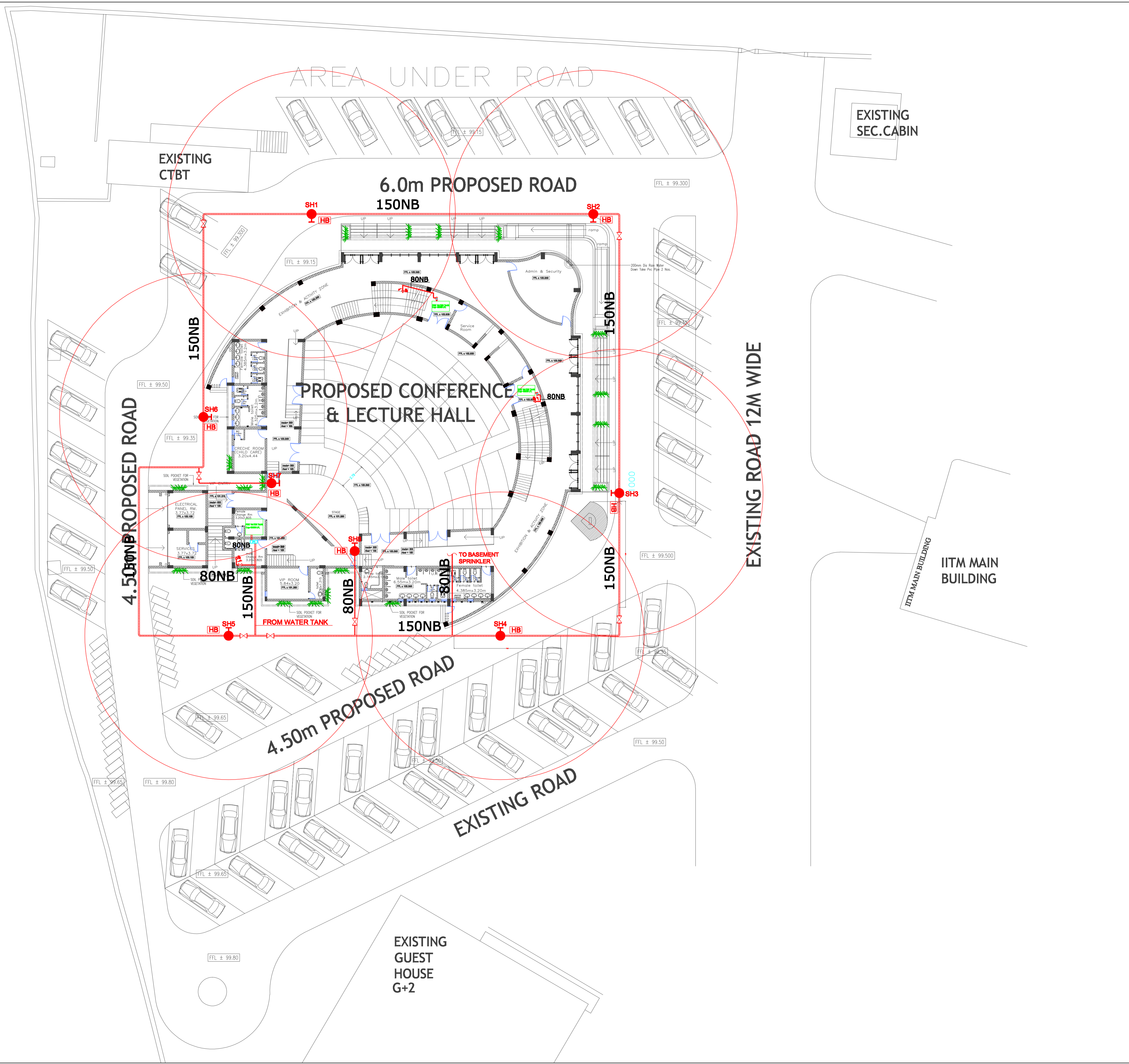
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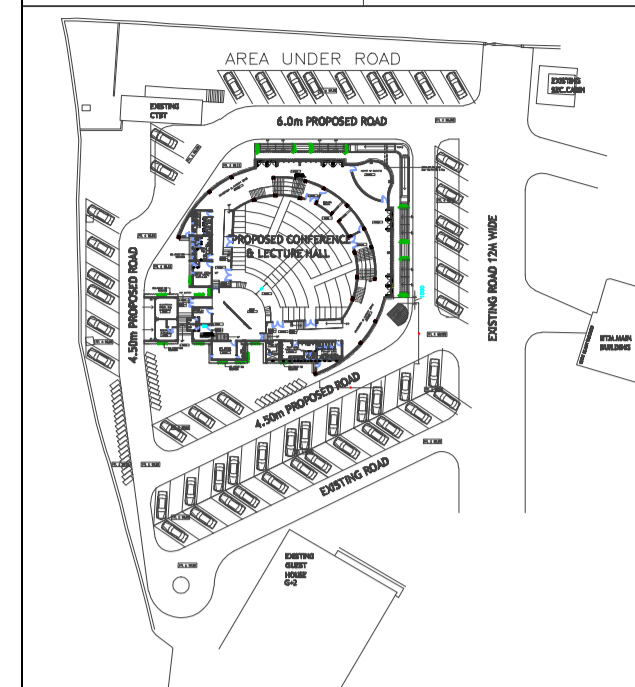
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 Mayur Colony, Kothrud,  
 Pune-411029 Ph: 25451102  
 Email: prideprojects@gmail.com

|                             |               |                                 |
|-----------------------------|---------------|---------------------------------|
| TITLE : FIRE HYDRANT LAYOUT |               | DATE : 04-10-11                 |
| CLIENT : IITM AUNDH         |               | SCALE : 1:1                     |
| DWG.NO. : --                | REVISION : RO | DRAWN : SUWARNA<br>CHK.BY : LSG |

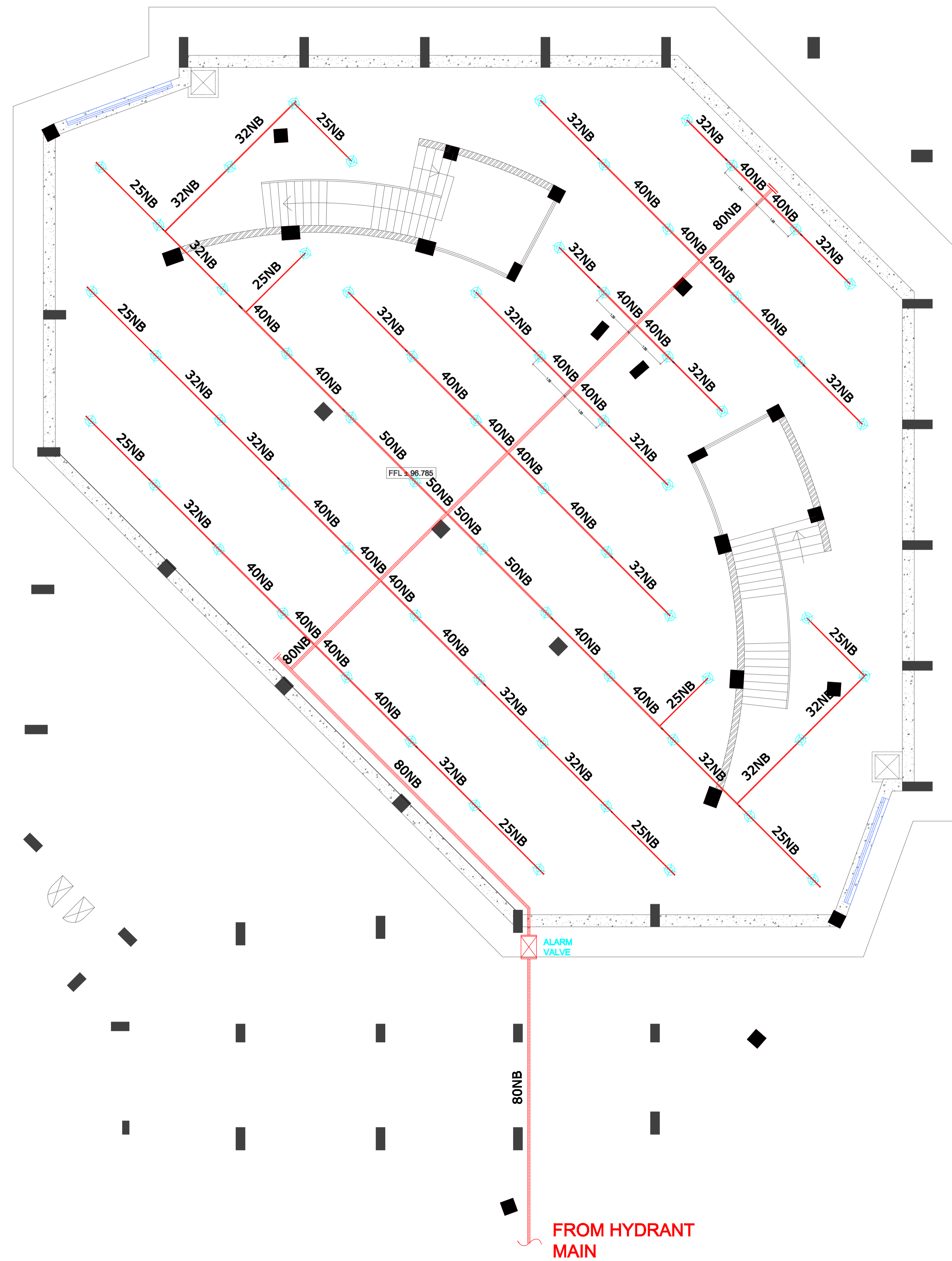
**ARCHIVISTA**  
 ENGINEERING PROJECTS PVT. LTD.  
 B-10, MIDC & 18th/75  
 OFFICE ROAD, LADKARWADI  
 PUNE-411004, INDIA  
 Tel: 25451102, 25451103  
 Email: info@archivista.com







KEY PLAN



LEGENDS

|  |                |
|--|----------------|
|  | SPRINKLER MAIN |
|  | SPRINKLER HEAD |
|  | ALARM VALVE    |

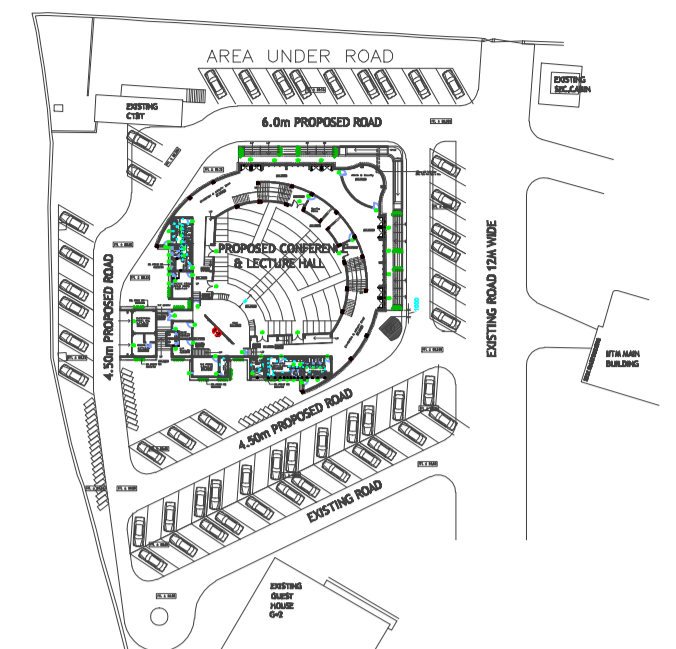
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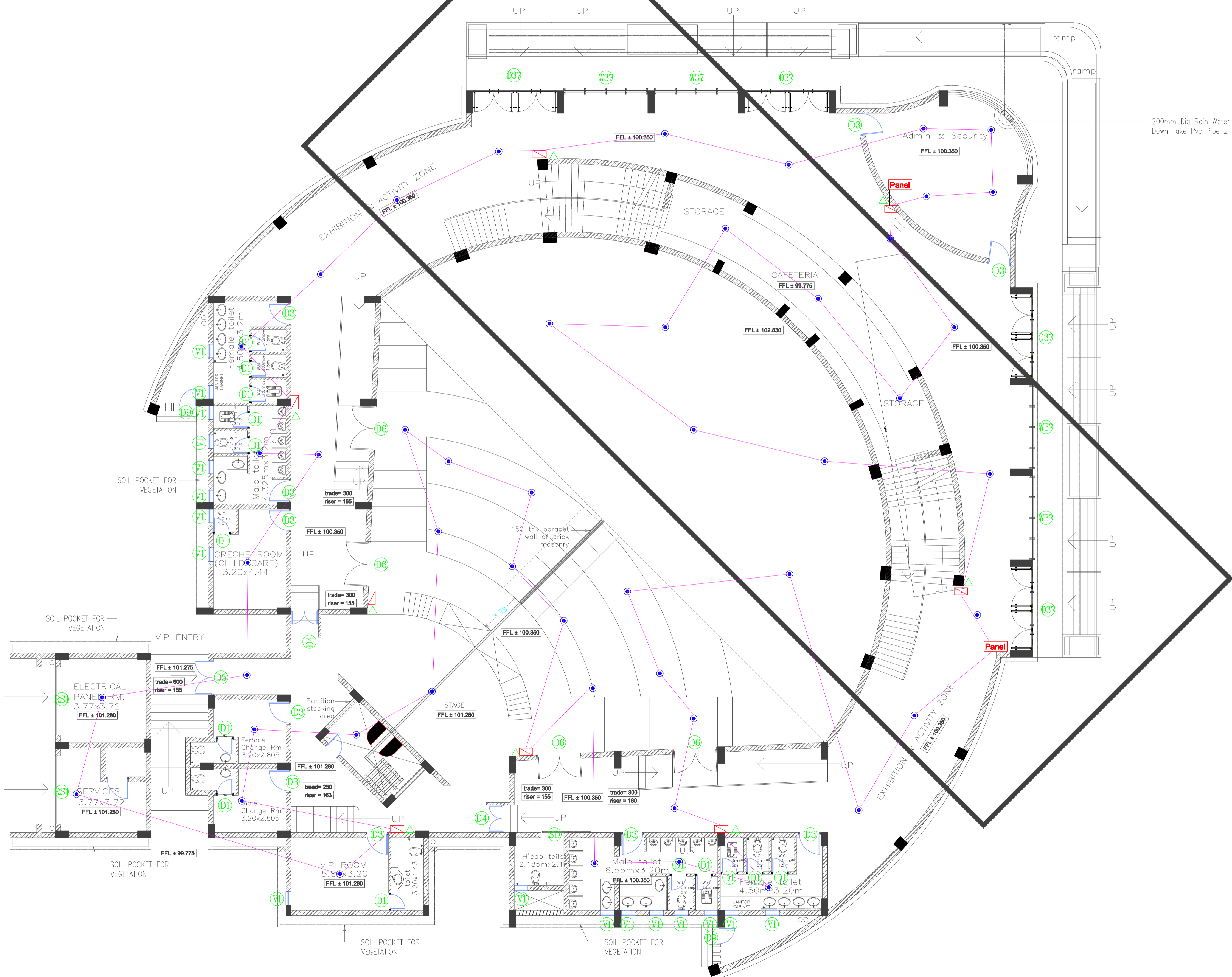
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 Pune-411028 Ph: 25451102  
 Email: prideprojects@gmail.com

|                          |               |                                 |
|--------------------------|---------------|---------------------------------|
| TITLE : SPRINKLER LAYOUT |               |                                 |
| CLIENT : IITM AUNDH      |               |                                 |
| SCALE : 1:1              | DATE 04.10.11 |                                 |
| DWG.NO. --               | REVISION RO   | DRAWN : SUWARNA<br>CHK.BY : LSG |

FROM HYDRANT MAIN



KEY PLAN



200mm Dia Rain Water Down Take Pvc Pipe 2 Nos.

LEGENDS

|  |                   |
|--|-------------------|
|  | SMOKE DETECTOR    |
|  | MANUAL CALL POINT |
|  | HOOTER            |
|  | CONTROL PANEL     |
|  | CABLE             |

REVISIONS :

| NO. | DESCRIPTION | DATE |
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**PRIDE PROJECTS & CONSULTANTS**  
 Guri Tanay Apartment,  
 Navketan society,  
 Mayur Colony, Kolhrud,  
 Pune-411029 Ph: 25451102  
 Email: prdeprojects@gmail.com

|                               |               |                                 |
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| TITLE : SMOKE DETECTOR LAYOUT |               |                                 |
| CLIENT : IITM AUNDH           |               |                                 |
| SCALE : 1:1                   | DATE 04.10.11 | DRAWN : SUWARNA<br>CHK BY : LSG |
| DWG.NO. --                    | REVISION RO   |                                 |

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 ENGINEERING PROJECTS PVT. LTD.  
 E-10, 1ST FLOOR & 1ST/2ND  
 OFFICE BUILDING, IITM  
 AUNDH, PUNE-411029  
 Ph: 25451102  
 Email: archivista@archivista.com





| SR       | DESCREPTION   | UOM  | QTY | SUPPLY |        | LABOUR |        |
|----------|---|------|-----|--------|--------|--------|--------|
|          |   |      |     | RATE   | AMOUNT | RATE   | AMOUNT |
| <b>A</b> | <b>FIRE DETECTION AND ALARM SYSTEM AND ACCESSORIES</b>  |      |     |        |        |        |        |
| 1        | Supplying, installing, testing & commissioning of conventional Fire Alarm Panel with PA system of 60 watts  | No   | 1   | -      | -      | -      | -      |
| 2        | Supplying, installing, testing & commissioning of Addressable manual call point assly complete with address switch  | No   | 15  | -      | -      | -      | -      |
| 3        | Supplying, installing, testing & commissioning of indoor electronic hooter  | No   | 15  | -      | -      | -      | -      |
| 4        | Supplying, installing, testing & commissioning of smoke detector assly  | No   | 55  | -      | -      | -      | -      |
| 5        | Supplying, installing, testing & commissioning of Repeater Fire Alarm Panel to be installed at the security gate collecting and controlling the total Fire Detecetion system comprising of PA system of 60 watts(Repeater Panel)  | Nos. | 1   | -      | -      | -      | -      |
| 6        | Supplying, drawing, connecting, testing and commissioning of 2c x 1.5 sq. mm armoured FRLS cable, PVC insulated and screened required accessories and G.I. spacers mini 6 mm thick and G.I. saddles and screws with one 16 SWG bare copper earth wire run in parralel the cable ,crimped and terminated as directed by the consultants etc. complete.<br>FINOLEX/POLYCAB ISI MARKED | Rmt  | 600 | -      | -      | -      | -      |
| <b>B</b> | <b>FIRE EXTINGUISHERS AND EXIT SIGNS(for all area )</b>   |      |     |        |        |        |        |
| 1        | Providing and fixing portable fire extinguishers of approved make ISI marked of following Capacity at the places shown on Drawing & as per IS 2190  |      |     |        |        |        |        |
|          | Dry chemical powder of 5 kg capacity as per ISI 2171  | No   | 42  | -      | -      | -      | -      |
|          | Water Expelled type fire extinguisher 9 ltr capacity complete set with initial charge   | No   | 8   | -      | -      | -      | -      |
|          | CO2 type fire extinguisher 9 kg capacity complete set with initial charge   | No   | 2   | -      | -      | -      | -      |

| SR   | DESCRIPTION  | UOM  | QTY | SUPPLY |        | LABOUR |        |
|--|--|------|-----|--------|--------|--------|--------|
|  |  |      |     | RATE   | AMOUNT | RATE   | AMOUNT |
| <b>EXTERNAL &amp; INTRNAL HYDRANT SYSTEM :</b> |  |      |     |        |        |        |        |
| 1  | Supplying, installation testing and commissioning of the following 'C' class MS ERW Pipe as per IS:1239(I) for overhead pipes with fittings and with heavy clamps,hangers, brackets or pipe supports (all with screwed/welded joints) as required including and painting two coats of approved shade(Post office red)of enamel paint over a coat of approved primer for over heads pipes and for underground pipe shall have anticorrosive wrapping coating done of 4 mm thk material of IWRL make only. | Rmt  | 200 | -      | -      | -      | -      |
|  | 150 NB   | Rmt  | 200 | -      | -      | -      | -      |
|  | 100 NB   | Rmt  | 20  | -      | -      | -      | -      |
|  | 80 NB  | Rmt  | 90  | -      | -      | -      | -      |
|  | 50 NB  | Rmt  | 20  | -      | -      | -      | -      |
|  | 40 NB  | Rmt  | 60  | -      | -      | -      | -      |
|  | 32 NB  | Rmt  | 70  | -      | -      | -      | -      |
|  | 25 NB  | Rmt  | 25  | -      | -      | -      | -      |
| 2  | Supply and installation of Wafer type Slimseal Butterfly Valve, CI Body,Disc SGI Coated with Nylon, Seat EPDM, PN 10 Rating, With Flow Control Lever   |      |     |        |        |        |        |
|  | 150 NB   | No.  | 8   | -      | -      | -      | -      |
|  | 100 NB   | No.  | 2   | -      | -      | -      | -      |
|  | 80 NB  | No.  | 5   | -      | -      | -      | -      |
| 3  | Supply and installtion of single headed 63 mm dia G.M. Hydrant Valve in the courtyard Including with 2.1/2" 'Morris' pattern instaneous couplings as per IS 5290   | Nos. | 8   | -      | -      | -      | -      |
| 4  | Supply and installation of 2 Nos.65mm dia RRL hose pipe as per IS 636 TAC/ LPA approved of 15 m standard length each including gun metal male and female Coupling duely bound with copper wire with gun metal nozzle etc. complete.  | Nos. | 8   | -      | -      | -      | -      |
| 5  | Supply and installation of hose reel drum wall mounting swinging type fitted with 30 mtrs,20mm dia high pressure rubber hose to IS-5132 with 5mm outlet gunmetal nozzle with shut off valves as per IS:884 with mounting arrangement and anchor bolts  | Nos. | 5   | -      | -      | -      | -      |
| 6  | Supplyand installation of 4 way Fire Brigade connection with 4 No. 63mm size GM male inlets for fire brigade connection with hydrant line and for the Emergency Tank filling.  | Nos. | 1   | -      | -      | -      | -      |
| 7  | Supply and installation of hose cabinets made out of 18gg MS sheet duely painted with POST OFFICE RED enamel paint for housing hydrant hose pipes ( 2 nos) and one no of brass branch pipe with lockable glass door and break hammer. (750 mm long x 600 mm height x 300 mm depth )  | Nos. | 8   | -      | -      | -      | -      |
| 8  | Supplyand installation of SS branch pipe connection for the hydrant hoses.   | Nos. | 8   | -      | -      | -      | -      |
| 10   | Supply, Erection of 400 mm dia NP3 Class RCC Hume Pipe at road crossings   | Mtr. | 20  | -      | -      | -      | -      |
| 11   | Supply installation and testing of the pendant type standard response qartz sprinkler heads with k=80,operating temp 78 deg cel  | No   | 62  | -      | -      | -      | -      |
| 12   | Supply installation and testing of Installation valves assemblies with gong bell, test point, drain point and interconnectd piping including vent and drain pipes  |      |     |        |        |        |        |
|  | 100 NB   | No.  | 1   | -      | -      | -      | -      |
| 13   | Supply installation testing and commissioing of flow switches to be installed after the alarm valves in the main sprinkler pipe  |      |     |        |        |        |        |
|  | 100 NB   | No.  | 1   | -      | -      | -      | -      |
| 14   | supply installtion of air vent valves 25 NB threaded type connection   | No   | 4   | -      | -      | -      | -      |

| SR | DESCRIPTION   | UOM  | QTY | SUPPLY |        | LABOUR |        |
|----|---|------|-----|--------|--------|--------|--------|
|    |   |      |     | RATE   | AMOUNT | RATE   | AMOUNT |
| D  | <b>MAIN FIRE PUMPS</b>  |      |     |        |        |        |        |
| 1  | Supplying, installing, testing & commissioning main electric fire pump with cast iron casing & bronze impeller, of approved make, complete with coupling guard necessary RCC foundation, anti vibration mountings, capable of discharging 450 LPM (27 CuM) at 50 Mtr head complete with electrical TEFC 3-ph, 440-V, 50 Hz, suitable RPM motor of '10HP B' class winding, suitable for automatic start of pump on drop of pressure in system. | No   | 3   | -      | -      | -      | -      |
| 2  | Supply, erection, testing and commissioning of starter for the pumps to be installed on terrace as well as on the ground floor (should be in parallel )   | No   | 6   | -      | -      | -      | -      |
| 3  | Supplying, installation testing and commissioning of the following 'C' class MS ERW Pipe as per IS:1239(I) with fittings and pipe supports (all with screwed/welded joints) as required including and painting two coats of approved shade(Post office red)of enamel paint over a coat of approved primer   |      |     |        |        |        |        |
|    | 150 NB  | mtr  | 30  | -      | -      | -      | -      |
|    | 100 NB  | mtr  | 12  | -      | -      | -      | -      |
|    | 50 NB   | mtr  | 30  | -      | -      | -      | -      |
| 4  | Supply and installation of Wafer type Slimseal Butterfly Valve, CI Body,Disc SGI Coated with Nylon, Seat Nitrile PN 10 Rating, With Flow Control Lever  |      |     |        |        |        |        |
|    | 150 NB  | Nos. | 6   | -      | -      | -      | -      |
|    | 100 NB  | Nos. | 4   | -      | -      | -      | -      |
|    | 50 NB   | Nos. | 2   | -      | -      | -      | -      |
| 5  | Supply and installation of Non Return Valve, CS Body, Trim 8, Class 150, flanged end  |      |     |        |        |        |        |
|    | 100 NB  | Nos. | 3   | -      | -      | -      | -      |
| 6  | Supply and installation of CS ball Valve with SS internals, flanged suaibale for 10 kg/cm2 pressure operations  |      |     |        |        |        |        |
|    | 50 NB   | Nos. | 4   | -      | -      | -      | -      |
|    | 25 NB   | Nos. | 4   | -      | -      | -      | -      |
| 7  | Supply and fixing of "Y" type strainer for suction line of fire pump with cast iron body with brass filter media. size 150 mm HAMMER make   | Nos. | 3   | -      | -      | -      | -      |
| 8  | Pressure gauge assembly - 4" dial, 0-12 kg/sqcm, with cyphon tube, isolation valve with required pipe fittings to mount the assembly.   | Nos. | 6   | -      | -      | -      | -      |
| 9  | Supply and fixing of rubber vibration eliminators of undernoted sizes of approved make with test pressure of 14 kg/sq cm along with necessary flanges, nut bolts etc  |      |     |        |        |        |        |
|    | 100 mm  | Nos. | 6   | -      | -      | -      | -      |

| SR       | DESCRIPTION  | UOM  | QTY | SUPPLY |        | LABOUR |        |
|----------|--|------|-----|--------|--------|--------|--------|
|          |  |      |     | RATE   | AMOUNT | RATE   | AMOUNT |
| <b>A</b> | <b>FIRE DETECTION AND ALARM SYSTEM AND ACCESSORIES</b>   |      |     |        |        |        |        |
| 1        | Supplying, installing, testing & commissioning of conventional Fire Alarm Panel with PA system of 60 watts   | No   | 1   | -      | -      | -      | -      |
| 2        | Supplying, installing, testing & commissioning of Addressable manual call point assly complete with address switch   | No   | 15  | -      | -      | -      | -      |
| 3        | Supplying,installing,testing & comossioning of indoor electronic hooter  | No   | 15  | -      | -      | -      | -      |
| 4        | Supplying, installing, testing & commissioning of smoke detector assly   | No   | 55  | -      | -      | -      | -      |
| 5        | Supplying, installing, testing & commissioning of Repeater Fire Alarm Panel to be installed at the security gate collecting and controlling the total Fire Detecetion system comprising of PA system of 60 watts(Repeater Panel)   | Nos. | 1   | -      | -      | -      | -      |
| 6        | Supplying, drawing, connecting, testing and commissioning of 2c x 1.5 sq. mm armoured FRLS cable, PVC insulated and screened required accessories and G.I. spacers mini 6 mm thick and G.I. saddles and screws with one 16 SWG bare copper earth wire run in parralel the cable ,crimped and terminated as directed by the consultants etc. complete. FINOLEX/POLYCAB ISI MARKED | Rmt  | 600 | -      | -      | -      | -      |
| <b>B</b> | <b>FIRE EXTINGUISHERS AND EXIT SIGNS(for all area )</b>  |      |     |        |        |        |        |
| 1        | Providing and fixing portable fire extinguishers of approved make ISI marked of following Capacity at the places shown on Drawing & as per IS 2190   |      |     |        |        |        |        |
|          | Dry chemical powder of 5 kg capacity as per ISI 2171   | No   | 42  | -      | -      | -      | -      |
|          | Water Expelled type fire extinguisher 9 ltr capacity complete set with initial charge  | No   | 8   | -      | -      | -      | -      |
|          | CO2 type fire extinguisher 9 kg capacity complete set with initial charge  | No   | 2   | -      | -      | -      | -      |

| SR       | DESCRIPTION  | UOM  | QTY | SUPPLY |        | LABOUR |        |
|----------|--|------|-----|--------|--------|--------|--------|
|          |  |      |     | RATE   | AMOUNT | RATE   | AMOUNT |
| <b>C</b> | <b>EXTERNAL &amp; INTRNAL HYDRANT SYSTEM :</b>   |      |     |        |        |        |        |
| 1        | Supplying, installation testing and commissioning of the following 'C' class MS ERW Pipe as per IS:1239(I) for overhead pipes with fittings and with heavy clamps,hangers, brackets or pipe supports (all with screwed/welded joints) as required including and painting two coats of approved shade(Post office red)of enamel paint over a coat of approved primer for over heads pipes and for underground pipe shall have anticorrosive wrapping coating done of 4 mm thk material of IWRL make only. |      |     |        |        |        |        |
|          | 150 NB   | Rmt  | 200 | -      | -      | -      | -      |
|          | 100 NB   | Rmt  | 20  | -      | -      | -      | -      |
|          | 80 NB  | Rmt  | 90  | -      | -      | -      | -      |
|          | 50 NB  | Rmt  | 20  | -      | -      | -      | -      |
|          | 40 NB  | Rmt  | 60  | -      | -      | -      | -      |
|          | 32 NB  | Rmt  | 70  | -      | -      | -      | -      |
|          | 25 NB  | Rmt  | 25  | -      | -      | -      | -      |
| 2        | Supply and installation of Wafer type Slimseal Butterfly Valve, CI Body,Disc SGI Coated with Nylon, Seat EPDM, PN 10 Rating, With Flow Control Lever   |      |     |        |        |        |        |
|          | 150 NB   | No.  | 8   | -      | -      | -      | -      |
|          | 100 NB   | No.  | 2   | -      | -      | -      | -      |
|          | 80 NB  | No.  | 5   | -      | -      | -      | -      |
| 3        | Supply and installtion of single headed 63 mm dia G.M. Hydrant Valve in the courtyard Including with 2.1/2" 'Morris' pattern instaneous couplings as per IS 5290   | Nos. | 8   | -      | -      | -      | -      |
| 4        | Supply and installation of 2 Nos.65mm dia RRL hose pipe as per IS 636 TAC/ LPA approved of 15 m standard length each including gun metal male and female Coupling duely bound with copper wire with gun metal nozzle etc. complete.  | Nos. | 8   | -      | -      | -      | -      |
| 5        | Supply and installation of hose reel drum wall mounting swinging type fitted with 30 mtrs,20mm dia high pressure rubber hose to IS-5132 with 5mm outlet gunmetal nozzle with shut off valves as per IS:884 with mounting arrangement and anchor bolts  | Nos. | 5   | -      | -      | -      | -      |
| 6        | Supplyand installation of 4 way Fire Brigade connection with 4 No. 63mm size GM male inlets for fire brigade connection with hydrant line and for the Emergency Tank filling.  | Nos. | 1   | -      | -      | -      | -      |

| SR       | DESCREPTION  | UOM  | QTY | SUPPLY |        | LABOUR |        |
|----------|--|------|-----|--------|--------|--------|--------|
|          |  |      |     | RATE   | AMOUNT | RATE   | AMOUNT |
| 7        | Supply and installation of hose cabinets made out of 18gg MS sheet duely painted with POST OFFICE RED enamel paint for housing hydrant hose pipes ( 2 nos) and one no of brass branch pipe with lockable glass door and break hammer. (750 mm long x 600 mm height x 300 mm depth )  | Nos. | 8   | -      | -      | -      | -      |
| 8        | Supplyand installation of SS branch pipe connection for the hydrant hoses.   | Nos. | 8   | -      | -      | -      | -      |
| 10       | Supply, Erection of 400 mm dia NP3 Class RCC Hume Pipe at road crossings   | Mtr. | 20  | -      | -      | -      | -      |
| 11       | Supply installation and testing of the pendant type standard response qartz sprinkler heads with<br>k=80,operating temp 78 deg cel   | No   | 62  | -      | -      | -      | -      |
| 12       | Supply installation and testing of Installation valves assemblys with gong bell, test point, drain point and interconnecetd piping including vent and drain pipes<br>100 NB  | No.  | 1   | -      | -      | -      | -      |
| 13       | Supply installation testing and commissioing of flow switches to be installed after the alarm valves in the main sprinkler pipe<br>100 NB  | No.  | 1   | -      | -      | -      | -      |
| 14       | supply installtion of air vent valves 25 NB threaded type connection   | No   | 4   | -      | -      | -      | -      |
| <b>D</b> | <b>MAIN FIRE PUMPS</b>   |      |     |        |        |        |        |
| 1        | Supplying, installing, testing & commissioning main electric fire pump with cast iron casing & bronze impeller, of approved make, complete with coupling guard necessary RCC foundation, anti vibration mountings, capable of discharging 450 LPM (27 CuM) at 50 Mtr head complete with electrical TEFC 3-ph, 440-V, 50 Hz, suitable RPM motor of ' 10HP B' class winding, suitable for automatic start of pump on drop of pressure in system. | No   | 3   | -      | -      | -      | -      |

| SR | DESCRIPTION   | UOM  | QTY | SUPPLY |        | LABOUR |        |
|----|---|------|-----|--------|--------|--------|--------|
|    |   |      |     | RATE   | AMOUNT | RATE   | AMOUNT |
| 2  | Supply, erection, testing and commissioning of starter for the pumps to be installed on terrace as well as on the ground floor (should be in parallel )   | No   | 6   | -      | -      | -      | -      |
| 3  | Supplying, installation testing and commissioning of the following 'C' class MS ERW Pipe as per IS:1239(I) with fittings and pipe supports (all with screwed/welded joints) as required including and painting two coats of approved shade(Post office red)of enamel paint over a coat of approved primer |      |     |        |        |        |        |
|    | 150 NB  | mtr  | 30  | -      | -      | -      | -      |
|    | 100 NB  | mtr  | 12  | -      | -      | -      | -      |
|    | 50 NB   | mtr  | 30  | -      | -      | -      | -      |
| 4  | Supply and installation of Wafer type Slimseal Butterfly Valve, CI Body,Disc SGI Coated with Nylon, Seat Nitrile PN 10 Rating, With Flow Control Lever  |      |     |        |        |        |        |
|    | 150 NB  | Nos. | 6   | -      | -      | -      | -      |
|    | 100 NB  | Nos. | 4   | -      | -      | -      | -      |
|    | 50 NB   | Nos. | 2   | -      | -      | -      | -      |
| 5  | Supply and installation of Non Return Valve, CS Body, Trim 8, Class 150, flanged end  |      |     |        |        |        |        |
|    | 100 NB  | Nos. | 3   | -      | -      | -      | -      |
| 6  | Supply and installation of CS ball Valve with SS internals, flanged suaibale for 10 kg/cm <sup>2</sup> pressure operations  |      |     |        |        |        |        |
|    | 50 NB   | Nos. | 4   | -      | -      | -      | -      |
|    | 25 NB   | Nos. | 4   | -      | -      | -      | -      |
| 7  | Supply and fixing of "Y" type strainer for suction line of fire pump with cast iron body with brass filter media. size 150 mm HAMMER make   | Nos. | 3   | -      | -      | -      | -      |
| 8  | Pressure gauge assembly - 4" dial, 0-12 kg/sqcm, with cyphon tube, isolation valve with required pipe fittings to mount the assembly.   | Nos. | 6   | -      | -      | -      | -      |
| 9  | Supply and fixing of rubber vibration eliminators of undernoted sizes of approved make with test pressure of 14 kg/sq cm along with necessary flanges, nut bolts etc  |      |     |        |        |        |        |
|    | 100 mm  | Nos. | 6   | -      | -      | -      | -      |

UTILITY TENDER DOCUMENT  
SUN PHARAMCEUTICALS LIMITED, SIKKIM.

SCHEDULE OF MAKES

| sr no | Description        | Prefered make                             |
|-------|--------------------|---|
| 1     | Pipes ( MS / GI)   | TATA/Jindal                               |
| 2     | MS Fittings        | IS approved                               |
| 3     | GI Fittings        | IS approved                               |
| 4     | Ball Valves        | Audco / <del>Kirloskar</del>              |
| 5     | Strainer           | Leader/ Greeves/ Hawa/HAMMER              |
| 6     | Hose Pipes         | Priyanka/ shah Bhogilal / <b>Newage</b>   |
| 7     | Butterfly valves   | Audco / <b>Intervolve</b>                 |
| 8     | Non Return Valves  | Audco/Expert/                             |
| 9     | Level Indicator    | Pune Tectrol/Equivalent                   |
| 10    | pressure gauge     | WIKA / <b>Waree</b>                       |
| 11    | Ball float Valves  | Prayag                                    |
| 12    | Foot Valves        | <del>Kirloskar</del> / <b>Normex</b>      |
| 13    | Water Pumps        | Kirlosker/ M+P / <b>Crompton</b>          |
| 14    | Electric motor     | Kirlosker/Crompton                        |
| 15    | Hydrant Valves     | New Age Industries/Priyanka / IS approved |
| 16    | Pressure Switches  | Indfoss/ Danfoss/ Orion / <b>Switzer</b>  |
| 17    | Tanks              | Sintex, double lined                      |
| 18    | Smoke Detectors    | Honeywell / <b>IAS Morley</b>             |
| 19    | Fire Alarm Panel   | Honeywell / <b>IAS Morley</b>             |
| 20    | Fire Extinguishers | IS approved                               |
| 21    | Hose Reels         | Priyanka/ shah Bhogilal / IS approved     |



**MECHANICAL SECTION**  
**TENDER DOCUMENT**  
**FOR FIRE FIGHTING, FIRE ALARM**  
**AND SMOKE DETECTION SYSTEM**

**Client** : **Indian Institute of Tropical Meteorology, Pune.**

**Project** : **Multi Training Facility Building.**

**Project Location** : **Dr. Homi Bhaba Road, Pashan, Pune 411008.**

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**NOTICE INVITING TENDERS**

**Indian Institute of Tropical Meteorology, Pune, Maharashtra** is setting up a **Multi Training Facility building** at existing building Pashan, Pune, Maharashtra. *Director Indian Institute of Tropical Meteorology, Pune.* invites sealed tenders for Air conditioning work for the to be carried out for their building at Dr. Homi Bhabha Road, Pashan.Pune, Maharashtra.

This facility is expected to be commissioned in **February’ 2012**. The Fire Fighting, Fire Alarm and Smoke Detection tender for this job is as per the specifications indicated elsewhere in the tender.

The scope of the vendor shall include selection of systems and equipments, supply, commissioning supported by appropriate documentation.

The equipment and system offered by vendor shall be user friendly for operation and maintenance and designed for complete personal safety and shall offer no health hazards.

The system offered shall be highly efficient with excellent performance level, continuous trouble free operations and with minimum BHP/TR.

1. The Tenderers are requested to give detailed sealed tender in their own forms in two bid i.e.  
Part –I Technical Bid.  
Part – II Commercial Bid

Both the sealed bid should be sent in another sealed envelope addressed to the **Director, Indian Institute of Tropical Meteorology, Dr. Homi Bhabha Road, NCL post, Pashan Pune – 411008 .INDIA** so as to reach **on or before 16 Jan’ 2011**.

2. If a request is made to IITM, Pune for tender documents, a sum of **Rs 500.00 (Rs Five Hundred Only)** for Indigenous supplier / Indian agents (Non-refundable) has to be paid in the form of Demand Draft drawn in favour of **The Director, Indian Institute of Tropical Meteorology, Pune** enclosed in Technical Bid only.

3. You have to submit two separate bids in two separate envelopes and you may keep both the bid envelope in an envelope for sending us.

One envelope will contain only the **TECHNICAL SPECIFICATION** of the indented equipment.

Another envelope will contain only the financial bid in which price, maintenance, AMC etc. and any other information, which has financial implication, will only be given.

The main envelope will contain both the bids, should be super scribed with our tender enquiry No- **WS/FIRE/MFTCH/2011/01**

4. The technical bid will be opened on the specified due date in the presence of bidders who wish to be present & the financial bids of only those bidders will opened whose technical bid is found suitable by us.

5. The date and the time of opening of part –II (Commercial Bid) will be intimate only to pre-qualified and technically acceptable bidders for the item at a later date.

Last date and Time for receipt of Tender :-**Upto 12.30 hrs. On 16/01/2012.**

Date and Time for opening of Tenders: **At 15.00 hrs. On 17/01/2012.**  
(Part-I technical Bid Only)

6. The tenders shall be submitted in the following manner and shall contain details / documents as listed here in. Technical / Commercial Bid containing the following:

- 1) Complete sets of the tender document as issued, dully filled and signed by the bidders, and shall comprise of:
  - a) A confirmation of the design conditions.
  - b) Duly Filled in Technical Data Sheets.
  - c) Bill of quantities and rates with prices.
  - d) Equipment catalogue / literature.
  - e) Separate Commercial & Technical Deviation sheet, if any.
  - f) Confirmation of the commercial terms

7. Bids shall be kept valid for a period of 120 days from the due date indicated above.

8. Bidders shall quote in strict accordance with the requirements of this tender. Bidders are advised to avoid making technical and commercial deviations. Bidders shall note that unless any and all deviations they may wish to make from the specifications and other terms and conditions are listed in a separate deviation sheet, it shall be deemed that the bids are in strict accordance with the requirements of this inquiry.

9. Bidders must survey if they wish to, the site in consultation with CLIENT / CONSULTANT with prior appointment.

10. The owner does not bind himself to accept the lowest or any bid or a portion there of without assigning any reason for/to split the contract during progress of work due to unsatisfactory work of any one vendor / contractor. Where more than one item is covered by this inquiry OWNER reserves the right to place orders for the various items with different bidders. OWNER also reserves the right to add or delete any item to the contract and the same shall be binding to the contractor / vendor.

11. All the rates mentioned in the tender shall be inclusive of all taxes / duties / levies / sales tax / Works contract Tax / Service Tax / Octroi duty / ESIC scheme for workers, transport charges etc.

12. This tender notice shall form a part of the contract.

13. This tender is not transferrable.

14. Conditional offer will not be considered.

15. The Director Indian Institute of Tropical Meteorology, Pune 411108 (India) reserve the right to Accept any tender in full or in part or to reject the lowest or any all tenders without assigning any reason.

16 Pre Bid meeting will be held on 10/01/2012 at IITM, Campus Pune, 11.00 A.M.

FOR; *Director,  
Indian Institute of Tropical Meteorology,  
Dr. Homi Bhaba Road, Pashan,  
Pune 411008.*

*Date: -----*

**FORM OF TENDER**

Following Form of Tender to be filled in by the tenderer, **on their own letterhead** and to be submitted with tender documents.

1. Works to be carried out at : **Indian Institute of Tropical Meteorology,  
Dr. Homi Bhaba Road, Pashan,  
Pune 411008**

2. Name of the Bidder :

3. Registered Office Address :

4. Central Sales Tax Number :

State Sales Tax Number:

5. Nature of Work : Supply, Installation, Testing & Commissioning  
Of Fire Fighting, Fire Alarm and Smoke Detection system.

6. Total Price Offered in Rs. : Rs.

Price in words. (Rupees \_\_\_\_\_)

7. Validity of Quotation : 120 Days from **15 Jan 2012**.

8. Performance Guarantee Period: 12 Months from the date of commissioning.  
(Defect Liability Period) certificate.

9. Work Completion Period : by **45 Days**.

10. Terms & Conditions & Scope of Work: As per Tender Document.

11. Partly Offer, Inadequate/Unclear information or any omission/deviation in the scope of work specifications, terms & conditions laid down in the tender documents make the tender liable for rejection.

12. The earnest Monet deposit of Rs 25,000/- (**Rs Twenty Five Thousand Only**) must be paid / sent along with your technical bid in the form of a Demand draft. Banker's cheque or Bank guarantee (preferably from a nationalised Bank only) drawn in the favour of **The Director, Indian Institute of Tropical Meteorology, Pune.**, Otherwise your technical & financial bids will not be considered at all. The Earnest Money of successful bidder will be return only after installation, commissioning, satisfactory demonstration and on acceptance of the system by user engineer as per the terms of our work order. If any the successful bidder fails to fulfil the contractual obligation before the due date,he will forfeit the EMD.

12. Final Fire NOC shall be in the scope of successful bidder.

I/We have carefully studied and understood all contents of this tender & aware of the scope and specifications of the work to be done and the local conditions and other factors bearing on execution of the work.

It is understood by me/us that the lowest or any tender will not necessarily be accepted.

Yours faithfully,

Place:

Date:

Signature of Contractor

With Company Seal.

Address:

## SCOPE

1. This specification covers the manufacture, testing at manufacturers works, supply and delivery, at site, installation, testing and commissioning of Fire Fighting system, Fire Alarm and Smoke Detection for Multi Training Facility Building at “**Indian Institute of Tropical Meteorology, Dr. Homi Bhaba Road, Pashan, Pune 411008.**”
2. It is not the intent to specify completely herein all details of construction of the equipment. However, the equipment shall conform, in all respects, to high standards, of engineering and workmanship and be capable of performing in continuous commercial operation up to Vendor's guarantee in a manner acceptable to PURCHASER who will interpret the meaning of drawings and specification and shall have the power to reject the work or material which in his judgement, are not in full accordance therewith.



**BASIC GUIDELINES TO THE BIDDER**

1. The contractor shall guarantee for the complete performance of the systems offered inline with the specification mentioned elsewhere in the document. It is mandatory for the bidder to carefully study the design specifications provided in this tender. Any deviation shall be highlighted while submitting the offer.
2. The drawings submitted in this tender are more or less in detail. However the necessary detail drawings including detail duct routing layout shall be submitted by the successful bidder. On completion of the job the contractor has to submit required no of copies and a CD of the as built drawings to the client
3. The bill of material format is only for guidance and shall be filled by the bidder. The bill of material thus filled shall form the basis of offer. Any deviation proposed by bidder shall be quoted as extra items.
4. The original tender shall be returned after duly filling the \*\* marks.
5. Price bid shall be submitted in the format attached to this tender. Additional items if any may be added as extra items.
6. The bidder shall submit their company profile and list of client along with the tender.

**SPECIAL CONDITIONS OF CONTRACT**

All bidders should furnish their offer in the Document issued by this office only and it should be strictly as per stipulated Tender conditions. In case of any variance Tender may be rejected at the sole discretion of the clients.

In the event of there being any change in specification / other conditions having the financial implications the extent of such financial implications will be assessed by the consultant/client and weightage in the respect of the same will be added / subtracted to the quoted amount to arrive at the final Tender amount.

All material supplied at site will be inspected by the Client's Engineers / Consulting Engineer, prior to installation or fabrication.

Contractors who have done at least **20 Lakh INR (10 Mn INR)** value Fire Fighting, Fire Alarm and Smoke Detection System work in past 3 years shall be considered for pre qualification.

**CLAUSES 1 to 37**

**CLAUSE 1 - DEFINITIONS**

1. **OWNER / PURCHASER** shall mean “M/s Indian Institute of Tropical Meteorology, Pune.” on whose behalf the enquiry is issued by the **ENGINEER / CONSULTANT** and shall include his successors and assigns, as well as his authorised offices / representatives.
2. **BIDDER** shall mean the firm / party who quotes against an enquiry.
3. **VENDOR / CONTRACTOR** shall mean the successful BIDDER whose Bid has been accepted by the **OWNER / PURCHASER** and on whom the ‘Contract’ or Purchase Order is placed by the **OWNER / PURCHASER** and shall include his heirs, legal representatives, successors and permitted assigns.
4. **DETAIL ENGINEERING CONSULTANT** shall mean “M/s Archivista Engineering Projects Pvt. Ltd, Pune”
5. **“THE EQUIPMENT”** means machinery, equipment, materials, and other items to be supplied by the contractor pursuant to the contract.
6. **“THE WORK”** means all the duties, responsibilities and obligations to be discharged by the contractor pursuant to the contract.
7. **“THE CONTRACTORS EQUIPMENT”** means all machinery, apparatus, materials and equipments to be provided by the contractor pursuant to the contract for and in connection with the work **BUT NOT** forming or intending to form a permanent part of the plant.
8. **SUB - VENDOR / SUB - CONTRACTOR / SUB - FABRICATOR** shall mean the person named in the Contract undertaking a part of the work or any person to whom a part of the Contract has been sublet with the consent in writing of the **OWNER / PURCHASER** and shall include his heirs, legal representatives, successors and permitted assigns.
9. **MANUFACTURER** refers to a person or firm who is producer and furnisher of material or designer and fabricator of equipment's to either the **OWNER / PURCHASER** or the **VENDOR / CONTRACTOR** or both under the Contract.
10. **OTHERS** shall mean other successful **BIDDERS** whose Bids have been accepted by the **OWNER / PURCHASER** and to whom the orders have been placed by the **OWNER / PURCHASER** and shall include their heirs, legal representatives, successors and permitted assigns.
11. **INSPECTOR** shall mean the authorised representatives appointed by the **OWNER /PURCHASER** or the **ENGINEER / CONSULTANT** for purposes of inspection of materials / Equipment / Works.
12. **‘Project’** shall mean the project specified in the Scope.
13. **‘Site’** shall mean the actual place of the proposed ‘Project’ as detailed in the Specification or other place where work has to be executed under the Contract.
14. **‘Month’** shall mean calendar month.

15. **Specification** shall mean collectively all the terms and stipulations contained in those portions of the Contract known as General Conditions, the specifications and such Amendments, Revisions, Deletions or Additions, as may be made in the Agreement and all written Agreements made or to be made pertaining to the method and manner of performing the work or to the quantities and qualities of the materials to be furnished under this Contract.
16. **'Bid'** shall mean the proposal / document that the **BIDDER** submits in the requested and specified form in the specification issued by the **OWNER/ PURCHASER**.
17. **'Plant Equipment'** and **'Work'** shall mean respectively the goods to be supplied and services to be provided by the **VENDOR / CONTRACTOR** under the Purchase order or Contract.
18. **'Contract'** or **Purchase Order'** shall mean the order and associated specifications executed by the **OWNER /PURCHASER** and the **VENDOR** including or other documents agreed between the parties or implied to form a part of the 'Contract'.
19. **Contract Price** shall mean, if there is a formal agreement the prices referred to in the agreement or if there is no formal agreement, the price agreed to be the value of the Contract.
20. Contract Period shall mean the period during which the Contract shall be executed as agreed between **VENDOR / CONTRACTOR** and **OWNER / PURCHASER** in the Contract.
21. 'Guarantee Period' shall mean the period during which the installed air-conditioning system & its 'Plant or 'Equipment' shall give the same performance as guaranteed by the **VENDOR** in the Schedule of Guarantee as in the 'Specification'.
22. 'Approved' and 'Approval' where used in the 'Specification' shall mean, respectively, approved by and approval of the **OWNER / PURCHASER** or the **ENGINEER /CONSULTANT**.
23. **CONSULTANT'S INSTRUCTIONS** shall mean any drawings and / or instructions oral and / or in writing, details, direction and explanations issued by the **ENGINEER / CONSULTANT** or the **OWNER / PURCHASER** from time to time during the 'Contract Period'.
24. **'CONTRACTOR'S Works'** or **MANUFACTURER'S Works** shall mean and include the land and other places which are used by the **VENDOR / CONTRACTOR / FABRICATOR** or **SUB - VENDOR / SUB - CONTRACTOR - SUB - FABRICATOR** for the manufacture of 'Equipment' or performing the Works.
25. 'Performance Tests' shall mean such tests as are prescribed in the 'Specification' to be done by the **VENDOR** before the plant is handed over to the **OWNER / PURCHASER**.
26. 'Virtual Completion' shall mean that all work is completed as directed and the 'Site' is cleared to the satisfaction of the **OWNER / PURCHASER** or the **ENGINEER / CONSULTANT**.
27. Words importing persons shall include Firm, Companies, Corporations and other Bodies, whether incorporated or not.

28. 'Drawings' shall mean all:

- (a) Drawings furnished by the **OWNER / PURCHASER** or the **ENGINEER / CONSULTANT** as a basis for proposals.
- (b) Supplementary drawings furnished by the **OWNER / PURCHASER** or The **ENGINEER / CONSULTANT** to clarify and to define in greater detail the intent of the Contract.
- (c) Drawings submitted by the **VENDOR** with his proposal provided such drawings are acceptable to the **OWNER / PURCHASER** or the **ENGINEER / CONSULTANT**.
- (d) Drawings furnished by the **OWNER / PURCHASER** or the **ENGINEER/CONSULTANT** to the **VENDOR** during the progress of the work, and
- (e) Engineering data and drawings submitted by the **VENDOR** during the progress of the work
- (f) Provided such drawings are acceptable to the **ENGINEER / CONSULTANT**.

#### **CLAUSE 2 – CONTRACTOR'S SERVICES**

- a) The Contractor shall supply the Equipment and provide execute, complete and maintain the work in accordance with the Contract.
- b) The Contractor shall be responsible for ensuring that the positions, levels and dimensions of the work are correct according to the Contract notwithstanding that he may have been assisted by the Owner in settling out the said positions, levels and dimensions.
- c) The work to be done under the Contract shall be executed with all the diligence and despatch and in the manner specified in the Contract and to the satisfaction of the Owner. The Contractor hereby undertakes that the work shall be ready for tests on completion not later than the date of completion.

#### **CLAUSE 3 – CONTRACT PRICE**

- a) The owner shall pay the Contractor the sum set out in the Price Schedule hereto increased or reduced by such sums (if any) as under the Contract are to be taken into account in ascertaining the Contract Price.
- b) The contractor shall credit the owner with the sum, which may become allowable or due under the contract at the times and in the manner herein specified.
- c) The rates and prices quoted by the Contractor are inclusive of all taxes, duties etc. as applicable.
- d) Octroi, if applicable at site, contractor shall mention it separately. Caparison will be is on landed cost at IITM

**CLAUSE 4 – CONTRACTOR TO INFORM HIMSELF FULLY**

The Contractor shall be deemed to have examined the site and the nature of the work and to have fully satisfied himself with regard there to prior to entering into the Contract.

**CLAUSE 5 – FINANCIAL GUARANTEE FOR PERFORMANCE**

- (i) 10 % of the value of work done, shall be deducted from each R.A. Bill towards retention money. The Contractor shall, however, have the option of submitting Bank Guarantee for 10 % in lieu of cash retention. Bank Guarantee, if submitted, shall be valid for the full duration of defects liability period of 12 months reckoned from the date of handing over the complete works to us.
- (ii) 5% performance security of the cost of award has to be submitted to the institute in the form of D.D./Bank guaranty before starting the work.

**CLAUSE 6 – DRAWINGS AND DESIGNS**

All technical information, furnished to the Contractor by the Owner in connection with the work and as indicated by the Owner in writing at that time to be confidential, shall be treated as confidential by the Contractor and shall not be revealed to third parties, duplicated or used by the Contractor for any other purpose other than for this plant. This will, however, not be applicable to such information as :

Information which at the time of disclosure or thereafter become public knowledge provided that such information does not become public knowledge by reason of the Contractor's breach of the agreement.

Information which prior to disclosure hereunder was already in the Contractor's possession or in the possession of its employees then their use will be without violation of any secrecy obligation to the Owner.

Information which subsequent to disclosure hereunder is obtained by the Contractor from a third party who, to the best of the Contractor's knowledge is lawfully in possession of such information and is not subject to a secrecy obligation to the Contractor.

**CLAUSE 7 – PATENTS AND OTHER RIGHTS**

The Contractor shall fully indemnify the Owner against any action, claim or demand, costs of expenses arising from or incurred by reason of any infringement or alleged infringement of any letters, patent, registered design, trade mark or name copyright or other protected right in respect of the work or any arrangement system or method of using, fixing or working the Equipment authorised or recommended by the Contractor. In the event of any action being brought or any claim or demand being made against the Owner on account of any such matters as aforesaid, the Contractor shall immediately be notified thereof and he shall at his own expenses, fully co-operate with the Owner and shall do all that, the Owner may reasonably require to assist in the defence in such action or to resist such claim or demand. The Owner shall not settle any such action or satisfy or comprise any such claim or demand without the consent in writing of the Contractor which consent will not be unreasonably withheld.

The Owner warrants on his part that any design or instruction furnished or given by him shall not be such as will cause the Contractor to infringe any letters, patent, registered, design, trade marks, or copyright in performance of the Contract.

**CLAUSE 8 – ROYALTIES**

All payments and royalties payable in respect of any letters, patent and other right whether payable in one sum or by installments or otherwise are included in the Contract Price and shall be paid by the Contractor as and when due to the person or persons to whom they shall be payable. The contractor shall indemnify the company from any such payments.

**CLAUSE 9 – ASSIGNMENT AND SUB-LETTING OF THE CONTRACT**

The Contractor shall not without the consent in writing of the Owner assign or transfer the Contract or the benefits of obligations thereof, or any part thereof, or enter into any sub-contract with any other

person, provided that this shall not effect any right of the Contractor to assign, either absolutely or by way of charges, any moneys due or to become due to him, or which may become payable to him under the Contract. Any such consent shall not relieve the Contractor from his obligations under the Contract.

**CLAUSE 10 – GUARANTEES**

- i) All equipment supplied and work done by the Contractor pursuant to the Contract shall be guaranteed by the Contractor to be of the new & first quality and workmanship and to be of expert design conforming to generally accepted international standards and to be sufficient size and capacity and of proper materials so as to fulfil in all respect the operating and other condition specified and to meet all the requirements specified in regard thereto.
- ii) If at any time during the execution of the work or during the maintenance period specified in Article 30 hereof, the Owner shall decide that any equipment supplied or work done by the Contractor fails in any respect to conform to the guarantee given by the Contractor in Article 10(i) hereof. The Owner may, as soon as, give the Contractor reasonable and practicable notice in writing / verbal of the respects in which the Equipment supplied or the work done has failed. At his own expenses, including reimbursement of all costs and expenses incurred by the Owner in connection therewith, replace any equipment and carryout any further work that may be necessary to ensure that the equipment supplied and the work done conforms to such guarantee.
- iii) If the Contractor fails within a reasonable time to take such steps as may be necessary to fulfil his obligations under Article 10 (ii) hereof then the Owner may, at the expense of the Contractor take such steps as may be necessary to ensure that the equipment supplied or the work done by the Contractor shall conform to such guarantee.
- iv) If any replacement of equipment or the work done by the Contractor pursuant to this Article shall be of such a nature to affect the efficiency thereof or any portion thereof, the Owner may give to the Contractor notice in writing requiring that a test or tests shall be made in which event such tests shall be carried out at the expenses of the contractor.

**CLAUSE 11 – VARIATIONS AND OMISSIONS**

- i) The Contractor shall not alter any of the work except as directed in writing by the Owner, but the Owner shall have full power from time to time during the execution of the Contract by notice in writing to direct the Contractor to turn, to alter, amend, add to, or otherwise vary any of the work and the Contractor shall carryout such variation, and be bound by the Contract so far as applicable as though the said variation were stated in the Contract. In any case in which the Contractor has received any such direction from the Owner which either then , or in the opinion of the Contractor will later involve any increase or decrease in the Contract Price, the Contractor shall, within 7 days of such direction, advise the Owner in writing to that effect. The Owner shall thereupon approve in writing such variations which are to be given effect together with the amount of increase or decrease in the Contract Price on that account. The Contractor shall then give effect to such variations. The difference in costs due to such variations shall be added to or deducted from the Contract Price and paid in the same way as the Contract Price.
- ii) If, in the opinion of the Contractor, any such variation is likely to prevent or prejudice him from or in fulfilling any of his obligations under the Contract, he shall notify the Owner thereof, in writing and the Owner shall decide forthwith whether or not such variations shall be carried out. If the Owner amends his instructions in writing, the said obligations shall be modified to such an extent as may be agreed in writing between the Owner and the Contractor provided, however, that the Contractor may not call upon the Consultant to agree to any such variations as would, in any way, have the effect of modifying the obligations of the Contractor under the provisions of Article 7 and 10 hereof.
- iii) Where the rates for extra items cannot be derived from tender rates, the same shall be arrived at on the basis of cost of materials plus cost of labour plus 10% towards Overheads and Profits of the contractor. The Contractor shall submit all details, relevant rate analysis as demanded by the Owner/Consultant to enable them to arrive at the rates to be recommended. The owner decision will be final after considering his details.

**CLAUSE 12 – EXECUTION OF WORK IN INCLEMENT WEATHER**

The Contractor shall during, inclement weather carry out the work in accordance with the Contract and the Contractor shall not be entitled to any additional payment over and above the Contract Price by reason of his being unable to carry out the work owing to inclement weather.

**CLAUSE 13 – CONTRACTOR’S DEFAULT**

If the Contractor shall fail or neglect to execute the work with all due diligence and expedition, or shall refuse or neglect to comply with any reasonable orders given to him in writing by the Owner in connection with the work, or shall contravene the provisions of the Contract, the Owner may give notice in writing to the Contractor to make good such failure, neglect or contravention. Should the Contractor fail to comply with the notice, within the time specified in the notice, then the Owner shall be at liberty forthwith to execute such part of the works as the contractor may have failed or neglected to do all. Without prejudice to any other rights, the Owner may, under sub-contract, take the works wholly or in part thereof from the Contractor’s hands and contract with any other person to complete the work or part thereof, and in that event the Owner shall have the free use of all Contractor’s equipment and other things that may be at any time be on the site in connection with the work, without being responsible to the Contractor for fair wear and tear thereof, and to the exclusions of any right of the Contractor over the



same. The Owner shall be entitled to retain and supply any balance which may be otherwise due, under the Contract to the Contractor or such part thereof as may be necessary to the payment of the cost of executing the said part of the work or of completing the work as the case may be and of meeting claims of third parties against the Owner and arising from or in consequence of the Contractor's failure, neglect refusal or contravention as aforesaid. If the cost of completing the work or executing a part thereof or of meeting claims of third parties as aforesaid shall exceed the balance due to the Contractor, the Contractor shall pay such excess to the Owner.

**CLAUSE 14 – BANKRUPTCY AND WINDING UP**

If the Contractor shall become bankrupt or insolvent, or have a receiving order made against him, or compound with his creditors, or being a corporation, commence to be wound up, not being a member's voluntary winding up for the purpose of reconstruction, or carry on its business under a receiver for the benefit of its creditors or any of them, the Owner shall be at liberty:-

- a) to terminate the Contract forthwith by notice in writing to the Contractor or to the receiver or liquidator or to any person in whom the Contract may become vested, and to act in the manner provided in Article 13 hereof as though the last mentioned notice had been the notice referred to in such Article and the work had been wholly taken out of the Contractor's hands, or
- b) to give such receiver, liquidator or other person the option of carrying out the Contract subject to his providing guarantee for the due and faithful performance of the Contract up to an amount to be agreed.

**CLAUSE 15 – INSPECTION AND TESTING**

- i) Representatives of the Owner shall be entitled at all reasonable times to inspect the work or any part thereof.
- ii) Whenever it is necessary to cover up any work in respect of which previous inspection is desired and the Contractor has been notified accordingly in writing, the Contractor shall give notice in writing to the Owner before the work is covered up. No such work shall be covered up or built upon unless it has been inspected and approved by the Owner or unless the Owner consents in writing to the being done without his previous inspection and approval.
- iii) On receiving notice from the Contractor that the work is ready for inspection, the Owner shall without unreasonable delay, attend for the purpose of inspecting the said work.
- iv) The Contractor shall uncover any part of the works or make openings for inspection as the Owner may direct and shall reinstate and make good such part to the reasonable satisfaction of the Owner.

**CLAUSE 16 - ORIGIN OF MATERIALS**

- i) The owner shall have the right, at any time, to call upon the Contractor for evidence of origin of raw materials and parts of equipments.
- ii) All goods or materials supplied or used shall be of first class quality of the grade specified.

**CLAUSE 17 - MILL CERTIFICATES**

All Mill Certificates covering physical and analytical tests shall be produced as called for by the owner.

**CLAUSE 18 - TEST CERTIFICATES**

The Contractor shall provide specified number of test certificates and/or material analysis certificates and/or radiographic examination reports as called for by the Owner.

**CLAUSE 19 - ACCESS TO AND POSSESSION OF THE SITE**

- i) Subject to paragraph (iii) of this Article, access to and possession of the site shall be afforded to the Contractor by the Owner in reasonable time, and except in so far as, the Contractor may provide to the contrary the, Owner shall provide a road suitable for the transport of the equipment from the nearest public thoroughfare or railhead available to the site.
- ii) In the execution of the work, no persons other than the Contractor's employees shall be allowed on the site, except by the written permission of the Owner, but facilities to inspect the works at all times shall be afforded to the Owner and his representatives.
- iii) The access to possession of the site referred to in paragraph (i) hereof shall not be exclusive to the contractor but only such as shall enable him to execute the work. The Contractor shall offer to the Owner other Contractors and sub-contractors every reasonable facility for the execution of work concurrently with his own.
- iv) Unless otherwise provided in the Contract, the owner shall give the Contractor facilities for carrying out the work on the site continuously during the normal working hours generally recognized in the district. The Owner may, after consulting with the Contractor direct that the work, shall be done at other times if it shall be practicable in the circumstances for the work to be done and the extra cost of such work (if any) shall not be added to the Contract price.
- v) The Contractor shall arrange his own source of electricity and water that may be required for any testing purpose or for any other purpose at his own cost.
- vi) The contractor shall construct his site office provided with furniture, telephone, fax at the space allocated within the site at his own cost.
- vii) The Contractor shall make arrangements for shelters/labour colony for his workmen at his own cost. No space is available at site.

**CLAUSE 20 – CONTRACTOR'S EQUIPMENT**

- i) The Contractor shall at his own expense, provide all equipment necessary to execute and complete the work. If any equipment is available at the site, the contractor may with the written consent of the Owner, use the same on payment of any necessary charges.
- ii) All contractor's equipment shall be used solely for the purpose of the work and shall not be taken away by the contractor while it is required on the site for the purpose of the work without the permission in

writing of the Owner and the contractor shall be liable for the loss of, destruction thereof or damage thereto. If there shall be due, owing or accruing to the Owner from the Contractor any money under or in respect of the Contract the Owner shall be at liberty at the cost of the Contractor to sell and dispose of any such Contractor's equipment as the Owner shall think fit, and to apply the proceeds in or towards the satisfaction of such moneys as aforesaid.

**CLAUSE 21 – CONTRACTOR'S REPRESENTATIVE & WORKMEN**

- i) The Contractor shall employ one or more competent representatives, whose name or names shall have previously been communicated in writing to the Owner by the Contractor to superintend the carrying out of the work. The said representative shall be present on the site during working hours and orders or instructions which the owner may give to the said representative shall be deemed to have been given to the Contractor.
- ii) The Owner shall be at liberty, by notice in writing to the contractor, to object to any representative or persons employed by the contractor in execution of or otherwise about the work, whose presence at site in the opinion of the Owner is not in the interest of the work or is prejudicial to the interest of the Owner, the Contractor shall remove such person from the site forthwith.
- iii) The Owner shall be given the opportunity to approve the employment of casual labour hired for the work.
- iv) The contractor and his employees shall abide by the site working conditions referred to in the third Schedule hereto.
- v) The Contractor shall immediately notify the Owner in writing of any labour dispute affecting the work. Such notice shall describe the nature of the labour dispute and the actions to be taken by the Contractor to settle the dispute.

**CLAUSE 22 – LIABILITY FOR ACCIDENTS & DAMAGE & INSURANCE**

- i) The Contractor shall during the execution of the work, properly cover up and protect any part of the work liable to injury by exposure to the weather and shall take every reasonable precaution against accident or injury to the work from any cause.
- ii) All Contractors' equipment shall be at the sole risk of the Contractor.
- iii) The Contractor shall insure all his personnel employed for the execution of the work against any personal injury that may be sustained by them as a result of the execution of the work and present satisfactory evidence that such insurance is in force. The insurance cover shall be for adequate amount prescribed by statutory Authorities.
- iv) The Contractor shall at all times indemnify the Owner against all claims, damages or compensation under the provisions of Payment of Wages Act 1936, Minimum Wages Act 1948, Employees Liability Act, 1938, the Workman's Compensation Act, 1923, Industrial Dispute Act 1947 and the Maternity

Benefit Act, 1961 or any modification thereof any other similar act, law and rules made there under from time to time.

- v) The Contractor shall be responsible for Workman's Compensation Insurance and all other statutory requirements in regards to the personnel in the contractor's employment.
- vi) The Contractor shall ensure that similar insurance policies are taken out by his sub-contractors (if any) and shall be responsible for any claims or losses to the Owner resulting from their failure to obtain adequate insurance protection in connection thereof.
- vii) All formalities and legal requirements in regard to ESI coverage for the Contractor's workmen working in the plant is solely the responsibility of the Contractor including what is required for the Factory Inspectorate.
- viii) Any of contractors or sub contractors persons causes damage of equipment or property of the company, the contractor will be solely held responsible for the cost of consequences thereof.

**CLAUSE 23 – POSTPONEMENT OF COMPLETION DATE**

- i) Neither the Owner nor the contractor shall be considered in default in the performance of his obligations hereto if such performance is prevented or delayed by circumference of Force Majeure as herein defined then in such an event the concerned party shall immediately give notice in writing to the other parties of the existence of Force Majeure, together with the evidence relied upon and the postponement to the date of completion shall be mutually agreed by all the parties.
- ii) For the purpose of this article Force Majeure shall mean and be limited to the following :
  - a) any war or hostilities
  - b) any riot or civil commotion
  - c) Any earthquake, flood, tempest, lightning or other natural physical disaster.
  - d) any accident, fire or explosion on the site not caused by the negligence of the Contractor.
  - e) any strike exceeding 10 days in duration affecting the performance of the contractual obligations hereunder.
  - f) any law or order of any government or government department or other authority which delay or impede the Contractor in the execution of the work.

**CLAUSE 24 – PENALTY ON LATE COMPLETION**

In the event of the contract work getting delayed due to reasons attributable to the Contractor, the Owner shall be levying the penalty at the rate of 1% per week to the maximum of 10% of the contract value.

**CLAUSE 25 – TEST ON COMPLETION**

The Contractor shall carry out tests on completion of work as specified in the Tender Document.

**CLAUSE 26 – TAKING OVER**

- i) As soon as the work has been completed in accordance with the contract (except in minor respects that do not affect their use for the purpose for which they are intended and except for the maintenance thereof as provided in CLAUSE 29 hereof) and have passed the tests on mechanical completion, the Owner shall issue a Certificate (hereinafter called a “TAKING OVER CERTIFICATES “) in which he shall certify the date on which the work has been so completed and has passed the said tests and the Owner shall be deemed to have taken over the work on the date so certified, but the issue of a TAKING OVER CERTIFICATE shall not operate as an admission that the work has been completed in every respect. In the event of the work being divided by this contract into two or more section, the Owner shall be entitled to take over any section before the other or others and thereupon the Owner shall issue a TAKING OVER CERTIFICATE in respect thereof. If by agreement between the Owner and the Contractor any portion of the work (other than a section or sections) shall be takeover before the reminder of the work, the Owner shall issue a TAKING OVER CERTIFICATE in respect of that portion.
- ii) If by reason of any default on the part of the Contractor, TAKING OVER CERTIFICATE has not been issued in respect of every portion of the work within 15 days of the date of completion, the Owner shall be at liberty to use the work or any portion thereof in respect of which a TAKING OVER CERTIFICATE has not been issued, provided that the work or the portion so used as aforesaid shall be reasonably capable of being used and the Contractor shall be afford reasonable opportunity of taking such steps as may be necessary to permit the issue of the TAKING OVER CERTIFICATE.
- iii) All system shall be handed over together & taking over certificates obtained. The Job can be treated as complete only when taking over certificates for all the systems are issued.

**CLAUSE 27 – SUSPENSION OF WORK**

- i) The Contractor shall, on the written order of the Owner, delay or suspend the progress of the work for such time or times and to such extent and in such manner as the Owner may specify.
- ii) All reasonable expenses incurred by the Contractor by reason of such delay or suspension by the Owner (otherwise than in consequence of some default on the part of the Contractor) shall be added to the Contract price provided that no claim shall be made under this Article, unless the Contractor has, within a reasonable time after the event giving rise to the claim, give notice in writing to the Owner of his intention to make such claims.

**CLAUSE 28 – TERMINATION**

- i) The Owner may, for any reason whatsoever, at any time, by notice in writing to the Contractor terminate the Contract.
- ii) In the event of a termination pursuant to paragraph (i) of this CLAUSE :-

- iii) The Contractor shall carry out instruction of the Owner in connection with such termination including the cancellation of orders and the termination of contracts which the Contractor may have placed with others.
- iv) The Owner shall pay the Contractor for all materials used and work executed pursuant to the contract, but unpaid at the date of such termination together with any costs necessarily incurred by the Contractor in connection with the work as a result of such termination, provided that the Owner shall not be liable for any business loss or damage suffered by the Contractor as a result of such termination.
- v) The Contractor shall upon receiving notice from the Owner in accordance with paragraph (i) of this Article, notify the Owner within a reasonable time of the sums for materials used and work executed as mentioned in paragraph (ii) (b) of this Article.

These sums and all terms and conditions of termination pursuant to this Article shall be agreed in writing between the Owner and the Contractor.

- vi) Upon termination of the Sub-Contract pursuant to this Article, all obligations of the parties hereto shall cease except as to the liabilities of either part to the other for obligation accrued to the date of such termination.

#### **CLAUSE 29 – MAINTENANCE PERIOD**

For a period of 24 months, after the work or any portion thereof has been taken over, the Contractor shall be responsible for making good with all possible speed and free of all costs and expenses to the Owner, any defects in the work arising from faulty or defective equipment, bad workmanship or from failure of the Contractor to carry out his obligations under the Contract.

#### **CLAUSE 30 – PAYMENTS DUE FROM THE CONTRACTORS**

All costs, damages or expenses for which the Contractor is liable under the Contract may be deducted from money due or becoming due to the Contractor or may be recovered by action of law or arbitration pursuant to CLAUSE 33.

#### **CLAUSE 31 – TERMS OF PAYMENT**

- 70% Against Supply of Material/ Equipment at site.
- 20% Against satisfactory Commissioning/ Demonstration.
- 10% Against Bank guarantee valid for 24 Month.

#### **CLAUSE 32 – STATUTORY AND OTHER REGULATIONS**

The Owner shall when requested in writing afford reasonable assistance to the Contractor in obtaining information as to the local conditions.

The Contractor shall not in the performance of the Contract in any manner endanger the safety or unlawfully interfere with the convenience of the public.

**CLAUSE 33 – ARBITRATION**

- i) If at any time any question, dispute, or difference shall arise between the Owner and the Contractor under or in connection with the Contract either party shall as soon as reasonable practicable give to the other, notice in writing of the existence of such question, dispute or difference specifying its nature and the point at issue and the same be referred to arbitration in accordance with the provision of the Indian Arbitration Act 1940. The award of such arbitration shall be final and binding on the parties hereto.
- ii) Performance of the Contract shall continue during arbitration and any subsequent proceeding.
- iii) The venue of all arbitration shall be Pune.

**1.2 CLAUSE 34 – RECOURSE**

The Owner shall have recourse to the Contractor for any costs, claims, demand, proceedings, damages and expenses whatsoever arising out or in connection with any failure of the Contractor to perform any of his obligations under the terms of the Contract.

**CLAUSE 35 – ADVERTISING**

No advertising, publicity matter or other literature in relation to the Contract or the work is to be published or utilised by the Contractor except with the prior written permission of the Owner.

**CLAUSE 36 – PRICES**

All prices shall be fixed for the duration of the Contract and shall not be subject to escalation of any description unless stated otherwise in schedule of rates.

**CLAUSE 37 – CONSTRUCTION OF THE CONTRACT**

- i) The Contract to the exclusions of all other agreements, statements or representation whether oral or written constitutes the full agreement between the parties hereto for the work to be performed hereunder.
- ii) No variation to the terms of the Contract shall be valid unless it is made in writing and signed on behalf of both the Owner and the Contractor by their respective authorised representatives.
- iii) The Contract shall be constructed in accordance with and governed by Indian Law.
- iv) Where general conditions of Contract are in conflict with schedules annexed to the Contract the latter shall govern.

**\* ARBITRATOR**

The Arbitrator will be the owner.

The names of the arbitrator will be selected from one of the following disciplines, in order of preference.

- a) Retired High Court / Supreme Court Judges, who have experience in handling Arbitration cases.
- b) Members of the Council of Arbitration.
- c) Fellow of Institution of Engineers.
- d) Eminent retire Chief Engineers from State / Center / P.W.D. / Public Sector undertakings.
- e) As per directives of Government of India.

For the purpose of appointing the sole Arbitrator referred to above, the Appointing Authority will send within thirty days of receipt by him of the written aforesaid notice to the contractor.

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

If the Appointing Authority fails to send to the contractor the panel of three names as aforesaid within the period specified, the contractor shall send to the Appointing Authority a panel of three names of persons who shall all be unconnected with either party. The appointing Authority shall on receipt by him of the names as aforesaid select any one of the persons named and appoint him as the sole Arbitrator. If the Appointing Authority fails to select the person and appoint him as the sole Arbitrator within 30 days of receipt by him of the panel and inform the contractor accordingly, the contractor shall be entitled to appoint one of the persons from the panel as the sole Arbitrator and communicate his name to the appointing Authority.

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

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

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

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

The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The Arbitrator shall decide each dispute in accordance with the terms of the contract and give a reasoned award. The venue of arbitration shall be such place as may be fixed by the Arbitrator in his sole discretion.

The fees, if any, of the Arbitration shall, if required to be paid before the award is made and published, be paid half by each of the parties. The costs of the reference and of the award including the fees, if any, of the Arbitrator who may direct to and by whom and in what manner, such costs of any part thereof shall be paid and may fix or settle the amount of costs to be so paid.



**The award of the Arbitrator shall be final and binding on both the parties. Subject to aforesaid the provisions of the Arbitration Act 1940 or any statutory modification or re-enactment thereof and the rules made there under, and for the time being in force, shall apply to the arbitration proceeding under the clause. In all cases where the amount of the claim in dispute is Rs.75,000/- (Rupees Seventy Five Thousand Only) and above, the arbitrator shall give reasons for the award.**

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

I / We hereby declare that I / We have read and understood the above terms and conditions and that we shall abide if the work is awarded to us. I / we shall achieve inside design conditions at any given time.

**DATE:**

**SIGNATURE OF TENDERER.**

## TECHNICAL SPECIFICATION FOR FIRE FIGHTING SYSTEM

### 1.0 SCOPE OF WORK

The work to be carried out under this section shall include detailed design, supply, installation, testing, commissioning and handing over of the entire fire protection system. In addition to the above, getting the final NOC from the local fire authorities. This shall include item wise demonstration and training of all the equipments installed, submission of as – built drawings both in hard and soft copies.

Without restricting to the generality of the foregoing works, the scope of work shall include the following:

Fire fighting pumps

Electric driven, pumps with all related electrical and mechanical works.

Hydrant system

External hydrant system with hoses, branch pipes, hose boxes etc.

Internal Hose reel system with hoses, branch pipes, hose reels etc.

Sprinkler system

Automatic sprinkler system with installation control valve, sprinklers, air release valves etc.

Extinguishers.

Portable first aid fire extinguishers.

### 2.0 LIST OF CODES FOR FIRE FIGHTING SERVICES:

| Sl.No. | CODE NUMBER         | DESCRIPTION  |
|--------|---------------------|--|
| 1.     | NBC – Part IV       | National Building Code – Fire protection.                              |
| 2.     | TAC Manual          | TAC's manual for fire hydrant system                                   |
| 3.     | IS 15105            | Sprinkler system installation hand book.                               |
| 4.     | IS 2190             | layout for Portable Fire Extinguishers                                 |
| 5.     | IS: 1239 – (I & II) | Specifications for Mild Steel tubes, and other wrought steel fittings. |
| 6.     | IS: 3589            | Specifications of steel pipes for water & sewage 168.- 2540 mm OD.     |
| 7.     | IS: 778             | Specifications for copper alloy gate and globe valves.                 |
| 8.     | IS: 14846           | Specification for sluice valves for water works.                       |
| 9.     | IS: 5312            | Specification for swing check type reflux valves. (NRV).               |
| 10.    | IS: 5290            | Specification for hydrant valves.                                      |
| 11.    | IS: 636             | Specification for hoses.   |
| 12.    | IS: 903             | Specification for coupling, branch pipes and nozzles.                  |
| 13.    | IS: 884             | Specification for first aid hose reel.                                 |
| 14.    | IS: 8442            | Water Monitor  |
| 15.    | IS: 10221           | Wrapping & Coating   |

**3.0 SPECIFICATIONS**

Work under this contract shall be carried out strictly in accordance with specifications attached and all relevant latest Indian standards, National building code (NBC), Tariff Advisory Committee (TAC), **local fire approval authorities (fire service department)** & any other statutory bodies.

Items not covered under these specifications shall be carried out as per specifications of the latest local fire officer's regulations with the latest amendment applicable.

In the event of the works not covered by Indian standards, British / American standards shall be followed.

**4.0 EXECUTION OF WORK**

The work shall be carried out in conformity with the fire fighting system drawings and within the requirements of architectural, HVAC, Electrical and other specialized service drawings.

**5.0 DRAWINGS**

Drawings submitted along with the tender are indicative drawings only and are meant for tender purpose only. The contractor shall submit the drawings to PMC / consultant / architect and get their approval before commencement of the work. Execution shall start only after getting the approval on the drawings. (Approved for construction).

**6.0 REFERENCE POINTS**

All reference points shall be in relation to the levels and locations given in the architectural and fire fighting drawings.

**7.0 RATES**

Rates quoted shall be inclusive of detailed engineering, cost of material, labour, supervision, erection, tools, plant, scaffolding, service connections, transport to site, transit insurance, storage at site, taxes, octroi, duties, breakage, wastage, pilferage, testing, commissioning, handing over, getting the approval from the local fire authorities and all such expenses as may be necessary and required to completely do all the items of work and put them in a working condition.

All rates quoted are inclusive of making holes and chases in walls and floors and making good the same with existing type and quality of material.

**8.0 TESTING**

Piping shall be tested as described further.

All materials and equipments found defective during testing / commissioning shall be replaced and retested to the same specifications.

**9.0 DETAILED DESCRIPTION OF FIRE PROTECTION SYSTEM DESIGN**

The system has been designed to basically meet the requirements of NBC – Part IV. Since the building come under Institutional Low Hazards Category, hence the building can be categorized as Class G1 occupancy. Taking into account the highest level of security and safety the fire protection system has been designed to meet the most stringent requirement and even supersede in case of water requirement and pump capacity.

The following fire protection systems are recommended to meet the requirements for statutory approval and for Life safety:

- External hydrant system – as per NBC 2005 section IV
- Internal hydrant system – as per NBC 2005 section IV
- Automatic sprinkler system – as per IS 15105
- Portable first aid fire extinguishers – as per IS 2190.

In spite of the above mentioned standards, all the systems should have the compliance of the authority having jurisdiction (i.e local fire brigade authorities).

#### **10.0 FIRE WATER SUPPLY**

The individual terrace shall have 10000 litres capacity tanks as per the Provisional NOC received installed above all the staircase of the premises.

#### **11.0 FIRE FIGHTING PUMPS.**

The selected pump capacity is recommended as per NBC – Part IV and as mentioned in the Provisional NOC received . This is done taking into account the significance and importance of the building.

Connecting shaft shall be stainless steel with bronze sleeve and grease lubricated bearings as per TAC regulations.

The pumps shall be connected to the drive by means of spacer type love – joy coupling which shall be individually balanced dynamically and statically.

The coupling, which joins the prime mover with the pump, shall be provided with a sheet metal guard. Pumps shall be installed on anti – vibration pads.

#### **12.0 MOTORS**

Electrical motors shall be Totally Enclosed Fan Cooled (TEFC) induction motors. Motors shall be equivalent to the horse power required to drive the pumps at 150 % of its rated discharge and shall be designed for continuous full load duty.

Motors shall be suitable for 415 Volts, 3 phase, 50 cycles AC supply and the protection shall be as per IP 56. The motors shall be as per IS: 325.

#### **13.0 CONTROL PANELS**

Switch board cubicles FOR EVRY PUMP of approved type shall be fabricated from 14 gauge MS sheet with dust and vermin proof construction. It shall be painted with one coat of red oxide primer and two coats of synthetic enamel paint of red colour as per shade No. 536 of IS:5 and suitably marked for identification. It shall be fitted with suitable etched plastic identification plates for each motor. The cubicle shall comprise of the following:

- Incoming main switch fuse unit of required capacity.
- Isolation switch fuse unit for each motor.
- Automatic DOL starter for the main pumps with push buttons one for each motor and ON / OFF / Trip indicating neon lamps.
- Single phasing preventor of appropriate rating for each motor.
- Rotary duty selector switch.
- Panel type ampere meters for each motor.
- Panel type voltmeter on incoming main with rotary selector switch to read voltage between phase to neutral and phase to phase.
- LED Phase indicating lamps for incoming main and on / off indicating lamps for each motor.
- Rotary switch for auto / manual operation.
- The panel shall be pre-wired with colour coded wiring including all interconnecting wiring from incoming main to switch gear, meters and accessories within the switchboard panel.
- Switch board cubicles shall be floor mounted as recommended by manufacturer and approved by client.
- The control panel should operate in such a way that the starting and stopping of the jockey has to be automatic in nature. Starting of the main pumps and the diesel engine operated pump has to be automatic in nature whereas the stopping of these pumps is to be done manually.

#### **14.0 CABLES**

The electrical department shall provide incoming cabling to the fire pump MCC.

Contractor shall provide all power, control cables from the motor control centre to motors,

Cables shall confirm to IS: 1554 and carry ISI mark. Wiring cables shall confirm to IS: 694

All power and wiring cables shall be copper conductor PVC insulated / armoured and PVC sheathed 1100 volts grade.

All control cables shall be copper conductor PVC insulated / armoured and PVC sheathed 1100 volts grade.

All cables shall have standard conductors.

All cable joints shall be made in approved manner as per the standard practice.

The selection of cable must be as per the recommendations of India Electricity rules.

#### **1.0 CABLE TRAYS**

The contractor shall provide MS Slotted cable trays at locations as required (inside the pump house only) and this has to be included in the cost of cabling items.

Cable trays shall be supported from the bottom of the slab / wall face at intervals of 30 cm at both ends by welding support rods with insert plates to reinforcement bars. Cutting of holes in the slab for exposing of bars or making provisions on the wall and making good the same after welding / fixing of support bars shall be included as part of cabling work. Required cable ties / saddle spacers etc shall all be included in the contractors scope of work.

**16.0 EARTHING**

The entire earthing system shall fully comply with the India Electricity Act & Rules. The contractor shall carryout any changes desired by the electrical inspector or the owner, in order to make the installation confirm to the Indian Electricity rules. The exact location of earth conductor, earth electrodes and earthing points on the equipment shall be determined in the field. All hard ware used for earthing installation shall be hot dip galvanised. Spring washer shall be used for all earthing connections of equipments.

Following sizes of earth conductors shall be used for motors:

|               |                         |
|---------------|-------------------------|
| Upto 5 KW     | 8 SWG G.I. Wire         |
| 5 KW to 30 KW | 25 mm * 3 mm G.I. Flat  |
| Above 30 KW   | 32 mm * 6 mm G.I. Flat. |

The complete earthing system for the fire fighting system shall be included in the scope of work. This shall include earthing for MCC, motors, distribution boards, fire alarm systems, push button stations, gaseous system control panels and any other interconnections to make the system complete.

**17.0 OPERATING CONDITIONS FOR THE FIRE PUMPS**

| PUMP          | Cut in Pressure | Cut out Pressure | Remarks    |
|---------------|-----------------|------------------|------------|
| Main Pump - 1 | 5.0 kg / cm2    | Manual Stop      | Auto start |

**18.0 PIPE AND FITTINGS**

The pipes used for fire fighting shall be GI ERW HEAVY CLASS IS 1239 inclusive of all required fittings, flanges, nut bolts, anchor bolts, couplings, U clamps, of reputed make.

All pipes within the building shall be GI HEAVY CLASS ERW as per IS: 1239 for sizes upto 150 mm dia. 200 mm dia & above pipes shall be GIHEAVY CLASS C Class as per IS: 3589 with a minimum thickness of 6.35 mm.

For pipes 50 mm and below in diameter screwed joints shall be used and fittings shall be of malleable iron. For pipes 65 mm and above welded fittings shall be used.

Flanges shall have appropriate number of holes as per the relevant IS standard and shall be fastened with nut bolts and 4 mm thk compressed asbestos gasket. The flanges shall be as per CLASS 150. Elbows and bends shall be seamless.

**19.0 PIPE PROTECTION**

All pipes above ground and in exposed locations shall be painted with 2 coats of Red oxide primer and 2 coats of synthetic enamel paint of fire red colour.

All pipes under ground shall be protected against soil corrosion by wrapping and coating material as per IS: 10221.

Pipe coating and wrapping shall be done as follows:



and a weld piece welded on site in front of Engineer-in-charge will be sent to the laboratory for the X-ray and NDT tests.

Structural welding shall not commence until the joint elements are bolted or tacked in intimate contact and adjusted to dimensions shown with allowance for any weld shrinkage that is expected. Welding sequence shall be planned and controlled to minimize undue stress or undue distortions in restrained members and those having a high degree of restraint shall be welded with low hydrogen type electrodes.

Ratio of weld width to weld depth shall preferably vary from a minimum of 1 to 1 to a maximum 1.4 to 1.

#### TESTING OF WELDS

All welds shall be tested by Dye penetration test as per the latest practices.

At 10 % of all joints shall be radiographically tested as per IS: 1182 at the locations specified by the Engineer-in-charge. Percentage of welds to be tested may be increased or decreased by the Engineer-in-charge depending on the quality of welds and results obtained for previous weld tests.

#### QUALITY CONTROL FOR WELDING

Welding machines mobilised shall be in good working condition and shall have proper control for regulating current. Adequate spares shall be kept in stock at site during the execution of the work for routine maintenance. Location of welding machines and the distribution boards to be connected with them shall be decided in consultation with site electrical supervisor to avoid overloading of the distribution boards, cables and electrical power sources.

For executing site fabrication and welding, the electric cables, distribution boards and maintained in good working condition. Welding cables used shall have proper insulation throughout the length. The cables shall be carefully examined and repaired as necessary every day.

All welding shall be performed strictly in accordance with the welding requirements detailed in approved WPSs and ASME Boiler and Pressure vessel code section IX. Suitable WPSs to be adopted for welding are required to be qualified.

#### WELDING ELECTRODES

Generally all welding shall be performed using Shielded metal arc welding (SMAW) process with low hydrogen basic coated electrodes (i.e., E 7016 or E 7018 type). However, use of cellulosed-coated electrode (E 6010 type) shall be permitted for welding root run of full penetration groove welds. At least two runs with E 7018 electrode shall be made on socket weld and fillet welds.

Storing of welding electrodes:

Welding electrodes shall be stored indoors free from moisture. The package of the welding electrodes shall not be opened until immediately before use.

Drying of Welding Electrodes:

All hydrogen welding electrodes shall be dried in an electrode oven in accordance with the manufacturer's recommendation. After backing, the electrodes shall be stored in a holding oven or heated quivers. Welding electrodes not consumed in a day shall be baked by the same method, with only two re-baking permitted.

Handling of Welding Electrodes:



During welding work, welding electrodes shall be stored in heated quivers. The lid of the quiver shall be kept closed to ensure that the electrodes are not exposed to moisture in the atmosphere.

**Brands of Welding Electrodes:**

The following approved makes of welding electrodes shall be used during fabrication and erection

- Advani Oerlikon
- ESAB
- D & H Secheron, India,

Use of any other brand of electrodes is subject to approval by client.

No welding shall be done if there is impingement of any rain, or high winds on the weld area except when suitable protection or shield against the rain or wind is provided.

Tack welds may be done either with full penetration or as bridge tacks. If full penetration tacks are made, the ends shall be ground to featheredge and inspected for presence of any defect. If tacks are cracked, these shall be completely removed by grinding and the area shall be inspected by Dye Penetrant examination to ensure freedom from defects.

Before welding, the ends shall be cleaned by wire brushing, filing or grinding. Each weld-run shall be thoroughly cleaned to remove the slag, irregularities and any defects, before the next run is deposited. Welding of any joint shall be completed uninterrupted. If this cannot be followed for some reason, at least first two passes shall be welded prior to interruption.

**CONTROL OF WELDERS**

**Qualification of welders**

Qualified and certified welders only shall do welding. All welders assigned to the work shall be qualified by test as per the WPSs in accordance with ASME code Sec. IX and approved by QA/QC Engineer. Welders deployed for welding piping joints shall have qualification in SMAW process in 6G position in accordance with ASME code SEC. IX. Previously qualified welders, whose qualification is still valid, may be deployed subject to the Engineer-in-Charge's approval. Welding qualification records shall be maintained at site for reference of client at any time.

**Instruction to Welders**

Welding procedure and other related requirements should be fully explained to each welder and fitter prior to welding work. Welding shall not be started if bevel preparation and fit up of the base materials to be welded is not correct.

**Identification of Weld**

An identification number shall be given to each welder. Each weld shall be identified by marking the welder's identification number given. This shall be marked on the welded seam or at an adjacent location with metal marker.

**BOLTING PROCEDURE**

All flanged joints shall be fitted so that the faces of the flanges meet evenly with the gasket, and then the bolts shall be tightened in a sequence to ensure uniform bolt stress.

In bolting flanged joints, the bolt shall be tightened in a proper manner to compress the gasket to build up compression suitable for the type of gasket used. Flanges shall be faced and have jointing of rubber insertion or asbestos compound.

All bolts shall extend completely and uniformly through their nuts. Bolt loads shall be in accordance with the manufacturer's recommendation.

#### INSPECTION BEFORE WEILDING

- Dimension and orientation of spool assembly and installed spool and / or piping components shall be checked with the piping drawings.
- Width of root opening, bevel angle and alignment of components shall also be checked on each joint fitted up.
- Surfaces to be welded shall be checked to ensure that they are clean and free from foreign material such as grease, oil, paint, scale, etc., for a distance of at least 25mm from bevel ends.

#### INSPECTION DURING WELDING

Crack in tack welds, alignment, welding slag, inter-run cleaning, welding current conditions and bead finish shall be checked. Any discrepancy or defects found shall be rectified immediately.

#### INSPECTION OF COMPLETED WELDS

All welds shall be visually inspected during and after welding by QA/Qc engineer / Engineer-in-Charge. Finished welds shall be visually inspected for parallel and axial misalignment, lack of fusion, un-repaired burn-through, size of fillet welds, dimensions and surface defects. After clearance of visual inspection, Dye penetrant examination, radiography shall be carried out as applicable. Joints close to the pumps (areas of cycling loading) shall be selected for radiography wherever radiography percentage is less than 100%.

- All the root welding shall be 100% Liquid Penetrant tested.
- 10% of the total finish welding shall be Liquid Penetrant tested.
- Liquid Penetrant or magnetic particle examination shall be performed in accordance with section V of ASME code.

#### ACCEPTANCE STANDARDS

Acceptance criteria for visual, dye penetrant inspection and radiography shall be in accordance with fire protection system specification, unless otherwise amended.

Under cutting adjacent to the final bead on the surface of the pipe shall not exceed 0.8mm in depth or 12 ½ % of the pipe wall thickness whichever is smaller.

The following defects are not acceptable:-

- Crack on external surface not acceptable
- Lack of fusion.
- Incomplete penetration.
- Reinforcement not greater than as indicated by the drawing / calculation.

#### REPAIR AND REMOVAL OF DEFECTS

Defects, which are not within the acceptable limits, as revealed in visual, and NDT shall be removed from the joint completely by air-arc gouging, chipping or grinding. If gouging is done, the gouged surface shall be ground to smooth white metal, prior to re-welding. The excavated groove after removal of defects shall be suitable for welding 1 re-welding shall be done in accordance with the WPS adopted for original weld.

When the whole joint is found unacceptable, the weld shall be cutout and the ends of the joints shall be restored according to relevant clauses under fabrication.

No repair shall be carried out without prior approval of the Engineer-in-charge.

Traces of jigs / stiffeners removed, undercutting, craters and beds shall be ground to sound metal and weld metal deposited, if necessary.

Repairs of weld reinforcement and overlap shall be ground and weld metal deposited.

Repairs of weld reinforcement and overlap shall be ground smooth. Spatter and slag shall be removed with a chipping hammer or by power wire brushing. A crack found visually shall be removed and examined by a magnetic particle or liquid penetrant test until assured that no defect remains.

Only two repair attempts shall be allowed on any weld. If unacceptable defects are found after two repairs, the joint shall be cut out. A distance of 25mm shall be cut off from each prior to bevel preparation for the new joints.

#### **24.0 PAINTING**

Paint shall be thoroughly stirred before pouring in small containers and while applying to ensure uniform consistency. The operation for each coat shall consist of a stroke of the brush given from the top downwards, another from the bottom upward over the first stroke and similarly sideways before it dries. No brush marks, hair marks or clogging of paint puddles shall be left. Each coat shall be allowed to dry before the next coat is applied. After the work is complete, the brushes shall be cleaned of paint and linseed oil by rinsing by turpentine. Initial cleaning of the pipes by buffing wheel, to be followed by 2 coats of Red Oxide primer and followed by 2 Coats of Fire Red enamel paint.

#### **25.0 Y-TYPE STRAINER**

'Y' Type strainer consists of a cast iron body and cover with a removable perforated stainless steel / brass strainer.

Flanges may be faced and drilled to BS: 10 Table F or IS: 1538 or ANSI 125/150, with flat face to suit matching flange.

Working pressure = 10 Kg/sq. cm.      Test Pressure = 15 Kg/sq. cm.

#### **26.0 HOSE REELS**

First-aid fire hose reels shall be 20mm diameter high pressure Dunlop rubber hose as per IS: 5132, 36.5m long with gun metal nozzle with 5mm bore and control valve, all mounted on circular hose reel of heavy duty mild steel and cast iron brackets, conforming to IS:884. the fire hose reel shall be connected directly to the M.S. pipe riser taken independently from the header.

#### **27.0 AIR RELEASE VALVE**

The mounting shall be screwed type. The material shall be gunmetal. This should be of spring type.

**28.0 PRESSURE GAUGE**

|                    |   |   |
|--------------------|---|---|
| Fluid              | - | Water   |
| Working pressure   | - | 8.8 Kg / sqcm   |
| Type               | - | Diameterl type  |
| Element            | - | Bourdon tube element of SS 316  |
| Dial Size          | - | 100 mm diameter & scale division shall be in metric units marked in B/W |
| Operating pressure | - | 0 to 15 Kg/cm <sup>2</sup>  |
| Connection size    | - | ½" NPT (M)  |
| Case               | - | Aluminum  |
| Accuracy           | - | +/- 1%  |

All pressure gauges shall be complete with isolation cock, copper tube, nipple tail pipes etc.

**29.0 PRESSURE SWITCH**

|                          |   |                                |
|--------------------------|---|--------------------------------|
| Fluid                    | - | Water                          |
| Working temperature      | - | Ambient                        |
| Element type & material- | - | Bellows type & phosphor bronze |
| Connection size          | - | ½" NPT (FM)                    |
| Switch type              | - | Snap acting micro switch       |
| Size of cable entry      | - | ½" NPT                         |
| Accuracy                 | - | +/- 0.5%                       |
| Type of enclosure        | - | Dust proof                     |
| Voltage                  | - | 230V, 50 Hz                    |
| Operating                | - | Electrical contact closure     |

The pressure switch shall be industrial type single pole double throw electric pressure switch designed for starting or stopping of equipment when the pressure in the system drops or exceeds the pre-set limits. It shall comprise of a single pole changeover switch, Bellows element assembly and differential spindle. All the pressure switches shall have ¼" B.S.P. (F) inlet connection and screwed cable entry for fixing cable gland.

**30.0 VALVES**

Butterfly valves shall be tested to a minimum of 10 kg / cm<sup>2</sup>. The valves shall fulfill the requirements of BS: 5155 or AWWA C 504, API 609 and MSS-SP-67. The disc shall be heavy duty cast iron with anti corrosive epoxy or nickel coating. The valve seat shall be high grade elastomer or nitrile rubber. The shaft shall be of EN8 grade carbon steel. PN 16

Check valves shall be Cast Iron Double Flanged confirming to IS: 5312

Globe and gate valves 50 mm dia shall be of Gun metal confirming to IS: 778.

Valves shall include matching flanges, bolts, nuts, washers, gaskets etc.

**31.0 VALVE CHAMBER**

Contractor shall provide suitable brick masonry chamber in cement mortar 1:5 on cement concrete foundations 150 mm thick in 1:5:10 mix. The chamber shall be constructed in such a manner that there is a minimum distance of 200 mm below the valve for free movement of the spanner and the internal clear distance between the 2 walls should not be less than 1 Mtr. Water proofing should be carried out on the floor of the chamber. The walls should be plastered internally as well as externally. The chambers shall be covered with heavy duty Cast Iron covers.

**32.0 HYDRANT VALVE**

All the fire hydrant valves shall confirm to IS: 5290. The hydrants shall be oblique pattern and drilled to IS specifications. The valves shall have GM / SS body, must be single outlet and be provided with a metal chain and cap. The hydrants shall be ISI marked.

**33.0 HOSES**

The hoses shall be reinforced rubber lined hoses as per IS: 636 Type A with SS / GM male female couplings with SS / Cu binding. All hoses shall be 15 M long and 63 mm in diameter irrespective of whether they are going to be used as internal hoses or external hoses.

**34.0 BRANCH PIPE**

Branch pipe with nozzle shall be as per IS: 903, Short size of SS / GM. Also there is a provision for providing select-o-flow branch pipe with nozzle which will give a variable flow and pattern (i.e jet, fog, curtain).

**35.0 HOSE BOX**

Hose cabinets shall be fabricated from 16 gauge MS sheet with double glass fronted door, locking arrangement with breakable glass key arrangement duly painted Red with enamel paint (overall size 750 mm \* 600 mm \* 250 mm deep) suitable for wall mounting or pedestal mounting.

**36.0 FIRE EXTINGUISHERS**

Portable extinguishers are used to fight fires at incipient stages. The extinguishers shall be distributed throughout the building and placed at strategic locations as per the requirements as per IS 2190. ABC Type extinguishers have been proposed keeping in mind the simplicity of operation and its ability to fight all types of fires. Co2 extinguishers have been located only in the electrical panel / control rooms. All the extinguishers shall come with a pressure gauge (indicating gauge). All the extinguishers shall meet the required Indian standards and shall bear ISI mark.

**37.0 INSTALLATION CONTROL VALVE (ALARM VALVE)**

The installation control valve shall be double seated clapper type check valve. The body and cover shall be made from Cast Iron to IS: 210 grade F 200. The seat and clamp shall be made from bronze to IS: 318, LTB II grade. The sealing to the seat shall be neoprene gasket. The hinges pin and ball shall be of stainless steel.

The valve shall be suitable for vertical mounting and the direction of water travel shall be indicated on the surface. It shall be rated to 12 kg / cm<sup>2</sup> and tested to 25 kg / cm<sup>2</sup> pressure.

A by-pass valve shall be fitted to adjust minor and slow variations in water pressure for balancing so as to avoid any false alarm.

The valve shall be provided with a test control box. The box shall house a lever to test and operate the ICV. A brass strainer shall also be provided at the point of water supply to the alarm gong. A retarding chamber shall also be provided. The chamber shall be able to balance the water pressure in case of water line surges.

Each valve shall consist of the following:

- Upstream gate valve.
- In and out pressure gauges.
- Test connection of adequate size with valve and orifice plate with pressure connections.

- Water motor gong with necessary piping, isolating valve, strainer and drain. This shall be mechanically operated by discharge of water through an impeller. The drive bearing shall be weather resistant. A strainer shall be provided on line before the nozzle. The gong piece shall be constructed from bronze to IS: 318.

### 38.0 SPRINKLERS

Sprinkler heads spacing shall be in conformity with the drawings and properly coordinated with the electrical, HVAC and the plumbing departments.

Sprinkler heads shall be brass / chrome plated with a Quartzoid bulb operating @ 68 Deg C. Sprinkler shall be of a type and quality approved by the local fire brigade. The inlet shall be screwed. Sprinkler heads shall be pendant, recessed or sidewall type. All sprinklers shall be UL listed.

### 39.0 TENDER PRICE

The scope of work involves supply, installation, testing and commissioning of fire fighting system for as per schedule of quantities issued along with this specification.

Incoming cabling to the MCC is not included in this fire protection system scope of work.

Power / control cabling from fire pumps MCC / Control panel to individual pumps, pressure switches and other devices to be included in the scope of works.

### 40.0 GENERAL

Cost of painting of all equipment, piping, etc. shall be included in each item as given in the specifications. The contractor shall provide all anchor fasteners and their installations for successful completion of work.

### 41.0 All fire fighting equipment should have BMS compatibility.

### 41.0 LIST OF APPROVED VENDORS

|     |                           |   |
|-----|---------------------------|---|
| 1.  | PUMPS                     | KIRLOSKAR/MATHERAN PLANT/ CROMPTON              |
| 2.  | MOTORS                    | KEC / GREEVES / SIEMENS                         |
| 3.  | DIESEL ENGINE             | KOEL / CUMMINS                                  |
| 4.  | STARTERS / SWITCHES / SFU | L & T / SIEMENS / SCHNEIDER                     |
| 5.  | VOLTMETER & AMMETER       | RISHAB / AUTOMATIC ELECTRIC / INDUSTRIAL METERS |
| 6.  | PRESSURE SWITCH           | INDFOSS / SWITZER                               |
| 7.  | PRESSURE GAUGE            | FIEBIG / H.GURU                                 |
| 8.  | PIPES                     | JINDAL / ZENITH/TATA/SURYA/APOLLO/SIDDHARTHA    |
| 9.  | FITTINGS                  | ANY REPUTED MAKE AS PER SPECS.                  |
| 10. | SLUICE VALVE              | KIRLOSKAR / KARTAR                              |
| 11. | GM VALVES – UPTO 50 mm    | LEADER / ZOLOTO / SANT.                         |
| 12. | BUTTERFLY VALVE           | AUDCO / INTERVALVE                              |
| 13. | NON RETURN VALVE          | NORMEX / KIRLOSKAR                              |
| 14. | HYDRANT VALVE             | SBJ / NEWAGE                                    |
| 15. | STRAINER                  | AS REPUTED MAKE AS PER SPECS.                   |

|     |                   |                                |
|-----|-------------------|--------------------------------|
| 16. | HOSES             | NEWAGE / CRC                   |
| 17. | HOSE REEL – DRUM  | SBJ / NEWAGE                   |
| 18. | HOSE REEL – HOSE  | DUNLOP / NEWAGE                |
| 19. | BRANCH PIPE       | SBJ / NEWAGE                   |
| 20. | HOSE BOX          | ANY REPUTED MAKE AS PER SPECS. |
| 21. | WRAPPING COATING  | IWL / RUSTEK.                  |
| 22. | PAINT             | ASIAN PAINTS / BERGER / J& N.  |
| 23. | CABLES            | POLYCAB / CCI / FINOLEX.       |
| 24. | BATTERIES         | EXIDE / AMCO / TATA GREEN      |
| 25. | EXTINGUISHERS     | MINIMAX / SAFEX / ZENITH.      |
| 26. | ALARM VALVE       | HD FIRE / FIRETECH / NEWAGE    |
| 27. | SPRINKLERS        | HD FIRE / SPRAYSAFE / NEWAGE   |
| 28. | AIR RELEASE VALVE | SBJ / EQUIVALVENT.             |

## TECHNICAL SPECIFICATION FOR THE FIRE ALARM AND SMOKE DETECTION SYSTEM

### 1.0 SCOPE OF WORK

The work to be carried out under this section shall include detailed design, supply, installation, testing, commissioning and handing over of the Fire alarm and smoke detection system.

Without restricting to the generality of the foregoing works, the scope of work shall include the following:

Addressable fire alarm system

Analogue addressable fire alarm system with smoke detectors, manual call points, hooters and other required devices.

Signages.

Photo luminescent safety and evacuation signages.

### 2.0 LIST OF CODES FOR FIRE FIGHTING SERVICES:

| Sl.No. | CODE NUMBER | DESCRIPTION                                       |
|--------|-------------|---|
| 1.     | NBC –       | Part IV National Building Code – Fire protection. |
| 2.     | TAC Manual  | TAC's manual for fire hydrant system              |
| 3.     | NFPA 72     | Code of practice for automatic fire alarm system  |

### **3.0 SPECIFICATIONS**

Work under this contract shall be carried out strictly in accordance with specifications attached and all relevant latest Indian standards, National building code (NBC), Tariff Advisory Committee (TAC), local fire approval authorities (fire service department) & any other statutory bodies.

Items not covered under these specifications shall be carried out as per specifications of the latest local fire officer's regulations with the latest amendment applicable.

In the event of the works not covered by Indian standards, British / American standards shall be followed.

### **4.0 EXECUTION OF WORK**

The work shall be carried out in conformity with the fire fighting system drawings and within the requirements of architectural, HVAC, Electrical and other specialized service drawings.

### **5.0 DRAWINGS**

Drawings submitted along with the tender are indicative drawings only and are meant for tender purpose only. The contractor shall submit the drawings to PMC / consultant / architect and get their approval before commencement of the work. Execution shall start only after getting the approval on the drawings. (Approved for construction).

### **6.0 REFERENCE POINTS**

All reference points shall be in relation to the levels and locations given in the architectural and fire fighting drawings.

### **7.0 RATES**

Rates quoted shall be inclusive of detailed engineering, cost of material, labour, supervision, erection, tools, plant, scaffolding, service connections, transport to site, transit insurance, storage at site, taxes, octroi, duties, breakage, wastage, pilferage, testing, commissioning, handing over, getting the approval from the local fire authorities and all such expenses as may be necessary and required to completely do all the items of work and put them in a working condition.

All rates quoted are inclusive of making holes and chases in walls and floors and making good the same with existing type and quality of material.

### **8.0 TESTING**

Piping shall be tested as described further.

All materials and equipments found defective during testing / commissioning shall be replaced and retested to the same specifications.

### **9.0 DETAILED DESCRIPTION OF FIRE PROTECTION SYSTEM DESIGN**

The system has been designed to basically meet the requirements of NBC – Part IV. Since the building consist of multiple types of occupancies hence the building can be categorized as Class D or Class E occupancy. Taking into account the highest level of security and safety the fire protection system has been designed to meet the most stringent requirement .



The following fire protection systems are recommended to meet the requirements for statutory approval and for Life safety:

- Analogue addressable fire alarm system – as per NFPA 72.
- Photo luminescent safety signages – as required by the layout.

In spite of the above mentioned standards, all the systems should have the compliance of the authority having jurisdiction (i.e local fire brigade authorities).

## **10. ANALOGUE ADDRESSABLE FIRE DETECTION & ALARM SYSTEM**

### **SCOPE:**

This specification covers in general the requirements of independent Analogue addressable type fire alarm system and its associated accessories / components, which constitutes the fire alarm system.

The scope comprises of supply, installation, testing and commissioning of Analogue Addressable Fire Alarm System in accordance with the specifications, drawings and schedule of quantities

Microprocessor based addressable and intelligent (analogue) fire detection and alarm system complete with addressable, intelligent (analogue) head and smoke sensors & addressable manual call point and hooters and other accessories.

The analogue addressable fire alarm control panel (FACP) shall function as fully stand-alone panel.

FACP shall have its own microprocessor, software and memory complying with BS: 5839 Part 4 (1995).

### **CODES AND STANDARDS**

The design, manufacture, testing, performance, etc. of the various components of the fire alarm system shall comply with latest applicable statutes, regulations and safety codes in the locality where the equipment shall be installed.

Unless otherwise specified, the fire alarm system and the components shall conform to the latest applicable Indian or IEC standards. Equipment complying with other standards, such as British, USA, VDE etc. shall also be accepted if it is of reputed makes. The relevant Indian standards as listed below.

- NFPA 72
- IS: 2189 Code of practice for Automatic fire alarm system.
- IS: 2175 Code of practice for Heat sensitive fire Detectors.

### **LIST OF FIRE ALARM EQUIPMENTS:**

- Push button type addressable manual call points
- Analogue Addressable type multi-loop fire alarm panels.
- Electronic Hooters (Addressable loop powered sounder)
- Addressable automatic fire detectors
- Short circuit isolator
- Response Indicator
- Control module
- Zone module
- Required Cables / Wires and
- Other accessories required for analogue addressable type fire alarm system.

### **SPECIFICATION FOR FIRE ALARM EQUIPMENTS**

The equipment shall be suitable for satisfactory operation even when the supply voltage falls to 70% of their rated voltage.

The equipment shall be free from malfunctioning due to vibrations and mechanical shocks. All electrical contacts shall be capable of withstanding at least 10000 operations.

#### **PUSH BUTTON TYPE ADDRESSABLE MANUAL CALL POINT**

Each manual call point unit shall comprise of a push button of reputed make enclosed in M.S. box. The push button shall have minimum 1 NO + 1 NC contacts. The push button shall be shrouded and the same shall be projecting out from the surface of the M.S. box. This whole assembly of push button in MS box shall again be enclosed in an external M.S. enclosure with all sides covered except the front side. The front side shall be sealed with breakable glass cover using neoprene or equivalent gasket. The glass cover shall be fixed in such a way that the actuating push button is kept depressed (with 'NC' contact closed and 'NO' contact opened) so long as the glass cover is in tact. In case of fire, when glass cover is broken to give fire warning, the button shall be released due to spring action hence giving remote fire alarm through the 'NC' contact, which has now changed over.

Under normal conditions push button shall be in the depressed condition. In the case of fire when the glass cover is broken, the push button shall be released by the spring action and shall actuate an alarm at the control panel through its switching contacts.

In addition to this, there shall be a LED indicator on the monitor module for visual indication to locate the call point easily.

The manual stations shall be non-coded re-settable key type general alarm devices, painted red and suitable for surface of flush mounting. Manual stations shall be capable of being interfaced to a monitor module that is addressable. The manual station shall have normally open fire alarm and annunciator contacts and these contacts shall close on activation. Contacts shall remain closed until station is manually reset.

- The M.S. box and the external M.S. enclosure shall be completely dust, damp, weather and vermin proof. They shall be made of sheet steel of 16 gauge (minimum) thickness.
- The complete unit shall be suitable for wall / column mounting with necessary mounting accessories.
- The unit shall be suitable for mounting on freestanding pedestals wherever required.
- The complete unit and push button shall be painted 'signal red' (as per IS: 5 Shade 537). The internal surface of the external M.S. enclosure of box shall be painted with 'white' colour.
- The external painting shall be of chlorinated rubber based or epoxy or equivalent.
- Clear inscription reading in (English) 'FIRE ALARM – IN CASE OF FIRE, BREAK GLASS' shall be provided for each manual enclosure or on a separate metal plate mounted behind the glass cover. Apart from this, inscription in the specified vernacular shall also be provided.
- The metal plate for inscription shall not tarnish under the atmospheric conditions.

Each manual call point unit shall be provided with the following accessories:

- An iron hammer of sufficient weight, which could be used to break the glass cover. The iron hammer shall be suspended on a hook fixed to the external MS enclosure by means of a non-corrodible iron chain of sufficient length and placed to facilitate easy breaking of the glass cover.
- Two numbers diametrically opposite earthing studs located on the outer surface of the external MS enclosure.

- An identification number (on a number plate), which shall be invariably same as the number given to the fire alarm indicating point on the remote fire alarm indicating panel.
- The details of numbering scheme shall be followed as per the final execution drawings.
- A dust-sealing gland or equivalent on the external MS enclosure for the outgoing cable from the unit.
- Compression type, cables terminating brass glands of reputed make for outgoing cable from the internal M.S. enclosure. If wires are being used, suitable arrangement shall be made for the end termination at the MCP as per standards.

#### **ADDRESSABLE LOOP POWERED SOUNDER WITH FLASHER (ELECTRONIC HOOTER)**

Depending on the floor area and its layout, external audible fire alarm hooter (loop powered sounder) shall be provided to give required sound level. The number of hooters and their spacing shall be sufficient to produce the sound levels as specified in IS: 2189.

The loop-powered sounder comprises of low profile design sounder and base for the analogue sensor, allowing solid state addressing either automatically by control panel or remotely. The unit can be installed swiftly and efficiently producing significant savings in labour and costs by wiring to only one unit. A selection of tones is available and the unit can be driven continuously or pulsed under full synchronization of the control panel, hence all sounders shall pulse at the same time.

The unit can also be mounted on a standard BESA box and adapts to a wall-mounted version by the simple addition of a clip to its cover.

The volume level can be varied from 75dB (A) or 95dB (A). Flasher should be an integral part of the loop sounder.

#### **SHORT CIRCUIT ISOLATOR**

The fault isolator devices detect and isolate a short – circuited segment of a fault tolerant loop. The devices automatically determine a return to normal condition of the loop and restore the isolated segment. One isolator is suggested for every 20 devices. This has LED that latches to indicate a short on the loop.

#### **ANALOGUE ADDRESSABLE TYPE FIRE ALARM PANEL**

Supply and install an analogue fully addressable type automatic fire alarm and control system as specified and as shown on the drawings and connect all components to form a complete system the approval of the local fire services authorities and complying with IS standard. The panel shall be capable of adding number of loops. The panel and the detectors shall be from the same supplier of the system. This panel shall also be the control panel. The panel shall supervise the operation of sprinkler flow switches, detectors, break glass manual call point and main air-conditioning equipment. The panel shall be of console type fitted with a hinged door or doors with stainless steel trim provided with chrome-plated combination locks. Two keys are to be provided to fit all locks. For facilitating easy identification at the Analogue Addressable FAP in case of fire in an area, it may be necessary to divide the premises into more than one loop. Each loop shall be divided such that a loop as a maximum of 99 addressable detectors / addressable Manual calls points / addressable devices. Fire in

each device shall be independently indicated in the FACP. This loop indication panel shall form nerve center of the complete fire alarm system in a particular loop consisting of various types of detectors both manual and automatic.

An Analogue Addressable Fire Alarm Control Panel (FACP) is provided to effect total control over the analogue detection devices required in the building. The FACP is of the digital, distribution, real time, multi tasking & multi-user type. The system is provided with addressable and analogue fire alarm initiating, annunciation and controlling devices. The Analogue addressable system is such that smoke sensors, heat sensors, manual call points, etc. can be identified with the point address.

FACP operates on 230V AC supply & Smoke detectors are powered using the FACP based smoke detection circuits. Devices receive power and communication from the same pair of conductors. FACP provides for resetting detectors, fault isolation and sensor loop operation. It is possible to mix different fire devices within the same loop to optimize field wiring.

FACP shall provide alarm indication on INDIVIDUAL sensors. Panel provides for detector trouble alarm indication for just accumulation. The panel checks each detector once every 24hrs for contamination for this purpose. Based on the site condition the user has the discretion to either clean the detector immediately or manually change the alarm threshold level on the panel (by programming) after ascertaining the trouble conditions and not developing alarm condition at the site.

Setting smoke detector sensitivity remotely possible from Analogue Addressable Fire Alarm system to either high sensitivity manually or pre-programmed sequence e.g. (Day/Night) period. The panel regularly supervises all the sensors and devices on the loop and initiates fire or trouble alarm whenever required.

The FACP processes requires the true continues analogue signal from the sensors. Whenever the detector reached the alarm threshold, detector sends out a dynamic analogue value corresponding to the temperature / smoke sensitivity level for display in the panel. An alarm condition is sensed at the FACP when an analogue sensor reports a value greater than the threshold value. Each thermal detector can be individually accessed from the panel and asked to display the actual temperature sensed by it.

The pre-alarm level for thermal detector and smoke detector is user defined. When the pre-alarm level is reached the panel signals warning at which moment the actual temperature / analogue value corresponding to the pre-alarm smoke level is displayed.

The heat detector is designed to initiate an alarm at 135deg. F and to respond to increase in excess of 15deg. Per minute. Detectors shall be of self-locking, plug – in design for installation in pre – wired bases.

Two visible LEDs on the detector shall blink-in standby and provide a 360-degree field-viewing angle. These shall latch permanently unless the alarm condition is rectified and the system is reset and the indicating detector returns to normal condition.

The LEDs shall latch permanently unless reset, indicating the detector is in alarm condition. The detectors have field adjustable sensitivity and removable cover and insect screen for field cleaning. The detectors are suitable for a supply voltage of 24V DC without affecting its sensitivity and a built-in test switch. The base has a switch so that the loop is not disturbed even if one detector is taken out for servicing. The blinking LED indicates that the detector is functioning properly. All the detectors shall approved by TAC / UL / ULC / FM.

## POWER SUPPLY

The control panel shall be provided with operating power from 240V, 50Hz single phase A.C. source. This power shall be converted into 24V DC for system operation by power supply unit. In the event of failure of the operating supply, the system shall automatically transfer to standby battery supply. The battery shall be of the maintenance free and shall be housed inside the fire control panel.

The analogue addressable type fire alarm panel shall incorporate:

- Visible indication pinpointing the location of individual fire sensor. i.e., testing for zone or device locations.
- Audible alarms for fire and faults. Providing fast information on point of fire / fault complete with hard printout of date, time, device number, device type and text location.
- Necessary power supplies unit for the fire alarm system.
- Interrogating all devices continuously of their operating state by a microprocessor within the main control Panel.
- Controlling the operation / non-operation of the other mechanical and electrical system.
- Acknowledge, reset and test devices.

The scheme shall work as follows:

- The complete circuitry shall be fail proof as require in IS: 2189 – 1999.
- If required the panel shall have additional capacity to operate auxiliary equipment like fire dampers, fire closers, ventilation and / or pressurizing fans, emergency light, smoke exhausters, etc.
- Any auxiliary relays, which are required for the scheme, shall also be included in the scope of supply.
- The analogue addressable fire alarm panel be free standing type, totally enclosed, dust, damp and vermin proof fabricated with sheet of minimum 16 gauge thickness. The panel shall be painted as per standard with colour as specified.
- The panel shall be completely factory wired absolutely ready in all aspects for installation at site and termination of the external cables for which undrilled bottom gland plate shall be provided. The internal standard copper wires of minimum size rated for the current in the corresponding circuit. The minimum size of the wire shall not be less than 1.5sq.mm standard copper. Wiring shall be of switchboard type single core standard, annealed copper wire with PVC insulation.
- All wiring to be hooked up with external cables shall be terminated in suitable terminal blocks complete with washers, terminal screws, etc. 10% spare terminals shall be provided on the terminal blocks. The wiring termination shall be done using ferrules having indelible markings. Insulated sleeves shall be provided at terminations to reduce the possibility of short circuit between various wires. L & T shall be solely responsible for the correctness of the internal wiring and for the proper functioning of the equipment supplied.
- Neoprene or equivalent rubber gaskets shall be provided at all openings.

- All necessary relays, contractors, indicators, alarm push buttons, shall be housed in this panel.
- A power supply unit shall be provided inside the indicating panel as follows:-
- Silicon diode battery charger suitable for operation on the auxiliary power available at the risk / building. The capacity of the charger shall be such that the same can boost charge the battery (within 8hours) while supplying the rated load of the fire alarm system. Facilities shall be provided to limit the voltage supplied to the fire alarm equipment to their rated values during time of boost charging. The charges shall normally supply battery trickle charging current and the D.C. load of the fire alarm system. The battery shall normally float. In case the A.C. supply on the input side of the charger fails, the battery shall supply the complete fire alarm system.
- Battery bank shall be of adequate capacity to supply fire alarm system power for a period of 8 hours from the instant if charger on A.C. failure.
- Battery bank shall be of adequate capacity to supply fire alarm system power for a period of 8 hours from the instant if charger on A.C. failure.
- Switches, fuses, overload devices, voltmeter, ammeter and earth fault indication devices etc shall be provided for the power supply system
- Visible and audible annunciation for troubles or failure in the power system like ‘charger failure’ ‘battery low voltage’ etc. shall be furnished.
- Two numbers diametrically opposite earthing connections shall be provided on the zone indicating panels for connecting to the earth. All metal casing of devices inside the panel shall be connected to a common bush bar of 25x5mm copper cross-section provided at the bottom of the panel.
- The panel shall have provision to indicate all faults in a circuit for a two wire wiring system to the FAP.

#### **FACILITIES**

Facilities available on the main fire alarm panel shall include but not be limited to the following:-

- Common fire indication.
- Pre-alarm indication
- Device fault indication
- Device numbers with active condition
- Loop numbers with active condition
- Liquid Crystal Display (internal zonal repeater)
- Area group indication
- Isolation indication
- Common fault indication
- Supply healthy indication
- Alarm silence indication
- Evacuate indication

Manual call point (break glass)

- Seven (7) push button switch control shall be provided as below.
- Evacuate

- Silence sounder / mute fault tone
- Panel reset
- Scroll display
- Paper feed
- Lamp test
- Direct communication to local fire brigade station.

Apart from all above, the following general facilities also shall be provide:-

- Battery test facilities with numerical display for volt and current.
- Space within panel for housing the batteries and charging equipment. Battery shall be of the seal recombination type.
- Labelling to clearly indicate all equipment.

#### CABLING

The contractor shall supply and erect the cable, which conform to the following:

PVC insulated copper conductor armoured / unarmoured FRLS cable confirming to Indian or British standards. Cables connected to the detector shall be properly clamped to the ceiling. Loop shall also be left where cables connects ALPS (hooters), panels, etc. appropriate glands shall be provided where the cable enters the junction box.

All the cables and wires shall be tagged for proper identification. Ferrules at junction shall identify wires and cables by colour bands at every 3m distance.

When connecting different buildings, etc., overhead lines fire alarm system shall not be used. This shall be laid underground according to IS: 1255-1983

#### RESPONSE INDICATOR

Response indicator shall be fabricated from 16-gauge MS fabricated box or in aluminium casing. The response indicator shall glow clearly in case the detector to which it is connected gives an alarm signal. The word "FIRE" shall be clearly written on the visible face of the box.

No company logo shall be printed on it. The response indicator shall also have the words "ROOM" or "ABOVE FALSE CEILING" screen printed on it, as the case may be.

NOTE - ALL THE DEVICES MUST BE UL APPROVED

#### 11.0 PHOTOLUMINESCENT SIGNAGES

The descriptive photo luminescent safety signage in different sizes / graphics / colours / texts can be made according to the standard for the following fire equipments / accessories / areas:-

Fire hose reel, Lifts, Fire extinguishers, Emergency exits, Analogue addressable Main fire alarm panel, Sprinkler control valves & Fire doors etc.

Photo luminescent safety signage plays a vital safety role in risk-prone areas and panic causing situation. Escape routes of public places, offices, institutions, etc can be marked with photo luminescent products to reduce confusion and fear in case of emergency. When the source of light suddenly goes off, photo luminescent materials glow settles to near continuous intensity.

This type of signages is Positive lifesaver during evacuation of buildings, in case of fire or other sudden emergencies.

The luminous components that make up materials are crystals consisting mainly of zinc sulphide in protective glass like shell; these crystal are incorporated in rigid plastic. In the presence of light, these crystal are excited and they glow brightly when light is not present. The crystal are made luminescent (glow in the dark) by the action of light. The term phosphorence is sometimes used to describe

luminescence, but these signage materials contain no phosphorus. The intense glow is instantly visible in the dark but the glow intensity keeps decreasing continuously but can last for more than eight hours. This photo luminescent safety signage shall be non-toxic, non-radioactive and containing no phosphorus or lead or any other hazardous element or chemical. These shall be highly versatile and considerably less expensive than other forms of emergency lighting. These are ready to use, easily applied, long – lasting, virtually maintenance free and indefinitely reusable. Fluorescent light shall excite more crystal than incandescent light.

**12.0 TENDER PRICE**

The scope of work involves supply, installation, testing and commissioning of fire alarm system for as per schedule of quantities issued along with this specification.

Incoming cabling to the panel is not included in this fire protection system scope of work.

**13.0 All Smoke detection equipment should have BMS compatibility.**

**14.0 LIST OF APPROVED VENDORS**

- |     |   |                          |
|-----|---|--------------------------|
| 01. | ADDRESSABLE SMOKE<br>DETECTORS / PANEL / MCP /<br>SOUNDERS & ACC. | FIRELITE / SYSTEM SENSOR |
| 02. | CABLES  | POLYCAB / CCI / FINOLEX. |
| 03. | PHOTO LUMINESCENT<br>SIGNAGES                                     | GLO – LITE / AUTO GLOW   |



### **Mode of Measurement**

#### **General:**

The supply items shall include the main items specified, standard accessories and fittings.

#### **Installation:**

The installation rates shall include the installation, testing and commissioning of the entire system. The rate shall include all fixing materials, accessories, consumables, tools and instruments required for installation, testing and commissioning.

All measurements for piping shall be at the center line of the piping work.

The installation of the material supplied by the owner shall include taking delivery and transporting of the material to the site.

Measurements and rates as mentioned here are applicable for item rate tender only.

#### **Document Submission**

Contractor shall prepare and submit 'As Built' drawings for all the jobs carried out by him.

Test reports for all the material supplied by him shall be submitted.

O & M annuals for the bought-out items supplied by Contractor shall be submitted.

**SPECIAL CONDITIONS FOR ERECTION CONTRACT**

1.0 PROGRAMME :

The Contractor shall prepare, in consultation with the Owner, a programme for the completion of the work, which may be carried by agreement in writing between the Owner and the Contractor. The contractor shall maintain progress throughout the contract period so as no to delay other traders or Contractors.

2.0 DIMENSIONS :

Dimensions are to be adhered to as stated in the specifications or as figured on the drawings. Large scale details and written particulars furnished by the Owner are to be used in preference to small scale drawings and are to be strictly followed as to their true intent and meaning. However, Contractor should check physical dimensions before proceeding with any work. Any discrepancies between drawings and physical dimensions to be brought to the notice of Owner's Site Engineer.

3.0 INCLEMENT WEATHER:

The Contractor shall take note of the climatic conditions as pertaining to the areas in which the works are located and shall be deemed to have included all costs for protecting from injury by weather all works and materials that may be so affected.

4.0 FREE ISSUE OF MATERIALS:

All items of equipment as accepted by the Contractor from the Owner's store or from any other place shall be erected by the Contractor without any damage.

5.0 SUPERVISION OF WORK:

The Owner reserves the right to interview the Contractor's nominated site representative and skilled tradesmen either prior to the award of the contract or prior to commencing work on site. Should the nominated representative not be considered suitable, the Contractor shall provide further representatives and skilled tradesmen for interview until such time as the Owner is satisfied that a competent man will be appointed. That the Owner may have approved the appointment will in no way relieve the Contractor of any responsibility under the terms of contract. All costs including travelling expenses etc., incurred by the Contractor in following the above procedure shall be born by the Contractor.

6.0 LABOUR DISPUTE :

The Contractor shall keep the Owner fully informed on all matters concerning labour disputes, strikes, etc., involving the Contractor's labour force and the effects on the progress of work. The Owner shall be kept fully informed of the course of action proposed to remove or alleviate the cause of the dispute.

7.0 COMPLETION :

7.1 Completion shall be as defined in the Time Schedule.

7.2 Following completion, the Contractor shall have the rights of access to all parts of the plant at all reasonable time in so far as operation of the plant by the Owner permits for the purpose of completing outstanding work and inspection and making tests and modifications to fulfill obligations under the contract. Such access shall be at the Contractor's risk. The Contractor shall not bring visitors to the plants as potential customers or for other purpose without prior agreement in writing of the Owner on each occasion.

8.0 RESPONSIBILITIES OF OWNER :

8.1 Provide an adequate area adjacent to the site to accommodate the Contractor's temporary facilities.

8.2 Provide and maintain suitable access to the job sites for the Contractor's personnel, equipment and materials.

8.3 Provide electrical power at a convenient location to be mutually decided between erection contractor and the Owner. Provide water at one point in the site.

9.0 POSSESSION OF SITE :

The Owner shall give the Contractor facilities for carrying out the works on the site from the date set for the beginning of work on the site. Access to a possession of the site shall not be exclusive to the Contractor.

The Contractor shall give to any other Sub-Contractor every reasonable facility for the execution of concurrent work.

10.0 The Contractor will arrange to carry out all necessary work associated with holes for pipes through brick work, concrete or steel work and for drilling all holes for fixings.

11.0 PHOTOGRAPHS:

The Contractor shall not take photographs of any part of the works without the written permission of the Owner

12.0 CONSUMABLES

The Contractor shall use all the consumables but not limited to industrial gas, argon gas, oil & grease, jointing compounds, PTFE tape, emery tape, cleaning rags, saw blades, welding filter wires and electrodes.

13.0 CONTRACTORS CONTROL:

It is the intention of the Owner to monitor and control progress of the works and authorise interim payments. The Owner will expect the full co-operation of the Contractor in the preparation of the valuations and reporting systems and the contractor's price is inclusive of all such costs.

14.0 OTHER CONTRACTORS:

The Contractor shall take fully into account the effect of other concurrent work being carried out in the area or on the same site by other Contractors on the site will be expected from the contractors to ensure that the works are completed in a trouble free, efficient and neat manner.

**ADDITIONAL CONDITIONS**

1. Please note all required tools tackles, ladders, scaffolding etc. for execution / completion of site shall be organised by the successful contractor for carrying out their work.
2. Main incoming supply 3phase/ 1phase, 415V/230V, 50hz, will be provided by the buyer at one point .The successful contractor shall carry out further distribution to his user point.
3. The buyer shall carry out all required major civil work like opening in walls & making good of all holes. All fire seals for the openings shall be carried out by the successful contractor of F-90 Class
4. All required labour and material handling equipment required for execution at site shall be organised by the successful contractor for carrying out their work.
5. Please note all the labour engaged at site for execution of work shall be covered under ESI/PF as per the government rules, and all necessary details shall be submitted to the client before starting the execution work at site.
6. The contractor shall have a comprehensive all risk (CAR) & Workman Compensation (WC) of the full amount of the contract value.
7. For carrying out extra work or if the contractor decides to work after duty hours, special permission shall be taken from the authorities before doing so.

All labour employed at site shall use safety belts, safety shoes, safety gloves, boiler suit, safety helmet, safety goggles etc., If any of the contractor found not adhering to the safety precautions, his work at site would be stopped immediately & a penalty of Rs.1,000/- per day will be charged to him. However this delay should not reflect in the overall project delay, as it might lead to penalty as per the LD clause.

**STATUTORY OBLIGATIONS**

The Contractor shall observe that the working as intended in the document is adhered to or conforming to and NOT NECESSARILY BE LIMITED to the following standard regulations:

- i) FACTORIES ACT as amended (latest)
- ii) Explosive Act.
- iii) Safety regulations laid down by Central Government and state Authorities and the Owner.
- iv) Indian Electricity Rules and Regulations.
- v) Standard Codes for Pressure Piping (ASA B31.3.1973)
- vi) Statutory requirements for inspection and test of all lifting appliances and auxilliary lifting gear.
- vii) Labour Act.
- viii) Local-By-Laws.
- ix) Regulations laid by the Fire Safety Committee, Insurance Association of India.

1.2 In case of conflict between these specifications and the standards which come into force shall be considered as included and applicable to the work covered here and elsewhere in this document.

----- **END OF SECTION** -----