ANNEXURE-A

Providing & laying M.S. Medium grade "B" class pipe size 150mm dia IS : 1239 in position with all fitting including flanges, cutting, beveling welding, bending, threading, erection and installation, with fabrication of all types of support with erection and installation of upper ground pipeline to required level of elevation including hook and piping with equipment including painting two coats of approved shade (Post office red)of enamel paint over a coat of approved primer for overheads pipes etc complete.

Materials :-

General Requirements:

1. All the materials shall be of TAC approved, best quality conforming to the specifications and subject to the approval of the engineer in charge. If so directed, materials shall be tested in an approved testing laboratory & the contractor shall produce the test certificate in original to the Engineer-in-charge & the entire charges for original as well as repeated tests shall be borne by the Contractor.
2. Before welding, the pipe faces shall be cleared & then shall be welded conforming to IS: 9595 – 1980. The electrodes used for welding shall comply with IS:814. The laying of welded pipe shall also comply to IS 5822 – 1986. The welding joints shall be tested in accordance to IS:3600, Part 1973.
3. Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workman like manner
4. Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.
5. Pipes shall be securely fixed to walls and ceilings by suitable clamps or supported at every 3 mtr. & at change of direction as required. Only approved type of anchor fasteners shall be used for RCC ceiling and walls
6. All the underground pipes shall be properly supported. Also thrust blocks shall be provided wherever pipe changes its direction. Thrust blocks shall be of cement concrete 1:2:4 mix.
7. The above ground pipes also properly supported with „L‟ angle / hinge supports.
8. Valve and other appurtenances shall be so located that they are easily accessible for operations, repairs and maintenance

The pipes and fittings shall be of M.S-SEAMLESS. They shall conform to IS 1978 or IS 3589 as specified in schedule of quantities. All the pipes and fitting shall have ISI certification mark. The specified nominal bore of the pipe shall refer to inside approximate bore according to the thickness corresponding to outside fixed diameter. The pipe and fittings shall be smooth, sound, free from any imperfections and neatly dressed.

LAYING:-

The plumbing contractor shall set the layout of the plumbing approved by the Engineer-in-charge as may be required by the bye-laws. Pipes shall be laid in plumb and in straight and parallel lines. When unavoidable, pipes may be buried for short distances provided additional protection is given against damage and where so required joints are not buried. Where directed by the Engineer – in-charge, A M.S. tube sleeve shall be fixed at a place the pipe is passing through a wall or floor for reception of the pipe and to allow freedom for expansion, contraction and other movements. In case

the pipe is embedded in walls or floors the pipes shall be painted with anticorrosive bitumastic paints of approved quality. The pipe shall not come in contact with mortar or lime concrete as the pipe is affected by lime. Under the floors the pipe shall be laid in layer of sand filling as done under concrete floors.

FIXING:-

The entire pipe line shall be fixed in position as shown in the drawing or as directed by the Engineer- in charge. All pipes shall be fixed truly vertical and horizontal unless unavoidable. The pipe line shall be supported with "U" type G.I. clamps not less than 2 mm thick and G.I. nails not less than 40 mm long, wooden gutties etc keeping the pipe about 15 mm clear of the wall. Type of hangers and components for all piping shall be selected by Contractor and approval obtained from the Purchaser/Architect before commencement of the work.

Spacing of fixing for internal piping shall be as per IS 2065 – 1983 as given below:

NBof pipe in MM	**For Horizontal Runs in MTR**	**For Vertical Runs in MTR**
15mm	2.0M	2.5M
20 mm to 32 mm	2.5M	3.0M
40 mm to 50 mm	3.0M	3.5M
65mm to 80 mm	3.5M	5.0M

No joints shall be located inside the wall. If the pipe is required to be cut, the hums of the cut end shall be filed smooth and any obstruction in bore shall be entirely eliminated

JOINTING:-

While fixing the pipe line the joints shall be made by electrical resistant welding or MS flanged joints. The branch connection shall not protrude in the bore of parent pipe. 10% welded joints shall be dye penetration (D.P.) tested.

PAINTING:-

MS – SEAMLESS pipes and fittings running exposed shall be painted with two coats of anticorrosive paint of approved make and shade over a two coats of red oxide primer. The underground or concealed pipe shall be protected from corrosion as per IS 10221

TESTING:-

The pipes and fittings after they are laid and jointed shall be tested to hydraulic pressure of 1MPa (10 Kg/sq.cm) OR 1.5 times the maximum working pressure which ever to be higher. This hydrostatic pressure should be m The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw off taps and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually, Pressure gauge must be accurate and preferably should have been recalibrated before the test.

During testing, all valves except drain & air valves shall be kept fully open. All piping after installation shall be tested for a hydrostatic test pressure of 1.5 times of the system pressure maintained for 24 hours.The test pump having been stopped, the test pressure should be maintained without loss for at least 2 (two) hours.

All piping system shall be capable of withstanding the maximum pressure arising from any condition of testing (as stipulated) and operation, including water hammer effects.

The pipes and fittings shall be tested in sections as the work of paying proceeds, having the joints exposed for inspection during the testing. Pipes or fittings which are found leaking shall be replaced and joints found leaking shall be redone, without extra payment.

Mode of Measurement and Payment :

Payment shall be made on one Running meter of pipe.

The rate shall be for unit of **one Running meter**

ANNEXURE-B

Providing & laying M.S. Medium grade "B" class pipe size 100mm dia IS : 1239 in position with all fitting including flanges, cutting, beveling welding, bending, threading, erection and installation, with fabrication of all types of support with erection and installation of upper ground pipeline to required level of elevation including hook and piping with equipment including painting two coats of approved shade (Post office red)of enamel paint over a coat of approved primer for overheads pipes etc complete.

Materials & Workmanship:-

The detail specification for this item shall be as per the specification of Item No. 107 of this Tender Document Except that dia. Of pipe is 100 mm.

Mode of Measurement and Payment:

Payment shall be made on one Running meter of pipe.

The rate shall be for unit of **one Running meter**

ANNEXURE-C

Providing & laying M.S. Medium grade "B" class pipe size 80mm dia IS : 1239 in position with all fitting including flanges, cutting, beveling welding, bending, threading, erection and installation, with fabrication of all types of support with erection and installation of upper ground pipeline to required level of elevation including hook and piping with equipment including painting two coats of approved shade (Post office red)of enamel paint over a coat of approved primer for overheads pipes etc complete.

Materials &Workmanship :-

The detail specification for this item shall be as per the specification of item No. 107 of this Tender Document Except that dia. Of pipe is 80 mm.

Mode of Measurement and Payment :

Payment shall be made on one Running meter of pipe.

The rate shall be for unit of **one Running meter**

ANNEXURE-D

Providing & laying M.S. Medium grade "B" class pipe size 50mm dia IS : 1239 in position with all fitting including flanges, cutting, beveling welding, bending, threading, erection and installation, with fabrication of all types of support with erection and installation of upper ground pipeline to required level of elevation including hook and piping with equipment including painting two coats of approved shade (Post office red)of enamel paint over a coat of approved primer for overheads pipes etc complete.

Materials &Workmanship :-

The detail specification for this item shall be as per the specification of item No. 107 of this Tender Document Except that dia. Of pipe is 50 mm.

Mode of Measurement and Payment :

Payment shall be made on one Running meter of pipe.

The rate shall be for unit of **one Running meter**

ANNEXURE-E

Providing & laying M.S. Medium grade "B" class pipe size 25mm dia IS : 1239 in position with all fitting including flanges, cutting, beveling welding, bending, threading, erection and installation, with fabrication of all types of support with erection and installation of upper ground pipeline to required level of elevation including hook and piping with equipment including painting two coats of approved shade (Post office red)of enamel paint over a coat of approved primer for overheads pipes etc complete.

Materials &Workmanship :-

The detail specification for this item shall be as per the specification of item No. 107 of this Tender Document Except that dia. Of pipe is 25 mm.

Mode of Measurement and Payment :

Payment shall be made on one Running meter of pipe.

The rate shall be for unit of **one Running meter**

ANNEXURE-F

Providing and fixing 150 diameter CI sluice/butter fly valve ISI marked with gun metal / SS working parts with stainless steel; spindle with necessary jointing materials filling etc complete as directed.

Materials :-

The Sluice valve shall be of 1) INDIAN VALVE CO, 2) KIRLOSKAR, 3) CRESCENT, 4) UPADYAYA or equivalent approved make with ISI make Class or pressure rating as specified in the schedule of quantities and conforming to I.S. 14846. The valve shall be of cast iron and / or spheroid iron having non-rising spindle with hand wheel & spindle of stainless steel.

Workmanship :-

The C.I. sluice valve shall be fixed in position as indicated in the drawing or as directed. They shall be fitted with the tail pieces on both sides by means of flange joints

DEWATERING: The contract rate shall include bailing or pumping out all the water if accumulated during the progress of the work either form rain, seepage, springs or any other cause till completion of the work

TESTING: The Sluice Valve and the joints shall be tested as per the clause of testing of the pipe line. The testing shall be done along with the pipe line testing

The items would be executed as per standards IS specifications including all materials, labour etc complete.

Mode of Measurement and Payment :

The measurement shall be for each unit of Sluice Valve fixed. The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-G

Providing and fixing 150mm diameter non return valve with gunmetal working parts as per IS including.

Materials:-

Non-return valve shall be conforming to IS 9338 or IS 5312 as specified in schedule of quantities. The body, domes, covers, stuffing box, thrust plates, hand wheel, wedges, gland and cap shall be of cast iron not less than of grade FG200 and all in side working parts should be of any non ferrous or ferrous materials such as gun metal. Valve of single door pattern swing type shall have test pressure of PN1.6(50 to 125 mm size), PN1.0 (150 to 300mm size),PN0.6 (350 to 600 mm size)as per IS 5312 (part.1). Valve of multi door pattern swing type shall have test pressure of PN 0.6(400 to 1200 mm size), PN1.0 (400 to 1200mm size)as per IS 5312 (part 2).Valve shall be tested for the body and seat and the defective valve shall be replaced by the contractor at his own cost.

Workmanship :-

The valves shall be fixed in position in the pipeline as shown in the drawing or as directed with necessary socket or union, nuts etc. The screwed, flanged joint shall be made with few turns of fine Teflon tap taken over the threaded ends to obtain complete water tightness.

TESTING: -

The joints shall be tested to a hydraulic pressure of 1 MPa (10 kg/cm2) along with the testing of pipe line.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material Teflon tap for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-H

Providing and fixing 100 diameter CI sluice/butter fly valve ISI marked with gun metal / SS working parts with stainless steel; spindle with necessary jointing materials filling etc complete as directed

Materials &Workmanship :-

The Sluice valve shall be of 1) INDIAN VALVE CO, 2) KIRLOSKAR, 3) CRESCENT, 4) UPADYAYA or equivalent approved make with ISI make Class or pressure rating as specified in the schedule of quantities and conforming to I.S. 14846. The valve shall be of cast iron and / or spheroid iron having non-rising spindle with hand wheel & spindle of stainless steel

The items would be executed as per standards IS specifications including all materials, labour etc complete.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-I

Providing and fixing 100mm diameter non return valve with gunmetal working parts as per IS including.

Materials:-

Non-return valve shall be conforming to IS 9338 or IS 5312 as specified in schedule of quantities. The body, domes, covers, stuffing box, thrust plates, hand wheel, wedges, gland and cap shall be of cast iron not less than of grade FG200 and all in side working parts should be of any nonferrous or ferrous materials such as gun metal. Valve of single door pattern swing type shall have test pressure of PN1.6(50 to 125 mm size), PN1.0 (150 to 300mm size),PN0.6 (350 to 600 mm size)as per IS 5312 (part.1). Valve of multi door pattern swing type shall have test pressure of PN 0.6(400 to 1200 mm size), PN1.0 (400 to 1200mm size)as per IS 5312 (part 2).Valve shall be tested for the body and seat and the defective valve shall be replaced by the contractor at his own cost.

Workmanship :-

The valves shall be fixed in position in the pipeline as shown in the drawing or as directed with necessary socket or union, nuts etc. The screwed, flanged joint shall be made with few turns of fine Teflon tap taken over the threaded ends to obtain complete water tightness.

TESTING: -

The joints shall be tested to a hydraulic pressure of 1 MPa (10 kg/cm2) along with the testing of pipe line.

Mode of Measurement and Payment:

The rate shall be include cost of all labour, materials, tools and plant and material Teflon tap for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-J

Providing and fixing 80 diameter CI sluice/butter fly valve ISI marked with gun metal / SS working parts with stainless steel; spindle with necessary jointing materials filling etc complete as directed

Materials &Workmanship :-

The Sluice valve shall be of 1) INDIAN VALVE CO, 2) KIRLOSKAR, 3) CRESCENT, 4) UPADYAYA or equivalent approved make with ISI make Class or pressure rating as specified in the schedule of quantities and conforming to I.S. 14846. The valve shall be of cast iron and / or spheroid iron having non-rising spindle with hand wheel & spindle of stainless steel

The items would be executed as per standards IS specifications including all materials, labour etc complete.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-K

Providing and fixing 63mm Gun metal / SS single outlet type hydrant valve as per IS 5290 with ISI marked 75 mm inlet and 63mm female instantaneous coupling rubber washer and cast iron hand wheel operation with close and open direction as directed.

Materials &Workmanship :-

Yard or External Hydrants shall be as per IS:908 and the valve as per IS:5290. Hydrant shall have oblique female instantaneous pattern 63 mm diameter outlet with caps and chains. The hydrant shall be of gunmetal and flange inlet and single outlet conforming to IS:5290, a duck foot bend and flanged riser of required height to bring the hydrant to level above ground. The valve body, stop valve, check valve, nut, instantaneous female outlet and blank cap shall be of leaded-tin bronze conforming to Grade-II of IS: 318-1962. The valve spindle shall be of brass rod conforming IS: 320 - 1962.

The hand wheel shall be mild steel or cast iron washers gaskets shall be of rubber conforming to IS:638 - 1965 or leather conforming to IS:581 : 1969. The hydrant shall consist of stand post assembly and a masonry base 200 mm X 200 mm X 200 cm high and shall be made at the point where it comes out of the soil. The valve shall complete with hand wheel, quick coupling connection spring and blank cap.

The hydrant shall be laid on 150/100 diameter main tee of 100mm dia. Stand post column shall be fitted with 65 mm size instantaneous male coupling and 80 mm size C.I. duck-foot bend, C.I. sluice valve. 80 mm socket or flanged tail piece shall be as per site requirements. Hydrant and C.I. sluice valve shall be fixed in position as indicated in the drawing or as directed. They shall be fitted by means of flange joints on the pipe line.

Yard or External hydrant shall be controlled by a cast iron sluice valve. Each external hydrant shall be provided with two nos. 63 mm. Diameter 15 mtr. Long hose pipe with gunmetal male and female instantaneous type coupling, machined wound with G.I. wire hose of IS 636 type A and couplings to IS:903 with IS certification, gunmetal branch pipe with 20 mm nozzle conforming to IS:903.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-L

Providing and fixing 63mm dia Gun metal /SS branch pipe of standard length with 20mm bore hexagonal nozzle as per IS 903 with ISI marked as directed.

Materials &Workmanship :-

External hydrant shall be machined wound with 63mm dia Gun metal /SS branch pipe of standard length with 20mm bore hexagonal nozzle as per IS 903 with ISI marked.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-M

Providing and fixing 63mm Parole fire hose of approved grand conforming to IS 636 type B having crushing pressure of 37.20 kg/cm 2 of ISI marked of 15 mtr length fitting with necessary S.S 63mm delivery hose coupling as IS 903 with ISI mark bided with GI wire etc complete directed.

Materials &Workmanship :-

The item include supplying of approved synthetic hose pipe of 63 mm dia x 15 m as specified in schedule along with guaranteed bursting pressure of 32 kg km2 fitted with 63 mm dia. Instantaneous male and female brass/ SS coupling on each end as specified in schedule of quantities

The hose pipe shall be Unlined Flax Canvas for fire fighting conforming to IS 4927,Fabric Reinforced Rubber Lined Woven-Jacketed (RRL) fire hose type A or Synthetic Fibre Woven-Jacketed (SFWJ)/ Elastomeric fire hose type B conforming to IS 636 or controlled percolations (CP) Hose conforming to IS 8423 all with ISI mark as specified in schedule of quantities. The instantaneous male and female coupling shall be of brass / SS conforming to IS 903 with ISI mark.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-N

Mild steel box hose cabinet of 18SWG of suitable size with looking arrangement and 3mm thick glass panel to accommodate 1 Nos of hose pipe (15mtr) and 1 No. GM / SS branch pipe etc painting red colors etc as directed.

Materials &Workmanship :-

The item include supplying fabricated MS sheet metal hose pipe box shall be capable to accommodate 1 or 2 nos. hose pipe as specified in the schedule of quantities. The hose pipe box shall be fabricated of 18 gauge (as per item description) M.S. Sheet of size 750 x 450 x250 mm for accommodating single headed hydrant, 2 nos. of hose pipe and branch pipe with nozzle or hose branch pipe with nozzle specified in schedule of quantities. The box shall have centre opening, double glass front doors (cleat glass of 4mm thickness) with angle iron frame. The glass shall be firmly fixed by means of steel clips and screw with rubber beading. Hinges shall also be screwed and not welded. The corner members (frame) shall be of 25 x 25 x 3 mm thick angle. The hose box shall be lockable. The cabinet shall be painted with two coats of approved shade (Post office red) of enamel paint over a coat of approved primer

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-O

Providing and fixing first aid hose reel wall mounting fix type having side of the hose reel made of MS providing with 30mtr long thousand six length 25mm dia PVC nylon braided flexible hose with S.S shut off nozzle of approved quality etc complete as directed.

Materials &Workmanship :-

Material:

The item include supplying of approved rubber hose reel of 25mm dia x 30 m long with swinging drum with cut off outlet nozzle. The hose reel shall be high pressure rubber hose reel fitted on fixed type OR swinging wall mounted type drum of 25 mm diameter x 37 m (120‟) long conforming to IS:3876 and IS:884 to IS 884 along with 8mm dia. outlet cut off nozzle GM or chromium plated brass or stainless steel as specified in the schedule of quantities. The rubber tubing shall be of best quality and the nozzle shall be 165 mm diameter shut off type.

FIXING:

The swinging wall mounted drum fitted with rubber hose reel shall be fixed on necessary bracket on the wall with 4 nos. of C.P. brass screws. The hose reel shall be directly tapped from the riser through a 25 mm diameter pipe, the drum and the reel being firmly held against the wall by use of dash fasteners.

PAINTING:

The drum and brackets shall be painted with two coats of signal red enamel paint from outside and white enamel pain from inside.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-P

Providing and erecting connection of siemens connection with necessary fitting at our required place of the fire hydrant system as directed.

Materials &Workmanship :-

Connection of siemens connection with necessary fitting at our required place of the fire hydrant system shall be done as directed by Engineer In charge.

Mode of Measurement and Payment :

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for unit of **one Number.**

ANNEXURE-Q

Supplying installing, Testing & commissioning of SMB pump capacity 97M3/HR. at 70 mtr. Head with 40 HP

Material & Workmanship:-

The work shall be carried out or providing and installing testing commissioning of SMB pump of Standard make and made of 97 m3 / hr at 70.00 meter head with 40 HP TEPC type (Standard Make and made) three phase motor with base plate etc complete. The work involves to provide and erecting required materials for starter, joints etc complete.

Mode of measurement &Payment :-

The measurement of work shall be taken on number basis of complete item. Rate shall be for a unit of **one number.**

ANNEXURE-R

Supplying installation, Testing & Commissioning of control panel for above pump with Flanges nuts bolts gaskets etc.

Material & Workmanship:-

Providing & fixing consist of (full automatic star delta) necessary switch fuse over unit over load units single phasing prevent or or relay. Voltmeter, ammeters, with sector switch etc. for automatic operation for one no. of submersible pumps with suitable designed for 40 H.P. submersible pump set as directed. For automatic operation for one No. submersible pump with suitable designed for 40 H.P. motor pump set.

Mode of measurement &Payment :-

The payment of work shall be taken on number basis of complete item. Rate shall be for a unit of **one number.**

ANNEXURE-S

Wrapping and coating of 150 mm / 100mm MS pipe

Material & Workmanship:-

The coating material shall be as approved by Engineer in charge.

Pipelines to be laid underground buried in the soil shall be protected against corrosion by means of coating & wrapping as per IS: 10221. The pipe shall be painted with black japan colour in two coat as instructed by Engineer In Charge.

Then coating and wrapping shall be carried out in systematic manner such that uniform thickness of coating is obtained as per IS specification. Buried pipelines shall be laid in general with top of pipe 1(one) meter below the ground level. The minimum thickness of the coating & wrapping material shall be four (4 mm).

Mode of measurement &Payment :-

The payment of work shall be taken on running meter of pipe coated.. Rate shall be for a unit of **one Running Meter.**

ANNEXURE-T

Supplying installation, Testing & Commissioning of On/Off switch for all Hydrant Post.

Material & Workmanship:-

The work shall be carried out for Supplying installation, Testing & Commissioning of On/Off switch for all Hydrant Post as directed by Engineer in charge.

Mode of measurement &Payment :-

The payment of work shall be taken on number basis of complete item. Rate shall be for a unit of one number.

ANNEXURE-U

Design, supply & installation of safety signage made of zinc base glow in the dark rigid sheet with high luminous with pasted on 3 mm thick on rigid PVC foam sheet. Such as EXIT EMERGENCY EXIT. Do not use lift etc.

Material :

The material of of safety signage is good glow in dark. The sign are made in green / red colour. The size of the board shall be as per the size of the signages or as directed by Engineer In charge.

Workmanship:-

The signage is fixed on the wall with screw or gum tap so it can be fixed properly. as directed by Engineer in charge.

Mode of measurement &Payment :-

The measurenment of this item is taken the length and width of the signage lettering in cm. Rate shall be for a unit of **one Square meter of size of letters of signages**.

ANNEXURE-V

3C x 2.5sqmm cable with PVC pipe wiring

Material & Workmanship:-

The detail specification of this item shall be as per the Specification booklet for Electrical work attached with this tender document.

Mode of measurement &Payment :-

Rate shall be for a unit of **one Running meter.**

ANNEXURE-W

Supplying of Armored Aluminum cable PVC Insulated Approved mark 3.5C x 50 sq mm cable.

Material & Workmanship:-

The detail specification of this item shall be as per the Specification booklet for Electrical work attached with this tender document.

Mode of measurement &Payment :-

Rate shall be for a unit of **one Running meter.**

ANNEXURE-X

Pressure switch for Entire System

Material & Workmanship:-

Pressure switches shall be used to control the operation of the main fire pump and the jockey pump. The pressure switches shall be of bellows type with required differential as per the system (Schematic offered and the range shall be adjustable and suitable for the operation of the pumps). The pressure switch shall be snap action SPDT switch rated 10A @ 220V operated through a stainless steel diaphragm. The switch shall have a pointer of manual adjustment of set point, and all electrical connections shall be terminated in a screwed terminal connector. The entire unit shall be encased in a cold drawn steel enclosure.

Mode of measurement &Payment :-

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

Rate shall be for a unit of **one Number.**

ANNEXURE-Y

Pressure gauge for Entire System with fitting

Material & Workmanship:-

The pressure gauge shall be brass body syphon and cock dial type. Pressure gauge sensing elements shall be of continuous `C' bourdon type. Gauges shall be of 150 mm diameter dial stored enamel black finish case. Normal process pressure shall be gauged within 70% of full scale reading of the scale range. Accuracy shall be within 1.0 % of full scale range. Gauges shall have internal and external stop pegs for cover range protection of 125% of maximum range and zero point respectively. All gauges shall have bottom connection for local mounting. All gauges shall be provided with 3 way gauge isolation valve or lock union nut, with nipple and tail pipe, wherever required. The Dial shall have the calibration in MKS and FPS units and shall be properly calibrated before installation.

Mode of measurement &Payment :-

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

Rate shall be for a unit of **one Number.**

ANNEXURE-

Supply installing Testing & Commissioning of Fire Alarm System with Manual Call Point with Hotter and Panel System Set.

Material & Workmanship:-

The item includes supplying and fixing pendant Fire Alarm System with Manual Call Point with Hotter (per unit) and Panel System Set of specified diameter.(per riser) It shall be fixed to the M.S. seamless distribution pipe line connected to riser pipe if required.

Fire Hotter Or Fire Alaram

Fire hotter should be made from M.S. sheet box …and it should be paint with post office red colour. There should be best quality speaker for fire siren. (24-Vote DC) Upper part of the box should be covered by the Iron net or holes on the upper side of cover for the convenience of sound. Wire for power supply and for series should be ISI marked or Approved by fire officer or engineer in Charge or any reputed company. Size of M.S. Box not more than 180mm L x 130mm w x 60mm H.(one No.)

Manual Call Point

Manual call point should be made from M.S. sheet box and it should be paint with post office red colour. The Size of M.S. box not more than 115mm W x 90mm L x 55mm T (Each floor & Each Riser and Each Class). There should be a 4 mm glass in the centre of covered box and in the glass there should be pressurized switch. When the glass broken from **small steel hammer** (which is attach with manual call pt.) switch will release from the pressure and switch is ON. Wire for Power supply and for series should be ISI marked or Approved by fire officer or engineer in Charge or any reputed company. (28 no.)

Fire Alaram Panel

Fire alarm panel should be made from M.S. Sheet box. And it should be indicating lamp in red colour for each zone indication. The panel should be 24-votel DC power operated with batter back up. There should be a clear glass of 4 mm thick to see the zone indication.

Wiring System as per instructed or guided by Electrical Engineer In Charge/EIC.

Mode of measurement &Payment :-

The rate shall be include cost of all labour, materials, tools and plant and material for fixing etc., required after satisfactory installation and commissioning / completion of this item as specified as certified by engineer in charge.

Rate shall be for a unit of **Job Number**

Supply, Installing ,Testing& Commissioning of centrifugal end suction type Jocky pump (Electrical Driven) with electric motor having CI casting & bronze impeller & internal parts of motor. The rated capacity of 11m3/hr at 80 mtr head with the capacity of 2900 RPM,NPSh is 1.6 mtrs with 28% efficency etc complete including 11KW/ 15HP with 2900 RPM speed with 415V/50HZ frequency. TEFC enclosure and 50 mm suction amd 32mm discharge size with approx 235mm dia bronze impeller with SS 410 shaft sleeve including CI casing etc. complete as per manufracturer specification.

Material & Workmanship:-

The detailed specification of centrifugal end suction type Jocky pump (Electrical Driven) shall be with electric motor having CI casting & bronze impeller & internal parts of motor. The rated capacity of 11m3/hr at 80 mtr head with the capacity of 2900 RPM,NPSh is 1.6 mtrs with 28% efficency etc complete including 11KW/ 15HP with 2900 RPM speed with 415V/50HZ frequency. TEFC enclosure and 50 mm suction amd 32mm discharge size with approx 235mm dia bronze impeller with SS 410 shaft sleeve including CI casing etc. complete as per manufracturer specification. as directed by Architect and Engineer In Charge.

Mode of measurement &Payment :-

The payment shall be made on unit of one number for entire work with Supply, Installing ,Testing& Commissioning of centrifugal end suction type Jocky pump. Rate shall be for a unit of **one number.**

Supply Installation testing and commissioning of 57 Deg standard response and standard coverage sprinkler.

Material:

Outer body to be made of Brass. Inside swirl vane to be made of SS:304.

Technical Specifications:

57 Degrees Bulb type sprinkler. 13 lpm flow at 9 bar. ½" inlet connection.

Workmanship:

Sprinkler would be supplied and fitted in the required locations with Teflon windings.

Mode of measurements and payment

The rate shall be include cost of labour, materials, tools and plant and material Teflon tap for fixing etc. required after satisfactory installation and commissioning / completion of this item as specified as certified by architects and engineer in charge.

The rate shall be for a unit of **One Number.**