

Job-Supply & laying of fire water pipeline and equipments at Thinchupangkha, Paro-Bhutan

S No	Job Description	Unit	Quantity	Rate	Amount
A	Supply Part				
1	Supply of Gate Valve -- 150# CS TR13CR 400 NB as per attached specification and recommended make	No.	2		
2	Supply of Gate Valve -- 150# CS TR13CR 300 NB as per attached specification and recommended make	No.	2		
3	Supply of Gate Valve -- 150# CS TR13CR 250 NB as per attached specification and recommended make	No.	4		
4	Supply of Gate Valve -- 150# CS TR13CR 200 NB as per attached specification and recommended make	No.	2		
5	Supply of Gate Valve -- 150# CS TR13CR 100 NB as per attached specification and recommended make	No.	6		
6	Supply of STRAINER Y-TYPE FLGD CS(CST) 150# 300 NB as per attached specification and recommended make	No.	2		
7	Supply of CS NRV 150# 200 NB as per attached specification and recommended make	No.	2		
8	Supply of FLG SO CS A105 RF 150# 400NB as per attached specification and recommended make	No.	6		
9	Supply of FLG SO CS A105 RF 150# 300NB as per attached specification and recommended make	No.	8		
10	Supply of FLG SO CS A105 RF 150# 250 NB as per attached specification and recommended make	No.	12		
11	Supply of FLG SO CS A105 RF 150# 200NB as per attached specification and recommended make	No.	8		
12	Supply of FLG SO CS A105 RF 150# 150 NB as per attached specification and recommended make	No.	2		
13	Supply of FLG SO CS A105 RF 150# 100 NB as per attached specification and recommended make	No.	19		
14	Supply of FLG BLIND CS A105 RF 150# 400NB as per attached specification and recommended make	No.	2		
15	Supply of PIPE CS IS3589 ERW 6.35MM 400 NB as per attached specification and recommended make	M	18		
16	Supply of PIPE CS IS3589 ERW 6.35MM 300 NB as per attached specification and recommended make	M	12		
17	Supply of PIPE CS IS3589 ERW 6.35MM 250 NB as per attached specification and recommended make	M	680		
18	Supply of PIPE CS IS3589 ERW 6.35MM 200 NB as per attached specification and recommended make	M	12		
19	Supply of PIPE CS IS1239 ERW MM 100 NB as per attached specification and recommended make	M	8		
20	Supply of 750-500 GPM MANUAL OPRATED HVLR MONITOR as per attached specification and recommended make	No.	6		
21	Supply of VALVE DOUBLE HYDRANT MS/CS SIZE:100MM as per attached specification and recommended make	No.	13		
22	Supply of BOX HOSE MOC:MS SIZE:30X24X10 IN 4 RPS as per attached specification and recommended make	No.	17		
23	Supply of HOSE FIRE C/W CPL 63MM 15M as per attached specification and recommended make	No.	13		
24	Supply of 9 KG DCP fire extinguisher as per attached specification and recommended make	No.	13		
25	Supply of 75 KG DCP fire extinguisher as per attached specification and recommended make	No.	1		
26	Supply of 4.5 KG CO2 fire extinguisher as per attached specification and recommended make	No.	4		
27	Supply of 9 litre sand bucket	No.	4		
28	Supply of first aid box as per attached specification	No.	1		

B	Installation Part				
1	<p>FIRE FIGHTING PUMPS WITH ENGINE AND ACCESSORIES</p> <p>Shifting of pumps with prime mover and accessories from owner's storage points(within plant premises) to work site,assembly of sub-assemblies,placing the equipment on existing foundations,levelling including supply and fixing of shims,magnetic/mechanical alignment (before and after piping connection),grouting the supplied holding down bolts in the pockets already provided in the foundation using GP2 cement etc complete in all respects.</p> <p>Job includes installation of fuel tank with associated piping,exhaust pipe,drain pipe,panels,batteries with stand and wooden base,connecting of battery leads with cap, etc fixing of drain valve wherever required etc carrying out trial and start up runs and completing the work in all respects as per drawings,specifications and instruction of Engineer-in-charge.</p> <p>Scope of work also includes -</p> <ol style="list-style-type: none"> 1. Providing assistance to the OEM during commissioning of the pumps. 2. All civil works,electrical cabling and termination works & structural works shall be paid seperately under other items of BOQ. 3. Only Fire engine, fuel tank and panel shall be issued as free issue materials. All other associated items like cooling piping,fuel piping, exhaust piping, drain piping, battery stand with wooden base, any other accessories required for successful commissioning of fire engines are in contractor's scope <p>Capacity of the pump upto 273 KL/HR</p>	EA	2		
2	<p>Fixing of CS Gate Valve/PBBV/Plug Valve/Ball valve/NRV/Strainer/Butterfly/Globe Valve using CAF gasket</p> <p>Shifting of all types of valves from owner's storage points to contractors stores / worksite and installation of valves flanged for 150 lbs. rating including assembly of valves accessories if any and supplying and fixing of CAF gasket suitable for FF as per the case; bolts & nuts of approved IS brands like UNBRAKO; TVS; TATA or equivalent (after prior approval); double washers ; wherever required as per drawings; specification and directions of Engineer-in-charge.</p> <p>The valve is to be hydrotested at 15.8 kg/sq cm as directed by Engineer in charge prior to installation : Size 400 NB</p>	NO	2		
3	<p>Fixing of CS Gate Valve/PBBV/Plug Valve/Ball valve/NRV/Strainer/Butterfly/Globe Valve using CAF gasket</p> <p>Shifting of all types of valves from owner's storage points to contractors stores / worksite and installation of valves flanged for 150 lbs. rating including assembly of valves accessories if any and supplying and fixing of CAF gasket suitable for FF as per the case; bolts & nuts of approved IS brands like UNBRAKO; TVS; TATA or equivalent (after prior approval); double washers ; wherever required as per drawings; specification and directions of Engineer-in-charge.</p> <p>The valve is to be hydrotested at 15.8 kg/sq cm as directed by Engineer in charge prior to installation : Size 300 NB</p>	No.	4		
4	<p>Fixing of CS Gate Valve/PBBV/Plug Valve/Ball valve/NRV/Strainer/Butterfly/Globe Valve using CAF gasket</p> <p>Shifting of all types of valves from owner's storage points to contractors stores / worksite and installation of valves flanged for 150 lbs. rating including assembly of valves accessories if any and supplying and fixing of CAF gasket suitable for FF as per the case; bolts & nuts of approved IS brands like UNBRAKO; TVS; TATA or equivalent (after prior approval); double washers ; wherever required as per drawings; specification and directions of Engineer-in-charge.</p> <p>The valve is to be hydrotested at 15.8 kg/sq cm as directed by Engineer in charge prior to installation : Size 250 NB</p>	No.	4		
5	<p>Fixing of CS Gate Valve/PBBV/Plug Valve/Ball valve/NRV/Strainer/Butterfly/Globe Valve using CAF gasket</p> <p>Shifting of all types of valves from owner's storage points to contractors stores / worksite and installation of valves flanged for 150 lbs. rating including assembly of valves accessories if any and supplying and fixing of CAF gasket suitable for FF as per the case; bolts & nuts of approved IS brands like UNBRAKO; TVS; TATA or equivalent (after prior approval); double washers ; wherever required as per drawings; specification and directions of Engineer-in-charge.</p> <p>The valve is to be hydrotested at 15.8 kg/sq cm as directed by Engineer in charge prior to installation : Size 200 NB</p>	No.	4		
6	<p>Fixing of CS Gate Valve/PBBV/Plug Valve/Ball valve/NRV/Strainer/Butterfly/Globe Valve using CAF gasket</p> <p>Shifting of all types of valves from owner's storage points to contractors stores / worksite and installation of valves flanged for 150 lbs. rating including assembly of valves accessories if any and supplying and fixing of CAF gasket suitable for FF as per the case; bolts & nuts of approved IS brands like UNBRAKO; TVS; TATA or equivalent (after prior approval); double washers ; wherever required as per drawings; specification and directions of Engineer-in-charge.</p> <p>The valve is to be hydrotested at 15.8 kg/sq cm as directed by Engineer in charge prior to installation : Size 100 NB</p>	No.	6		

7	Fabrication, welding of the supplied SORF, 150# on the pipelines / fittings using approved make / size of welding electrode confirming to IS 814; with three or more runs of weld on the outside for sizes more than 150 NB and 2 runs for sizes less than 150 NB and one or more runs inside(depending on the size of the flange) including cutting and beveling ends as necessary; cleaning of internal / external surfaces where welding is to be done; grinding of welds; etc.; as directed. Welding procedure should conform to ASME SEC IX /API 1104. SIZE -400 NB	No.	6		
8	Fabrication, welding of the supplied SORF, 150# on the pipelines / fittings using approved make / size of welding electrode confirming to IS 814; with three or more runs of weld on the outside for sizes more than 150 NB and 2 runs for sizes less than 150 NB and one or more runs inside(depending on the size of the flange) including cutting and beveling ends as necessary; cleaning of internal / external surfaces where welding is to be done; grinding of welds; etc.; as directed. Welding procedure should conform to ASME SEC IX /API 1104. SIZE -300 NB	No.	8		
9	Fabrication, welding of the supplied SORF, 150# on the pipelines / fittings using approved make / size of welding electrode confirming to IS 814; with three or more runs of weld on the outside for sizes more than 150 NB and 2 runs for sizes less than 150 NB and one or more runs inside(depending on the size of the flange) including cutting and beveling ends as necessary; cleaning of internal / external surfaces where welding is to be done; grinding of welds; etc.; as directed. Welding procedure should conform to ASME SEC IX /API 1104. SIZE -250 NB	No.	12		
10	Fabrication, welding of the supplied SORF, 150# on the pipelines / fittings using approved make / size of welding electrode confirming to IS 814; with three or more runs of weld on the outside for sizes more than 150 NB and 2 runs for sizes less than 150 NB and one or more runs inside(depending on the size of the flange) including cutting and beveling ends as necessary; cleaning of internal / external surfaces where welding is to be done; grinding of welds; etc.; as directed. Welding procedure should conform to ASME SEC IX /API 1104. SIZE -200 NB	No.	8		
11	Fabrication, welding of the supplied SORF, 150# on the pipelines / fittings using approved make / size of welding electrode confirming to IS 814; with three or more runs of weld on the outside for sizes more than 150 NB and 2 runs for sizes less than 150 NB and one or more runs inside(depending on the size of the flange) including cutting and beveling ends as necessary; cleaning of internal / external surfaces where welding is to be done; grinding of welds; etc.; as directed. Welding procedure should conform to ASME SEC IX /API 1104. SIZE -150 NB	No.	2		
12	Fabrication, welding of the supplied SORF, 150# on the pipelines / fittings using approved make / size of welding electrode confirming to IS 814; with three or more runs of weld on the outside for sizes more than 150 NB and 2 runs for sizes less than 150 NB and one or more runs inside(depending on the size of the flange) including cutting and beveling ends as necessary; cleaning of internal / external surfaces where welding is to be done; grinding of welds; etc.; as directed. Welding procedure should conform to ASME SEC IX /API 1104. SIZE -100 NB	No.	6		
13	Making flanged joints /fixing blind flanges class 150 lb including supplying and fixing 3mm thick compressed asbestos fibre gasket conforming to IS 2712; hi-tensile bolts & nuts; double-washers,igreasing etc.; complete(hi-tensile bolts and nuts should be of recommended make like UMBRAKO;TVS;TATA or equivalent(after prior approval), all complete including necessary tools and tackles as directed by the Engineer-in-charge SIZE-400 NB	No.	2		
14	Making flanged joints /fixing blind flanges class 150 lb including supplying and fixing 3mm thick compressed asbestos fibre gasket conforming to IS 2712; hi-tensile bolts & nuts; double-washers,igreasing etc.; complete(hi-tensile bolts and nuts should be of recommended make like UMBRAKO;TVS;TATA or equivalent(after prior approval), all complete including necessary tools and tackles as directed by the Engineer-in-charge SIZE-250 NB	No.	4		

15	<p>Fabrication, welding, testing & commissioning of above ground pipeline (IS 1239/3589 pipes) : Transporting of all piping items from owners storage point(within plant premises) to work site ; fabrication including cutting,edge preparation,fitup,welding and erection of above ground pipeline over existing pedestals; overheads on racks and at all elevations ;connecting with equipment nozzles; tapping for pressure gauges; sample connection; etc using approved make / size of welding electrode conforming to IS 814. This also includes alignment; internal cleaning and flushing by water,hydrostatic testing at 15.8 Kg/cm2,rectification of any leakage & re-testing of pipelines to the specified pressure ;draining,drying completing all such works in all respects as per the specification; drawings and instruction of Engineer in charge. Rate also includes 100 % DP of total butt joints for above ground .The other considerations against the above item are also to be noted for quoting & execution purpose,</p> <ol style="list-style-type: none"> 1. Fabrication of pipeline branches (tapping by making puncture in the pipelines), stubs,nipples sampling points, vent points, drain points, are included in the above scope 2. Welding of bends,elbows ,reducers,Tees supplied as free issue materials are included in the scope of work but shall be paid seperately under other item of BOQ. 3 Painting of pipeline as per Painting Manual shall be paid seperately. 4. Water for flushing/Hydrotesting would be arranged by contractor at his own cost. 5. Scope of work also includes reconciliation of supplied piping materials and transportation of surplus free issue materials to Owner's storage yard within the plant premises. 6. Payment under this item would be made in RM excluding the lengths of bends/elbows/reducers/valves/TEE's. <p>Welding procedure should conform to ASME SEC IX/API 1104 as applicable</p> <p>SIZE 400 NB</p>	M	18		
16	<p>Fabrication, welding, testing & commissioning of above ground pipeline (IS 1239/3589) : Transporting of all piping items from owners storage point(within plant premises) to work site ; fabrication including cutting,edge preparation,fitup,welding and erection of above ground pipeline over existing pedestals; overheads on racks and at all elevations ;connecting with equipment nozzles; tapping for pressure gauges; sample connection; etc using approved make / size of welding electrode conforming to IS 814. This also includes alignment; internal cleaning and flushing by water,hydrostatic testing at 15.8 Kg/cm2,rectification of any leakage & re-testing of pipelines to the specified pressure ;draining,drying completing all such works in all respects as per the specification; drawings and instruction of Engineer in charge. Rate also includes 100 % DP of total butt joints for above ground .The other considerations against the above item are also to be noted for quoting & execution purpose,</p> <ol style="list-style-type: none"> 1. Fabrication of pipeline branches (tapping by making puncture in the pipelines), stubs,nipples sampling points, vent points, drain points, are included in the above scope 2. Welding of bends,elbows ,reducers,Tees supplied as free issue materials are included in the scope of work but shall be paid seperately under other item of BOQ. 3 Painting of pipeline as perPainting Manual shall be paid seperately. 4. Water for flushing/Hydrotesting would be arranged by contractor at his own cost. 5. Scope of work also includes reconciliation of supplied piping materials and transportation of surplus free issue materials to Owner's storage yard within the plant premises. 6. Payment under this item would be made in RM excluding the lengths of bends/elbows/reducers/valves/TEE's. <p>Welding procedure should conform to ASME SEC IX/API 1104 as applicable</p> <p>SIZE 300 NB</p>	M	12		
17	<p>Fabrication, welding, testing & commissioning of above ground pipeline (IS 1239/3589) : Transporting of all piping items from owners storage point(within plant premises) to work site ; fabrication including cutting,edge preparation,fitup,welding and erection of above ground pipeline over existing pedestals; overheads on racks and at all elevations ;connecting with equipment nozzles; tapping for pressure gauges; sample connection; etc using approved make / size of welding electrode conforming to IS 814. This also includes alignment; internal cleaning and flushing by water,hydrostatic testing at 15.8 Kg/cm2,rectification of any leakage & re-testing of pipelines to the specified pressure ;draining,drying completing all such works in all respects as per the specification; drawings and instruction of Engineer in charge. Rate also includes 100 % DP of total butt joints for above ground .The other considerations against the above item are also to be noted for quoting & execution purpose,</p> <ol style="list-style-type: none"> 1. Fabrication of pipeline branches (tapping by making puncture in the pipelines), stubs,nipples sampling points, vent points, drain points, are included in the above scope 2. Welding of bends,elbows ,reducers,Tees supplied as free issue materials are included in the scope of work but shall be paid seperately under other item of BOQ. 3 Painting of pipeline as perPainting Manual shall be paid seperately. 4. Water for flushing/Hydrotesting would be arranged by contractor at his own cost. 5. Scope of work also includes reconciliation of supplied piping materials and transportation of surplus free issue materials to Owner's storage yard within the plant premises. 6. Payment under this item would be made in RM excluding the lengths of bends/elbows/reducers/valves/TEE's. <p>Welding procedure should conform to ASME SEC IX/API 1104 as applicable</p> <p>SIZE 250 NB</p>	M	680		

18	<p>Fabrication, welding, testing & commissioning of above ground pipeline (IS 1239/3589) : Transporting of all piping items from owners storage point(within plant premises) to work site ; fabrication including cutting,edge preparation,fitup,welding and erection of above ground pipeline over existing pedestals; overheads on racks and at all elevations ;connecting with equipment nozzles; tapping for pressure gauges; sample connection; etc using approved make / size of welding electrode conforming to IS 814. This also includes alignment; internal cleaning and flushing by water,hydrostatic testing at 15.8 Kg/cm2,rectification of any leakage & re-testing of pipelines to the specified pressure ;draining,drying completing all such works in all respects as per the specification; drawings and instruction of Engineer in charge. Rate also includes 100 % DP of total butt joints for above ground .The other considerations against the above item are also to be noted for quoting & execution purpose,</p> <p>1. Fabrication of pipeline branches (tapping by making puncture in the pipelines), stubs,nipples sampling points, vent points, drain points, are included in the above scope 2.Welding of bends,elbows ,reducers,Tees supplied as free issue materials are included in the scope of work but shall be paid seperately under other item of BOQ. 3 Painting of pipeline as perPainting Manual shall be paid seperately. 4.Water for flushing/Hydrotesting would be arranged by contractor at his own cost. 5. Scope of work also includes reconciliation of supplied piping materials and transportation of surplus free issue materials to Owner's storage yard within the plant premises. 6. Payment under this item would be made in RM excluding the lengths of bends/elbows/reducers/valves/TEE's.</p> <p>Welding procedure should conform to ASME SEC IX/API 1104 as applicable 200 NB</p>	M	12		
19	<p>Fabrication, welding, testing & commissioning of above ground pipeline (IS 1239/3589) : Transporting of all piping items from owners storage point(within plant premises) to work site ; fabrication including cutting,edge preparation,fitup,welding and erection of above ground pipeline over existing pedestals; overheads on racks and at all elevations ;connecting with equipment nozzles; tapping for pressure gauges; sample connection; etc using approved make / size of welding electrode conforming to IS 814. This also includes alignment; internal cleaning and flushing by water,hydrostatic testing at 15.8 Kg/cm2,rectification of any leakage & re-testing of pipelines to the specified pressure ;draining,drying completing all such works in all respects as per the specification; drawings and instruction of Engineer in charge. Rate also includes 100 % DP of total butt joints for above ground .The other considerations against the above item are also to be noted for quoting & execution purpose,</p> <p>1. Fabrication of pipeline branches (tapping by making puncture in the pipelines), stubs,nipples sampling points, vent points, drain points, are included in the above scope 2.Welding of bends,elbows ,reducers,Tees supplied as free issue materials are included in the scope of work but shall be paid seperately under other item of BOQ. 3 Painting of pipeline as perPainting Manual shall be paid seperately. 4.Water for flushing/Hydrotesting would be arranged by contractor at his own cost. 5. Scope of work also includes reconciliation of supplied piping materials and transportation of surplus free issue materials to Owner's storage yard within the plant premises. 6. Payment under this item would be made in RM excluding the lengths of bends/elbows/reducers/valves/TEE's.</p> <p>Welding procedure should conform to ASME SEC IX/API 1104 as applicable 100 NB</p>	M	8		
20	<p>FIRE-FIGHTING DOUBLE HYDRANT & MANUAL HVLR MONITORS Taking delivery of hydrant/monitors from owner's store and fixing the same on fire fighting network as per layout including. testing at 15.8 kg/sq.cm with water before fixing and painting of hydrant/monitors with two coats of synthetic enamel paint of approved make and shade as directed.</p> <p>Above item will also be applicable for aqua cum foam monitors (short/long range).The scope of job includes supply, fixing with 3 mm thick gasket, suitable size nut bolts etc. complete in all respect as directed by the engineering I/C without Gate Valve.</p>	No.	21		

C	Supply & Installation				
	Supplying,Fabrication,testing & commissioning of CS bends (as per mentioned specifications and directed) suitable for 150 # API 5L Grade A/B Pipeline : Fabrication including cutting; edge preparation; fitup; welding and erection of bends on the pipeline over existing pedestals; overheads on racks and at all elevations.This also includes alignment; cleaning and flushing by water;hydrostatic testing at 15.8 kg/cm2;draining; drying; completing all such works in all respects as per the specification; drawings and instruction of Engineer in charge. 100 % DP testing of the welding shall be done in this item . Bend shall be supplied by contractor.				
1	Size of the bend 100 NB	No.	4		
2	Size of the bend 200 NB	No.	4		
3	Size of the bend 250 NB	No.	22		
4	Size of the bend 300 NB	No.	4		
5	Size of the bend 400 NB	No.	1		
	Supplying,Fabrication,testing & commissioning of CS Reducers (as per mentioned specifications and directed) suitable for 150 # API 5L Grade A/B Pipeline : Fabrication including cutting; edge preparation; fitup; welding and erection of reducers on the pipeline over existing pedestals; overheads on racks and at all elevations.This also includes alignment; cleaning and flushing by water;hydrostatic testing at 15.8 kg/cm2;draining; drying; completing all such works in all respects as per the specification; drawings and instruction of Engineer in charge. 100 % DP testing of the welding shall be done in this item . Reducer shall be supplied by contractor.				
6	Size of the reducer 150X200 NB	No.	2		
7	Size of the reducer 150X300 NB	No.	2		
8	Compound Glycerine Filled Pressure gauges - Supply; erection; commissioning of Pressure gauge with 150 mm dia dial gauge ; including cost materials and labour. Range : -1 to +4 kg/cm2. Supply and welding of necessary socket,pulsation dampners(SS construction) and isolation needle valve (SS) of 12 mm compatible (Class 150) for fixing the pressure gauge is included in the scope of this item. Calibration certificate to be provided with the pressure gauge. Recommended Makes : H-GURU /WAREE/WIKA or equivalent after prior approval	No.	2		
9	Glycerine Filled Pressure gauges - Supply; erection; commissioning of Pressure gauge with 150 mm dia dial gauge ; including cost materials and labour. Range : 0 to 20 kg/cm2. Supply and welding of necessary socket,pulsation dampners(SS construction) and isolation needle valve (SS) of 12 mm compatible (Class 150) for fixing the pressure gauge is included in the scope of this item. Calibration certificate to be provided with the pressure gauge. Recommended Makes : H-GURU /WAREE/WIKA or equivalent after prior approval.	No.	2		
10	Cables :Supplying, Laying; Testing and Commissioning Of 1.1 Kv Grade Cables ; Pvc/XLPEinsulated; Pvc Sheathed; FRLS Armoured copper Conductor Cables of Following Sizes As Per Is:1554 (Part-I), IS 7098 Part I & IS 1225-Latest Version and Sealed properly with Pvc Caps In Built-Up Ready Made Trenches; Overhead Cable trays;Pull through Pipes Or Exposed On Wall .Beam/Rakes; Trusses Tie/Beamor Embedded In Floor Or buried Directly Underground (Excavation, sand and bricks shall be paid under separte item of BOQ) Or Through G. I.Pipe.Unit Rates Quoted For Installationof Cables Shall Be Same Irrespective Of Route and Method Of Laying. The rates Shall Include Laying, Pulling Of Cables, Proper Dressing Of Cables on Cable Trays, Racks, Vertical Raceways and Supply and Installation Of saddles, Spacers and Nylon Chord For Tying As Required,Identification Tags At Strategic Points/ Every 50 Meter Intervals,aluminium Clamps. etc. Cable Identification Tags At Strategic Points/ Every 50 Meter Interval For Identification Of Cable; Etc. Complete.The Straight Through Joints/ tying with armour In The Cables Should Be avoided. Procedure for laying of LT cables.MAKES/SPECIFICATIONS 10 CORE X 2.5 MM SQ. 2XWY Scope also includes supplying and fixing Heavy Duty flameproof and Weather Proof Brass double Compression Type Nickle Plated Cable Glands Type of Glands/Terminations respective size. The job includes termination charges, making the requisite holes in the Gland Plate, fixing the glands,terminating the cables in the Glands, Earthing the cable Armour, neatly clamping the Cables in the Cable Alleys/ Wiring Troughs and connecting to the terminals/ marking with wire number Ferrules/ Cable Tags (Aluminium Minimum 2 mm thick and 20 mm wide at the termination point), etc. Job also includes consumable items like Crimping paste, insulation Tapes, etc, stripping of cable Insulation, fixing of cable glands, putting PVC hoods etc complete.	RM	20		

11	Supplying and laying in position RCC of specified nominal mix using 20mm and down size graded crushed stone aggregate in sub structure of all types e.g. trenches, culverts, manholes, pipe encasement, catchpits, drains, pits, etc., including placing of concrete, supplying pockets, openings, recesses, chamfering wherever required etc., vibrating, tamping, curing and rendering if reqd. to give a smooth and even surface etc. all complete (excluding the cost of reinforcement, but including the cost of centring and shuttering) for all depths below and up to plinth level in any shape, position, thickness etc. all complete as specified and directed. Only steel shuttering will be used so as to obtain required finish. The height of shuttering shall not exceed 1.5 m per lift of concrete.: 1:1.5:3 (1 cement: 1.5 coarse sand: 3 grade stone aggregate 20 mm nominal size)	Cu.M	8		
12	Supplying and placing HYSD steel reinforcement of Grade 500 (TMT) conforming to IS 1786 in position for RCC works including straightening, cutting, bending, placing in position and binding with 16 SWG black soft annealed binding wire at every intersection, supplying and placing appropriate cover block all complete including cleaning and making it free from oil, grease etc. complete for all heights and depths and conforming to relevant IS code (Make: SAIL, TATA, JSW, ESSAR, VIZAG STEEL or approved equivalent make conforming to IS code)	Kg	700		
13	Providing and laying PLAIN CEMENT CONCRETE for all depths below and above plinth level in foundations, drains, fillings, non-suspended floors, pavements & ramps or any other works etc. including the cost of position cement concrete of specified grade including the cost of centring and shuttering, tamping, ramming, vibrating, curing, in any shape, position, thickness and finishing the top surface rough or smooth, etc. all complete as per directions of Engineer-in-charge. - 1:2:4	Cu.M	1		
14	BRICK MASONRY: Providing and laying Brick work with bricks having compressive strength not less than specified and conforming to BIS std. of specified class and above, satisfying efflorescence, water absorption and dimension test as per IS code) in foundation, plinth & above plinth in Cement mortar 1:5 (1 cement: 5 Coarse sand) as per specifications in one or more brick thickness including soaking of bricks, providing openings, recesses, scaffolding, staging, curing, finishing the joints flush below ground level and raking out joints etc. all complete, as per directions of Engineer-in-charge. CL 50 (BIS Class 50, Compressive strength 50 kg/cm ²)	Cu.M	4		
15	Supply, fabrication and erection in position; bolted and/or welded structural steel works at all levels; including all built-up sections / compound sections made out of rolled sections and / or plates intrusses; rafters; purlins; wind ties; columns; portals; platforms; staircases; (excluding chequered plates, swing ladders, foundation bolts and gratings) ladders; stoppers; brackets sag rods; supports for equipment and accessories; hand railings posts cutting to required size as per approved drawings; straightening if required bolting/ welding of joints (including sealing the joints of the box sections with continuous welding wherever specified) finishing edges by grinding; fixing in line and level with temporary staging and removal of same after erection; grouting with ordinary grout or non-shrink grout as specified; including preparation of detailed fabrication drawings, Cost of painting as specified below, Complete in all respect as directed by Engineer-in-charge. Cost of nutbolts to be borne by contractor. NOTE : 1. All structural steel shall conform to IS-2062 & IS-808 and of SAIL/TISCO/ISCO/ JINDAL/ ESSAR/ VIZAG STEEL or equivalent make with prior approval. 2. The structure may be Pre-fabricated with bolting arrangements by making necessary holes, surface preparation by manual cleaning/ wire brushing etc and painting except final coat, which will be carried out after completion of the erection works. Min. hot works will be allowed at site. It is vendors responsibility to verify the actual measurements at site before making the bolting schedule. 3. PAINTING SPECIFICATIONS : The cost includes surface preparation by manual cleaning/wire brushing etc. Primer Coat : After surface preparation one coat of inorganic zinc silicate @ 65 microns. two coats surface tolerant epoxy primer @ 125 microns Intermediate Coat: One coat of epoxy high built micaceous iron oxide @ 100 microns. Top Finish Coat : 2 coats of acrylic aliphatic polyurethane @ 30 microns per coat. Total DFT 225 microns minimum. The rate includes the cost of materials, consumables, labour, tools and plants, transportation, loading, unloading, machinery, safety requirements incidental charges if any. all complete	Kg	1000		
16	CEMENT PLASTER Providing cement plaster finished including cleaning, hacking of base surfaces, scaffolding, curing, finishing etc. all complete for all heights as per specifications and directions of Engineer-in-charge including grooves, bands, drip moulder where ever required as specified. also including providing 20 gauge chicken wire mesh stretched tight at all RCC/ PCC and masonry meeting points in 300mm wide strips (150mm on each surface) fixed with G.I. "U" type nails before plastering. (Payment will be made separately for chicken wire mesh). 12mm thick with 1:5 (1 cement: 2 parts of fine sand: 3 parts of coarse sand)	Sq.M	20		

17	Earth work in excavation upto required depth below existing ground level upto required depth including removal of vegetation, shrubs and debris cutting and dressing the sides in slopes and bottom, levelling, grading and ramming of bottoms, bailing out of water, supplying of Temporary supports to existing services line like water pipes, sewage pipes, electric overhead and u/g cables etc all if encountered, shoring, strutting and disposal of excavated earth anywhere inside premises as directed by the Engineer in Charge, complete. Payment shall be made as per the actual measurement but not more than excavation plan. Also no payment would be made for extra excavation for making slopes etc. The excavated earth to be spread in loose 150 mm thick layers, watered, rolled and well consolidated using suitable compactors. The density to be achieved shall not be less than 90% of the density obtained in the laboratory (modified proctor method) Depth upto 1.5 M normal soil	Cu.M	10		
18	Surface preparation by copper slag blasting to SA 2.5 finish of Swedish standard SIS 05 5900 (external surface of Pipe Line/Structure as specified) including all materials, consumables, labour; scaffolding; equipments etc. complete. Rate shall be paid in M2 basis of the blasted surface	Sq.M	585		
19	Supplying and applying primer on the prepared surface including all labour; scaffolding; consumables; equipments; primer etc. complete as per specifications (primer shall be applied within 8 hours of surface preparation). Paint shall be as per attached list of recommended manufacturers. One coat of Inorganic zinc silicate primer at 65 micron. Rate shall be paid in M2 basis of the painted surface.	Sq.M	585		
20	Supplying and applying intermediate coat on the prepared pipe surface including all labour; scaffolding; consumables; equipments; primer etc. complete as per specifications (primer shall be applied within 8 hours of surface preparation), Paint shall be as per attached list of recommended manufacturers. One coat of tie coat epoxy coating of 75 micron. Rate shall be paid in M2 basis of the painted surface.	Sq.M	585		
21	Supplying and applying finish paints on the prepared pipe surface including all labour; scaffolding; consumables; equipments; primer etc. complete as per specifications Paint shall be as per attached list of recommended manufacturers. Finish Coat : Two coats of acrylic aliphatic polyurethane at 30 microns/coat in Aluminium shade/Fire Red/Luminous Yellow/golden yellow shade as per IS : 5. Rate shall be paid in M2 basis of the painted surface.	Sq.M	585		
22	EARTHING : Supplying, providing and constructing GI Pipe Earth electrodes as Per IS:3043-(Latest), Earthing drawing; 100 mm Dia; GI Pipe Medium Class 'B' 3000 mm long complete with Earth Pit and all necessary materials including excavation of Earth Pit, filling with homogeneous layer of Charcoal and salt, Back filling, providing necessary Brick Masonry work, Plastering, Cast Iron cover hinged to C. I. Frame fixed with wire mesh; Test links for connecting the earth Grid and Earth Electrode etc. complete. This also includes testing of Earth resistance after completion and must be made within acceptable Limits as per Indian Electricity Rules and submitting the Test Report To Engineer-in-charge. Minimum depth of burial shall be 3000 mm, homogenous hygroscopic material should not be less than 1 cum. & should cover 300 mm around the electrode up to a height of 2500 mm. The scope of work also includes providing earth pit markers indicating resistance, test date, next due date etc. as per std. earthpit boards on GI plate of size @ 300 x 300 mm x 2mm thick with a GI hollow section stand of 25 mm square & length @ 1m; grouted in PCC 1:4:8 at a depth of @ 300 mm below the ground level and the top of plate should be @ 700 mm above the ground level.	No.	2		
	Earthing : Supply, laying /installing, connecting and testing following Hot Dip galvanised wires/ strips of following sizes for grounding the system. Wire/ strip shall run on wall, Column, Roof, Truss, Tie buried directly underground at a depth of 600 mm including excavation and backfilling, passing through installed/ laid pipes, neutral of the system to be embedded in floor. Installation shall include supply and installation of GI clamps; GI spacers; GI hardware; GI pipe sleeves, binding wires, nuts, bolts, washers, paints, etc. while passing through wall or coming out of Floor chiseling of wall/Floor & making it good is also included. The scope shall include connections, end termination, jointing, supply of fixing clamps, binding wires, bolts, nuts, washers, paints, etc. The jointing of earth conductors shall be by bolting/welding/bracing/ soldering be as per IS:2709. The Jointing of strips shall be done by overlapping and with 2 sets of G.I. nut bolt & spring washer spaced at 50mm. The welded portion shall be covered with bitumen compound. Conductors required for gland earthing shall be included in the following items. If separate structural supports, pipes, the same shall be covered by separate rates. GI coating shall be 85 micron. Double Bolting of GI strips should be done with SS bolts with required nuts/washers etc. Welding of flats should be neatly covered with bitumen paint				
23	50X6 mm	M	10		
24	25X6 mm	M	20		
25	Supply of vertical centrifugal submersible pump (Specification attached)	No.	2		