	DAFFPL				
	BOQ FOR RCC RING WALL SAND PAD FOUNDATION, SUPPLYING, FABRICATION, ERECTION & COMMISSIONING OF CR VERTICAL TANKS & ALLIED CIVIL WORKS				
	SUPPLY (A)				19-12-2017
				Rev	25-01-18
SL. No.	DESCRIPTION OF ITEM	QTY	UNIT	Unit Rate	Amount
	REINFORCEMENT & EMBEDMENTS				
1	Supplying high yield strength deformed bars Thermo Mechanically Treated Bars Fe- 500 OR Fe-500 d grade, Conforming to as per IS: 1786 for all R.C.C works.	20.00	T		
2	Supplying MS foundation bolts with necessary GI nuts and sizes,with suitable anchorage all conforming to relevant Indian Standards / approved drawing.	200.00	Kg.		
	STRUCTURAL STEEL				
3	Supplying of all types of structural steel work in rolled steel joints, channels, angles, tees, flats, plates, lattice members built up / compound sections in columns, portals, girders, beams, bracings, trusses, purlins, rafters, staircase, steps, hand-railings, walkway, cat ladder with cages, toe plates, side walling, trestles, Conveyor gantries grating, chequred plate etc. including gusset plates, anchor plates etc., including site and shop fasteners, riveting, bolting, welding at shop or work site at all heights etc. & including applying approved two coat of primers and enamel painting Technical specification. Complete as per drawing and direction of Owner / Consultant. (All material supply is in contractor's scope including paints)	1.00	T		
4	Supply of Anchor bolt M30 x 1000 LG Material Gr A307.	24.00	Nos		
5	Supply of 1" pipe(SA 106 Gr. B) Sch. 40 in tank ring wall complete as per drawing.	110.00	Meter		
	TANK FABRICATION, ERECTION & COMMISSIONING				
6	Supplying of bottom, shell, wind girders, fixed cone roof as per our specifications and drawings with including transportation, Loading at stockyard and Unloading of Steel Plates at site and with all other items such as labour, materials, consumables, water, power, etc. supplied by the contractor. Steel plates for web and flange of wind girders, reinforcement plates for shell / roof manholes, nozlles, gusset plates etc, shall be in the scope of contractor and included under this item.	245.00	MT		
	a) CRVT - 18 M Dia x 20 M Ht Fire Water Tank - 2 no				
7	Supplying the structurals for CR vertical tank of following size such as rafters, curb angles, handrailing on tank shell, roof & stairways, spiral straicase with galvanised electro forged landing platforms and gratings, platform to approach combined gauge well, pipe supports on tank shell, shear plates, pad plates on shell for welding of spiral staircase and hand railing, base plates to tank bottom, as per specifications and standard drawings.	35.00	MT		
	a) CRVT - 18 M Dia X 20 M High Fire Water Tank				
8	**SUPPLY OF MECHANICAL LEVEL GAUGES FOR TANKS**	**2.00**	**NOS.**		
9	**SUPPLY OF PIPES**				
	STEEL PIPES,Material: IS1239 / IS3589, Black pipe as per specifications				
9.1	600 NB, PE SCH 20	M	36.00		
9.2	500 NB, PE SCH 20	M	47.00		
9.3	300 NB, PE SCH 20	M	47.00		
9.4	150 NB, PE SCH 40	M	90.00		
9.5	100 NB, PE SCH 40	M	129.00		
10	**SUPPLY OF FLANGES**				
	CS, Slip on Flanges, Material: A-105, END-RF/125AARH As per ASME B16.5				
10.1	100 NB, 150#	Nos.	6.00		
10.2	150 NB, 150#	Nos.	2.00		
10.3	200 NB, 150#	Nos.	2.00		
10.4	300 NB, 150#	Nos.	8.00		
10.5	500 NB, 150#	Nos.	8.00		
10.6	600 NB, 150#	Nos.	2.00		
11	**SUPPLY OF BLIND FLANGES**				
	CS,Blind Flanges, Material: A-105, END-RF/125AARH As per ASME B16.5				
11.1	100 NB 150#	Nos.	2.00		
11.2	200 NB 150#	Nos.	1.00		
11.3	300 NB 150#	Nos.	2.00		
11.4	500 NB 150#	Nos.	2.00		
12	**SUPPLY OF PIPE FITTINGS**				
	CS Elbows, Material: ASTM A 234 Grade WPB Seamless, Beveled end and dimensions as per ASME B 16.9 & all fitting should be forged fitting				
	90 Deg LR (1.5D)				
12.1	100 NB, SCH.40	Nos.	7.00		
12.2	200 NB, SCH.40	Nos.	1.00		
13.3	300 NB, SCH.20	Nos.	5.00		
12.4	500 NB, SCH.20	Nos.	5.00		
12.5	600 NB, SCH.20	Nos.	2.00		
	45 Deg LR (1.5D)				
12.5	100 NB, SCH.40	Nos.	2.00		
12.6	200 NB, SCH.40	Nos.	1.00		
12.7	300 NB, SCH.20	Nos.	2.00		
12.8	500 NB, SCH.20	Nos.	2.00		
13	**PROCUREMENT & SUPPLY OF TEE**				
	CS Tee, Material: ASTM A 234 Grade WPB Seamless, Beveled end and dimensions as per ASME B 16.9 & all fitting should be forged fitting				
	CS Tee				
13.1	100 NB x 100 NB,SCH40 x SCH40	Nos.	3.00		

13.2	200 NB x 200 NB,SCH40 x SCH40	Nos.	1.00		
13.3	300 NB x 300 NB,SCH20 x SCH20	Nos.	3.00		
13.4	500 NB x 600 NB,SCH20 x SCH20	Nos.	3.00		
14	**SUPPLY OF CARBON STEEL GATE VALVES (ANSI B 16.10) AS PER SPECIFICATION**				
14.1	100 NB, 150#	Nos.	4.00		
14.2	300 NB, 150#	Nos.	2.00		
14.3	500 NB, 150#	Nos.	2.00		
15	**PROCUREMENT & SUPPLY OF MECHANICAL LEVEL GAUGES FOR TANKS**	**Nos.**	**2.00**		
16	**Supply of Fire Fighting Equipments**				
16.1	Double Fire Hydrant as per specifications	Nos	2.00		
16.2	Water cum Foam Monitor as per specifications	Nos	1.00		
	Amount (A)				
	GST @ % on Amount (A)				
	Total Amount including taxes				

Total Amount in Words:

Notes:	
1	Construction Water, loading and boarding, Site Storage with watch and ward, receipt, unloading, shifting material to store and internal shifting to site shall be included in Vendor's scope.
2	The unit rates as quoted to arrive at above total price shall be firm and inclusive of all taxes, duties, levies, transportation etc. No separate payment shall be made for site mobilization / demobilization, insurance etc.
3	The Schedule of Rates should be read with all the other sections of the tender.
4	The tenderer shall be deemed to have studied the drawings, specifications and the details of work to be done within the time schedule and to have acquainted with the conditions prevailing at site. Site visit is mandatory.
5	The quantities shown against the various items are only indicative of the quantum of work and it may vary to any extent. Billing will be done as per actual.
6	The rate quoted shall be inclusive of all work as mentioned in the scope of work (Technical Specifications).
7	All the items of work in the schedule of rates shall be carried out as per specifications, drawings and instructions of the Engineer-in-Charge.
8	The rates quoted by tenderers shall be inclusive of all costs for removal and re-installation, should any defects occur or modifications are required during testing, calibration and loop tests and no extra claims for such works shall be entertained.
9	Supply of Pipeline and associated fittings should be done after carrying out site survey and prior approval to be obtained from DAFFPL & DAFFPL representatives.

Signature of Bidder along with company seal

	DAFFPL				
	BOQ FOR RCC RING WALL SAND PAD FOUNDATION, FABRICATION, ERECTION & COMMISSIONING OF CR VERTICAL TANKS & ALLIED CIVIL WORKS				
	INSTALLATION WORKS (B)				
				Rev	25-01-18
SL. No.	**DESCRIPTION OF ITEM**	**QTY**	**UNIT**	**Unit Rate**	**Amount**
	RCC RING WALL FOUNDATION FOR TANKS				
	EARTHWORK				
	a) The prices for all excavations are to include for removing and clearing away all shrubs, bushes, roots etc. b) The prices are also to include for all leveling and ramming foundation beds, trimming of sides and bottom grading to proper level as required. c) Removal and carrying shall include for all loading, unloading and handling as may be necessary and also all necessary means of transport (Mechanical or manual as required). d) The prices are also to include removal of water accumulated due to subsoil seepage, rains or from any kind of sources, either by pumping or by bailing or by any suitable method like well point dewatering etc. if reqd. No extra payment shall be made for dewatering. This also includes for draining out the pumped water to nearby available drainage system. e) Normally payment of earth work shall be made according to the sizes of PCC for trenches / pits as contemplated in the working drawings. Extra due to widening or deepening of trenches / pits shall not be paid for except for the cases where water / acid proofing would be accepted as per working drawings in such case the mode of measurement shall be as per IS : 1200 f) Nothing extra shall be paid for sorting / screening of excavated materials to obtain good earth for filling. g) Nothing extra shall be paid on account of any lift for disposal of excavated materials h) Where excavation are made in excess of the depth required, the contractor shall at his own expense fill up to the desired level with lean concrete of mix 1:5:10 (1 Cement: 5 Coarse sand: 10 Graded stone aggregate 40 mm nominal size. i) Rate shall include Royalty, Taxes, etc., levied by the local authorities, all transportation, loading and unloading, etc., and nothing extra will be paid on this account. j) Soft / loose soil also includes filled up earth / moorum.				
1	Earthwork in excavation (including all lead and lifts / depth) in all types of soils such as ordinary / hard rock and soil, RCC, Kankar, Murrum, gravel, pebbles, bajri, removal of shrubs, uprooting the tree roots etc. and all types of material encountered in excavation including excavation of saturated soils, mud, sludge etc. bailing out of sub-soil water or any other water, provision of shuttering, shoring etc. Available excavated earth free from all foreign matters, boulders shall be back filled in plinths, sides of foundation, within plot in layers not exceeding 150 mm thick, watering and consolidating of the same with hand / machine tamping and as per specifications / direction of Engineer-in-charge including disposing of all debris, unserviceable materials to an un-objectionable place as per directions of site Engineer.				
	for excavation upto 1.5 M below the existing ground level.	975.00	Cu.M		
	for excavation beyond 1.5 M to 3 M below the existing ground level.	975.00	Cu.M		
	for excavation beyond 3.0 M to 4.0 M below the existing ground level.	650.00	Cu.M		
2	Supplying and filling coarse sand of Zone III as per IS Code, in plinth, under floors, under gorund tanks & tank foundations etc. in layers not exceeding 200mm in depth, each deposited layer shall be compacted by mechanical vibration and watering and dressing complete as per technical specifications and drawings.	1,800.00	Cu.M		
	CONCRETE WORK / REINFORCED CONCRETE WORK				
	a) The prices for concrete in beds and slabs are to include for laying on any type of sub grade, laying to falls, or cambers and for preparing surfaces to receive concrete. b) All concrete surfaces shall be finished to a fair face to give a smooth and even surface. Nothing extra shall be paid on this account. c) The prices are to include leaving pockets, cut outs and holes and to provide wooden boxes or any other suitable arrangements in RCC for bolt holes in slab, beams, walls, foundation of equipments etc. as per approved working drawing. (Nothing extra shall be paid on this account). d) No deduction in RCC quantity shall be made for pockets and nothing extra shall be paid for providing pockets as mentioned in para 'C' above. e) Measurement of opening in concrete work/RCC work: For measurement of openings in concrete work / RCC works, shall be as per IS: 1200 Part-III. f) All pocket holes are to be properly covered by suitable means so that dirt, rain water etc. etc., should not enter the pockets / holes etc. (Nothing extra shall be paid on this account.) g) Threads of bolts etc. which have already been fixed in the pockets are to be greased and polythene sheet properly covered with gunny bags to protect it from damages from all sources. (Nothing extra shall be paid on this account.) h) The prices shall include for all rebating, trotting, chamfering weathering, molding etc. to accord with the details shown on the approved working drawings i) Nothing extra shall be paid for any intricate concrete work for foundations of equipments and machinery (dynamic / static), RCC wall and other superstructure works or any delay in concreting in small and thin sections in PCC or RCC works. j) The prices for concrete are to include for hoisting and / or lowering to any height and / or depth required and in any type of form work, packing around reinforcement where required and finishing the surfaces, to fair and even surface. k) The prices shall include working up or hacking of concrete surface for providing keys for further concrete work and shall also include all plane, rebated or grooved constructional and other joints. l) The design mixes of all controlled concrete of various grades shall be established by the contractor on the basis of weigh batching, at the beginning of work. In all concrete / RCC work graded coarse aggregate shall be used. Any concrete work with honey comb shall be rejected and the work has to be redone by the contractor at his own cost. m) Concrete admixtures for workability if necessary, may be used in RCC if decided by Engineer-in-charge. No extra payment for mixing etc, shall be made on this account. n) Machine and equipment foundations shall mean all foundations including pedestals of vessels, towers, pumps, compressor motors, or any other equipment or machinery (both static and dynamic), pipe supports, etc. and the				
	Following additional points to be noted for Ready Mix Concrete (RMC)				

	a) Ready mix concrete (RMC) of approved vendor at the site of casting including coordinating with Engineer-in-charge, prior to casting, making all arrangement to unload the concrete so as to ensure that RMC is not detained for unloading, placing the concrete at site, vibrating, taking concrete cubes, testing, curing the concrete etc. complete in relevant items. b) Necessary schedule will have to be submitted by agency 3 days in advance so that proper coordination with Engineer-in- charge is done. c) It shall be ensured that shuttering done by contractor shall be adequate to withstand pumping pressure. d) Any loss of material shall be contractor's responsibility. e) Submission of test results at RMC mixing plant site as well as casting site shall be contractors responsibility f) Desired design mix shall be got approved from Engineer-in charge before placing order for RMC. g) Any toll taxes applicable to be borne by the contractor. h) Any other taxes as levied by Govt. from time to time shall be deemed to be inclusive in the contract. i) Approved brand of 43 grade cement shall be used for preparing RMC & Cement shall be tested as per relevant IS Codes. Cement supply shall be in contractor's scope.				
3	PLAIN CEMENT CONCRETE				
	Providing and laying cement concrete in foundation, footings and base for columns / walls including proportioning, mixing in mechanical mixer, laying vibration by means of mechanical vibrators, curing etc. complete including the cost of shuttering:-				
3	Concrete of mix 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	45.00	Cu.M		
4	REINFORCED CEMENT CONCRETE				
	IN FOUNDATION & PLINTH:				
4.1	Providing and laying reinforced cement concrete of grade M - 25 (using 20 mm, nominal gauge graded stone aggregate) manufactured in fully automated batching plant and mechanically vibrated and finished to a fair face including the cost of centering, shuttering, including providing weep pipe as per drawing.etc. but excluding reinforcement, in foundation and plinth, for rafts, footings, bases of columns, pedestals, beams, walls, columns, slabs, machine and equipment foundations, box sections, lift shaft, pipe supports, etc., complete in all respects as per direction of Engineer-in-Charge. The quantity of cement shall be minimum 410 Kg./Cu.M. of concrete.	200.00	Cu.M		
	IN SUPERSTRUCTURE:				
4.2	Providing and laying reinforced cement concrete of grade M-25 (using 20 mm, nominal gauge graded stone aggregate), machine mixed, mechanically vibrated and finished to a fair face including the cost of centering, shuttering, etc. but excluding reinforcement, in superstructure up to 6m heights above plinth for columns, pillars, posts, attached pilasters, portals, struts, inclined posts, pedestals for equipments and similar vertical members, walls including walls of any thickness, shape or size including attached buttresses, pilasters, lintels, beams, portal beams, brackets, girders, cantilevers, suspended floors, roofs, staircase roofs and their supports, balconies, staircase waist and landing slabs and steps including preparation of top surface and finishing, nosing, etc. Chajja, fins, roof gutters, drop wall not exceeding 15 Cm. in thickness, railing, parapet wall, window sills, complete in all respects as per direction of Engineer - in - Charge.	20.00	Cu.M		
5	Providing grouting in pockets with cement concrete 1: 1: 2 (1 cement: 1 coarse sand : 2 coarse aggregate 10 mm nominal gauge) with approved anti shrinkage compound as per manufacturer's specifications (payment for anti shrinkage compound shall be made separately) with necessary finishing etc all complete as per directions of Engineer–in-Charge.	15.00	Cu.M		
6	Extra for providing and mixing MONOLITHEX or any other approved equivalent anti shrinkage compound as per manufacturer's specifications by weight of cement in grouting work as specified in the drawing and as directed by Engineer- in-Charge.	15.00	Kg.		
	REINFORCEMENT & EMBEDMENTS				
	a) Wastage in cutting will not be paid for. Only steel actually fixed in position will be paid by the linear measurement i/c hooks, chairs, dowels and laps. Only authorised hooks and laps approved in bar bending schedule shall be paid. Lapping of bars will be allowed only where the required bar length exceeds the standard lengths available. All other laps provided unless otherwise specified in the drawings shall not be measured and paid for. Weight of binding wire shall not be measured for payment. The prices are to include for the supply of all Reinforcement & Embedment at site by the Contractor				
	b) Reinforcement are to be tack welded in addition to binding by 18 SWG annealed wire wherever necessary to impart fixity. Bars of 28 mm dia & above shall also be provided with stitch weld in additions to binding with annealed iron wire and nothing extra will be paid for stitch welding. Stitch welding shall be done as per IS specifications. No extra claim shall be entertained on this account.				
7	Cutting, bending, hoisting, placing in position with proper precast concrete block cover and binding with 18 SWG annealed wire, high yield strength deformed bars Thermo Mechanically Treated Bars Fe- 500 OR Fe-500 d grade, Conforming to as per IS: 1786 for all R.C.C works including all necessary handling at all heights and depths complete in all respects and as per direction of the Engineer-in-Charge.	20.00	T		
8	Fixing of MS foundation bolts with necessary GI nuts and sizes,with suitable anchorage all conforming to relevant Indian Standards / approved drawing	200.00	Kg.		
	STRUCTURAL STEEL				
9	De-rusting, fabricating, erecting, hoisting and fixing in position with necessary welding and / or bolting with MS bolts conforming to property class 4.6 of I.S:1367 at all height as per approved fabrication drawings of all types of structural steel work in rolled steel joints, channels, angles, tees, flats, plates, lattice members built up / compound sections in columns, portals, girders, beams, bracings, trusses, purlins, rafters, staircase, steps, hand-railings, walkway, cat ladder with cages, toe plates, side walling, trestles, Conveyor gantries grating, chequred plate etc. including gusset plates, anchor plates etc., including site and shop fasteners, riveting, bolting, welding at shop or work site at all heights etc. & including applying approved two coat of primers and enamel painting Technical specification. Complete as per drawing and direction of Owner / Consultant. (All material supply is in contractor's scope including paints)	1.00	T		
10	Fixing of Anchor bolt M30 x 1000 LG Material Gr A307.	24.00	Nos		
	MISCELLANEOUS				
11	Making leak detection membrane by providing Black Low Density Ployethylene (LDPE) film, 4000 gauge (=1mm thickness) as per IS 2508-1984. Joints in the film shall be heat-sealed insitu during laying of the film, using a 3-sealer thermostatically controlled electric iron and checked carefully.The film may be laid at a slope (towards the periphery of the sand pad foundation) of atleast 1 in 200, to effectively drain leaked product, if any, away from the sand pad. The film shall be anchored at the periphery of the ring beam, as shown in attached drawing.	580.00	Sq.M		

12	Supplying and laying bituminous carpet (anti corrosive layer) 50 mm thickness for sand pad foundation in one layer using bitumen and stone grit mix made by throughly mixing dry stone grit with cut back bitumen 60 / 70 grade heated to about 105 C to 115 C proportion being 100 Kg of bitumen per Cu.m of stone grit, consolidating, rolling lightly to the required slope, etc., complete as per drawing and instruction at site.	545.00	Sq.M		
13	Supplying and laying 40 mm nominal size stone chips of sand of 300 mm horizontal thickness for sand pad foundation to the required shape and slope as per drawing and instruction at site.	85.00	Cu.M		
14	Erection of 1" pipe(SA 106 Gr. B) Sch. 40 in tank ring wall with stone gravels at its one end side of the tank for draining of any leaked product , complete as per drawing and direction of Engineer-in-charge.	110.00	Meter		
	TANK FABRICATION, ERECTION & COMMISSIONING				
15	Fabricating, erecting, welding, testing & commissioning of bottom, shell, wind girders, fixed cone roof etc including cutting, squaring, bevelling, rolling, etc., marking the plates for identification, lifting & placing the plates in position by any approved methods for the CR vertical tanks of following size by hydraulic jacking erection method, as per our specifications and drawings with including transportation, Loading at stockyardand Unloading of Steel Plates at site and with all other items such as labour, materials, consumables, water, power, etc. supplied by the contractor. Rates quoted should include radiographic examination as per specification,hydrostatic testing for shell, vacuum box testing for bottom plates, pneumatic test for roof plates, Chalk Kerosene Test for shell to bottom joint (on completion, tank has to be tested as per standards) etc. complete.	245.00	MT		
	a) CRVT - 18 M Dia x 20 M Ht Fire Water Tank - 2 no				
	i) Steel plates for web and flange of wind girders, reinforcement plates for shell / roof manholes, nozlles, gusset plates etc, shall be in the scope of contractor and included under this item.				
	ii) Testing of bottom plate lap welds with vacuum box method. Dye penetration test for the welding joints where vaccum box test is not possible, Chalk kerosene test for the periphery of the shell to bottom annular plate joints as per standard specification.				
	iii) Radiograph quality welding and carrying out spot radiography inspection of shell plates butt welds, manhole necks and other joints as per enclosed radiography procedure and specifications.				
16	Fabricating, erecting, assembling, fitting and welding the structurals for CR vertical tank of following size such as rafters, curb angles, handrailing on tank shell, roof & stairways, spiral straicase with galvanised electro forged landing platforms and gratings, platform to approach combined gauge well, pipe supports on tank shell, shear plates, pad plates on shell for welding of spiral staircase and hand railing, base plates to tank bottom, as per specifications and standard drawings.	35.00	MT		
	a) CRVT - 18 M Dia X 20 M High Fire Water Tank				
17	Supply, Fabrication,erection,welding and testing of all appurtenances such as roof manholes, shell manhole, shell nozzles (inlet & outlet, re-circulation) pressure transmitter nozzle, temperature hatch, gauge hatch, Nozzle for radar gauge & level switch (on seperate roof manholes i.e. other than normal roof manholes), roof vents, water draw off sump and water draw off pipe line with supports, expansion relief arrangements for inlet and outlet product lines,overflow arrangement for firewater tanks from roof upto the bottom of tank circular drain, GI pipe earthing arrangements as per standard, including earthing pits and GI flat connection from tanks to the pits, etc., complete(earthing pits shall be constructed outside the dyke).				
	a) The items include all the jobs to complete the Fire water tanks as per standard drawings as per requirement of API 650 latest edition and specifications except the fabrication works,steel structurals mentioned in item no.3 above. and combined gauge well unit which will be operated under relevant items of this schedule & as per directional drawigns.				
	a) CRVT -18 M Dia x 20 M Ht Fire Water Tank	2.00	NOS.		
	Note:				
	(i) CS Plates required for shear plates, pad plates, base plates for pipe supports, brackets, all manholes man hole neck and man hole covers shall be supplied and provided by the contractor at their cost.				
	(ii) All pipes and flanges required for shell and roof nozzles, water draw-off pipe, expansion / pressure relief line, overflow arrangement for fire water tanks and for all other appurtenances shall be supplied by contractor.				
18	Cleaning & painting of underside of bottom plates before laying as per the following scheme:- Shot / Grit Blasting to SA 2.5. - 1 coat of Epoxy Zinc Phosphate 75 microns. - 2 coats of High build bitumen coating of 90-100 microns each upto total DFT of 260 microns				
	a) CRVT - 18 M Dia X 20 M High Fire Water Tank	2.00	NOS.		
19	Calibration.				
	Conducting bottom calibration by providing the required water, labour, water meter, water pump, etc. The work involves pouring into the tanks measured quantities of water in the bottom saucer portion upto the level of the datum plate to ascertain the exact volume of the conical portion of the tank and removing the water after calibration and cleaning the tank bottom thoroughly as per instruction at site. The calibration has to be certified through competent authorities and certified calibration charts in Triplicate to be submitted.				
	a) CRVT - 18 M Dia x 20 M Ht Fire Water Tank	2.00	NOS.		
20	Shot / Grit blasting and painting the EXTERNAL surface of mild steel CR tanks to standard SA 2.5 (Swedish standard) including cleaning the surface thoroughly free from grease, dirt, rust, mill scales and removing all other sharp points weld splatter, flux etc. and supplying and painting the outside surface of the tank shell up to and including curb angle, shell extension, shell appurtenances, spiral staircase with hand rails, mid & top landing platforms, top handrailing, all other structures, appurtenances and fittings on the tank, labour, materials etc., complete in all respects as per technical specification mentioned in the scope or work, with necessary safety arrangements and instructions at site .				
	The colour of finish coats for external surfaces and appurtenances shall be white or lustrous aluminium finish and black finish for staircase, hand railing, bands at bottom & dip hatch etc as per standards. The colour of finish coats for external surface of water tank shall be sky blue. DAFFPL logo and monogram shall be provided at two places on the shell. All other lettering such as tank no., product name etc. as per the drawings and specifications shall also be painted. The rate for external painting is inclusive of the above.				
	a) CRVT - 18 M Dia x 20 M Ht Fire Water Tank	2.00	NOS.		
21	INSTALLATION OF MECHANICAL LEVEL GAUGES FOR TANKS	2.00	NOS.		
FABRICATION AND ERECTION OF PIPING					

22	Laying of Above Ground Fire Water & Utilities pipelines of steel on pedastals/sleepers/Under culvert/overhead pipe rack/structures up to 10.0 m height etc. Pipes in the scope of DAFFPL shall be supplied anywhere within the terminal area and the contractor shall shift the same to the site of work at no extra cost with all leads and lifts. The pipeline laying includes cutting, beveling, positioning, setting, fixing the pipe fittings such as elbows, bends tees, reducers etc., complete with supports as per drawings and hydro testing the pipelines at 18.0 Kg/cm2 for a minimum period of 4 Hrs. Note: a. The job includes Blast cleaning (using Grit/ Shots) & painting of the outer surfaces of above ground pipeline/ fittings/ specials all leads & lifts etc. complete including all materials and machineries as per enclosed specifications and instructions at site. b. Pipe length indicated against each size is actual as per drawing. Payment will be made for the actual quantity executed at site.				
	c. Rates shall also include the cost of supervision, labour, overhead/profits, materials which are in Bidder's scope, consumables, conditions listed in Preamble to Schedule of Rates and other associated arrangements required to execute all the related activities d. Concrete sleepers/Pedestals to be constructed as per respective item. e. Structural Pipe rack is not in the scope of this tender. f.Hydrant pipe lines material confirm to API 5L Gr. B/ IS3589/ IS1239 g. Utility Pipe lines material confirm to IS-1239 Hvy Black & IS-1239 Hvy Galv. h.The primer and paint shall be as per the list of paint manufacturers enclosed.				
	i.Painting of pipes and blast cleaning of external surfaces of pipes to Sa 2½ & Primer:- one coat of Zinc Ethyl sylicate (P1) 75 micron, Undercoat: one coat of 2 pack Epoxy Polyamide MIO (U1) 120-125 micron, Finish coat:- Two coats of 2 pack Aliphatic Polyurathane (F1) 40-45 micron each coat, for corrosive zone. Rates includes painting of fittings, flanges, valves & Strainers. Pipeline colour coding shall be carried out as per DAFFPL specifications at no extra cost for FIRE WATER piping.				
	k. The rates are inclusive of providing assistance during commissioning with necessary tools , tackles and manpower. Note: Item includes providing Cleaning of pipelines after Hydrotesting with compressed air for fully draining of hydrotested water from the pipe line.				
	600 NB SCH 20	M	36.00		
	500 NB SCH 20	M	47.00		
	300 NB SCH 20	M	47.00		
	150 NB SCH 40	M	90.00		
	100 NB SCH 40	M	129.00		
23	Fabrication & Edge preparation for butt weld as per ASME B 31.3, tack welding, and final welding of Utility pipelines including pipe fittings (3 runs minimum) with supply of approved electrodes/consumables, welding machine, tools & tackles etc.The rate also includes the branch connection of smaller dia pipe to run pipe, pipe to pipe connection with RF pad as per specification.Reinforcement pads shall be paid on the basis of one weld joint on main pipe on which pad is welded. No extra payment will be made for conducting tests for establishibg welding procedure (PQR and WPS) as per ASME Section IX. All pipes material confirm to specifications.				
	600 NB	JOINTS	4.00		
	500 NB	JOINTS	8.00		
	300 NB	JOINTS	8.00		
	150 NB	JOINTS	15.00		
	100 NB	JOINTS	22.00		
24	Welding of CS SORF flanges & socket welded falnges confirming to materail A105 of the following sizes on the Fire Hydrant,OWS & UTILITY pipelines including setting, positioning, setting, welding with min. three runs outside and one inside, all leads & lifts etc., complete as per specifications and instructions at site.				
	600 NB	JOINTS	4.00		
	500 NB	JOINTS	16.00		
	300 NB	JOINTS	16.00		
	200 NB	JOINTS	4.00		
	150 NB	JOINTS	4.00		
	100 NB	JOINTS	10.00		
25	RADIOGRAPHY				
	The unit rate to include cost of film, its developing charges and cost of taking radiographs etc., labor, supervision, overheads/profits scaffolding, dark room, radiograph viewer, overheads/ profits etc. Payment shall be made only for those films which are found suitable after examination and for joints found acceptable as per codes, standards & enquiry specification. Films for defective joints shall not be paid for.Re-taking of radiography due to defective welds/ defective films/ defective workmanship etc., will be to contractor's cost.				
	NOTES: 1. Bidder shall consult with DAFFPL /DAFFPL'S Representative before execution of radiography for lengths and width of the film to be used. 2. Payment shall be made on the basis of weld length radiographed & for only those joints which are found acceptable by Owner/Owner's representative.				
	600 NB	JOINTS	4.00		
	500 NB	JOINTS	16.00		
	300 NB	JOINTS	16.00		
	200 NB	JOINTS	4.00		
	150 NB	JOINTS	4.00		
	100 NB	JOINTS	10.00		
26 (Opt)	Dye penetration examination for the welded pipes of FIRE WATER lines including providing all equipment & materials necessary for the job & labour etc as directed by the site in charge.				
	600 NB	JOINTS	4.00		
	500 NB	JOINTS	16.00		
	300 NB	JOINTS	16.00		
	200 NB	JOINTS	4.00		
	150 NB	JOINTS	4.00		
	100 NB	JOINTS	10.00		

27	Fixing the supplied CS Gate Valves of following sizes for Fire Hydrant & Utility PIPELINE. For size 50 mm dia. and above Fixing shall include supplying and fixing of Compressed Non Asbestos Fiber gaskets, Thick 3 mms (with 100% spare quantity),nuts & stud bolts confirm to ASTM A194-2H & ASTM A193B-7 respectively.				
	500 NB	Nos	2.00		
	300 NB	Nos	2.00		
	100 NB	Nos	2.00		
28	**PIPING SUPPORT**				
	Supply, fabrication,edge preparation & erection of pipe supports along with requirement of shoes, cradles, hangers, clamps (of all sizes/thicknesses), turn buckles, corrosion pads, stiffening rings, saddles, guides, special supports, pads, T post etc as per drawings, standards, specifications, conditions & instructions of Owner / Owner's representative. The work shall include blast cleaning of external surfaces of supports to SA 2½ & painting as per DAFFPL spec,the cost of materials, consumables, labor and overheads/profits etc. Category PS 1: Means carbon steel structural members and wrapper plates/corrosion pad plates (CS) and pipe trunnion.				
	Providing and laying in position, machine batched, machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work(including trenches, plinth, sides of foundations,culverts,wing walls etc), using cement as per approved design mix, including pumping of concrete to site of laying and cost of centering, shuttering but excluding the reinforcement. including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete,improve workability without impairing strength and durability as per direction of Engineer-in-charge. (Note :- a. Minimun Cement content considered in this item is @410 kg/cum.) b. Batch mixing plant of capacity to be approved by Site Engineer for the works to be installed by the Contractor at site along with required NOCs from concerned Authorities. Alternatevely, Contractor shall also be permitted to use RMC (if available) at no extra cost to DAFFPL & after obtaining prior approval from Engineer In-Charge. c. For small quantities (up to 5 cum per day), mixing & placing of concrete using mechanical mixer shall be permitted with the prior approval of DAFFPL. d. Hacking of exposed surface of green concrete (wherever applicable) as Key to plaster shall be done at no extra cost to DAFFPL.	Cu.M	10.00		
	PLAIN CEMENT CONCRETE Providing and laying cement concrete in foundation, footings and base for columns/walls including proportioning, mixing in mechanical mixer, laying vibration by means of mechanical vibrators, curing etc. complete including the cost of shuttering:- Concrete of mix 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	Cu.M	5.00		
29	Providing & fixing suitable 18mm Dia Teflon Ram Extruded Rod ,in possition for pipe line point support at all levels with necessary cleats welded on insert plate @ 150 c/c approx., complete in all respect as per approved drawing.	Rm	35.00		
29.1	MS Flat	Kg	650.00		
29.2	MS Strip 100 x 50 x 5 thk	Kg	34.00		
30	Installation of Fire Fighting Equipments				
30.1	Double Fire Hydrant	Nos	2.00		
30.2	Water cum Foam Monitor	Nos	1.00		
31	**MISCELLANEOUS**				
	Dismantling of existing water tanks structural plates works like trusses, purlin, column, frames for louvers, bracing, ladders, cage ladders, sag rods, cable racks, pipe bridges, chequered plates, bottom plates, grating along with all accessories viz nuts, bolts, cleats, gussets, suspenders etc. All necessary safety precautions, fire screen, scaffolding works etc to be considered in quoated price. Mechanically / Manually Breaking & removing existing tank pad foundations of any size / thickness including removing debris out side of terminal / site or as directed by Engineer-In-Charge.				
	20M Dia X 15 M Ht	Nos	1.00		
	14M Dia X 15 M Ht	Nos	1.00		
	09M Dia X 15 M Ht	Nos	1.00		
	Complete Fire Hydrant Pipeline and other supports & Fittings associated with above mentioned tanks	Lumpsum			
	Amount (A)				
	GST @ % on Amount (A)				
	Total Amount including taxes				

Total Amount in Words:

Notes:

1	Construction Water, loading and boarding, Site Storage with watch and ward, receipt, unloading, shifting material to store and internal shifting to site shall be included in Vendor's scope.
2	The unit rates as quoted to arrive at above total price shall be firm and inclusive of all taxes, duties, levies, transportation etc. No separate payment shall be made for site mobilization / demobilization, insurance etc.
3	The Schedule of Rates should be read with all the other sections of the tender.
4	The tenderer shall be deemed to have studied the drawings, specifications and the details of work to be done within the time schedule and to have acquainted with the conditions prevailing at site. Site visit is mandatory.
5	The quantities shown against the various items are only indicative of the quantum of work and it may vary to any extent. Billing will be done as per actual.
6	The rate quoted shall be inclusive of all work as mentioned in the scope of work (Technical Specifications).
7	All the items of work in the schedule of rates shall be carried out as per specifications, drawings and instructions of the Engineer-in-Charge.
8	The rates quoted by tenderers shall be inclusive of all costs for removal and re-installation, should any defects occur or modifications are required during testing, calibration and loop tests and
9	Supply of Pipeline and associated fittings should be done after carrying out site survey and prior approval to be obtained from DAFFPL & DAFFPL representatives.

Signature of Bidder along with company seal

PIPING MATERIAL SPECIFICATION

THE COMPONENTS AND MATERIALS SHOWN BELOW ARE SUITABLE FOR ALL MEDIA AND DESIGN CONDITIONS DESCRIBED UNDER THIS PIPE CLASS ON THE PIPING CLASS LIST, IN SECTION ONE.	**PRESSURE RATING**	**PIPE CLASS**
	150	B-22
	MATERIAL TYPE	
	C. S.	

PIPE

Nom. Diam.	Wall thk.	Material	Face	Code	Notes
0.5 - 1.5	HEAVY	IS 1239	PE	IS 1239 Part I	
2 - 6	HEAVY	IS 1239	BE	IS 1239 Part I	
8 - 10	6 mm	IS-3589 GR.410 ERW	BE	IS 3589	
12 - 18	8 mm	IS-3589 GR.410 ERW	BE	IS 3589	
20 - 24	10 mm	IS-3589 GR.410 ERW	BE	IS 3589	
26 - 48	12 mm	IS-3589 GR.410 ERW	BE	IS 3589	

FLANGE GROUP

Nom. Diam.	ITEM NAME	Material	Rating		Type	Code	Notes
0.5 - 1.5	FLANGE	A105	150 #		SW - RF / 125AARH	ASME B16.5	1
2 - 24	FLANGE	A105	150 #		SO - RF / 125AARH	ASME B16.5	1
0.5 - 24	BLIND FLANGE	A105	150 #		RF / 125AARH	ASME B16.5	1
0.5 - 8	FIG. 8 FLANGE	A105	150 #		FF / 125AARH	ASME B16.48	
10 - 24	SPCR & BLIND FLANGE	A105	150 #		FF / 125AARH	ASME B16.48	

GASKET

Flange Diameter	Gasket Materials	Flange Rating	Gasket Type	Code	Notes
0.5 - 24	Butyl Rubber	150 #	Flat Ring (t = 3 mm)	ASME B16.21	

BOLTSET MATERIALS: BOLTS / NUTS: A193-B7 / A194-2H

Flange Diameter	Flange Rating	Flange Face	Codes, Bolts / Nuts	Notes
0.5 - 24	150 #	RF	ANSI B16.5 STUD BOLTS / B18.2 HEAVY HEX	

FITTINGS BW

Nom. Diam.	Wall thk.	Material	Rating	Code	END	Notes
2 - 6	As Pipe	A234 - WPB		ASME B16.9	BW	1
8 - 12	As Pipe	A234 - WPB-W		ASME B16.9	BW	
16 & 24	As Pipe	A234 - WPB-W		ASME B16.9	BW	

FITTINGS SW

Nom. Diam.	Wall thk.	Material	Rating	Code	Notes
0.5 - 1.5		A105	3000 #	ASME B16.11	1

PIPING MATERIAL SPECIFICATION

THE COMPONENTS AND MATERIALS SHOWN BELOW ARE SUITABLE FOR ALL MEDIA AND DESIGN CONDITIONS DESCRIBED UNDER THIS PIPE CLASS ON THE PIPING CLASS LIST, IN SECTION ONE.	**PRESSURE RATING**	**PIPE CLASS**
	150	B-22
	MATERIAL TYPE	
	C. S.	

FITTINGS THD

Nom. Diam.	Wall thk.	Material	Rating	Code	Notes
0.5 - 1.5		A105	3000 #	ASME B16.11	

FITTINGS SPECIAL

Nom. Diam.	Wall thk.	Material	Rating	Code	Notes
2 - 24	AS PIPE	A105		MSS SP 97	1

FITTINGS OTHER

Nom. Diam.	Wall thk.	Item Name	Material	Code	End	Notes
0.5 - 3	STD, STD	SWAGE.CONC	A105	BS 3799	PBE	
0.5 - 3	STD, STD	SWAGE.ECC	A105	BS 3799	PBE	
0.5 - 1.5		UNION	A105	BS 3799	SW, 3000#	

NIPPLES SPECIAL

Nom. Diam.	Wall thk.	Material	Face	Code	Notes
0.5 - 1.5	HEAVY	IS 1239	PBE	IS 1239-I	

VALVES

Type	End Connection	Nom. Diam.	Standard	Code	Notes
GATE VALVE	SW	0.5 - 1.5	API-602	GAV 201	
GATE VALVE	FLG	2 - 24	API-600	GAV 210	
GLOBE VALVE	SW	0.5 - 1.5	BS-5352	GLV 201	
GLOBE VALVE	FLG	2 - 16	BS-1873	GLV 210	
CHECK VALVE	SW	0.5 - 1.5	BS-5352	CHV 201	
CHECK VALVE	FLG	2 - 24	BS-1868	CHV 210	
BUTTERFLY VALVE	(WAFER TYPE)	2 - 24	API 609 / BS5155	BUV 210-W	
BALL VALVE	SW	0.5 - 1.5	BS 5351	BAV 201	
BALL VALVE	FLG	0.5 - 16	BS 5351	BAV 210	

STRAINER

Type	End Connection	Nom. Diam.	Standard	Code	Notes
Y-TYPE STRAINER	SW	0.5 - 1.5	B:A105; INT:SS304	YTS 201	
Y-TYPE STRAINER	FLG	2 - 24	B:A216 Gr.WCB; INT:SS304	YTS 210	

VALVE MATERIAL SPECIFICATION (VMS)
VALVE DATA SHEET

GATE VALE SPECIFICATION				MANUF'S OFFER			
VALVE TAG NO.:		PIPING CLASS:	B22	STANDARD:			
STANDARD:	API 602	RATING:	150#	MFGRS CAT / FLG:			
SIZE RANGE:	1.1/2" - 24"	ENDS:	FLNG - RF, B16.5 / 125AARH	RATING:		ENDS:	
CONSTRUCTION							
BODY		CAST					
BONNET TO BODY CONNECTION		BOLTED					
HANDWHEEL		NON-RISING					
STEM		RISING					
STEM AND YOKE TYPE		OS & Y					
GATE TYPE		WSF OR WDF (WSS ACCEPTABLE FOR SIZE 1.1/2")					
GEAR OPERATED		YES >= 14"					
BY PASS VALVE		NO, (VALVES >= 10" AND >= 600" RATING SHALL HAVE BOSSES FOR BY-PASS CONNECTION ACC. TO API 600 AND MSS. SP 45)					
MATERIALS							
BODY		ASTM A216 Gr.WCB					
BONNET		ASTM A216 Gr.WCB					
STEM		13% CR. STEEL (NO CASTING)					
BODY SEAT RING	RENEWABLE	A105 / A216 Gr. WCB STELLITED					
GATE		A216 Gr. WCB, 13% Cr. FACED					
STEM PACKING		GRAPHITE WITH SACRIFICIAL CORR. INHIB. & INCONEL WIRE REINFORCEMENT					
TRIM NUMBER							
HAND WHEEL		MALLEABLE IRON / DUCTILE IRON					
BONNET BOLTS		ASTM A193 GR B7					
BONNET NUTS		ASTM A194 GR 2H					
BONNET GASKETS		SP. WOUND SS316-GRAFOIL FILLER					
HYDROSTATIC TEST PRESSURE		BODY:	450 PSIG	SEAT:	325 PSIG		
TEST PRESSURE WITH AIR		80 PSIG					
DESIGN CONDITIONS				**DESIGN CONDITIONS**			
Pressure Rating		ASME B16.34	°C				
Fluid		Kg/cm²g	°C				

NOTES:

1	This Valve spec. shall be read in conjunction with Technical Notes for Valves.
2	Bidder shall clearly write all / any deviation against each part / material of valve in the space provided for. Wherever Bidder agrees with Consultant's Spec., Bidder shall indicate "AGREED".
3	No. cuting / overwriting by Bidder on Consultant's Spec. is allowed.
4	Testing shall be as per API 598.
5	Copper and Copper Alloys not permited.
6	Gland shall be suitable for repacking under pressure when Valve is fully open.
7	If not otherwise stated the Valves shall be full Bore.
8	Mandatory Standards: API598, API600, ASME B16.10, ASME B16.34, ASME B16.5.

Gate Symbols	Type of Seat	Type of Gate	Type of Blockade
WSS	Wedge	Single	Solid WEB
WSF	Wedge	Single	Flex. Solid WEB
WDF	Wedge	Double	Slip on or Split
PDF	Parallel	Double	Flexible

VALVE MATERIAL SPECIFICATION (VMS)
VALVE DATA SHEET

GATE VALE SPECIFICATION				MANUF'S OFFER			
VALVE TAG NO.:		PIPING CLASS:	B22	STANDARD:			
STANDARD:	API 602	RATING:	800#	MFGRS CAT / FLG:			
SIZE RANGE:	1/2" - 1.1/2"	ENDS:	SW, 3000#, B16.11	RATING:		ENDS:	
CONSTRUCTION							
BODY		FORGED					
BONNET TO BODY CONNECTION		BOLTED					
HANDWHEEL		NON-RISING					
STEM		RISING					
STEM AND YOKE TYPE		OS & Y					
GATE TYPE		WSS					
GEAR OPERATED		NO					
BY PASS VALVE		NO					
MATERIALS							
BODY		ASTM A105					
BONNET		ASTM A105					
STEM		13% CR. STEEL (NO CASTING)					
BODY SEAT RING	RENEWABLE	STELLITED					
GATE		STELLITED					
STEM PACKING		GRAPHITE WITH SACRIFICIAL CORR. INHIB. & INCONEL WIRE REINFORCEMENT					
TRIM NUMBER							
HAND WHEEL		MALLEABLE IRON / DUCTILE IRON					
BONNET BOLTS		ASTM A193 GR B7					
BONNET NUTS		ASTM A194 GR 2H					
BONNET GASKETS		SP. WOUND SS316-GRAFOIL FILLER					
HYDROSTATIC TEST PRESSURE		BODY:	2975 PSIG	SEAT:	2175 PSIG		
TEST PRESSURE WITH AIR		80 PSIG					
DESIGN CONDITIONS				**DESIGN CONDITIONS**			
Pressure Rating		API 602					
Fluid		Kg/cm²g	°C				

NOTES:

1	This Valve spec. shall be read in conjunction with Technical Notes for Valves.
2	Bidder shall clearly write all / any deviation against each part / material of valve in the space provided for. Wherever Bidder agrees with Consultant's Spec., Bidder shall indicate "AGREED".
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Gate Symbols	Type of Seat	Type of Gate	Type of Blockade
WSS	Wedge	Single	Solid WEB
WSF	Wedge	Single	Flex. Solid WEB
WDF	Wedge	Double	Slip on or Split
PDF	Parallel	Double	Flexible

NOTE 1

NOZZLE SCHEDULE

	NOZZLE			QTY.	FLANGE			PROJ.	SERVICE
	MARK	SIZE	SCH/THK		RTG.	TYPE	FACE		
SHELL	M1/2	750	12 THK	02	AS PER B AND R			139	SHELL M/H WITH COVER
	N2	500	8 THK	01	150#	WN	RF	250	OUTLET
	N4	150	SCH. 40	01	150#	WN	RF	200	OVER FLOW
	N6	300	SCH. 40	01	150#	WN	RF	225	RECIRCULATION LINE
	N8	100	SCH. 40	01	150#	WN	RF	175	DRAIN
FIXED ROOF	M3/4	600	5 THK	02	AS PER B AND R			ROOF MANHOLE WITH COVER	
	N1	100	SCH. 40	01	150#	SO	RF	INLET	
	N3	200	SCH. 40	01	150#	SO	RF	LEVEL TRANSMITTER	
	N5A~D	100	SCH. 40	04	150#	SO	RF	ROOF VENT	
	N7	100	SCH. 40	01	150#	SO	RF	SPARE	