

**BILL OF QUANTITIES****CEYLON PETROLEUM STORAGE TERMINALS LIMITED - ENGINEERING FUNCTION****JOB : DEVELOPMENT OF PIPELINES SYSTEM AT LBD KURUNEGALA.****BOQ No: E/02/2021**

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
	<b>Note:</b> Contractors are strictly advised to visit the site & follow the given details, sketch drawings, specifications before bidding & before commence the works. If any discrepancies should be forwarded to the Engineering Manager of CPSTL Kolonnawa before commencement of such works. Construction work to be carried out without damaging existing drains, pipes and other CPSTL property. if some damage occur, contractor should repair by own cost according to the Engineer's or his representative's instructions.				
<b>A</b>	<b>PRELIMINARIES</b>				
A1	Allow lump sum for mobilization & de mobilization and construction of temporary site office and stores (approx. 20 m <sup>2</sup> ) for the contractor's personnel acceptable to engineer's satisfaction.	Item	1.00		
A2	Allow lump sum for cleaning the site before commencement of work, after completion of work and keep site in clean and tidy during construction.	Item	1.00		
	<b>Total amount carried to summary</b>				
<b>B</b>	<b>METAL WORK</b>  <b>Note :</b> a) Unless otherwise specified all welding should be with 6mm of leg length having strength of 0.90kN/mm  b) All the members to be welded along the full length of the perimeter of the pipes or connecting plate. (for piping works 6010 welding rods shall be used for root and 7018 welding rods shall be used for filler and cap. )  c) All necessary materials which are not provided by the CPSTL , to be supplied by the contractor to successfully completion of the scope of the project.				

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
	d) All gaskets to be fabricate and fixing where necessary as directed by the engineer. <b>Gasket materials will be supplied by CPSTL.</b>				
	<b><u>FABRICATION AND ERECTION OF PRODUCT PIPE LINE SYSTEM</u></b>				
	<b><u>MATERIAL TRANSPORTATION</u></b>				
B1	Allow for collect and transport line pipes, valves, flanges, bends, reducers, nut and bolt, GI pipes, "I" beams, MS plates etc. <b>(provide by CPSTL)</b> from CPSTL Kolonnawa pipe yard to LBD Kurunegala site. Rate shall include for loading and unloading.	Item	1.00		
B2	Allow for disconnect and removal of existing line pipes, valves, strainers with fittings ( flanges, reducers etc.) of main pump house, tank farm , old LS pump house and surrounding area etc. and balance materials (provided by CPSTL for the project) transport to CPSTL Kolonnawa and handover to RDD stores. Rate shall include for loading and unloading etc.	Item	1.00		
	<b><u>PIPE SUPPORTS</u></b>				
B3	Fabricating & fixing of pipe support unit type - A. Rate to include for fixing 12mm thick base plates to existing RCC base with non shrinking grout. Refer drawing no. 1745- 3.	nr	6.00		
B4	Fabricating & fixing of pipe support unit type - B-0 (approximate height 930 mm) . Rate to include for fixing 12mm thick base plates to existing RCC base with non shrinking grout. Refer drawing no. 1745- 3.	nr	1.00		
B5	Fabricating & fixing of pipe support unit type - B (approximate height 1330 mm). Rate to include for fixing 12mm thick base plates to existing RCC base with non shrinking grout. Refer drawing no. 1745- 3.	nr	6.00		
B6	Fabricating & fixing of pipe support unit type - C (approximate average height 1330 mm and height will be changed slightly according to site condition ). Rate to include for fixing 12mm thick base plates to existing RCC base with non shrinking grout. Refer drawing no. 1745- 3.	nr	5.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
B7	Fabricating & fixing of pipe support unit type - D1 - (approximate height 2500 mm) . Rate to include for fixing 12mm thick base plates to existing RCC base with non shrinking grout. Refer drawing no. 1745- 3.	nr	1.00		
B8	Fabricating & fixing of pipe support unit type - D2, D3 - (approximate height 5500 mm) . Rate to include for fixing 12mm thick base plates to existing RCC base with non shrinking grout. Refer drawing no. 1745- 3.	nr	2.00		
B9	Fabricating & fixing of pipe support unit type E - (approximate height 5500 mm) . Rate to include for fixing 12mm thick base plates to existing RCC base with non shrinking grout. Refer drawing no. 1745- 5.	nr	2.00		
B10	Fabricating & fixing of pipe support unit type - P - (approximate height 300 mm). Rate to include for fixing 12mm thick base plates to new RCC base (RCC base measured separatly) with non shrinking grout. Refer drawing no. 1745- 5.	nr	10.00		
B11	Fabricating & fixing of pipe support unit type - Q - (approximate height 300 mm). Rate to include for fixing 12mm thick base plates to new RCC base (RCC base measured separatly) with non shrinking grout. Refer drawing no. 1745- 5.	nr	10.00		
B12	Fabricating & fixing of pipe support unit type - R - (approximate height 300 mm). Rate to include for fixing 12mm thick base plates to new RCC base (RCC base measured separatly) with non shrinking grout. Refer drawing no. 1745- 5.	nr	12.00		
<b><u>HOT DIPPED GALVANIZED U-BOLTS</u></b>					
B13	Supplying & fixing of hot dipped galvanized 3" dia. U-bolt - (12mm thick ) as per drawing.	nr	30.00		
B14	Supplying & fixing of hot dipped galvanized 4" dia. U-bolt -(12mm thick ) as per drawing.	nr	40.00		
B15	Supplying & fixing of hot dipped galvanized 6" dia. U-bolt -(12mm thick ) as per drawing.	nr	20.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
B16	Supplying & fixing of hot dipped galvanized 8" dia. U-bolt (12mm thick) as per drawing.	nr	40.00		
B17	Supplying & fixing of hot dipped galvanized 10" dia. U-bolt (12mm thick) as per drawing.	nr	12.00		
B18	Supplying & fixing of hot dipped galvanized 2" dia. U - bolt - (12mm thick) to hang sprinkler line as per drawing. Rate to include for necessary angle iron brackets by using 50 x50 x5 mm angle iron sections.	nr	15.00		
	<b><u>FABRICATION AND FIXING OF PIPE ASSEMBLING UNITS</u></b>				
	<b>Note: Rate shall include for</b> (a). Positioning of pipes and fittings on pipe supports / pedestal .  (b). Welding of pipe joints, flange joints etc. after preparation of ends by bevelling as necessary.  ( c ) Fabricate and fixing of gasket where required				
B19	Fabricating & fixing of assembling unit - Type-A . Refer Drawing No.1745-6.	nr	8.00		
B20	Fabricating & fixing of assembling unit with drain plug - Type-B . Refer Drawing No.1745-6	nr	8.00		
B21	Fabricating & fixing of assembling unit - Type-C . Refer Drawing No.1745-6	nr	8.00		
B22	Fabricating & fixing of assembling unit - Type-D . Refer Drawing No.1745-6	nr	1.00		
B23	Fabricating & fixing of assembling unit - Type-E1. Refer Drawing No.1745-6	nr	1.00		
B24	Fabricating & fixing of assembling unit - Type-E2. Refer Drawing No.1745-6	nr	1.00		
B25	Fabricating & fixing of assembling unit - Type-E3. Refer Drawing No.1745-6	nr	1.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
B26	Fabricating & fixing of assembling unit - Type-F1. Refer Drawing No.1745-6	nr	1.00		
B27	Fabricating & fixing of assembling unit - Type-F2. Refer Drawing No.1745-6	nr	1.00		
B28	Fabricating & fixing of assembling unit - Type-F3. Refer Drawing No.1745-6	nr	1.00		
B29	Fabricating & fixing of assembling unit - Type-G1. Refer Drawing No.1745-7	nr	1.00		
B30	Fabricating & fixing of assembling unit - Type-G2. Refer Drawing No.1745-7	nr	1.00		
B31	Fabricating & fixing of assembling unit - Type-H. Refer Drawing No.1745-7	nr	2.00		
B32	Fabricating & fixing of assembling unit - Type-I. Refer Drawing No.1745-7	nr	8.00		
B33	Fabricating & fixing of assembling unit - Type-J. Refer Drawing No.1745-7	nr	8.00		
B34	Fabricating & fixing of assembling unit - Type-K1. Refer Drawing No.1745-7	nr	2.00		
B35	Fabricating & fixing of assembling unit - Type-K2. Refer Drawing No.1745-7	nr	2.00		
B36	Fabricating & fixing of assembling unit - Type-K3. Refer Drawing No.1745-7	nr	2.00		
B37	Fabricating & fixing of assembling unit - Type-L1. Refer Drawing No.1745-7	nr	2.00		
B38	Fabricating & fixing of assembling unit - Type-L2. Refer Drawing No.1745-7	nr	2.00		
B39	Fabricating & fixing of assembling unit - Type-M1. Refer Drawing No.1745-8	nr	1.00		
B40	Fabricating & fixing of assembling unit - Type-M2. Refer Drawing No.1745-8	nr	1.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
B41	Fabricating & fixing of assembling unit - Type-N. Refer Drawing No.1745-8	nr	1.00		
B42	Fabricating & fixing of assembling unit - Type-O. Refer Drawing No.1745-8	nr	2.00		
B43	Fabricating & fixing of assembling unit of foam feed manifold . Refer Drawing No.1745-4	nr	4.00		
B44	Fabricating & fixing of assembling unit of tank water drencher system manifold . Refer Drawing No.1745-4	nr	1.00		
B45	Supply, fabricating & fixing of <b>hot dipped galvarnized</b> valve operating platform at the pump house as per drawing. Refer Drawing No.1745-2.	nr	1.00		
B 46	Supply, fabricating & fixing of pipe crossing platforms with foundation at the tank farm.	nr	2.00		
	<b><u>Laying line pipes - Product, Drencher and Foam</u></b>				
B47	Fabrication, laying on pipe supports and installing of LS 92 (Gasoline) pump delivery pipelines (from pump delivery header to tank no 1,2,4,5 and pump delivery header to Gantry) as per the drawing no 1745-1,2,3,5. Rate shall include for positioning of pipes, necessary welding of pipes, flages, fittings, installing of relevant valves connect to tanks and gantry piping etc.	nr	1.00		
B48	Fabrication, laying on pipe supports and installing of LS 92 (Gasoline) pump suction pipelines (from tank no 1,2,4,5 to pump suction header and from existing unloading piping to pump suction header) as per the drawing no 1745-1,2,3,5. Rate shall include for positioning of pipes, necessary welding of pipes, flages, fittings, installing of relevant valves connect to tanks and existing unloading piping etc.	nr	1.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
B49	Fabrication, laying on pipe supports and installing of LAD (Gas oil) pump delivery pipelines (from pump delivery header to tank no 3,9,10 and pump delivery header to Gantry) as per the drawing no 1745-1,2,3,5. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves connect to tanks and gantry piping etc..	nr	1.00		
B50	Fabrication, laying on pipe supports and installing of LAD (Gas oil) pump suction pipelines (from tank no 3,9,10 to pump suction header and from existing unloading piping to pump suction header) as per the drawing no 1745-1,2,3,5. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves connect to tanks and existing unloading piping etc..	nr	1.00		
B51	Fabrication, laying on pipe supports and installing of fire water drencher line from drencher header to Tank no 01 and 02 as per the drawing no 1745-4,5. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves and connect to existing pipe lines of the tank etc..	nr	1.00		
B52	Fabrication, laying on pipe supports and installing of fire water drencher line from drencher header to Tank no 03 and 04 as per the drawing no 1745-4,5. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves and connect to existing pipe lines of the tank etc..	nr	1.00		
B53	Fabrication, laying on pipe supports and installing of fire water drencher line from drencher header to Tank no 05, 09 and 10 as per the drawing no 1745-4,5. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves and connect to existing pipe lines of the tank etc..	nr	1.00		
B54	Fabrication, laying on pipe supports and installing of Fire foam pipe line from fire foam feeding point to tank no 01 and 02 as per the drawing no 1745-4,5. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves connect to existing pipe line of the tanks etc..	nr	1.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
B55	Fabrication, laying on pipe supports and installing of Fire foam pipe line from fire foam feeding point to tank no 04 and 05 as per the drawing no 1745-4,5. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves connect to existing pipe line of the tanks etc..	nr	1.00		
B56	Fabrication, laying on pipe supports and installing of Fire hydrant pipe line existing termination point to existing other point through drencher header. Rate shall include for positioning of pipes, necessary welding of pipes, flanges, fittings, installing of relevant valves connect to existing pipe lines etc..	nr	1.00		
B57	Fabrication, laying on pipe supports and installing of Fire foam pipe line from fire foam feeding point to Gantry as per the drawing no 1745-4,5. Rate shall include for necessary welding of pipes, flanges, fittings, installing of relevant valves etc..	nr	1.00		
B58	Fabrication, laying on pipe supports and installing of Fire foam pipe line from fire foam feeding point to Pump house as per the drawing no 1745-4,5. Rate shall include for necessary welding of pipes, flanges, fittings, installing of relevant valves etc..	nr	1.00		
	<b><u>Butterfly valves</u></b>				
B59	Supply and Installation of butterfly valves - (3" - dia.)	nr	15.00		
	<b><u>Foam Sprinklers</u></b>				
B60	Supply and Installation of foam stainless steel high pressure foam sprinkler heads .	nr	30.00		
	<b><u>Installation of pumps</u></b>				
B61	Installation of Pumps as per drawing (after complete the new piping system). Rate to include for disconnect of 3 nos pumps of old LS pump house and transport to main pump house) and supply necessary GI anchor bolts to fixed on pump beds with necessary alignment.	nr	3.00		



Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
	<b><u>Installation of pressure gauge assembly</u></b>				
B62	Supply fabrication and Installation of pressure gauge assembly with necessary piping, fittings , valves, reducers etc.as per drawing (drawing no. STD-PH-01) and specifications.	nr	16.00		
	<b><u>Testing and Commissioning</u></b>				
B63	Hydrostatic test, at 150 psi, Die penetrant test (DP) and commissioning of the whole systems with reports - (All necessary materials and equipments to be supply by the contractor)	Item	1.00		
	<b><u>Earthing System</u></b>				
B64	Supply fabrication and fixing of line pipes earthing system units as per the drawing no. 1745-8	nr	2.00		
B65	Supply fabrication and fixing of copper conductors for flange joints as per drawing no. 1745-8	nr	50.00		
	<b>Total amount carried to summary</b>				
<b>C</b>	<b><u>PAINTING WORK</u></b>  a) All steel surface excluding GI members and valves(gate valves, check valves etc.) shall be painted with applying one coat of primer or and two coats of finish paint of sigma paint or equavelent as per the specsification  b) All the surfaces which are to be painted to be cleaned to confirm to Swedish Standard SA 2 ½ by sand blasting.  c) Power tool cleaning confirm to ISO ST3  d) All GI members and valves(gate valves, check valves etc.) shall be painted with applying one coat of primer or and two coats of finish paint of enamel paint - Dulux or equavelent as per the specsification				

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
C1	Painting of all line pipes and accessories (10", 8" , 6" , 4" , 3" and 2") and fittings (bends, reducers, flanges etc.) after surface preparation according to the specification.( <b>Sigma paint or equalent</b> )-	Item	1.00		
C2	Painting of all pipe supports after surface preparation according to the specification.( <b>Sigma paint or equalent</b> )	Item	1.00		
C3	Painting of all valves , check valves and strainers etc. (10", 8" , 6", 4"and 3" ) Applying of enamel paint after surface preparation according to the specification. ( <b>Dulux paint or equalent</b> )	Item	1.00		
	<b>Total amount carried to summary</b>				
<b>D</b>	<b><u>YARD CONCRETE WORK &amp; MISCELLANIOUSE WORK</u></b>  EXCAVATION AND EARTH WORK Note: Rate shell include for  (a). Trimming and leveling of edges and bottom face of excavation.  (b). Compaction and testing of excavation area.  (c). Keeping all excavation free from storm and/or percolating water as required or directed by Engineer to keep excavation dry.  (d). Debris and excavated material shall be transport to a location which is away from CPSTL premises. Location should be selected by the contractor and approval shall be obtained from the Engineer.  (e). Dewatering and shoring for required area or as directed by Engineer  (f). Working space where necessary.				
D1	Excavation for yard paving base in any type of soil except rock requiring blasting..	m <sup>3</sup>	50.00		
D2	Extra over excavation for hard rock excavation by using machinery. Rate to include for removing debris and usable material to be stack at site as directed. (Provisional quantity)	m <sup>3</sup>	5.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
D3	Supplying, laying, levelling & compacting 300 mm thick A.B.C (aggregate base course) layer in 75 mm thick well compacted layers by using 8 ton vibrator roller as directed.	m <sup>3</sup>	30.00		
D4	Allow for laying gauge 1000 polyethylene layer over the compacted ABC surface. Rate to include for provide 300 mm wide lap.	m <sup>2</sup>	105.00		
	<p><b>Concrete work</b></p> <p><u>Note:</u></p> <p>(a). Mixing, handling, hosting, depositing, compaction and curing as specified in relevant BS standards.</p> <p>(b). Cement, sand, aggregates and admixture shall comply to relevant BS standards.</p> <p>(c). Compressive strength of concrete and consistency of fresh concrete shall be tested according to method of testing defined as relevant BS standards.</p> <p>(d). Maximum aggregate size shall be 19 mm or as shown in drawings.</p> <p>(e). Minimum clear cover shall be provided for reinforcement. If underground, 50 mm If above ground, 40 mm or directed by Engineer.</p> <p>(e). Cover block shall be casted as directed by Engineer.</p> <p>(f). Fresh concrete shall be protected from adverse weather conditions such as rain, hot weather etc..</p> <p>(g). Water cement ratio shall be kept specified standard value.</p> <p><b>Formwork</b></p> <p>(a). All necessary boarding's, supporting, application of mould oil as necessary, erecting, framing, cutting angles cleaning, and treatment before placing concrete.</p> <p>(b). Lines and levels of formwork shall be maintained.</p> <p>(c). All formwork shall be in plywood sheet or smoothed timber plank (smooth surface without irregularities) with adequate thickness.</p> <p>(d). Grout leak shall be prevented.</p>				

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
	<p><b><u>Reinforcement</u></b></p> <p>(a).Rate shall include for supply, cutting, bending, fabrications &amp; placing in position, holding and supporting including temporary fixing support hangers &amp; 16/20 binding wire.</p> <p>(b). Wire brushing &amp; cleaning if necessary or as directed by the Engineer.</p> <p>(c). High yield reinforcement and hot rolled mild steel bar reinforcement shall be complied with relevant specifications. (BS 5950 characteristic strength 460 N/mm<sup>2</sup>).</p> <p>(d). All reinforcement shall be free of dirt, oil, paint or loose rust before fixing in position and shall be brushed with a stiff wire brush if so directed by the Engineer.</p> <p>(e). The size of reinforcement bars describe in the drawing or elsewhere shall be minimum size and the rolling margin and any other tolerance shall be wholly above this size. Hooks, anchorage and laps have been measured with the quantities.</p> <p>(f). Minimum covering, lap length and anchorage length shall be provide to all reinforcement as standard specification or as shown in drawing.</p> <p><u>Reinforced concrete in (1:2:4) with maximum 20mm aggregate</u></p>				
D5	200 mm thick 3050 mm x 3050 mm concrete floor slabs . Rate to include for forming expansion joints filled with sand and tar mixture in 3050 mm x 3050 mm grids. The yard levels to be maintained with existing levels in order to get proper storm water drain out let. Rate to include testing of samples at the rate of one sample per 15 m <sup>3</sup> of concrete. Rate to include for necessary form work .	m <sup>3</sup>	20.00		
D6	10 mm dia. tor steel bars at 150 mm centers in both ways of the two nets as per drawing and directed.	kg	1,700.00		
	<p><b><u>Pedestal</u></b></p>				
D7	Provide necessary RCC pedestal type - P and Q - as per the drawing by using grade 25 concrete.	nr	20.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
D8	Provide necessary RCC pedestal type -R - as per the drawing by using grade 25 concrete.	nr	12.00		
D9	Provide necessary RCC pedestal type -S in tank farm ground level as per the drawing by using grade 25 concrete.	nr	10.00		
	<b><u>Fire Foam storing Hut</u></b>				
D10	Supply fabrication and construct of 3.6 x 3.0 m and 2.7 m average height form store hut as per the drawing . Rate to include for necessary excavation, back filling, RCC foundation, 1 m height angle iron framed ramp with 1 x 1 m size MS plate stage and form storage platform. Rate to including necessary painting work as directed.	Item	1.00		
	<b>Total carried to summary</b>				
<b>E</b>	<b><u>ELECTRICAL WORK</u></b>				
E1	Supply & Installation of 2 mm thick 300mm X 50mm powder coated, perforated cable tray without lid on 2.5m high support poles at 2.4 m intervals as per the specifications and drawings provided.	m	10.00		
E2	Supply & Installation of 2 mm thick 100mm X 50mm powder coated, perforated cable tray without lid on 2.5m high support poles at 2.4 m intervals as per the specifications and drawings provided.	m	32.00		
E3	Modification to 8 m of existing cable tray and neatly arranging the existing cables.	Item	1.00		
E4	Laying & termination of 50 sqmm, 4-core, CU/XLPE/SWA/LSHF fire retardant cable on cable tray, from main electrical panel room to the fire pump house electrical panel. <b>(Cable provided by CPSTL)</b>	m	115.00		
E5	Supply, Laying and Termination of 25 sqmm, 4-core, CU/XLPE/SWA/PVC cable on cable tray, from main panel room to the product pump house electrical panel.	m	30.00		
E6	Supply, Laying & Termination of 25 sqmm, 4-core, CU/XLPE/SWA/PVC cable on cable tray, from Main panel room to the office building electrical panel.	m	100.00		

Item	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
E7	Supply, Laying & Termination of 4 sqmm, 3-core, CU/PVC/SWA/PVC cables in cable ducts, from Pump house electrical panel to the motors in pump house.	m	100.00		
E8	Supply, Laying & Termination of 1.5 sqmm, 6-core, CU/PVC/SWA/PVC cables on cable trays from the Pump house electrical panel to the product loading gantries.	m	450.00		
E9	Supply, Laying & Termination of 1.5 sqmm, 6-core, CU/PVC/SWA/PVC cables buried underground from the Pump house electrical panel to the product loading gantries.	m	170.00		
E10	Dismantling and Removal of decommissioned Switchgear and panel boards from the abandoned pump house.	Item	1.00		
E11	Modifications to the existing explosion proof switchgear panel at the product pump house to mount additional 3 Nos. of circuit breakers and 3 nos. of motor starters	Item	1.00		
E12	Installation of 3 Nos.explosion proof Circuit breakers and starters on the switchgear panel modified under Item E 11. (Switchgear would be supplied by CPSTL)	Item	1.00		
E13	Supply, Installation and termination of form 4 type Power distribution panel as per the specifications and drawings provided	Item	1.00		
E14	Testing & Commissioning of works under E1 to E13 and submission of 3 copies of as built drawings, test reports and manuals	Item	1.00		
	<b>Total carried to summary</b>				