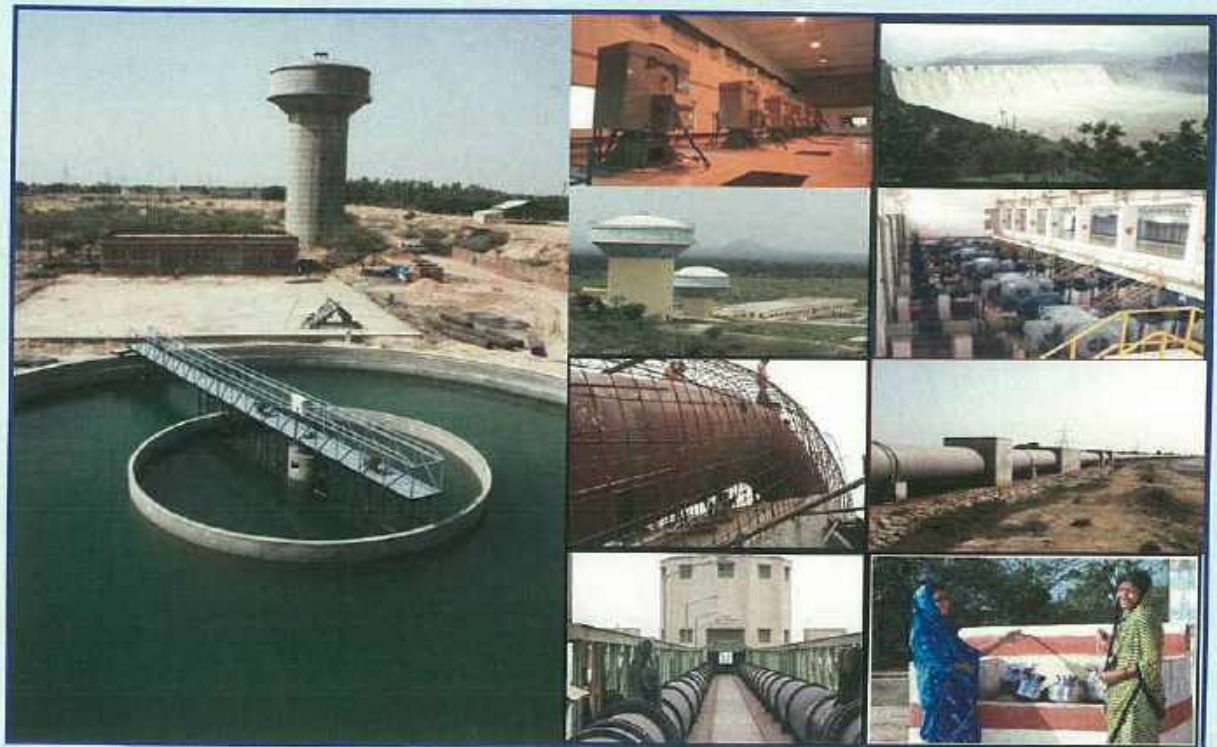


# SCHEDULE OF RATES



**YEAR : 2022-23**

## **PART-2 DRAINAGE SECTION**







# **SEWERAGE TREATMENT PLANT**

## **SECTION - C**





SECTION : 2.C - Sewage Treatment Plant			
ITEM NO.	ITEM DESCRIPTION	UNIT	Rate for 2022-23
1A	<b>Activated Sludge Process based Treatment Plant</b>		
A	Designing (hydraulic, process, structural and aesthetic), constructing and commissioning of Activated Sludge Process based Treatment Plant. Extended Aeration Process and its variants without primary clarification, is preferred for STP capacities less than 10 MLD. Scope of work consists of all Civil, Mechanical, Electrical, Instrumentation components of various sub-works as given below including necessary hydraulic testing, structural testing, equipment testing, trial run for 3 months, etc. complete as directed by Engineer-in-charge (turn-key job), to achieve BOD < 20ppm, TSS < 30 ppm, to meet GFCB standard of inland surface water discharge. The Coagulant Dosing System shall be provided, if required.		
	Minimum free board of 0.3 m shall be maintained unless other wise asked for 0.5 m stipulated for specific units.		
	<b>UNITS INCLUDED:</b>		
A	<b>PRIMARY TREATMENT</b>		
1	<b>Inlet Chamber</b> Designing, providing, and constructing RCC (M30) inlet chamber for the peak flow as per CPHEEO Manual including necessary excavation in all types of strata including walkway all around the periphery. Inlet chamber having minimum HRT of 60 seconds, each compartment will have steel gates with extension rod, head stock operating wheels. GI pipe railing etc. The work includes providing and making necessary arrangements to connect the flow to screen chamber by approach channel as directed and as per specifications.		
2	<b>Screen Chamber</b> Designing, providing, constructing, testing and commissioning of Two approach channels (min 4.5 m long), mechanically cleaned bar rack screen (6 mm clear opening 10 mm flats), Escalator screens, with 100% standby manual fine screen (10 mm clear opening) MCC: SS316, CI sluice gates (one before screen & one after screen), designed for average 1 DWF and maximum peak flow of 2 DWF in RCC (M-300), including inlet pipe/channel from inlet chamber, outlet pipe / channel to detritus tank, free board of 0.5 m minimum, RCC walkway 1.2 m wide with GI pipe railing, RCC stair case of 1.2 m width from GL to screen chamber, with operating platform and belt conveyor system incl. panel & push bottom switch at local level as well as MCC room for two way control.		
3	<b>Grit Chamber</b> Designing, providing and constructing grit Chamber- Detritus or vortex type or aerated type (100% standby), mechanically operated in RCC (M 30) capable of removing 100% of 0.2 mm size particle and above, having specific gravity 2.40, HRT of 1 minute at average flow (Detritus Tank), horizontal velocity not exceeding 0.30 m/sec at peak flow (Detritus Tank) with suitable arrangement of separation of grit from putrescible solids. Inlet and outlet channels of required sizes as may be required to connect the flow to connecting unit etc. Complete including hydraulic testing for water tightness of structure having minimum FB of 0.3 m, wash out arrangement to Grit chamber and platform 1.2 m wide RCC walkway with GI pipe railing shall be provided. A pit for collecting grit conveyed by conveyor shall be provided. It should be suitable to handle the grit for carting. All arrangements shall be as detailed specifications and as directed. CI sluice gates for upstream of grit chamber and for bypass arrangement to be provided.		
4	<b>Parshall flume</b> as per CPHEEO with necessary flow measuring devices/meter consisting of digital indicator in LPS & MLD		
8	<b>SECONDARY TREATMENT</b>		
5	<b>Distribution chamber with CI sluice gates</b> for each clarifier & bypass chamber, having appropriate size, operating platform with CI pipe upto central pier		
6	<b>Primary Clarifier</b> Surface loading rate of 25-30 cum./sq.m/day and free board of 0.5, weir loading limited to 125 cum/day.m. at average flow (upto 10 mld flow & 200 cum/day m at average flow for larger than 10 mld capacities), scum removal arm, double armed scraper mechanism, launder as required, telescopic valve, sludge removal pit with CI piping for inlet & outlet, 8 mm th. FRP weir plate, upflow velocity in central pier receiving sewage from the pipeline (from distribution chamber) limited to 0.2 m /sec in central pier, sewage outlet fins of required size as per manual of practice (CPHEEO/ ASCE) (One unit upto 10 MLD & two units for more than 10 MLD (maximum diameter 48 m)		
7	<b>Distribution chamber with CI sluice gates</b> for each compartment of anoxic followed by aeration tank & bypass chamber, having appropriate size, operating platform with CI pipe upto central pier		
8	<b>Aeration tank</b> Minimum HRT 5 hours (at average flow + return sludge flow), 2 nos., minimum free board 0.6 m in case of diffused aeration system (disc/ tube type diffusers with retrievable mechanism) & 1 m in case of aspirator aerator, CS piping, air blowers, all biological parameters as per manual, minimum power level 0.915 kW/cum. and energy efficient aerators.		
9	<b>Process Air Blowers or aeration Device</b> The Plant should be based on Dissolved Oxygen/Oxygen Uptake Rate Control with VFD driven Aeration Device. The Aeration System shall be designed for 100 % Capacity of the design Air requirement. The aeration Blower/Aeration Device shall be having 100% installed standby unit. Air diffuser shall be of disc/ tubular, retrievable type installation. The wetted part of the aeration system of non-corrosive materials such as UPVC. Blowers shall be housed in process air blower building. The minimum area of the building is 20 sq.m. and height of 5m (min). The surface Aerators are not acceptable.		
10	<b>Distribution chamber with CI sluice gates</b> for each clarifier (in no case bypass shall be provided after aeration without secondary clarification), having appropriate size, operating platform with CI pipe upto central pier		
11	<b>Secondary Clarifier</b> surface loading rate of 15-35 cum./sq.m/day or less as required and free board of 0.5, weir loading limited to 185 cum/day.m. (at average flow), double armed scraper mechanism, launder as required, telescopic valve, sludge removal pit with CI piping for inlet & outlet, 8 mm th. FRP weir plate, upflow velocity in central pier receiving sewage from the pipeline (from distribution chamber) limited to 0.2 m/sec in central pier, sewage outlet fins of required size as per manual of practice (CPHEEO/ ASCE) (One unit upto 10 MLD & two units for more than 10 MLD (maximum diameter 48 m)		
12	<b>Raw sludge pump house</b> Sump with minimum HRT of 30 minutes & depth of sludge limited to 2 m, separate panel room outside the wet well		



ITEM NO.	ITEM DESCRIPTION	UNIT	Rate for 2022-23
13	<b>Return sludge pump house</b> Sump with minimum HRT of 30 minutes upto flow of 100% of return sludge capacity & depth of sludge limited to 2 m. separate panel room outside the wet well, 100% standby pumps		
D	<b>DISINFECTION</b>		
14	<b>Chlorine Contact Tank:-</b> Designing providing and constructing chlorine contact chamber with baffle walls for adequate capacity to deal with 1 DWF average flow. The chlorine contact tank should be of 30 min capacity, during average flow to achieve 99.99 % coliform reduction. Chlorine dose shall be maintained as per standard provisions, including designing, providing and constructing water supply provision for chlorination, including providing dewatering and by pass arrangement joining to final effluent mains and outlet weir etc complete. The effluent quality should match with the standards laid down by Gujarat Pollution Control Board and as per obligatory provision and as detailed specification and as directed by engineer in - charge.		
15	<b>Chlorinator and Chlorinator Room/Tonner Room:</b> Designing, providing and constructing chlorinators vacuum type 2 Nos. (1 working + 1 stand by) with auto switchover facility and having capacity for dosage of 5ppm or adequate for 0.5ppm FRC, chlorine booster pump (1W-1S), chlorine tonner with 15 days storage, chlorination room with specified area etc. complete. Necessary provision of having chlorinator room of adequate size. The chlorinator equipment shall include cost of chlorine cylinders/tonner, piping, valves, measuring and controlling equipment, safety devices, lifting equipment, etc. complete as per IS-10553 ( part II) 1982. The tonner room should have minimum 3 MT capacity Hoist for loading and unloading facility. Tonner storage should be distinctly isolated and should be for minimum storage space as directed in the design specification and as per gas laws 1981 and factory act shall be provided. All other matching amenities shall be provided. Minimum 5 MT gantry rail shall be provided for full length of tonner room at 6 m height from level of tonner room, with outlet chamber and treated effluent outlet channel etc complete as per detailed specification.		
E	<b>Sludge treatment</b> Raw excess sludge to be treated & digested prior to dewatering by means of belt filter press/ centrifuge/ Combi-machine/ Screw Press/ Bag Filter		
16	<b>Sludge Thickener with equipments:</b> Solids loading rate of 25-35 kg/m <sup>2</sup> /day. Designing, providing & constructing watertight of sludge thickener-gravity type (picket fence) in RCC (M-30) with inlet & outlet pipes, central feed well & sludge removal arrangement, grouting wherever necessary with walkway all around of 1.20m with GI pipe railing interconnecting CI pipes all complete as per specifications, having bottom slope 1:6 & min. 4.5m SVWD with necessary fixed bridge scraper arrangement as per detailed specifications & necessary inlet & outlet arrangement. All other arrangement as per detailed specifications. (Necessary above 3 MLD). Min sludge concentration of thickened sludge shall be 4%.		
17	<b>Sludge Digester of suitable capacity as per CPHEEO Manual (only cylindrical volume to be considered without hopper bottom), sludge mixing (by gas/mechanical mixing). Sludge digester shall comprise all the fixtures, fasteners, accessories, supernatant handling, PRV, other safety mechanism etc. along with Flare System</b>		
18	<b>Sludge Dewatering Room with Centrifuge or Belt Press or Screw Press or Bag Type or Filter Press or Combi-machine:</b> Designing, providing constructing and installing including foundation etc. Sludge Centrifuge or Belt Press or Screw Press or Bag Type or Filter Press or Combi-machine: to handle the sludge flow as per specifications, with appropriate inlet and outlet provision, sludge dewatering unit drain etc. Complete as per specifications.		
19	<b>Filtrate Pumps with 100% standby, designed to empty Recycle sump in 1 hour</b>		
20	<b>Valves/gates</b> Inlet, outlet, wash water inlet – only CI D/F and minimum size of 200 mm (for sludge) as per approved make/brand.		
21	<b>All types gauges and meters required for Q &amp; M as per design of specified make/brand.</b>		
22	<b>Dewatering during entire work using any technique.</b>		
23	<b>Necessary Instrumentation and control as per specifications</b>		
24	<b>Outfall Sewer:</b> Designing, providing and constructing appropriate outfall sewer of RCC NP2 pipe, up to plot boundary (as specified) and beyond for treated sewage disposal upto 500m, diameter as per design, including necessary chambers for inspection and cleaning including necessary excavation, dewatering, refilling, concrete encasing/bedding concrete steps to reach the disposal/ nallah bed level, pitching and energy dissipation chamber in nallah portion etc. complete up to 500 m length RCC NP2 pipe line and including all above items.		
25	<b>By pass arrangements</b> RCC pipes with manholes and C.I. sluice gates (MH to be raised above TWL of adjacent unit)		
26	<b>Piping work in CI-LA Glass including Sluice valves, Reflux Valves, MS Gates:</b> Providing laying and jointing pipes other than those already included in the above items for interconnection by - pass drains etc. of all units including adequate numbers of manhole chambers. The item includes excavations, refilling and hydraulic testing of pipes, valves, gates, accessories and cost of jointing materials. The items includes required channels with gates for interconnection of units by pass drains etc for all units as directed etc complete as per detailed specifications.		
27	<b>Administrative Building cum Laboratory (G+1):</b> Designing, providing and constructing administrative building, office cum Laboratory including stores. This shall be a building having appropriate carpet area and ground floor and at first floor complete as per specifications including necessary excavation, foundation in RCC M 200 framed structure B. B masonry (1:1 class in C.M. 1:5) 20 mm cement plaster in C.M 1:3 inside and outside painting, Aluminium door and window with glass panels, mosaic tile flooring and skirting and all other allied items, fixtures fastening electrification arrangement water supply arrangement etc complete.		
	a) Ground floor to accommodate administrative office & laboratory		

ITEM NO.	ITEM DESCRIPTION	UNIT	Rate for 2022-23
	b) First floor to accommodate Office of the Plant in Charge, air monitoring equipments to measure wind direction & speed, hydrogen sulphide concentration etc.		
27.1	Laboratory equipments Laboratory equipment (as per specifications), beautification, telephone and intercom arrangement and wireless system.		
27.2	Furniture and Office Equipments, Office furniture (Make: Godrej) or similar approved quality as per specifications.		
27.3	Ventilation and Safety equipments as per specifications		
27.4	Sanitary blocks Carpet area – 15 square meter minimum up to 25 MLD and 25 square meter above 25 MLD (or as specified).		
28	Maintenance Workshop of size as per specification		
29	Air blower Building with Air Blowers: Capable of delivering adequate free air for aeration device with suitable pressure (100% standby).		
30	MCC Room of minimum 9 m x 6 m clear inside with safety measures, approval of various statutory/ central/ foreign authority as applicable		
31	Electric installation		
31.1	Both internal and external including entire plant area (as specified).		
31.2	Electric installation - Sub Station Room as per specifications.		
32	DG room with DG sets, as per electric load and specifications (50 % energy requirement).		
33	General Infrastructure Development: Scope also includes, Designing, providing and constructing general infrastructure development such as internal roads, compound wall for STP site, internal street and building lightings, pathways of minimum 1 m wide to access all STP units and Entrance Gate in MS fabrication, etc. all complete as per specifications and directed by engineering in charge.		
33.1	Internal roads Asphalt road (Minimum 4.5 m) to connect all units from main gate of plot.		
33.2	Compound Wall as per the plant layout, along the boundary of STP site (considering plant layout for intermediate and ultimate build out capacity and 33% landscaping area).		
33.3	Green Belt (33% landscaping area) as per specification		
	Notes		
1	All the above conditions shall form a part and parcel of the tender and must be incorporated in draft tender papers of conventional Sewage Treatment Plants.		
2	The necessary changes should be carried out as per Site condition and project requirements at the time of preparing DTPs.		
3	Fine screens (SS 316) are of mechanically cleaned type for working unit and manual bar screen type (SS 316) for standby unit.		
4	Upto 5 MLD Capacity STP chlorination could be done by using sodium hypochlorite solution. Above 5 MLD capacity gas chlorinator to be provided.		
5	Gravity sludge thickener is not provided upto 3 MLD capacity STP. Sludge will be collected into sludge sump & pumped directly to digester or sludge dewatering system.		
6	Filter press or Bag Type for dewatering can be provided for STP's upto 5MLD capacity.		
7	Chlorinator room not provided for STP upto 3 MLD.		
8	Boundary wall, gate, Internal plant roads, storm water drains, site clearance, landscaping is considered in scope. Plant road shall be 4.5m wide. Landscaping area shall be min. 33% of plant area.		
9	All water retaining structures are in M-30 grade of concrete.		
10	Lead for excavation is considered as 500m.		
11	Grade of steel used is Fe 415.		
12	Peak factor considered for design for plants 2 to 5 MLD is 2.5, 6 to 20 MLD is 2.25.		
13	The rates mentioned above STP are considering sites falling in Seismic Zone III. For sites falling in seismic zone IV and V shall be increased by 5% and 8% respectively.		
14	Structural design criteria approved by technical committee shall be applicable for design.		
15	Hydraulic design of the plant shall be considered with free fall discharge of treated sewage to local water body (above HFL). Hydraulic loss shall be worked out for peak flow condition and shall not exceed 4.5m in any circumstances unless otherwise site specific condition and approved by technical committee.		
16	The cost of sewage pumping station and rising main is not included.		
17	Makes of equipment shall be approved by GWSSB.		
18	The rates include excavation, refilling and throwing away extra stuff as directed by the Engineer in Charge.		
19	All other details shall be as per design criteria and detail specifications.		
	The Rates are as under		
1	Fixed cost up to and including up to 1MLD	1No	7,766,663
2	Add (prorata) for capacity above 1MLD up to 2MLD	MLD	7,569,634
3	Cost of 2MLD treatment plant	1No	15,335,696
4	Add (prorata) for capacity above 2MLD up to 5MLD	MLD	7,274,991
5	Cost of 5MLD treatment plant	1No	37,160,670
6	Add (prorata) for capacity above 5MLD up to 10MLD	MLD	5,754,161
7	Cost of 10MLD treatment plant	1No	65,931,477
8	Add (Prorata) for capacity above 10MLD to 25MLD	MLD	5,366,862
9	Cost of 25MLD treatment plant	1No	146,434,408
10	Add (prorata) for capacity above 25MLD to 50MLD	MLD	3,817,812
11	Cost of 50MLD treatment plant	1No	241,879,688
12	Add (prorata) for capacity above 50MLD to 100MLD	MLD	3,698,210
13	Cost of 100MLD treatment plant	1No	426,790,179
14	Add (prorata) for capacity above 100MLD	MLD	3,633,920



SECTION : 2.C - Sewage Treatment Plant			
ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
1B	<b>Modified Activated Sludge Process based Treatment Plant with Biological Nitrogen &amp; Phosphorous Removal</b>		
A	Designing (hydraulic, process, structural and aesthetic), constructing and commissioning of Modified Activated Sludge Process based Treatment Plant with Biological Nitrogen and Phosphorous Removal. Extended Aeration Process and its variants without primary clarification, is preferred for STP capacities less than 10 MLD. For nutrient removal, coagulant dosing system for phosphorus removal and tertiary treatment by filtration to be opted wherever applicable. Scope of work consists of all Civil, Mechanical, Electrical, instrumentation components of various sub-works as given below including necessary hydraulic testing, structural testing, equipment testing, trial run for 3 months, etc. complete as directed by Engineer-in-charge (turn-key job), to achieve BOD < 10ppm, TSS < 10ppm, Biological TN < 10ppm & PO <sub>4</sub> < 2ppm to get recyclable quality of water for industrial / agricultural purposes. The Coagulant Dosing System shall be provided as an optional/ back up.		
	<b>UNITS INCLUDED:</b>		
A	<b>PRIMARY TREATMENT</b>		
1	<b>Inlet Chamber:</b> Designing, providing, and constructing RCC (M:30) inlet chamber for the peak flow as per CPHEEO Manual including necessary excavation in all types of strata including walkway all around the periphery. Inlet chamber having minimum HRT of 60 seconds, each compartment will have steel gates with extension rod, head stock operating wheels, GI pipe railing etc. The work includes providing and making necessary arrangements to connect the flow to screen chamber by approach channel as directed and as per specifications.		
2	<b>Screen Chamber:</b> Designing, providing, constructing, testing and commissioning of Two approach channels (min 4.5 m long), mechanically cleaned bar rack screen (6 mm clear opening 10 mm th. flats), Escalator screens, with 100% standby manual fine screen (10 mm clear opening) MOC: SS316, CI sluice gates (one before screen & one after screen), designed for average 1 DWF and maximum peak flow of 2 DWF in RCC (M - 300), including inlet pipe/ channel from inlet chamber, outlet pipe / channel to detritus tank, free board of 0.5 m minimum. RCC walkway 1.2 m wide with GI pipe railing. RCC stair case of 1.2 m width from GL to screen chamber, with operating platform and belt conveyor system incl. panel & push bottom switch at local level as well as MCC room for two way control.		
3	<b>Grit Chamber:</b> Designing, providing and constructing grit Chamber- Detritus or vortex type or aerated type (100% standby), mechanically operated in RCC (M 30) capable of removing 100% of 0.2 mm size particle and above, having specific gravity 2.40, HRT of 1 minute at average flow (Detritus Tank), horizontal velocity not exceeding 0.30 m/sec at peak flow (Detritus Tank) with suitable arrangement of separation of grit from putrescible solids. Inlet and outlet channels of required sizes as may be required to connect the flow to connecting unit etc. Complete including hydraulic testing for water tightness of structure having minimum FB of 0.3 m, wash out arrangement to Grit chamber and platform 1.2 m wide RCC walkway with GI pipe handling shall be provided. A pit for collecting grit conveyed by conveyor shall be provided. It should be suitable to handle the grit for carting. All arrangements shall be as detailed specifications and as directed. CI sluice gates for upstream of grit chamber and for bypass arrangement to be provided.		
4	Parshall flume as per CPHEEO with necessary flow measuring devices/meter consisting of digital indicator in LPS & MLD		
B	<b>SECONDARY TREATMENT</b>		
5	<b>Distribution chamber with CI sluice gates</b> for each clarifier & bypass chamber, having appropriate size, operating platform with CI pipe up to central pier		
6	<b>Primary Clarifier</b> Surface loading rate of 25-30 cum /sq m/day and free board of 0.5, weir loading limited to 125 cum/day.m at average flow (upto 10 MLD flow & 200 cum/day.m at average flow for larger than 10 MLD capacities), scum removal arm, double armed scraper mechanism, launder as required, telescopic valve, sludge removal pit with CI piping for inlet & outlet, 8 mm th. FRP weir plate, upflow velocity in central pier receiving sewage from the pipeline (from distribution chamber) limited to 0.2 m/sec in central pier, sewage outlet fins of required size as per manual of practice (CPHEEO/ ASCE) (One unit upto 10 MLD & two units for more than 10 MLD (maximum diameter 48 m))		
7	<b>Distribution chamber with CI sluice gates</b> for each compartment of anoxic followed by aeration tank & bypass chamber, having appropriate size, operating platform with CI pipe upto central pier		
8	<b>Anoxic and/ or Anaerobic Tanks with Submersible Mixers:</b> Suitable Anaerobic and/or Pre-Anoxic Tanks for Biological phosphorus removal and denitrification with submersible mixer arrangement, respectively, as per CPHEEO Manual.		
9	<b>Aeration tank</b> Minimum HRT 6 hours (at average flow + return sludge flow), 2 nos., minimum free board 0.6 m in case of diffused aeration system (disk / tube type diffusers with fixed/ retrievable mechanism) & 1 m in case of aspirator aerator, CS piping, air blowers, all biological parameters as per manual, minimum power level 0.015 kW/cu.m and energy efficient aerators		
10	<b>Internal Sludge recirculation pumps</b> Suitable pumps of capacity upto 400% to be provided for internal recirculation of MLSS from Aeration Tank to Anoxic Tank. There should also be the provision of 100% standby pumps in the warehouse.		



ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
11	<b>Process Air Blowers or aeration Device</b> The Plant should be based on Dissolved Oxygen/Oxygen Uptake Rate Control with VFD driven Aeration Device. The Aeration System shall be designed for 110 % Capacity of the design Air requirement. The aeration Blower/Aeration Device shall be having 100% installed standby unit. Air diffuser shall be of disk/ tubular type, retrievable. The wetted part of the aeration system of non-corrosive materials such as UPVC. Blowers shall be housed in process air blower building. The minimum area of the building is 20 sq.m. and height of 5m (min). The surface Aerators are not acceptable.		
12	<b>Distribution chamber with CI sluice gates</b> for each clarifier (in no case bypass shall be provided after aeration without secondary clarification), having suitable size, operating platform with CI pipe upto central pier		
13	<b>Secondary Clarifier</b> surface loading rate of 15-35 cum/sq.m/day or less as required and free board of 0.5, weir loading limited to 185 cum/day.m. (at average flow), double armed scraper mechanism, launder as required, telescopic valve, sludge removal pit with CI piping for inlet & outlet, 6 mm th. FRP weir plate, upflow velocity in central pier receiving sewage from the pipeline (from distribution chamber) limited to 0.2 m/sec in central pier, sewage outlet fins of required size as per manual of practice (CPHEEO/ ASCE) (One unit upto 10 MLD & two units for more than 10 MLD (maximum diameter 48 m)		
14	<b>Raw sludge pump house</b> Sump with minimum HRT of 30 minutes & depth of sludge limited to 2 m, separate panel room outside the wet well		
15	<b>Return sludge pump house</b> Sump with minimum HRT of 30 minutes upto flow of 100% of return sludge capacity & depth of sludge limited to 2 m, 4.5 m minimum diameter, separate panel room outside the wet well, 100% standby pumps		
C	<b>TERTIARY TREATMENT</b> Pressure Sand Filter / Rapid Sand Gravity Filter/ Coagulant Dosing System / Flash Mixer / Flocculator / Settling Tank / Clariflocculator. The design values / specifications for the tertiary treatment units are to be considered from current CPHEEO Manual on Water Supply & Treatment.		
16	<b>Flash Mixer</b> Rapid mixing device design conforming to IS: 7090 of 1985. Detention time 60 sec, velocity gradient 300-400 sec <sup>-1</sup> with fans gear and motor assembly as per design.		
17	<b>Coagulant Dosing System</b> Dosing Tanks- 2Nos. with mixing, carrying, dosing with piping arrangement, Chemical Storage area as per data/specifications		
18	<b>Flocculation &amp; Settling Tank or Clariflocculator</b> RCC Hopper bottom units having slope >45 Deg as per hydraulic and process design with detention period 20 minutes with flocculator paddles with gear and motor assembly as per design, Flocculator design conforming to IS: 7208-1974 (Type-C). Surface loading rate for clarifier 8,000 litres/hour/sq.m and depth 2.5m using PVC media with supporting arrangement and sludge collecting pipes as per detail specifications.		
19	<b>Filter Feed Sump &amp; Pumps</b>		
20	<b>Pressure Sand Filters</b> for STP capacities less than 10 MLD		
21	<b>Rapid Sand Gravity Filters with shed</b> Applicable to plant capacity above 10MLD only. Filter House (RCC framed structure with infill brick masonry walls) and RCC filter beds with sand and gravel bedding as per hydraulic and process design adopting 6000 Litres/hour/sq.m. Filtration rate with 2m water above sand media with under drainage system and inlet, outlet, backwash (rate 600LPM per Sq.m.) piping, pipe gallery, platform min. 5.5m in width and valves/gates arrangement as per design and detail specifications.		
21.1	<b>a. Filter Sand</b> Effective size 0.45 to 0.7 mm, uniformity coefficient not more than 1.7 nor less than 1.3, depth of sand 0.75m, free board 50cm, gravel 0.45m in depth, sand and gravel conforming to IS: 8491 (I)- 77, backwash by air wash (if specified) and hard wash by water, standard appurtenances (to be specified), rate of flow controller, filter gauge, sand expansion gauge, etc.		
21.2	<b>Wash Water Tank</b> Wash Water tanks of capacity equal to 2% of designed quantity of filtered water in a day (+) 10% with 8 to 10 Mtr. Head (as specified)		
21.3	<b>Wash Water Pumps</b> Wash Water Pumps with 100% Standby		
21.4	<b>Air Blowers</b> Capable of delivering 750 to 833 LPM per sq.m of free air flow area at 0.35 to 0.4 Kg/sq.m at the under drains (100% standby), (For capacity of FP more than 10 MLD)		
21.5	<b>Valves/gates</b> Inlet, outlet, wash water inlet- outlet and all types and sizes of valves/gates as per design of specified make/brand.		
21.6	All types gauges and meters required for filter operations and backwashing etc.		

ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
D	<b>DISINFECTION</b>		
22	<b>Chlorine Contact Tank:</b> Designing providing and constructing chlorine contact chamber with baffle walls for adequate capacity to deal with 1 DWF average flow. The chlorine contact tank should be of 30 min capacity, during average flow to achieve 99.99 % coliform reduction. Chlorine dose shall be maintained as per standard provisions, including designing, providing and constructing water supply provision for chlorination, including providing dewatering and by pass arrangement jointing to final effluent mains and outlet weir etc complete. The effluent quality should match with the standards laid down by Gujarat Pollution Control Board and as per obligatory provision and as detailed specification and as directed by engineer in - charge.		
23	<b>Chlorinator and Chlorinator Room/Tonner Room:</b> Designing, providing and constructing chlorinators vacuum type 2 Nos. (1 working + 1 stand by) with auto switchover facility and having capacity for dosage of 5ppm or adequate for 0.5ppm FRC, chlorine booster pump (1W+1S), chlorine tonner with 15 days storage, chlorination room with specified area etc. complete. Necessary provision of having chlorinator room of adequate size. The chlorinator equipment shall include cost of chlorine cylinders/tonner, piping, valves, measuring and controlling equipment, safety devices, lifting equipment, etc. complete as per IS -10553 ( part II) 1982. The tonner room should have minimum 3 MT capacity Hoist for loading and unloading facility. Tonne storage should be distinctly isolated and should be for minimum storage space as directed in the design specification and as per gas laws 1981 and factory act shall be provided. All other matching amenities shall be provided. Minimum 5 MT gantry rail shall be provided for full length of tonner room at 6 m height from level of tonner room, with outlet chamber and treated effluent outlet channel etc complete as per detailed specification.		
E	<b>Sludge treatment Raw/ excess sludge to be treated &amp; digested prior to dewatering by means of belt filter press/ centrifuge/ Combi-machine/ Screw Press/ Bag Filter</b>		
24	<b>Sludge Thickener with equipments:</b> Solids loading rate of 25-35 kg/m <sup>2</sup> /day, Designing, providing & constructing watertight of sludge thickener-gravity type (picket fence) in RCC (M-30) with inlet & outlet pipes, central feed well & sludge removal arrangement, grouting wherever necessary with walkway all around of 1.20m with GI pipe railing interconnecting CI pipes all complete as per specifications, having bottom slope 1:6 & min. 4.5m SWD with necessary fixed bridge scraper arrangement as per detailed specifications & necessary inlet & outlet arrangement. All other arrangement as per detailed specifications. (Necessary above 3 MLD). Min sludge concentration of thickened sludge shall be 4%.		
25	<b>Sludge Digester</b> of suitable capacity as per CPHEEO Manual (only cylindrical volume to be considered without hopper bottom), sludge mixing by gas or mechanical mixing system. Sludge digester shall comprise all the fixtures, fasteners, accessories, supernatant handling, PRV, other safety mechanism etc. along with flare system.		
26	<b>Sludge Holding Sump</b> Minimum HRT of 4 hours, Designing, providing and constructing of sludge holding sump and pump for discharging sludge to centrifuge using CI pipe complete as per detailed specification. Agitators/Mixers shall be provided in sump for keeping sludge in suspension. The pump shall be of Helical Screw pumps, 100% standby.		
27	<b>Sludge Dewatering Room with Centrifuge or Belt Pres or Screw Press or Bag Type or Filter Press or Combi-machine:</b> Designing, providing constructing and installing including foundation etc. Sludge Centrifuge or Belt Pres or Screw Press or Bag Type or Filter Press or Combi-machine: to handle the sludge flow as per specifications, with appropriate inlet and outlet provision, sludge dewatering unit drain etc. Complete as per specifications.		
28	<b>Filtrate Pumps</b> with 100% standby, designed to empty Recycle sump in 1 hour		
29	<b>Valves/gates</b> Inlet, outlet, wash water inlet – only CI D/F. and minimum size of 200 mm (for sludge) as per approved make/brand.		
30	All types <b>gauges and meters</b> required for Q & M as per design of specified make/brand.		
31	Dewatering during entire work using any technique.		
32	<b>Necessary Instrumentation and control</b> as per specifications		
33	<b>Outfall Sewer:</b> Designing, providing and constructing appropriate outfall sewer of RCC NP2 pipe, up to plot boundary (as specified) and beyond for treated sewage disposal upto 500m, diameter as per design, including necessary chambers for inspection and cleaning including necessary excavation, dewatering, refilling, concrete encasing/bedding concrete steps to reach the disposal/ nallah bed level, pitching and energy dissipation chamber in nallah portion etc. complete up to 500 m length RCC NP2 pipe line and including all above items.		
34	<b>By pass arrangements</b> RCC pipes with manholes and C.I. sluice gates (MH to be raised above TWL of adjacent unit)		
35	<b>Piping work in CI-LA Class including Sluice valves, Reflux Valves, MS Gates:</b> Providing laying and jointing pipes other than those already included in the above items for interconnection by - pass drains etc. of all units including adequate numbers of manhole chambers. The item includes excavations, refilling and hydraulic testing of pipes, valves, gates, accessories and cost of jointing materials. The items includes required channels with gates for interconnection of units by pass drains etc for all units as directed etc complete as per detailed specifications.		



ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
36	<b>Administrative Building cum Laboratory (G+1):</b> Designing, providing and constructing administrative building, office cum Laboratory including stores. This shall be a building having appropriate carpet area and ground floor and at first floor complete as per specifications including necessary excavation, foundation in RCC M 200 framed structure B, B masonry (1:1- class in C.M. 1:6) 20 mm cement plaster in C.M 1:3 inside and outside painting. Aluminium door and window with glass panels, mosaic tile flooring and skirting and all other allied items, fixtures fastening electrification arrangement water supply arrangement etc complete.		
	a) Ground floor to accommodate administrative office & laboratory		
	b) First floor to accommodate Office of the Plant In Charge, air monitoring equipments to measure wind direction & speed, hydrogen sulphide concentration etc.		
36.1	<b>Laboratory equipments</b> Laboratory equipment (as per specifications), beautification, telephone and intercom arrangement and wireless system.		
36.2	Furniture and Office Equipments, Office furniture (Make: Godrej/ or similar approved quality) as per specifications		
36.3	<b>Ventilation and Safety equipments</b> as per specifications.		
36.4	<b>Sanitary blocks</b> Carpet area – 15 square meter minimum up to 25 MLD and 25 square meter above 25 MLD (or as specified).		
37	<b>Maintenance Workshop</b> of size as per specification		
38	<b>Air blower Building with Air Blowers:</b> Capable of delivering adequate free air for aeration device as well as filter air scouring with suitable pressure (100% standby).		
39	<b>MCC Room</b> of minimum 9 m x 6 m clear inside with safety measures, approval of various statutory/ central/ foreign authority as applicable		
40	<b>Electric installation</b>		
40.1	Both internal and external including entire plant area (as specified).		
40.2	<b>Electric installation - Sub Station Room</b> as per specifications		
41	<b>DG room with DG sets</b> , as per electric load and specifications (50 % energy requirement).		
42	<b>General Infrastructure Development:</b> Scope also includes, Designing, providing and constructing general infrastructure development such as internal roads, compound wall for STP site, internal street and building lightings, pathways of minimum 1 m wide to access all STP units and Entrance Gate in MS fabrication, etc. all complete as per specifications and directed by engineering in charge.		
42.1	<b>Internal roads</b> Asphalt road (4.5 m Minimum) to connect all units from main gate of plot.		
42.2	<b>Compound Wall</b> as per the plant layout, along the boundary of STP site (considering plant layout for intermediate and ultimate build out capacity and 33% landscaping area).		
42.3	<b>Green Belt (33% landscaping area)</b> as per specification		
	<b>Notes</b>		
1	All the above conditions shall form a part and parcel of the tender and must be incorporated in draft tender papers of conventional Sewage Treatment Plants with Biological Nitrogen Removal and Tertiary treatment for phosphorus removal.		
2	The necessary changes should be carried out as per Site condition and project requirements at the time of preparing DTPs.		
3	Fine screens (SS 316) are of mechanically cleaned type for working unit and manual bar screen type (SS 316) for standby unit.		
4	Tertiary units such as flash mixing tanks, coagulant dosing system, flocculation chamber, clarifier or Clariflocculator and filters (optional) shall be provided if required as per process design for AO process to achieve specified effluent quality.		
5	Upto 5 MLD Capacity STP chlorination could be done by using sodium hypochlorite solution. Above 5 MLD capacity gas chlorinator to be provided.		
6	Gravity sludge thickener is not provided upto 3 MLD capacity STP. Sludge will be collected into sludge sump & pumped directly to digester or sludge dewatering system.		
7	Filter press or Bag Type for dewatering can be provided for STP's upto 5MLD capacity.		
8	Chlorinator room not provided for STP upto 3 MLD.		
9	Boundary wall, gate, Internal plant roads, storm water drains, site clearance, landscaping is considered in scope. Plant road shall be 4.5m wide. Landscaping area shall be min. 33% of plant area.		
10	All water retaining structures are in M-30 grade of concrete.		
11	Lead for excavation is considered as 500m.		
12	Grade of steel used is Fe 415.		
13	Peak factor considered for design for plants 2 to 5 MLD is 2.5, 6 to 20 MLD is 2.25.		
14	The rates mentioned above STP are considering sites falling in Seismic Zone III. For sites falling in seismic zone IV and V shall be increased by 5% and 8% respectively.		
15	Structural design criteria approved by technical committee shall be applicable for design.		
16	Hydraulic design of the plant shall be considered with free fall discharge of treated sewage to local water body (above HFL). Hydraulic loss shall be worked out for peak flow condition and shall not exceed 4.5m in any circumstances unless otherwise site specific condition and approved by technical committee.		
17	The cost of sewage pumping station and rising main is not included.		

ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
18	Makes of equipment shall be approved by GWSB.		
19	The rates include excavation, refilling and throwing away extra stuff as directed by the Engineer in Charge.		
20	All other details shall be as per design criteria and detail specifications.		
	The Rates are as under		
1	Fixed cost up to and including up to 1MLD	1No	11,785,714
2	Add(prorate) for capacity above 1MLD up to 2MLD	MLD	11,399,186
3	Cost of 2MLD treatment plant	1No	23,184,900
4	Add (prorate)for capacity above 2MLD up to 5MLD	MLD	7,274,991
5	Cost of 5MLD treatment plant	1No	45,009,873
6	Add (prorate)for capacity above 5MLD up to 10MLD	MLD	6,637,163
7	Cost of 10MLD treatment plant	1No	78,195,689
8	Add (Prorate)for capacity above 10MLD to 25MLD	MLD	5,745,249
9	Cost of 25MLD treatment plant	1No	184,374,422
10	Add (prorate)for capacity above 25MLD to 50MLD	MLD	4,434,375
11	Cost of 50MLD treatment plant	1No	275,233,797
12	Add (prorate)for capacity above 50MLD to 100MLD	MLD	3,928,571
13	Cost of 100MLD treatment plant	1No	471,662,369
14	Add (prorate)for capacity above 100MLD	MLD	3,633,929



SECTION : 2.C - Sewage Treatment Plant				
ITEM NO.	DESCRIPTION	UNIT		Rate for 2022-23
2	<b>Sequential Batch Reactor Technology (SBR TECHNOLOGY)</b>			
A	Designing, providing, constructing, hydraulic testing, commissioning and giving satisfactory trials of STP consisting of Inlet Chamber, Screen Chamber, Detritus Tanks, Distribution Chamber and SBR Basins, Sludge Sump, Chlorine Contact Tank, Chlorinator Room / Shed, Sludge Dewatering Equipment, necessary piping work with required valves, gates, drains, pathways, Administration Block cum Laboratory, Laboratory Equipments, Internal Roads, Pathways, compound wall, Tools and Plants, complete as turnkey job with all involved civil, electrical, instrumentation and mechanical works inclusive of following items, units as per detailed specifications for civil, electrical and mechanical components with all duties and taxes etc, complete to achieve BOD < 10ppm, TSS < 10ppm, Biological TN < 10ppm & PO4 < 2ppm to get recyclable quality of water for industrial / agricultural purposes. The Coagulant Dosing System shall be provided as an optional/ back up. All units shall be interconnected with administration building by Suitable or RCC overhead walkways.			
	<b>UNITS INCLUDED:</b>			
A	<b>PRIMARY TREATMENT</b>			
1	<b>Inlet Chamber :</b> Designing, providing, and constructing RCC (M:30) inlet chamber for the peak flow as per CPHEEO Manual including necessary excavation in all types of strata including walkway all around the periphery, Inlet chamber having minimum HRT of 60 seconds, each compartment will have steel gates with extension rod, head stock operating wheels, GI pipe railing etc. The work includes providing and making necessary arrangements to connect the flow to screen chamber by approach channel as directed and as per specifications.			
2	<b>Screen Chamber :</b> Designing, providing, constructing, testing and commissioning of Two approach channels (min 4.5 m long), mechanically cleaned bar rack screen (8 mm clear opening 10 mm the. flats), Escalator screens, with 100% standby manual fine screen (10 mm clear opening) MOC: SS316, GI sluice gates (one before screen & one after screen), designed fast per CPHEEO Manual in RCC (M-30), including inlet pipe/channel from inlet chamber, outlet pipe / channel to detritus tank, free board of 0.5 m minimum, RCC walkway 1.2 m wide with GI pipe railing, RCC stair case of 1.2 m width from GI. to screen chamber with operating platform and belt conveyor system incl. panel & push bottom switch at local level as well as MCC room for two way control.			
3	<b>Grit Chamber :</b> Designing, providing and constructing grit Chamber- Detritus or vortex type or aerated type (100% standby), mechanically operated in RCC (M 30) capable of removing 100% of 0.2 mm size particle and above, having specific gravity 2.40, HRT of 1 minute at average flow (Detritus Tank), horizontal velocity not exceeding 0.30 m/sec (Detritus Tank) at peak flow with suitable arrangement of separation of grit from putrescible solids. Inlet and outlet channels of required sizes as may be required to connect the flow to connecting unit etc. Complete including hydraulic testing for water tightness of structure having minimum FB of 0.3 m, wash out arrangement to Grit chamber and platform 1.2 m wide, RCC walkway with GI pipe handling shall be provided. A pit for collecting grit conveyed by conveyor shall be provided, It should be suitable to handle the grit for carting. All arrangements shall be as detailed specifications and as directed.			
4	<b>Parshall flume</b> having head loss limited to 0.15 m with necessary flow measuring devices/meter consisting of digital indicator in LPS & MLD			
B	<b>SECONDARY TREATMENT</b>			
5	<b>SBR Basins:</b> Designing, providing and constructing in RCC (M 300), CASP basins for biological removal of BOD along with built-in nitrification-denitrification, Bio-P removal in compartments to handle combine flow of 1 DMF incoming flow and recirculation flow including construction of selector compartments and providing 1.2 m wide clear approach walkways, expansion joints wherever necessary, including foundations etc as per specifications, Peak factor shall be 2, F/M ratio shall be 0.15, complete with air blowers, fine diffused aeration grid with Retrivable type installation equipment and FB 0.5 m and SWD as required, DO level in basin to be minimum 2 mg/l complete with "Oxygen Uptake Rate" control system and all related instruments. Stainless steel decanters and automation works, MLSS concentrations shall be 3000 - 5000 mg/l or more, MLVSS to MLSS ratio to be 0.6-0.7, HRT shall be min. 13.5 hrs and SRT suitable for fully digested sludge. SBR process shall have independent steps like Fill & aeration, Settling (Sedimentation/clarification), Decanting without overlapping each other. Since it is complete batch process, filling will not be acceptable during settling or Decanting. Minimum decanting depth shall not be less than 2.20 m. The system should work on a gravity influent condition. No influent/effluent equalization tanks or flash filling is accepted. It should have all other related works.			
	SRT shall be suitably provided to achieve N, P removal. Since these are the technology driven plants, bidders has to adopt well established, well tested and proven, IIT/ NEERI evaluated/approved SBR process /specifications and at least 50 % of the tendered capacity has been in successfully operating condition as per the outlet criteria mentioned in above in Government organizations of India since last two years including one year of standard defect liability period. Bidder has to tie-up with the well qualified technology provider who having experience in India at least 50 % of the tendered capacity with 1 year O & M experience in government organizations of India.			
6	<b>Process Air Blowers or Aspirator Aerator:</b> The Plant should be based on Dissolved Oxygen/Oxygen Uptake Rate Control with VFD driven Aeration Device. The Aeration System shall be designed for 110 % Capacity of the design Air requirement. The aeration Blower/Aeration Device shall be having 100% installed standby unit.  Air diffuser shall be of disk/ tubular type, retrievable. The wetted part of the aeration system of non-corrosive materials such as UPVC,  Blowers shall be housed in process air blower building. The minimum area of the building is 20 sq.m. and height of 5m (min).			
7	<b>Raw sludge pump house:</b> Raw Sludge Sump minimum HRT of 30 minutes & depth of sludge limited to 2 m, 4.5 m minimum diameter, separate panel room outside the wet well			

ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
C	<b>DISINFECTION</b>		
8	<b>Chlorine Contact Tank:</b> Designing providing and constructing chlorine contact chamber of adequate capacity to deal with 1 DWF average flow. The chlorine contact tank should be of 30 min capacity, during average flow to achieve 99.99 % coliform reduction. Chlorine dose shall be maintained as per standard provisions, including designing, providing and constructing water supply provision for chlorination, including providing dewatering and by pass arrangement joining to final effluent mains and outlet weir etc complete. The effluent quality should match with the standards laid down by Gujarat pollution control board and as per obligatory provision and as detailed specification and as directed by engineer in - charge.		
9	<b>Chlorinator and Chlorinator Room/Tonner Room:</b> Designing, providing and constructing chlorinators vacuum type 2 Nos. (1 working+ 1 stand by) with auto-switchover facility and having capacity for dosage of adequate chlorine to ensure 99.99 % coliform reduction as per obligatory provisions and detailed specifications with necessary provision of having chlorinator room of adequate size. The chlorinator equipment shall include cost of chlorine cylinders/tonner, piping, valves, measuring and controlling equipment, safety devices, lifting equipment, etc. complete as per IS -10553 ( part II) 1982. The tonner room should have minimum 3 MT capacity Hoist for loading and unloading facility. Tonner storage should be distinctly isolated and should be for minimum storage space as directed in the design specification and as per gas laws 1981 and factory act shall be provided. All other matching amenities shall be provided. Minimum 5 MT gantry rail shall be provided for full length of tonner room at 5 m height from level of tonner room, with outlet chamber and treated effluent outlet channel etc complete as per detailed specification.		
10	<b>Sludge treatment</b>		
10.1	<b>Sludge Thickener with equipments:</b> Solids loading rate of 25-35 kg/m <sup>2</sup> /day; Designing, providing & constructing watertight of sludge thickener-gravity type (picket fence) in RCC (M-30) with inlet & outlet pipes, central feed well, sludge it & sludge removal arrangement, grouting wherever necessary with walkway all around of 1.20m with GI pipe railing interconnecting CI pipes all complete as per specifications, having bottom slope 1:6 & min. 4.5m SWD with necessary fixed bridge scraper arrangement as per detailed specifications & necessary inlet & outlet arrangement. All other arrangement as per detailed specifications. (One unit upto 10 MLD and two units for more than 10 MLD). Min sludge concentration in thickened sludge shall be 4%.		
10.2	<b>Sludge Holding Sump :</b> Designing, providing and constructing of sludge sump and pump house of appropriate size with pumps, ceiling height minimum 6 m over sump for discharging sludge to centrifuge using CI pipe complete as per detailed specification.		
10.3	<b>Sludge Dewatering Equipment Room with Centrifuge or belt press or screw press or Filter Press or Combi-machine or Bag Type:</b> Designing, providing constructing and installing including foundation etc. Centrifuge or belt press or screw press or Filter Press or Combi-machine or bag Type to handle the sludge flow as per specifications, with appropriate inlet and outlet provision, sludge dewatering unit drain etc. Complete as per specifications.		
10.4	<b>Sludge/ filtrate Pumps</b>		
	a) Capacity to pump sludge in 1 hour with 100% standby (20-25% efficiency, "C" value to be adopted 50% than that of water to calculate friction loss)		
	b) Filtrate from thickening and dewatering to be conveyed only by PVC 10 kg/sq.cm.		
11	<b>Valves/gates</b>		
	Inlet, outlet, wash water inlet – only CI D/F and minimum size of 200 mm as per approved make/brand.		
12	All types gauges and meters required for O & M as per design of specified make/brand.		
13	Necessary instrumentation and control as per specifications		
14	<b>Outfall Sewer:</b> Designing, providing and constructing appropriate outfall sewer of RCC NP2 pipe, to discharge treated effluent from outlet chamber after chlorination tank to the disposal point at outlet battery limit of STP including necessary chambers for inspection and cleaning including necessary excavation, dewatering, refilling, concrete encasing/bedding concrete steps to reach the disposal/ nallah bed level, pitching and energy dissipation chamber in nallah portion etc. complete up to 500 m length RCC NP2 pipe line and including all above items.		
15	<b>By pass arrangements</b> RCC pipes with manholes and G.I. sluice gates (MH to be raised above TWL of adjacent unit)		
16	<b>Piping work in CI-LA Class including Sluice valves, Reflux Valves, MS Gates:</b> Providing laying and jointing pipes other than those already included in the above items for interconnection by - pass drains etc. of all units including adequate numbers of manhole chambers. The item includes excavations, refilling and hydraulic testing of pipes, valves, gates, accessories and cost of jointing materials. The item includes required channels with gates for interconnection of units by pass drains etc for all units as directed etc complete as per detailed specifications.		



ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23		
17	<b>Administrative Building cum Laboratory (G+1):</b> Designing, providing and constructing administrative building, office cum Laboratory including stores. This shall be a building having appropriate carpet area and ground floor and at first floor complete as per specifications including necessary excavation, foundation in RCC M 200 framed structure B. S masonry (1:1- class in C.M. 1:6) 20 mm cement plaster in C.M 1:3 inside and outside painting, Aluminium door and window with glass panels, mosaic tile flooring and skirting and all other allied items, fixtures fastening electrification arrangement water supply arrangement etc complete.				
	a) Ground floor to accommodate administrative office & laboratory				
	b) First floor to accommodate Office of the Plant in Charge, air monitoring equipments to measure wind direction & speed, hydrogen sulphide concentration etc.				
17.1	<b>Laboratory equipments</b> Laboratory equipment (as per specifications), beautification, telephone and intercom arrangement and wireless system.				
17.2	<b>Furniture and Office Equipments.</b> Office furniture (Make: Godrej/ or similar approved quality) as per specifications				
17.3	<b>Ventilation and Safety equipments</b> as per specifications				
17.4	<b>Sanitary blocks</b> Carpet area – 15 square meter minimum up to 25 MLD and 25 square meter above 25 MLD (or as specified).				
18	<b>Maintenance Workshop</b> of size as per specification				
19	<b>Air blower Building with Air Blowers:</b> Capable of delivering adequate free air for aeration device with suitable pressure (100% standby).				
20	<b>MCC Room</b> of minimum 9 m x 6 m clear inside with safety measures, approval of various statutory/ central/ foreign authority as applicable				
21	<b>Electric Installation</b>				
21.1	Both internal and external including entire plant area (as specified).				
21.2	Electric installation - Sub Station Room as per specifications.				
22	<b>DG room with DG sets</b> , as per electric load and specifications (50 % energy requirement).				
23	<b>General Infrastructure Development:</b> Scope also includes: Designing, providing and constructing general infrastructure development such as internal roads of minimum 6 mtr wide, compound wall for STP site, internal street and building lightings, pathways of minimum 1 m wide to access all STP units and Entrance Gate in MS fabrication, etc. all complete as per specifications and directed by engineering in charge.				
23.1	<b>Internal roads</b> Asphalt road (Minimum 4.5 m) to connect all units from main gate of plot.				
23.2	<b>Compound Wall</b> as per the plant layout, long the boundary of STP site (considering plant layout for intermediate and ultimate build out capacity and 33% landscaping area).				
23.3	<b>Green Belt</b> (33% landscaping area) as per specification				
	<b>NOTES:</b> 1. Fine screens (SS 316) are of mechanically cleaned type for working unit and manual bar screen type (SS 316) for standby unit. 2. Upto 5 MLD Capacity STP chlorination may be done by using sodium hypochlorite solution. Above 5 MLD capacity gas chlorinator to be provided. 3. Gravity sludge thickener is not provided upto 3 MLD capacity STP. Sludge will be collected into sludge sump & pumped directly to sludge dewatering system. 4. Filter press or Bag Type dewatering can be provided for STP's upto 5MLD capacity. 5. Chlorinator room not provided for STP upto 3 MLD. 6. Boundary wall, gate, Internal plant roads, storm water drains, site clearance, landscaping is considered in scope. Plant road shall be 4.5m wide. 7. All water retaining structures are in M-30 grade of concrete. 8. Lead for excavation is considered as 500m. 9. Grade of steel used is Fe 415. 10. Peak factor considered for design for plants 2 to 5 MLD is 2.5, 6 to 20 MLD is 2.25.				
	11. The rates mentioned above STP are considering sites falling in Seismic Zone-III. For sites falling in seismic zone-IV and V shall be increased by 5% and 8% respectively. 12. Structural design criteria approved by technical committee shall be applicable for design. 13. Hydraulic design of the plant shall be considered with free fall discharge of treated sewage to local water body (above HFL). Hydraulic loss shall be worked out for peak flow condition and shall not exceed 4.5m in any circumstances unless otherwise site specific condition and approved by technical committee. 14. The cost of sewage pumping station and rising main is not included. 15. Makes of equipment shall be approved by GVSSB. 16. The rates includes excavation, refilling and throwing away extra stuff as directed by the Engineer in Charge. 17. All other details shall be as per design criteria and detail specifications.				
No.	Capacity of Plant MLD	No. of Basin	Area Req (Ha)	Rate per MLD Rs. In Lakh	
1	Up to 2	2	MLD	0.20	200.89
	Cost of 2MLD treatment plant				401.79
2	2 to 3 mld prorata	2	MLD	0.25	133.93
	Cost of 3MLD treatment plant				535.71

ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
3	3 to 5 Cost of 5MLD treatment plant	2 MLD	66.96 869.64
4	5 to 10 Cost of 10MLD treatment plant	2 MLD	62.50 982.14
5	10 to 15 Cost of 15MLD treatment plant	2 MLD	58.04 1,272.32
6	15 to 20 Cost of 20MLD treatment plant	4 MLD	59.82 1,571.43
7	20 to 25 Cost of 25MLD treatment plant	4 MLD	65.18 1,897.32
8	25 to 30 Cost of 30MLD treatment plant	4 MLD	59.82 2,196.43
9	30 to 40 Cost of 40MLD treatment plant	4 MLD	62.50 2,621.43
10	40 to 50 Cost of 50MLD treatment plant	4 MLD	57.14 3,392.86
11	50 to 60 Cost of 60MLD treatment plant	4 MLD	51.79 3,910.71
12	60 to 75 Cost of 75MLD treatment plant	4 MLD	51.79 4,687.50
13	75 to 100 Cost of 100MLD treatment plant	6 MLD	51.79 5,982.14
14	100 to 125 Cost of 125MLD treatment plant	6 MLD	46.43 7,142.86
15	125 to 150 Cost of 150MLD treatment plant	6 MLD	35.71 8,035.71
3	<b>Moving Bed Bio Reactor Technology (MBBR)</b>		
	Designing (hydraulic, process, structural and aesthetic), providing, construction, hydraulic testing, commissioning and giving satisfactorily trial run for 3 months of STP consisting of Inlet Chamber, Screen chamber, Grit Separator, MBBR (Based on technologies providing attached growth on plastic media kept suspended in the sewage due to low density of plastic & provided with diffused air for aeration with tank, Secondary Clarifier, Sludge collection sump, Gravity Sludge Thickener, Chlorine Contact Tank, Chlorinator room, Sludge Dewatering Equipment, associated piping work with required valves, gates, drains; Administration Block cum Laboratory, associated buildings, Laboratory Equipments, inclusive of mandatory spare parts and instrumentation, etc. complete as turnkey job with all involved civil, electrical, instrumentation and mechanical works inclusive of following items, units as per detailed specifications for civil, electrical, instrumentation and mechanical components with all duties and taxes etc. complete to achieve BOD < 10ppm, TSS < 10ppm, Biological TN < 10ppm & PO4 < 2ppm to get recyclable quality of water for industrial / agricultural purposes. The Coagulant Dosing System is mandatory for chemical phosphorus removal. All units shall be interconnected with administration building by Suitable or RCC overhead walkways.		
	Min. freeboard of 0.3m shall be maintained unless otherwise asked for 0.5m stipulated for specific units.		
A	<b>PRIMARY TREATMENT</b>		
1	<b>Inlet Chamber :</b> Designing, providing, and constructing RCC (M:30) inlet chamber for the peak flow as per CPHEEO Manual including necessary excavation in all types of strata including walkway all around the periphery, Inlet chamber having minimum HRT of 60 seconds, each compartment will have steel gates with extension rod, head stock operating wheels, GI pipe railing etc. The work includes providing and making necessary arrangements to connect the flow to screen chamber by approach channel as directed and as per specifications.		
2	<b>Screen Chamber :</b> Designing, providing, constructing, testing and commissioning of Two approach channels (min 4.5 m long), mechanically cleaned bar rack screen (6 mm clear opening 10 mm the flats), Escalator screens, with 100% standby manual fine screen (10 mm clear opening) MCC/SS316, Cf sluice gates (one before screen & one after screen) , designed as per CPHEEO Manual in RCC (M -30), including inlet pipe/channel from inlet chamber, outlet pipe / channel to detritus tank, free board of 0.5 m minimum, RCC walkway 1.2 m wide with GI pipe railing, RCC stair case of 1.2 m width from GL to screen chamber, with operating platform and belt conveyor system incl. panel & push bottom switch at local level as well as MCC room for two way control.		
3	<b>Grit Chamber :</b> Designing, providing and constructing grit Chamber- Detritus or vortex type or aerated type (100% standby), mechanically operated in RCC (M 30) capable of removing 100% of 0.2 mm size particle and above, having specific gravity 2.40, HRT of 1 minute at average flow (Detritus Tank), horizontal velocity not exceeding 0.30 m/sec (Detritus Tank) at peak flow with suitable arrangement of separation of grit from putrescible solids: Inlet and outlet channels of required sizes as may be required to connect the flow to connecting unit etc. Complete including hydraulic testing for water tightness of structure having minimum FB of 0.3 m, wash out arrangement to Grit chamber and platform 1.2 m wide RCC walkway with GI pipe handling shall be provided. A pit for collecting grit conveyed by conveyor shall be provided. It should be suitable to handle the grit for carting. All arrangements shall be as detailed specifications and as directed.		
4	Parshall flume having head loss limited to 0.15 m with necessary flow measuring devices/meter consisting of digital indicator in LPS & MLD		
B	<b>SECONDARY TREATMENT</b>		



ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
5	<b>Distribution Chamber</b> Distribution chamber with CI sluice gates for each basin of MBBR and bypass chamber, min. 3m x 2m of required depth, operating platform with CI pipe to connect to MBBR basins. Bypass pipe from distribution chamber upto inlet of CCT shall be provided in RCC pipe with manholes and CI sluice gates.		
6	<b>MBBR Tank</b> Minimum Total HRT of 6.0 hours (at average flow with Aerobic Detention Time - 4.5 Hrs & Anoxic Detention Time -1.5 Hrs). Designing, providing & constructing in RCC (M-30) biological reactor tank for removal of BOD and T-N to handle the average flow & having hydraulics suitable to handle peak flow conditions with suitable 1.2m wide walkway, expansion joints as required, including foundation etc as per specifications. The tank shall be equipped with inlet & outlet arrangement, process air blowers for supply of air, fine bubble diffusers of EPDM material / Coarse bubble aeration grid in SS-304, PP (virgin plastic material of minimum 600 m2 specific surface area/ m3 ) carrier bio media etc. FB of 0.6m & SWD as required should be complete as per detailed specifications. The outlet of tank shall be provided with strainer (SS-304) for preventing escape of Media from the tank. (One unit upto 10 MLD and two units for more than 10 MLD) Air pipe of GI and Sub water pipe of SS316 material. Volume of the bio media shall not be less than 20% of the volume of the tank. Process air blowers of rotary twin lobe shall be capable of providing adequate oxygen for biological process to maintain minimum DO of 2 mg/lit in MBBR basin and also to keep media in suspension. In addition there would be internal sludge recirculation facility from Aerobic Tank to Anoxic Tank as per standard Design practice.		
7	<b>Process Air Blowers or aeration Device</b> The Plant should be based on Dissolved Oxygen/Oxygen Uptake Rate Control with VFD driven Aeration Device. The Aeration System shall be designed for 110 % Capacity of the design Air requirement. The aeration Blower/Aeration Device shall be having 100% installed standby unit. Air diffuser shall be of disk/ tubular type, fixed/retrievable. The wetted part of the aeration system of non-corrosive materials such as UPVC. Blowers shall be housed in process air blower building. The minimum area of the building is 20 sq.m. and height of 5m (min). The surface Aerators are not acceptable.		
8	<b>Secondary Clarifier</b> Designing, providing & constructing in RCC (M-30) water tight secondary clarifier as per design guidelines by CPHEEO manual. The settler shall be provided with a scraper mechanism in MS with epoxy painting for collecting the settled solids at the bottom. The sludge will be collected in sludge sump by gravity & supernatant will flow over a weir & will be collected in a launder.  <b>Return Sludge Pump House</b> - wet well with minimum HRT of 60 minutes upto flow of 80% of return sludge capacity and depth of sludge to be limited to 2m, separate panel room outside wet well, 100% standby pumps.		
9	<b>Raw sludge pump house</b> Sump with minimum HRT of 30 minutes & depth of sludge limited to 2 m, 4.5 m minimum diameter, separate panel room outside the wet well		
C	<b>TERTIARY TREATMENT</b> Coagulant Dosing System/ Flash Mixer + Flocculation + Settling Tank/ Clariflocculator. The design values of the tertiary treatment units are to be considered from CPHEEO Manual on Water Supply & Treatment.		
10	<b>Flash Mixer</b> Rapid mixing device design conforming to IS: 7090 of 1985. Detention time 60 sec, velocity gradient 300-400 sec-1 with fans gear and motor assembly as per design.		
11	<b>Coagulant Dosing System</b> Dosing Tanks- 2Nos. With mixing, carrying, dosing with piping arrangement. Chemical Storage area as per data/specifications.		
12	<b>Flocculation Tank</b> RCC Hopper bottom units having slope >45 Deg as per hydraulic and process design with detention period 20 minutes with flocculator paddles with gear and motor assembly as per design. Flocculator design conforming to IS: 7208-1974 (Type-C). Surface loading rate 8000 liters/hour/sq m and depth 2.5m using PVC media with supporting arrangement and sludge collecting pipes as per detail specifications.		
13	<b>Filter Feed Sump &amp; Pumps</b>		
14	<b>Pressure Sand Filters for STP capacities less than 10MLD</b>		
15	<b>Rapid Sand Gravity Filters with shed</b> Applicable to plant capacity above 10MLD only. Filter House (RCC framed structure with infill brick masonry walls) and RCC filter beds with sand and gravel bedding as per hydraulic and process design adopting 6000 Liters/hour/sq m. Filtration rate with 2m water above sand media with under drainage system and inlet, outlet, backwash (rate 600LPM per Sq.m.) piping, pipe gallery, platform min. 5.5m in width and valves/gates arrangement as per design and detail specifications.		
15.1	<b>a. Filter Sand</b> Effective size 0.45 to 0.7 mm, uniformity coefficient not more than 1.7 nor less than 1.3; depth of sand 0.75m, free board 50cm, gravel 0.45m in depth, sand and gravel conforming to IS: 8491 (I)- 77, backwash by air wash (if specified) and hard wash by water standard appurtenances (to be specified), rate of flow controller, filter gauge, sand expansion gauge, etc.		
15.2	<b>Wash Water Tank</b> Wash Water tanks of capacity equal to 2% of designed quantity of filtered water in a day (+) 10% with B to 10 Ml/s Head (as specified)		

ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
15.3	<b>Wash Water Pumps</b> Wash Water Pumps with 100% Standby		
15.4	<b>Air Blowers</b> Capable of delivering 750 to 833 LPM per sq.m of free air flow area at 0.35 to 0.4 Kg/sq.m at the under drains (100% standby). (For capacity of FP more than 10 MLD)		
15.5	<b>Valves/gates</b> Inlet, outlet, wash water inlet- outlet and all types and sizes of valves/gates as per design of specified make/brand.		
15.6	<b>All types gauges and meters</b> required for filter operations and backwashing etc.		
15.7	<b>The filtration system</b> could also be well tested cloth media disk filtration.		
D	<b>DISINFECTION</b>		
16	<b>Chlorine Contact Tank</b> Designing, providing and constructing chlorine contact tank of adequate capacity to deal with average flow. The CCT shall have baffle walls for enhancing mixing of chlorine. One unit of two compartments, contact time 30 minutes of average flow to achieve 99.99% reduction in coliform. Chlorine dosage shall be minimum 5 ppm provision including designing, providing & constructing water supply system for chlorination, chemicals preparation, domestic use, gardening etc. complete.		
17	<b>Chlorinator &amp; Chlorinator Room / Tonner Room</b> Designing, providing and constructing vacuum type chlorinators having adequate capacity for dosage of adequate chlorine to ensure 99.99% coliform reduction as per obligatory provisions detailed specifications with necessary provision of having chlorinator room of adequate size. The chlorinator (min. 1W+1SB) equipment shall include chlorine cylinders, tonners, piping, valves, measuring controlling equipments, safety devices, lifting equipment, chlorine booster pumps (min. 1W+1SB) etc. complete as per IS-10553 (Part-II). The tonner room should have min. 3 MT capacity crane for loading & unloading facility, neutralization pit. Tonner storage should be distinctly isolated and should have min. storage space for 15 days as per the detailed specifications & as per gas law & factory act shall be provided. Chlorination room of minimum 25 m <sup>2</sup> area shall be provided. All other matching amenities shall be provided, 5 MT gantry rail shall be provided for full length of tonner room a 6 m Ht from level of tonner room with outlet.		
18	<b>Sludge treatment</b>		
18.1	<b>Gravity Sludge Thickener</b> Solids loading rate of 25-35 kg/m <sup>2</sup> /day. Designing, providing & constructing watertight of sludge thickener-gravity type (picket fence) in RCC (M-30) with inlet & outlet pipes, central feed well, sludge it & sludge removal arrangement, grouting whenever necessary with walkway all around of 1.20m with GI pipe railing interconnecting CI pipes all complete as per specifications, having bottom slope 1:6 & min. 4.5m SWD with necessary fixed bridge scraper arrangement as per detailed specifications & necessary inlet & outlet arrangement. All other arrangement as per detailed specifications. (One unit upto 10 MLD and two units for more than 10 MLD). Min sludge concentration in thickened sludge shall be 5%.		
18.2	<b>Sludge Holding Sump</b> Minimum HRT of 4 hours. Designing, providing and constructing of sludge holding sump and pump for discharging sludge to centrifuge using CI pipe complete as per detailed specification. Agitators/Mixers shall be provided in sump for keeping sludge in suspension. The pump shall be of Helical Screw pumps, 100% standby.		
18.3	<b>Sludge Dewatering Equipment Room with Centrifuge or belt press or screw press or Filter Press or Combi-machine or Bag Type:</b> Designing, providing constructing and installing including foundation etc. Centrifuge or belt press or screw press or Filter Press or Combi-machine or bag Type to handle the sludge flow as per specifications, with appropriate inlet and outlet provision, sludge dewatering unit drain etc. Complete as per specifications.		
18.4	<b>Sludge/ filtrate Pumps</b> a) Capacity to pump sludge in 1 hour with 100% standby (20-25% efficiency, "C" value to be adopted 50% than that of water to calculate friction loss) b) Filtrate from thickening and dewatering to be conveyed only by PVC 10 kg/sq.cm.		
19	<b>Valves/gates</b> Inlet, outlet, wash water inlet – only CI D/F and minimum size of 200 mm as per approved make/brand.		
20	<b>All types gauges and meters</b> required for D & M as per design of specified make/brand.		
21	<b>Dewatering</b> during entire work using any technique.		
22	<b>Necessary instrumentation and control</b> as per specifications.		
23	<b>Outfall Sewer</b> It shall be designed for peak flows. Designing, providing, constructing appropriate sized outfall sewer of RCC (NP2 class) pipe to discharge treated effluent to the local water body/malah at the point shown on the drawing including necessary chambers for inspection & cleaning including excavation, dewatering, refilling including appropriate bedding.		
24	<b>Piping work including Valves and Gates</b> Providing, laying and jointing plant pipes as per specifications, including interconnection bypass arrangement etc. of treatment units including adequate numbers of manhole chambers. The item includes excavations, refilling & hydraulic testing of pipes, valves, gates, accessories & cost of jointing materials. The item includes required channels with gates or interconnection of units, etc. for all units as directed etc. complete as per detailed specifications. Sludge pipes shall be sized for maintaining minimum velocity for prevention of solids.		



ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
25	<b>Administrative Building cum Laboratory (G+1):</b> Designing, providing and constructing administrative building, office cum Laboratory including stores. This shall be a building having appropriate carpet area and ground floor and at first floor complete as per specifications including necessary excavation, foundation in RCC M 200 framed structure B. B masonry (1:1:6) 20 mm cement plaster in C.M 1:3 inside and outside painting. Aluminium door and window with glass panels, mosaic tile flooring and skirting and all other allied items, fixtures fastening electrification arrangement water supply arrangement etc complete.		
	a) Ground floor to accommodate administrative office & laboratory		
	b) First floor to accommodate Office of the Plant In Charge, air monitoring equipments to measure wind direction & speed, hydrogen sulphide concentration etc.		
25.1	Laboratory equipments Laboratory equipment (as per specifications), beautification, telephone and intercom arrangement, and wireless system.		
25.2	Furniture and Office Equipments, Office furniture (Make, Godraj or similar approved quality) as per specifications		
25.3	Ventilation and Safety equipments as per specifications		
25.4	Sanitary blocks Carpet area – 15 square meter minimum up to 25 MLD and 25 square meter above 25 MLD (or as specified).		
26	Maintenance Workshop of size as per specification		
27	<b>Air blower Building with Air Blowers:</b> Capable of delivering adequate free air for aeration device with suitable pressure (100% standby).		
28	<b>MCC Room</b> of minimum 9 m x 6 m clear inside with safety measures, approval of various statutory/ central/ foreign authority as applicable		
29	<b>Electric Installation:</b> Both internal and external including entire plant area as per technical specifications. DG set shall be provided for min 50% of electrical load on average flow condition. DG room shall be provided. Instrumentation shall be provided in the plant which includes level sensors, DO sensor, residual chlorine analyser, pressure gauges, flow meters, level switches, pressure indicating and temperature transmitters, alarms, etc. Maintenance workshop of size 5m x 4m x 3.5m shall be provided.		
30	<b>General Infrastructure Development:</b> Scope also includes: Designing, providing and constructing general infrastructure development such as internal roads of minimum 8 mtr wide, compound wall for STP site, internal street and building lightings, pathways of minimum 1 m wide to access all STP units and Entrance Gate in MS fabrication, etc. all complete as per specifications and directed by engineering in charge.		
30.1	<b>Internal roads</b> Asphalt road (Minimum 4.5 m) to connect all units from main gate of plot.		
30.2	<b>Compound Wall</b> as per the plant layout, along the boundary of STP site (considering plant layout for intermediate and ultimate build out capacity and 33% landscaping area).		
30.3	<b>Green Belt</b> (33% landscaping area) as per specification		
Sr. No.	Capacity of Plant (MLD)		Rate (Rs. in Lacs per MLD)
1	Up to 2		189.29
	Cost of 2MLD treatment plant		378.57
2	2 to 3		122.32
	Cost of 3MLD treatment plant		500.89
3	3 to 5		55.36
	Cost of 5MLD treatment plant		611.61
4	5 to 10		54.46
	Cost of 10MLD treatment plant		863.93
5	10 to 15		59.57
	Cost of 15MLD treatment plant		1,151.79
6	15 to 20		44.64
	Cost of 20MLD treatment plant		1,375.00

ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
	<p><b>NOTES:</b></p> <p>1. Fine screens (SS 316) are of mechanically cleaned type for working unit and manual bar screen type (SS 316) for standby unit.</p> <p>2. For chemical precipitation, Flash mixing Tank and Flocculation Chamber are optional. The design values of the coagulation systems are to be considered from CPHEEO Manual on Water Supply &amp; Treatment.</p> <p>3. Upto 5 MLD Capacity STP chlorination may be done by using sodium hypochlorite solution. Above 5 MLD capacity gas chlorinator to be provided.</p> <p>4. Gravity sludge thickener is not provided upto 3 MLD capacity STP. Sludge will be collected into sludge sump &amp; pumped directly to sludge dewatering system.</p> <p>5. Filter press or Bag Type dewatering can be provided for STP's upto 5MLD capacity.</p> <p>6. Chlorinator room not provided for STP upto 3 MLD.</p> <p>7. Boundary wall, gate, Internal plant roads, storm water drains, site clearance, landscaping is considered in scope. Plant road shall be 4.5m wide.</p> <p>8. All water retaining structures are in M-30 grade of concrete.</p> <p>9. Lead for excavation is considered as 500m.</p> <p>10. Grade of steel used is Fe 415.</p> <p>11. Peak factor considered for design for plants 2 to 5 MLD is 2.5, 6 to 20 MLD is 2.25.</p>		
	<p>12. The rates mentioned above STP are considering sites falling in Seismic Zone III. For sites falling in seismic zone IV and V shall be increased by 5% and 8% respectively.</p> <p>13. Structural design criteria approved by technical committee shall be applicable for design.</p> <p>14. Hydraulic design of the plant shall be considered with free fall discharge of treated sewage to local water body (above HFL). Hydraulic loss shall be worked out for peak flow condition and shall not exceed 4.5 m in any circumstances unless otherwise site specific condition and approved by technical committee.</p> <p>15. The cost of sewage pumping station and rising main is not included.</p> <p>16. Makes of equipment shall be approved by GVSSB.</p> <p>17. The rates includes excavation, refilling and throwing away extra stuff as directed by the Engineer in Charge.</p> <p>18. All other details shall be as per design criteria and detail specifications.</p>		
4	<b>Waste Stabilization Pond(Oxidation Pond)</b>		
	Constructing Waste stabilization pond of size as per design and drawing including providing and laying flat brick pitching 12 cm thick in C.M. 1:6 including filling in joints with C.M. and cement pointing 1:2 on surface, providing and laying dry rubble pitching 20 cm thick at side of embankment of oxidation pond, providing and fixing/filling inlets, outlets, distribution boxes, valves and gates levelling the bed and constructing earthen embankment of size and slope in 30cm layers including watering and consolidating to MDG At OMG as per soil expert's advice.		
	A) Up to 2 MLD	MLD	1,091,071.43
	B) Beyond 2MLD but not exceeding 4MLD	MLD	960,714.29
	C) Beyond 4MLD but not exceeding 10 MLD	MLD	974,107.14
	D) Beyond 10MLD	MLD	956,250.00
5	<b>Aerated lagoon type sewage treatment plant</b>		
5	Designing (hydraulic, process, structural and aesthetic), constructing and commissioning Aerated Lagoon Sewage Treatment Plant consisting of all Civil, Mechanical, Electrical, instrumentation components of various sub-works as given below including necessary hydraulic testing, structural testing, equipment testing, trial run for 3 months, etc. complete as directed by Engineer-in-charge (turn-key job).		
5.1	Minimum free board of 0.6 m shall be maintained unless other wise asked for 0.5 m stipulated for specific units.		
5.2	Inlet chamber having minimum HRT of 60 seconds with platform, hand railing & hand wheel operated CI sluice gates for each channel and plant bypass mechanism		
5.3	Two approach channels (min 4.5 m long), mechanically cleaned bar rack screen 100% standby (20 mm clear opening 10 mm ths, flats), CI sluice gates (one before screen & one after screen) with operating platform and walkway on both sides with hand railing, belt conveyor system incl. panel & push bottom switch at local level as well as MCC room for two way control		
5.4	Grit Chamber (100% standby units) of 1 m and surface loading suitable for sp. Gr of 2.4, HRT of 1 minute at average flow, horizontal velocity not exceeding 0.30 m/sec. at peak flow comprising CI sluice gates at upstream to regulate flows to either chamber as well as bypass units		
5.5	Parshall flume having head loss limited to 0.15 m with necessary flow measuring devices/meter consisting of digital indicator in lps & mld		
5.6	Distribution chamber with CI sluice gates for each lagoon & bypass chamber, min 2.4 m x 1.8 m of required depth, operating platform with CI pipe upto central pier		



ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
5.7	Facultative aerated lagoons including all excavations/civil works/embankment work/brick/stone pitching, baffles, fixed platforms, walk ways with railings, fixed type surface aerators, polishing pond if required as per specifications etc. complete. The design considerations shall be as stated earlier and shall conform to the latest stipulation of Manual on Sewerage & Sewage Treatment, CPHEEO, Ministry of Urban Development. The design of the Surface Aeration System shall be worked out as per design standard criteria as per the Oxygen transfer efficiency given by the approved manufacturers. Necessary calculations of oxygen demand using standard formula taking into consideration the oxygen saturation value of sewage, temperature, barometric pressure, D.O to be maintained in the waste etc. including calculations for determining conversion factor for assessing oxygen deviations from standard conditions to field conditions should be submitted along with the bidder's design information.		
	Surface fixed type aerators, is worked out. Each radial flow low speed aerator shall comprise:		
	Suitable HP electric motor, 1440 rpm, TEFC type, IP 55 PROTECTION, CLASS F insulation, vertical flange mounted, Aerator duty HELICAL GEAR BOX with service factor of 2, drywell arrangement on output shaft to make it oil leak proof, integrally cast MOUNTING BLOCKS WITH CASTING to facilitate aerator cone immersion adjustment in water. AERATOR CONE of appropriate technical design, statically balanced along with DRIVE TUBE in mild steel, sand blasted epoxy painted construction. Cone speed shall be nearly 55 rpm and shall not exceed 60 rpm. MOUNTING STUDS and FASTENERS shall be in mild steel galvanized construction.		
	After aeration flow shall discharge over outlet which shall be provided with adjustable FRP weir to adjust the TWL in lagoons within range of 100 mm. Suitable baffles of adequate size shall be provided to dampen the waves in lagoon due to aerators.		
5.8	Distribution chamber with CI sluice gates for each compartment of aerated lagoons & bypass chamber, min 2.4 m x 1.8 m of required depth, operating platform with CI pipe upto central pier		
5.9	MCC Room of minimum 9 m x 6 m clear inside with safety measures, approval of various statutory/central/foreign authority as applicable		
5.10	Administrative Building in Two Storays (floor wise area as specified)		
	Ground floor to accommodate administrative office & laboratory		
	First floor to accommodate Office of the Plant In Charge, air monitoring equipments to measure wind direction & speed, hydrogen sulphide concentration etc.		
5.11	By pass arrangements: RCC pipes with manholes and C.I. sluice gates (MH to be raised above TWL of adjacent unit)		
	Drainage arrangements: RCC pipes up to plot boundary (as specified) diameter as per design.		
5.12	Electric installation.		
	Both internal and external including entire plant area (as specified).		
5.13	Laboratory equipments		
	As per requirement (to be specified during tendering).		
5.14	Sanitary blocks.		
5.15	Carpet area: 15 square meter minimum up to 25 MLD and 25 square meter above 25 MLD (or as specified)		
5.16	Administrative block and internal roads.		
	To accommodate office room, laboratory room, and asphalt road to connect all units from main gate of plot.		
5.17	Dewatering during entire work using any technique.		
	<b>Notes</b>		
	(1) Conditions from Sr. No.7 to 7.25 shall form a part and parcel of the tender and must be incorporated in draft tender papers of aerated lagoon type: Sewage Treatment Plants.		
	(2) The necessary changes should be carried out as per Site condition and project requirements at the time of preparing DLP.s Inlet chamber can be dropped when Aerator is proposed otherwise it should be included.		
	(3) Hydraulic loss in entire Aerated lagoon shall not exceed 1.0 m in any circumstances unless otherwise site specific condition design criteria approved by Technical committee shall be referred and item description shall be modified accordingly.		
	(4) Structural design criteria approved by technical committee shall be applicable for design.		
	(5) Design flow shall be specified in mid in data sheet. No separate overloading provision shall be kept in any tender clause.		
	(6) All other details shall be as per design criteria and detail specifications.		
	(7) The following rates are for sites falling in seismic zone III for sites falling in zone IV and V rates shall be increased 5% and 8 % respectively		
	(8) The rates includes excavation, refilling and throwing away extra stuff to lead up to 500m		
	A) Up to 5 MLD	MLD	2,272,321.43
	B) Beyond 5 MLD	MLD	1,912,500.00

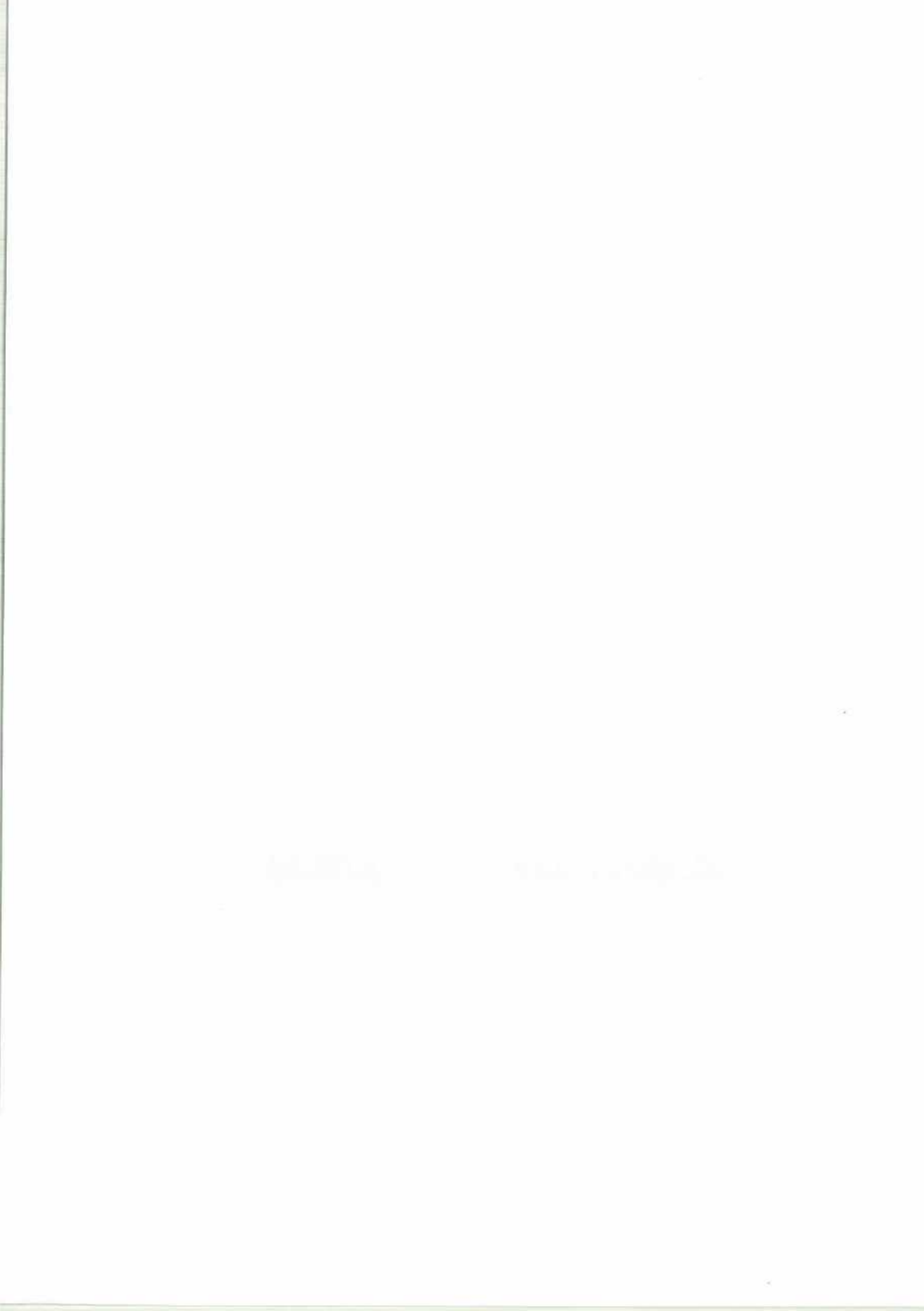
ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
5	<b>DEWATS (Decentralized wastewater treatment system)</b> Detailed design and engineering of Providing, construction, testing and commissioning DEWATS (Decentralized waste water treatment system) plant for sewage treatment based on anaerobic treatment systems. Constructing of settling chambers (Primary, secondary), anaerobic baffle reactor, anaerobic filter, treated water storage tank; necessary piping works for inlet, outlet, scouring and Bypass arrangement with required valves, gates, drain, screen, inlet chambers etc. complete including cost of all associated civil, mechanical, electrical works, process and instrumentation diagram, hydraulic diagram, site layout plan and site grading plan, single line diagram, control philosophy, quality assurance plan, civil and mechanical General arrangement drawings, structural designs and drawings, construction drawings, mechanical equipments datasheets and drawings, as-built drawings, operation and maintenance manuals, etc. complete.		
	<b>UNITS INCLUDED:</b> 1. Settling Chambers (Primary and/or secondary) 2. Anaerobic Baffle Reactor 3. Anaerobic Filter 4. Treated water storage tank		
	<b>NOTES:</b> 1.) The necessary changes should be carried out as per Site condition and project requirements at the time of preparing DTP's. 2.) Structural design criteria approved by technical committee shall be applicable for design. 3.) Design flow shall be specified in mld in data sheet. No separate overloading provision shall be kept in any tender clause. 4.) All other details shall be as per design criteria and detail specifications. 5.) The rates includes excavation, refilling and throwing away extra stuff to lead up to 50m.		
	A) Cost of 0.1 MLD capacity DEWATS	No	-
	* Add (Prorate) for capacity above 0.1MLD up to 0.25MLD	0.05 MLD	-
	B) Cost of 0.25 MLD capacity DEWATS	No	-
	* Add (Prorate) for capacity above 0.25MLD up to 0.5MLD	0.05 MLD	-
	C) Cost of 0.5 MLD capacity DEWATS	No	-
	* Add (Prorate) for capacity above 0.5MLD up to 0.75MLD	0.05 MLD	-
	D) Cost of 0.75 MLD capacity DEWATS	No	-
	<b>NOTE:</b> Planted Gravel Filter bed shall be provided separately if required and the rate of the same shall be derived.		



# CHAMBER & MANHOLE

## SECTION - D





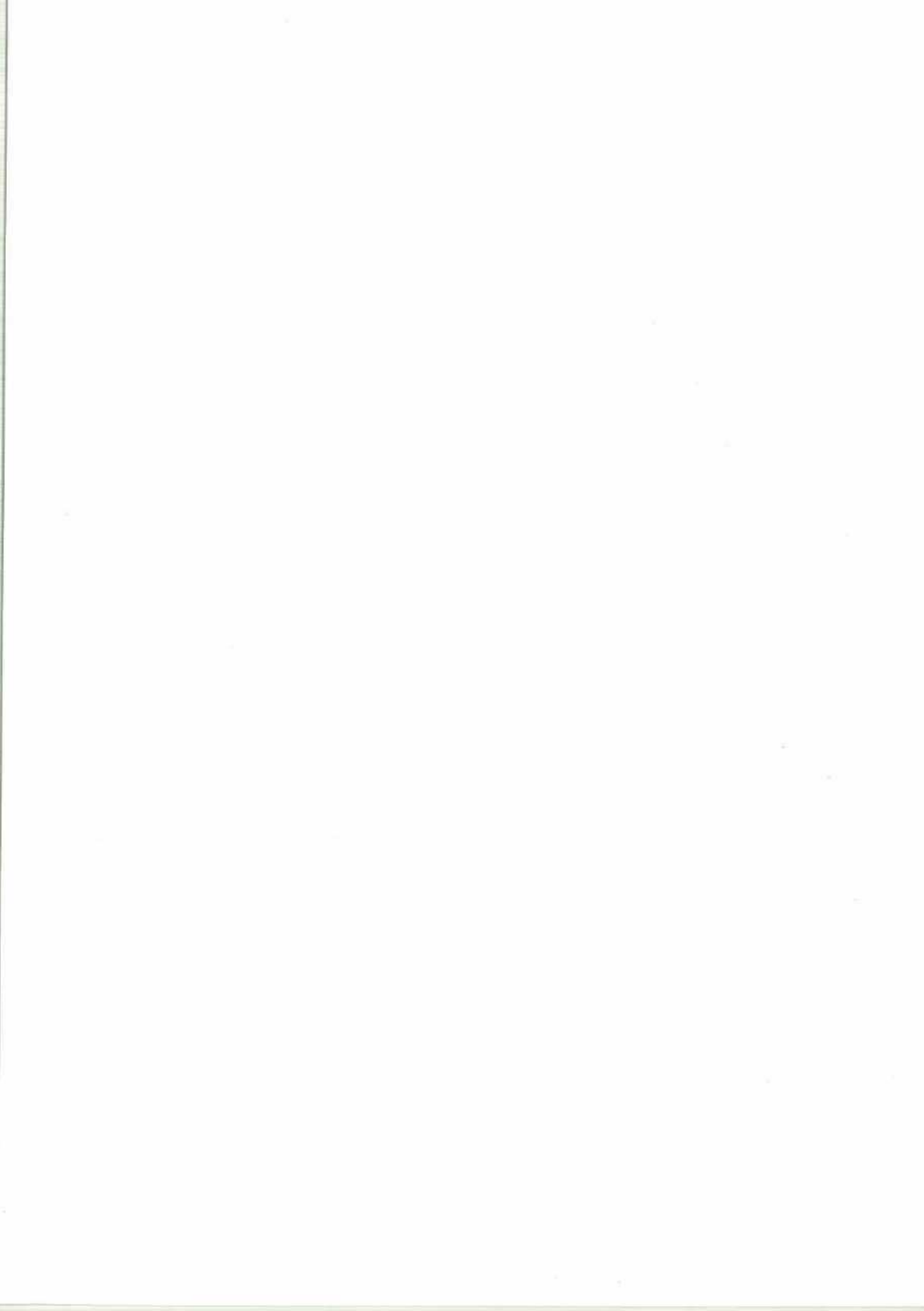


SECTION : 2.D - Chambers & Manholes				
ITEM NO.	DESCRIPTION	UNIT		Rate for 2022-23
Item no.1	Valve Chambers and Manholes			
	Construction of valves chambers in brick or bela stone masonry, locally available in C. M. 1:3. Foundation concrete 150 mm thick in C. C. 1:4:8 of trap metal size 25 mm to 40 mm thick, inside cement plaster in C. M. 1:3 and cement pointing outside in C. M. 1:3 and top cover of precast RCC slab 100 mm thick (with key hole in two parts, each with handles or MS Bar etc. complete as given size) Up to 1 Mt. depth from G. L. to pipe invert level incl. complete civil works but excl. cost of excavation and refilling, with cast in situ RCC slab in one single piece with fixing of CI-MH Frame and cover (excl. cost of CI-MH Frame and cover) with 23 mm thick brick masonry wall in C.M. 1:6			
a)	Size of 1.30 m x 1.30 m and 1.0 m deep			
1	With precast slab in two parts 15 mm	No.		11,351
2	- do - with single piece 10 cm with fixing M. H. cover	"		10,698
3	With bela in two parts 15 cm	"		11,079
4	- do - in single piece 10cm	"		10,328
5	For 1 Mtr. Extra Depth			6,084
b)	Size of chamber 1.30 m x 0.90 m and 1.0 mt deep			
1	With precast slab in two parts 15 cm	No.		9,189
2	- do - with single piece 10 cm with fixing M. H. cover	"		8,682
3	With bela in two parts 15cm	"		9,179
4	- do - in single piece 10cm	"		8,596
5	For 1 Mtr. Extra Depth			5,282
c)	Size of chamber 0.90 m x 0.90 m and 1.0 mt. deep			
1	With precast slab in two parts 15 mm	No.		7,738
2	- do - with single piece 10 cm with fixing M. H. cover	"		7,343
3	With bela in two parts	"		7,575
4	- do - in single piece	"		7,120
5	For 1 Mtr. Extra Depth			4,479
d)	Size of chamber 0.60 m x 0.60 m and 1.0 mt. deep			
1	With precast slab in two parts 15 mm	No.		5,380
2	- do - with single piece 10 cm with fixing M. H. cover	"		5,138
3	With bela in two parts	"		5,279
4	- do - in single piece	"		5,001
5	For 1 Mtr. Extra Depth			3,276
Item no.2	Sewer Manholes			
	Providing and constructing Sewer manholes, scraper manholes and unit house connection chamber, as per the type design in brick masonry in C. M. 1:5 and inside and outside 20mm thick plastering in C. M. 1:3 necessary 100 mm coping with reinforcement in R.C.C.M. 200 fixing C. I. steps and fixing manhole frame and covers (But excluding supply of manhole frame and covers) over manholes and house connection chambers and fixing Manhole covers (but excluding supplying of manhole covers) over scraper manhole etc. complete, providing and fixing safety chain wherever necessary as per the stipulations in the type design complete as per latest CPHEEO manual. (excl. excavation).			
a)	Manhole type "A" Circular type having inside diameter of 1200 mm for depth upto 1.5 m depth (for 150 mm to 500 mm dia sewer)			
1	Manhole type "A" as above but upto 1.0 M depth.	No.		12,179
2	Extra depth beyond 1.0 M but upto 1.5 M depth for type "A" manhole above.	R.Mt.		6,628
b)	Manhole type "B" circular type having inside diameter of minimum 1500 mm and for depth from 1.5 M to 4.0 M (for 150 mm to 600 mm dia sewers)			
1	Manhole type "B" as above but upto 1.5 M depth.	No.		21,116
2	Extra depth beyond 1.5 M but upto 4.0 M depth for type "B" manhole above.	R.Mt.		12,313
c)	Manhole type "C" circular type having inside diameter of minimum 1500 mm and for depth beyond 4.0 m to 6.0 m (for 150 mm to 1800 mm dia sewers)			
1	Manhole type "C" as above but upto 4.0 M depth.	No.		52,908
2	Extra depth beyond 4.0 M and up to 6.0 M depth for type "C" Manhole above.	R.Mt.		18,785
d)	Manhole type "D1" circular type having inside diameter of minimum 1500 mm and for depth beyond 6 m to 10 m (for 150 mm to 500 mm diameter sewers)			
1	Manhole type "D1" as above but upto 6.0 m depth	No.		91,174
2	Extra depth beyond 6.0 m and upto 10 mt depth but type "D1" manhole above.	R.Mt.		22,110
e)	Manhole type "D2" circular type having inside diameter of minimum 1500 mm and for depth beyond 6.0 M to 10.0 M (for 600 mm to 1000 mm dia sewers)			
1	Manhole type "D2" as above but upto 6.0 m depth	No.		89,818
2	Extra depth beyond 6.0 m and upto 10.0 m depth for type "D2" manhole above	R.Mt.		22,121
f)	Manhole type "D3" circular type having inside diameter of minimum 1900 m and for depth beyond 6.0 m to 10.0 m (for 1100 mm to 1800 mm dia sewers)			
1	Manhole type "D3" as above but upto 6.0 m depth	No.		109,142
2	Extra depth beyond 6.0 m and upto 10.0 m depth for type "D3" manhole above.	R.Mt.		26,015
g)	Scraper manhole type "S1" rectangular type for 600 mm dia to 1200 mm dia sewer pipes and for depth 2.5 m to 9.0 m			

ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
1	Scraper manhole type "S1" as above but upto 2.5 m depth.	No.	52,319
2	Extra depth beyond 2.5 m and upto 9.0 m depth for type "S1" scraper manhole above.	R.Mt.	31,907
<b>h) Scraper manhole type "S2" rectangular type for 1400 mm dia. sewer pipes and for depth 2.5 m to 9.0 m</b>			
1	Scraper manhole type "S2" as above but upto 2.5 m depth.	No.	48,103
2	Extra depth beyond 2.5 m and upto 9.0 m depth for type "S2" scraper manhole above.	R.Mt.	20,370
<b>Item no.3</b>			
<b>Vertical Drop Manhole arrangement</b>			
	Providing and constructing vertical drop arrangement of 0.6 m and more height as required including providing and jointing special such as double T. Bend required stoneware pipe fixed in m-100 C. C. at required level as type design cutting, jointing and filling as per specification etc. complete.		
1	Vertical drop arrangement as above upto 0.6 m height.	No.	2,154
2	Extra over item No.3.1 above for additional drop beyond 0.6 m	R.Mt.	1,926
<b>Item no.4</b>			
<b>Chamber for House Connection</b>			
	Providing and constructing rectangular brick masonry chamber for house connection as per type design in brick masonry in C. M. 1:3 including M-100 in foundation M-150 in benching inside plastering in C. M. 1:3 and outside plastering in C. M. 1:3 coping in M200 and fixing RCC precast manhole frame and covers, but Excl. supply of manhole and cover etc. complete excl. excavation.		
		No.	7,922
<b>Item no.5</b>			
<b>Ventilating Column</b>			
	Providing and erecting C. I. and MS ventilating columns 15 cms. dia. with C.I. ornamental cap and Min 6.00 Mtr. Height (Height may be varying as per site) base fixed firmly with necessary foundation with one coat of red lead oxide paint and one coat of any approved colour with 15 cms. dia. 10 Mt.in length with 0.35mt*0.35mt* M100 Encasing, stoneware or R.C.C. pipe connection with M.H. including excavation and jointing as required etc. complete. as per drawing.		
1	For 6 Mtr. Height (6 Mt MS pipe)	No.	33,836
2	For 12 Mtr. Height (2 m CI and 10m MS)	No.	41,230
<b>Item no.6</b>			
<b>Temporary/Permanent plugging and blocking of sewer line, branch connections and diversion of flows and removal of all plugs, etc.</b>			
a	300mm dia. & below sewer line	No.	1,210
b	400 to 500mm dia. Sewer line	No.	1,452
c	600 to 700mm dia. Sewer line	No.	2,420
d	800mm dia.	No.	2,904
e	900mm dia.	No.	3,484
f	1000mm dia.	No.	4,017
g	1200mm dia.	No.	4,839
h	1400 mm dia.	No.	5,324
i	1600mm dia.	No.	6,775
j	1800 mm dia.	No.	7,259
<b>Item No.7</b>			
	Loosen, de-silt and thoroughly clean and remove debris and objects such as boulders, bricks etc. bacteriological slimes, roots, encrustations, grease, carbonated deposits, etc from the sewer line including disposal of silt / debris / malba / objects etc. by super suction machine.		
a	300mm dia.& below	Rmt.	1,190
b	350mm dia. Sewer line	Rmt.	1,389
c	450mm dia. Sewer line	Rmt.	1,785
d	600mm dia.	Rmt.	2,381
e	800mm dia.	Rmt.	3,174
f	900mm dia.	Rmt.	3,582
g	1050mm dia.	Rmt.	4,307
h	1100 mm dia.	Rmt.	4,471
i	1200mm dia.	Rmt.	4,878
j	1400 mm dia.	Rmt.	5,691
k	1600 mm dia.	Rmt.	6,604
l	1800 mm dia.	Rmt.	7,317
m	2000 mm dia.	Rmt.	8,227



ITEM NO.	DESCRIPTION	UNIT	Rate for 2022-23
<b>Item No.8</b>	<b>Sewer Cleaning Equipment</b>		
a	Supplying, testing and Commissioning Jetting cum suction machinery inclusive of four wheeler vehicle TATA 1613/Eicher 20.16 or equivalent make with suitable RPM imported Italian make Triplex Plunger Pump of running on vehicle engine having flow rate of minimum 255 LPM and pressure minimum 140 bar with high pressure jetting hose of I.D. 25.4 mm and length 60 mt with 10S tank of minimum 5 mm thickness having total tank capacity 9000 lit, Partitioned with fresh water of 5000 litre and sludge tank of 4000 litre. With suction unit inclusive of vacuum pump of minimum capacity 390 m3/hr having maximum vacuum pressure of 85 to 95% having maximum operating relative absolute pressure of 1.5 bar running on vehicle engine with tank suction hose 75mm dia and length 15 mt. etc. complete with hydraulic system, hose reel, PTO (power take off unit), control panel, valves, instruments, accessories etc with cost of vehicles, etc. complete conforming with tender specifications and IS:11387-1985 or its latest revision	No.	3,812,123
b	Supplying, testing and Commissioning Jetting machinery inclusive of Four wheeler of MAKE TATA 275/TATA ACE or Equivalent Vehicle with suitable RPM Triplex Plunger Pump having minimum capacity 13 LPM and minimum pressure 200 Bar directly coupled with a separate 10 HP heavy duty, 4 stroke, air cooled diesel Engine, with water tank having capacity 500 lit, with jetting hose of 30 m length with ID 1/4", etc. complete with hose reel, spraying hose and gun, valves, instruments, accessories, with cost of vehicles etc. complete conforming with tender specifications.	No.	890,423
c	Supplying, testing and Commissioning Hydraulic operated cum Winch Driven De-silting Grab Bucket System inclusive of Four wheeler of MAKE TATA 275/TATA ACE or Equivalent Vehicle with system having travelling depth of at least 12 m, steel grab bucket of 20 ltrs capacity, hydraulic system driven by vehicle engine, 6mm wire rope with appropriate size reel, with hydraulic cylinder, hydro motor, flexible hose, oil tank, hopper, boom, hose of appropriate size etc. complete with valves, instruments, accessories, with cost of vehicles etc. complete conforming with tender specifications.	No.	862,597
<b>Item no.9</b>	<b>Desilting of inter septic chamber</b>		
	Desilting of inter-septic chambers incl. fixing of covers. Cleaning etc. with cleaning, rodding etc. for 100 mm dia. S. W. pipe chamber to chamber.	No.	493
<b>Item no.10</b>	<b>Renovation of manhole</b>		
	Renovation of manhole by increasing the height at top including cost of excavation, refitting of C. I. manhole frame and cover curing etc. complete incl. all carting and providing of materials which is required for the purpose (except manhole frame and cover)	No.	3,374
	For all type manhole by providing RCC 1:2:4 Partition walls with required reinforcement 25 cm thick and circular opening with 500mm clear dia and 0.40 mt. av. ht.	No.	
<b>Item no.11</b>	<b>Tracing of old manhole</b>		
1	All Type	No.	1,202
<b>Item no.12</b>	<b>R. C. C. Precast chamber</b>		
	Manufacture, supply and delivery of Chemical fabricated RCC Precast chambers with top cover as per specification and drawing attached with the tender documents for sizes as mentioned below. The delivery of chambers with clamps, nuts, bolts and locking arrangement (without lock) is to be made to GWSSB store or sites any where in Gujarat. The rates includes all taxes, loading, carting, unloading, stacking, including all taxes.		
A)	60 x 60 x 90 cm deep (Suitable to 80 to 300 mm dia pipes)	No.	3,053
B)	Foot rests for above chambers	Pair	814
C)	90 x 90 x 145 cm deep (Suitable to 350 to 600 mm dia pipes)	No.	7,527
D)	Foot rests for above chambers	Pair	1,729
E)	Rates for providing top cover only		
1	For 60 x 60cms size chamber	No.	1,018
2	For 90 x 90 cms size chamber	'	1,831





# MISCELLENEUOUS ITEMS

## SECTION - E







SECTION : 2.E - Miscellaneous			
ITEM NO.	DESCRIPTION OF ITEM	UNIT	Rate for 2022-23
Item no.1	<b>Dewatering by pumping set</b>		
	Dewatering by pumping set of required capacity including temporary platform carting pumping at site and fixing the same in position including all accessories, and fuel and labour etc. complete.		
	Pump set of Capacity	HP/hr.	18.32
Item no.2	<b>C.C M:100 for Pipe Encasing</b>		
	Providing C.C.M.:100 for encasing pipes using trap metal size 12 mm to 50 mm incl. form work curing consolidation etc. complete for various location on pipe line		
1	using trap metal 20 mm nominal size	Cu.M	4,113.80
2	using trap metal 40 mm size	Cu.M	3,368.55
Item no.3	<b>Loading / Unloading</b>		
(A)	<b>Manual Handling</b>		
	Labour charges for loading or unloading the material such as pipes specials of all types and sizes, cement, steel and other hard ware building materials.(Wt. Upto 200 kg.)		
1	For Cement, Sand, Steel etc.	M.T.	62.83
2	For Metallic pipe specials	M.T.	125.65
(B)	<b>Crane Handling</b>		
	Labour charges for loading or unloading the material such as pipes specials of all types and sizes, cement, steel and other hard ware building materials.(Wt. More than 200 kg)		
	Article having weight up to 1 M.T.	M.T.	242.61
	Article having weight From 1 M.T.to 5 M.T.		284.47
	Article having weight more than 5 M.T.		333.85
Item no.4	<b>Transporting of Pipe</b>		
	Transportation of pipe with manual loading & unloading is as per annexure.(A) &Transportation of pipe with loading & unloading with a crane is as per annexure.(B)		
Item no.5	<b>Unloading from Railway Wagon</b>		
	Unloading from railway wagon to platform for heavy articles such as C.I. Pipes, M.S. Plates, specials etc. where use of unloading equipments are necessary.& loading same material in to truck from railway platform		
		M.T.	325.63

ITEM NO.	DESCRIPTION OF ITEM	UNIT	Rate for 2022-23
<b>Item no.6</b>	<b>Pump House</b>		
	Designing (aesthetically) and constructing R.C.C frame structure of pump room with positive suction / Negative suction		
6A	<b>With Gantry structure</b> (Min. Height 4.5 M)		
	Upto 6.00 M (Plinth Level to Top slab Beam bottom)	Sq.Mt.	15,301.72
	Add for every 1.00 M above 6.00 M	Sq.Mt.	1,596.95
6B	<b>Without Gantry structure</b> (Upto 3.60 M)	Sq.Mt.	10,365.68
	<b>Note:-</b> 1. Minimum 15 % opening for ventilation should be provided. 2. Pump room rolling shutter, door and windows of aluminium section and window grill of iron should be provided (Included in Cost). 3. Plinth level of Pump house should be min.1 meter above GL. 4. Cost does not include foundation for pumping machinery.		
<b>Item no.7</b>	<b>Hiring of JCB including driver &amp; diesel</b>	<b>Hour</b>	
	Hiring of Hydra / Crane with Driver (8 working Hours in Day)		
	Hiring of crane	Day	6,412.47
	Hiring of Hydra		
	12 tone	Day	3,334.49
	16 tone	Day	3,418.65
	20 tone	Day	4,382.53
	Hiring of Tractor with trolley considering 8 hrs. as working day hours incl. Driver	Day	2,104.09
	Hiring of Three wheeler carrier (Chakado Rickshaw) considering 10 hrs. as working day hours incl. Driver	Day	1,153.24
<b>Item no.8</b>	<b>CONVEYANCE OF MATERIALS</b>		
8.a	Transportation Charges for Construction Material (Without Crane)		As per Table-A
8.b	Transportation Charges for Construction Material (With Crane)		As per Table-B



## SECTION : 2.E - Miscellaneous

## A. Transportation Charges for Construction Material (Without Crane)

Cost of Material over 0.5 Km including loading Unloading and stacking (for asphalt, cement, steel etc.)											
Hire Charges of Truck Rs.			w		x		y				
Diesel Rate			89.3		245.0		340.0				
Mobile Oil Rate			245.0		340.0		2040.0				
Mazdur per Day			2040.0		2040.0		2040.0				
Cost of 6 Mazdoor for loading & unloading											
Sr No.	Lead in Km	Avg. Speed	No. of Trips $N=8/(2L/S)+1$	KM Done $=2NL+6$	Liter of Diesel Consumed	Cost of Diesel Rs. (X*F)		Liter of Mobile Oil Consumed	Cost of Mobile Oil Rs. (Y*H)	Total Cost (W+G+I+Z)	Cost Per Trip Rs. (J/D)
A	B	C	D	E	F	G		H	I	J	K
						89 Rs/Ltr			245 Rs/Ltr		
1	0.50	15.00	7.50	13.50	3.38	301.49		0.09	22.97	5102.19	680.00
2	1.00	16.00	7.11	20.22	5.06	451.61		0.14	34.41	5246.45	738.00
3	1.50	16.50	6.77	26.31	6.58	587.52		0.18	44.76	5377.03	794.00
4	2.00	17.00	6.48	31.90	7.98	712.51		0.22	54.28	5497.14	849.00
5	2.50	17.30	6.21	37.03	9.26	827.00		0.26	63.00	5607.15	903.00
6	3.00	17.50	5.96	41.74	10.44	932.26		0.29	71.02	5708.29	958.00
7	3.50	17.80	5.74	46.19	11.55	1031.62		0.32	78.59	5803.76	1011.00
8	4.00	18.00	5.54	50.31	12.58	1123.50		0.35	85.59	5892.04	1064.00
9	4.50	18.30	5.36	54.26	13.57	1211.84		0.38	92.32	5976.94	1115.00
10	5.00	18.50	5.19	57.93	14.48	1293.72		0.40	98.56	6055.61	1166.00
11	6.00	19.00	4.90	64.84	16.21	1448.01		0.45	110.32	6203.86	1265.00
12	7.00	19.50	4.66	71.19	17.80	1589.94		0.49	121.13	6340.24	1362.00
13	8.00	20.00	4.44	77.11	19.28	1722.08		0.54	131.20	6467.21	1455.00
14	9.00	20.50	4.26	82.68	20.67	1846.35		0.57	140.66	6586.62	1546.00
15	10.00	21.00	4.10	87.95	21.99	1964.17		0.61	149.64	6699.83	1635.00
16	15.00	23.50	3.51	111.42	27.86	2488.30		0.77	189.57	7203.45	2050.00
17	25.00	28.50	2.90	151.22	37.81	3377.19		1.05	257.29	8057.57	2774.00
18	50.00	35.00	2.07	213.41	47.42	4236.37		1.48	363.09	8919.16	4300.00
19	100.00	40.00	1.33	272.67	54.53	4871.46		1.89	463.91	9576.23	7182.00
20	200.00	45.00	0.81	329.60	65.92	5888.55		2.29	560.77	10570.82	13067.00
21	400.00	50.00	0.47	382.47	76.49	6833.22		2.66	650.73	11494.60	24426.00

No. of Trips = N

Hours Working = 8

Trip Km distance = L

 $=8/(2L/S)+1$ 

Average Speed of vehicle = S

KM = Kilometer travel in 8 hours

Km travel per ltr Diesel Consumption

= As per CPWD

=2NL+6

= 5 Km

B. Transportation Charges for Construction Material (With Crane)												
Hire Charges of Truck Rs.		3350.0	w1									
Hire Charges of Crane Rs.		6400.0	w2									
Diesel Rate		89.3	x									
Mobile Oil Rate		245.0	y									
Mazdur per Day		340.0										
Cost of 2 Mazdoor for loading & unloading		680.0	z									
Cost of Heavy Material over 0.5 Km including loading Unloading and stacking (for Pipes etc.)												
Sr No.	Load in Km	Avg. Speed	No. of Trips $N=8/(2L/S)+1$	KM Done $=2NL+6$	Liter of Diesel Consumed	Cost of Diesel Rs. (X*F)	Liter of Mobile Oil Consumed	Cost of Mobile Oil Rs. (Y*H)	Total Cost (W1+W2+G+I+Z)	Cost Per Trip Rs. (J/D)		
											G	H
A	B	C	D	E	F	89 Rs/Ltr		245 Rs/Ltr				
1	0.50	15.00	7.50	13.50	3.38	301.49	0.09	22.97	9602.2	1280.00		
2	1.00	16.00	7.11	20.22	5.06	451.61	0.14	34.41	9746.4	1371.00		
3	1.50	16.50	6.77	26.31	6.58	587.52	0.18	44.76	9877.0	1459.00		
4	2.00	17.00	6.48	31.90	7.98	712.51	0.22	54.28	9997.1	1544.00		
5	2.50	17.30	6.21	37.03	9.26	827.00	0.26	63.00	10107.2	1629.00		
6	3.00	17.50	5.96	41.74	10.44	932.26	0.29	71.02	10208.3	1714.00		
7	3.50	17.80	5.74	46.19	11.55	1031.62	0.32	78.59	10303.8	1794.00		
8	4.00	18.00	5.54	50.31	12.58	1123.50	0.35	85.59	10392.0	1876.00		
9	4.50	18.30	5.36	54.26	13.57	1211.84	0.38	92.32	10476.9	1954.00		
10	5.00	18.50	5.19	57.93	14.48	1293.72	0.40	98.56	10555.6	2033.00		
11	5.00	19.00	4.90	64.84	16.21	1448.01	0.45	110.32	10703.9	2183.00		
12	7.00	19.50	4.66	71.19	17.80	1589.94	0.49	121.13	10840.2	2328.00		
13	8.00	20.00	4.44	77.11	19.28	1722.08	0.54	131.20	10967.2	2468.00		
14	9.00	20.50	4.26	82.68	20.67	1846.35	0.57	140.66	11086.6	2603.00		
15	10.00	21.00	4.10	87.95	21.99	1964.17	0.61	149.64	11199.8	2733.00		
16	15.00	23.50	3.51	111.42	27.86	2488.30	0.77	189.57	11703.5	3331.00		
17	25.00	28.50	2.90	151.22	37.81	3377.19	1.05	257.29	12557.6	4324.00		
18	50.00	35.00	2.07	213.41	47.42	4236.37	1.48	363.09	13419.2	6470.00		
19	100.00	40.00	1.33	272.67	54.53	4871.46	1.89	463.91	14076.2	10557.00		
20	200.00	45.00	0.81	329.60	65.92	5888.55	2.29	560.77	15070.8	18629.00		
21	400.00	50.00	0.47	382.47	76.49	6833.22	2.66	650.73	15994.6	33989.00		
Material												
Average Load in MT/Trip						Average Load in MT/Trip						
PVC/HDPE Pipe						Bricks						
Metallic Pipe						Roofing Tiles						
Cement/M.S. Bar/Steel						Excavated Rock						
Sand						Timber						
Earth						Concrete Block						
Lime/Murram						Aggregate of size 40mm t						



# ROAD / RAILWAY CROSSINGS

## SECTION - F



1. The first part of the paper is devoted to the study of the properties of the function  $f(x)$  defined by the equation



SECTION : 2.F - Road/Railway Crossings			
Item No.	Description	Unit	Rate for 2021-22
1	Drilling of 300mm dia Horizontal borehole for watermain pipeline under the railway tracks incl all strata with required length including fixing of 250mm dia MS casing pipe of minimum 5mm thick Or IRS Casing Pipe with welding pushing etc complete. Providing & fixing various size of pipe for 150/168mm dia watermain of G.I./M.S pipe of minimum 6.3mm thick for railway permits as per instruction & regulations of Railway authority & under supervision of Railway authority incl Providing, supplying & fixing of spacer at specified interval if required between Casing pipe and water main, ISI make sluice valve of required size at both side of railway boundary with construction of brickedge pavement including C/C encasing 1:3:6 in 10mtr length at both side. Incl providing & fixing of M.S/Iron Manhole frame with cover for valve chamber with locking arrangement etc complete with all material labour fabrication,hydraulic testing of pipe & valve etc complete for total 45 mt Length which includes horizontal pushing and with open excavation.		
1.0	MS Casing Pipe & Water Main Pipe-168	No.	282,012
1.1	Without Water main & with MS Casing Pipe-250 thick:5	No.	196,359
1.2	IRS casing pipe in place of MS Pipe + Water main -168mm	No.	196,980
1.3	Without Water main & with IRS Casing Pipe	No.	111,328
2	Drilling of 500mm dia Horizontal borehole for watermain pipeline under the railway tracks incl all strata with required length including fixing of 400mm dia M.S.casing pipe of minimum 6mm thick with welding pushing etc complete Providing & fixing various size of pipe for 193.7mm/219.10mm/244.5mm dia watermain of G.I./M.S pipe of minimum 6.3mm thick for railway permits as per instruction & regulations of Railway authority & under supervision of Railway authority incl Providing, supplying & fixing of spacer at specified interval if required between Casing pipe and water main, ISI make sluice valve of required size at both side of railway boundary with construction of brickedge pavement incl C/C encasing 1:3:6 in 10mtr length of pipe at both side. Incl providing & fixing of M.S/Iron Manhole frame with cover for valve chamber with locking arrangement etc. complete with all material labour fabrication,hydraulic testing of pipe & valve etc complete for 45 mt Length,which includes horizontal pushing and with open excavation.		
2.0	MS Casing Pipe + Water Main -193.7mm	No.	496,362
2.1	MS Casing Pipe + Water Main Size-219.1mm	No.	497,617
2.2	MS Casing Pipe + Water Main Size-244.5mm	No.	529,903
2.3	Without Water main & with MS Casing Pipe	No.	407,844
2.4	IRS casing pipe in place of MS Pipe + Water main -193.7mm	No.	393,824
2.5	IRS casing pipe in place of MS Pipe + Water main -219.1mm	No.	395,078
2.6	IRS casing pipe in place of MS Pipe + Water main -244.5mm	No.	427,364
2.7	Without Water main & with IRS Casing Pipe	No.	365,304
3	Drilling of 600mm dia Horizontal borehole for watermain pipeline under the railway tracks incl all strata with required length incl fixing of 500mm dia M.S.casing pipe of minimum 8mm thick Or IRS Casing Pipe with welding pushing etc complete Providing & fixing various size of pipe for 273.1mm/323.9mm/355.6mm dia watermain of G.I./M.S pipe of minimum 6.3mm thick for railway permits as per instruction & regulations of Railway authority & under supervision of Railway authority incl Providing, supplying & fixing of spacer at specified interval if required between Casing pipe and water main, ISI make sluice valve of required size at both side of railway boundary with construction of brickedge pavement incl C/C encasing 1:3:6 in 10mtr length of pipe at both side. Incl providing & fixing of M.S/Iron Manhole frame with cover for valve chamber with locking arrangement etc. complete with all material labour fabrication,hydraulic testing of pipe & valve etc complete for 45mt Length,which includes horizontal pushing and with open excavation.		
3.0	MS Casing Pipe + Water Main -273.1mm	No.	655,594
3.1	MS Casing Pipe + Water Main Size-323.9mm	No.	679,949
3.2	MS Casing Pipe + Water Main Size-355.6mm	No.	690,349
3.3	Without Water main & with MS Casing Pipe	No.	525,591
3.4	IRS casing pipe in place of MS Pipe + Water main -273.1mm	No.	526,073
3.5	IRS casing pipe in place of MS Pipe + Water main -323.9mm	No.	552,428
3.6	IRS casing pipe in place of MS Pipe + Water main -355.6mm	No.	562,828
3.7	Without Water main & with IRS Casing Pipe	No.	398,070
4	Drilling of 900mm dia Horizontal borehole for watermain pipeline under the railway tracks incl all strata with required length incl fixing of 800mm dia M.S.casing pipe of minimum 12mm thick Or IRS Casing Pipe with welding pushing etc complete Providing & fixing various size of pipe for 406.4 mm/457mm/508mm dia watermain of G.I./M.S pipe of minimum 6.3mm thick for railway permits as per instruction & regulations of Railway authority & under supervision of Railway authority incl Providing & supplying fixing of spacer at specified interval if required between Casing pipe and water main, ISI make sluice valve of required size at both side of railway boundary with construction of brickedge pavement incl C/C encasing 1:3:6 in 10mtr length of pipe at both side. Incl Providing & fixing of M.S/Iron Manhole frame with cover for valve chamber with locking arrangement etc. complete with all material labour fabrication,hydraulic testing of pipe & valve etc complete for 45 mt Length,which includes horizontal pushing and with open excavation.		
4.0	MS Casing Pipe + Water Main -406.4mm	No.	1,370,112
4.1	MS Casing Pipe + Water Main Size-457mm	No.	1,412,457
4.2	MS Casing Pipe + Water Main Size-508mm	No.	1,465,336
4.3	Without Water main & with MS Casing Pipe	No.	1,135,834
4.4	IRS casing pipe in place of MS Pipe + Water main -406.4mm	No.	1,127,922
4.5	IRS casing pipe in place of MS Pipe + Water main -457mm	No.	1,169,280
4.6	IRS casing pipe in place of MS Pipe + Water main -508mm	No.	1,221,612
4.7	Without Water main & with IRS Casing Pipe	No.	897,621

Item No.	Description	Unit	Rate for 2021-22
5	Drilling of 1300mm dia Horizontal borehole for watermain pipeline under the railway tracks incl all strata with required length incl fixing of 1200mm dia M.S.casing pipe of minimum 15mm thick Or IRS Casing Pipe with welding pushing etc complete Providing & fixing various size of pipe for 559mm/610mm/660mm/711mm dia watermain of G.I./M.S pipe of minimum 6.3mm thick for railway permisses as per instruction & regulations of Railway authority & under supervision of Railway authority incl Providing, supplying & fixing of spacer at specified interval if required between Casing pipe and water main,ISI make sluice valve of required size at both side of railway boundary with construction of brickedge pavement incl C/C encasing 1:3.6 in 10mtr length of pipe at both side. Incl Providing & fixing of M.S/Iron Manhole frame with cover for valve chamber with locking arrangement etc, complete with all material labour fabrication,hydraulic testing of pipe & valve etc complete for 45mtr Length.		
5.0	MS Casing Pipe + Water Main -559mm	No.	2,393,679
5.1	MS Casing Pipe + Water Main Size-610mm	No.	2,456,579
5.2	MS Casing Pipe + Water Main Size-660mm	No.	2,628,105
5.3	MS Casing Pipe + Water Main Size-711mm	No.	2,647,985
5.4	Without Water main & with MS Casing Pipe	No.	2,044,065
5.5	IRS casing pipe in place of MS Pipe + Water main -559mm	No.	1,896,657
5.6	IRS casing pipe in place of MS Pipe + Water main -610mm	No.	1,959,458
5.7	IRS casing pipe in place of MS Pipe + Water main -660mm	No.	2,130,984
5.8	IRS casing pipe in place of MS Pipe + Water main -711mm	No.	2,150,844
5.9	Without Water main & with IRS Casing Pipe	No.	1,546,944
6	Drilling of 200mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 150mm dia M.S casing pipe of minimum 5mm thick Or IRS Casing Pipe with pushing etc complete, providing and fixing various size of carrying pipe for 80mm dia (Complete for 45 mt. length)		
6.0	MS Casing Pipe + Water Main -80mm	No.	150,150
6.1	Without Water main & with MS Casing Pipe-150 thick:5	No.	50,836
6.2	RCC casing pipe in place of MS Pipe + Water main -80mm	No.	63,331
6.3	Without Water main & with RCC Casing Pipe	No.	17,365
7	Drilling of 250mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 200mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 100mm dia (For 45 mt Length)		
7.0	MS Casing Pipe + Water Main -100mm	No.	174,295
7.1	Without Water main & with MS Casing Pipe-200 thick:5	No.	131,441
7.2	RCC casing pipe in place of MS Pipe + Water main -100mm	No.	116,807
7.3	Without Water main & with RCC Casing Pipe	No.	73,952
8	Drilling of 300mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 250mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 168mm dia watermain (For 45 mt Length)		
8.0	MS Casing Pipe + Water Main -168mm	No.	196,073
8.1	Without Water main & with MS Casing Pipe-250 thick:5	No.	156,055
8.2	RCC casing pipe in place of MS Pipe + Water main -168mm	No.	142,206
8.3	Without Water main & with RCC Casing Pipe	No.	101,389
9	Drilling of 500mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 400mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 193.7 to 244.5mm dia watermain (For 45 mt Length)		
9.0	MS Casing Pipe + Water Main -193.7mm	No.	412,357
9.1	MS Casing Pipe + Water Main -219.1mm	No.	412,357
9.2	MS Casing Pipe + Water Main -244.5mm	No.	426,730
9.3	Without Water main & with MS Casing Pipe-400 thick:6	No.	358,789
9.4	RCC casing pipe in place of MS Pipe + Water main -193.7mm	No.	309,819
9.5	RCC casing pipe in place of MS Pipe + Water main -219.1mm	No.	309,819
9.6	RCC casing pipe in place of MS Pipe + Water main -244.5mm	No.	324,190
9.7	Without Water main & with RCC Casing Pipe	No.	256,260
10	Drilling of 600mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 500mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 273.1 to 355.6mm dia watermain (For 45 mt Length)		
10.0	MS Casing Pipe + Water Main -273.1mm	No.	596,452
10.1	MS Casing Pipe + Water Main -323.9mm	No.	621,381
10.2	MS Casing Pipe + Water Main -355.6mm	No.	631,416
10.3	Without Water main & with MS Casing Pipe-500 thick:6	No.	522,187
10.4	RCC casing pipe in place of MS Pipe + Water main -273.1mm	No.	440,186
10.5	RCC casing pipe in place of MS Pipe + Water main -323.9mm	No.	465,116
10.6	RCC casing pipe in place of MS Pipe + Water main -355.6mm	No.	475,151
10.7	Without Water main & with RCC Casing Pipe	No.	365,921
11	Drilling of 900mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 800mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 406.4 to 508mm dia watermain (for 45 Mtr. Length)		



Item No.	Description	Unit	Rate for 2021-22
11.0	MS Casing Pipe + Water Main -406.4mm	No.	1,146,879
11.1	MS Casing Pipe + Water Main -457mm	No.	1,168,319
11.2	MS Casing Pipe + Water Main -508mm	No.	1,186,970
11.3	Without Water main & with MS Casing Pipe-800 thick:12	No.	1,006,148
11.4	RCC casing pipe in place of MS Pipe + Water main -406.4mm	No.	937,005
11.5	RCC casing pipe in place of MS Pipe + Water main -457mm	No.	962,615
11.6	RCC casing pipe in place of MS Pipe + Water main -508mm	No.	982,473
11.7	Without Water main & with RCC Casing Pipe	No.	782,308
12	Drilling of 1300mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 1200mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 559 to 711mm dia watermain. (for 45 Mtr. Length)		
12.0	MS Casing Pipe + Water Main -559mm	No.	2,051,597
12.1	MS Casing Pipe + Water Main -610mm	No.	2,069,890
12.2	MS Casing Pipe + Water Main -660mm	No.	2,089,227
12.3	MS Casing Pipe + Water Main -711mm	No.	2,108,616
12.4	Without Water main & with MS Casing Pipe-1200 thick:16	No.	1,853,522
12.5	RCC casing pipe in place of MS Pipe + Water main -559mm	No.	1,574,597
12.6	RCC casing pipe in place of MS Pipe + Water main -610mm	No.	1,486,679
12.7	RCC casing pipe in place of MS Pipe + Water main -660mm	No.	1,654,559
12.8	RCC casing pipe in place of MS Pipe + Water main -711mm	No.	1,677,293
12.9	Without Water main & with RCC Casing Pipe	No.	1,356,401
	Note: The above rates are for 45 mt length for all Road/Railway crossing, if crossing length is increased or decreased than correction of Rs- (Rate of SOR)45 per meter shall be + or - as per actual length.		
13	Drilling of Horizontal bore hole for water main pipeline under the Railway / Road tracks in all strata with required length including fixing of M.S.(or as specified by Railway / Road authority) casing pipe of suitable size and Thickness. Rate includes the cost of Drilling of bore hole , Casing pipe & welding pushing etc complete but excluding the cost of water main, valves and other items. Entire work should be as per Approved Drawing and as per instruction of Railway / Road authority for Following diameter of Bore hole. for MS pipe		
13.0	Horizontal Drilling-1300;& MS Casing Pipe-1200 thick:16	RMT	36,583
13.1	Horizontal Drilling-900;& MS Casing Pipe-800 thick:12	RMT	18,142
13.2	Horizontal Drilling-600;& MS Casing Pipe-500 thick:8	RMT	9,166
13.3	Horizontal Drilling-500;& MS Casing Pipe-400 thick:6	RMT	6,439
13.4	Horizontal Drilling-300;& MS Casing Pipe-250 thick:5	RMT	2,553
13.5	Horizontal Drilling-250;& MS Casing Pipe-200 thick:5	RMT	2,148
13.6	Horizontal Drilling-200;& MS Casing Pipe-150 thick:5	RMT	1,510
14	Drilling of Horizontal bore hole for water main pipeline under the Railway / Road tracks in all strata with required length including fixing of M.S.(or as specified by Railway / Road authority) casing pipe of suitable size and Thickness. Rate includes the cost of Drilling of bore hole , Casing pipe & welding pushing etc complete but excluding the cost of water main, valves and other items. Entire work should be as per Approved Drawing and as per instruction of Railway / Road authority for Following diameter of Bore hole. for IRS pipe		
14.0	Horizontal Drilling-1300;& IRS Casing Pipe-1200	RMT	36,583
14.1	Horizontal Drilling-900;& IRS Casing Pipe-800	RMT	18,142
14.2	Horizontal Drilling-600;& IRS Casing Pipe-500	RMT	9,166
14.3	Horizontal Drilling-500;& IRS Casing Pipe-400	RMT	6,439
14.4	Horizontal Drilling-300;& IRS Casing Pipe-250	RMT	2,553
14.5	Horizontal Drilling-250;& IRS Casing Pipe-200	RMT	2,148
14.6	Horizontal Drilling-200;& IRS Casing Pipe-150	RMT	1,510
>	Gas/Oil Pipeline crossing(excluding cost of water carrier pipe and it's laying charges )		
	(I) In Hard Rock (Item No 15 to 19 )		
15	Drilling of 1000mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in Hard rock with required length incl fixing of 900mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 550 to 700mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
15.0	Auger Boring-1000;& IRS Casing Pipe-900	Job	1,721,772
15.1	Auger Boring-1000;& RCC Casing Pipe-900	Job	1,665,433
16	Drilling of 900mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in Hard rock with required length incl fixing of 800mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 400 to 500mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
16.0	Auger Boring-900;& IRS Casing Pipe-800	Job	1,380,463
16.1	Auger Boring-900;& RCC Casing Pipe-800	Job	1,289,143
17	Drilling of 500mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in Hard rock with required length incl fixing of 500mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 250 to 350mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
17.0	Auger Boring-500;& IRS Casing Pipe-500	Job	685,233

Item No.	Description	Unit	Rate for 2021-22
17.1	Auger Boring-600 & RCC Casing Pipe-500:	Job	588,825
18	Drilling of 500mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in Hard rock with required length incl fixing of 400mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 180 to 200 mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
18.0	Auger Boring-500 & IRS Casing Pipe-400:	Job	454,510
18.1	Auger Boring-500 & RCC Casing Pipe-400:	Job	386,743
19	Drilling of 300mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in Hard rock with required length incl fixing of 250mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for less than 200 mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
19.0	Auger Boring-300 & IRS Casing Pipe-250:	Job	184,661
19.1	Auger Boring-300 & RCC Casing Pipe-250:	Job	160,272
	(II) Other than Hard Rock (Item No 20 to 24)		
20	Drilling of 1000mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in other than Hard rock with required length incl fixing of 900mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 550 to 700mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
20.0	Auger Boring-1000 & IRS Casing Pipe-900:	Job	676,521
20.1	Auger Boring-1000 & RCC Casing Pipe-900:	Job	620,182
21	Drilling of 900mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in other than Hard rock with required length incl fixing of 800mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 400 to 500mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
21.0	Auger Boring-900 & IRS Casing Pipe-800:	Job	631,197
21.1	Auger Boring-900 & RCC Casing Pipe-800:	Job	443,012
22	Drilling of 600mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in other than Hard rock with required length incl fixing of 500mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 250 to 350mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
22.0	Auger Boring-600 & IRS Casing Pipe-500:	Job	288,942
22.1	Auger Boring-600 & RCC Casing Pipe-500:	Job	212,535
23	Drilling of 500mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in other than Hard rock with required length incl fixing of 400mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for 180 to 200 mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
23.0	Auger Boring-500 & IRS Casing Pipe-400:	Job	193,198
23.1	Auger Boring-500 & RCC Casing Pipe-400:	Job	125,430
24	Drilling of 300mm dia Horizontal borehole by auger method for watermain pipeline crossing under the gas & oil pipeline incl in other than Hard rock with required length incl fixing of 250mm dia M.S/RCC casing pipe with pushing etc complete various size of pipe for less than 200 mm dia watermain( for crossing length of 30 mts, excluding cost of water carrier pipe and laying charges )		
24.0	Auger Boring-300 & IRS Casing Pipe-250:	Job	80,136
24.1	Auger Boring-300 & RCC Casing Pipe-250:	Job	56,747
	Note: The above rates are for 30 mt length for all Gas/Oil Pipeline crossing, if crossing length is increased or decreased than correction of Rs- (Rate of SOR/30 per meter shall be + or - as per actual length).		
25	Replacement of air valve riser by Dismantling the existing air valve by excavation, dismantling conc and cutting/shifting of riser from top of pipe and install new M.S pipe of 6mm th and 3.2mt length with necessary fittings such as flange of appropriate size, nut bolts and embed the pipe in R.C.C M:15 with offset of 10 cm around pipe with necessary steel etc complete		
	Dia of A.V		
25.0	Dia of Air Valve 50mm	Nos	487
25.1	Dia of Air Valve 80mm	Nos	545
25.2	Dia of Air Valve 100mm	Nos	558
25.3	Dia of Air Valve 150mm	Nos	573
25.4	Dia of Air Valve 200mm	Nos	589
26	Erection of air valve riser by installing new M.S pipe of 6mm thick and 3.2mt length with necessary fittings such as flange of appropriate size, nut bolts and embed the pipe in R.C.C M:15 with offset of 10 cm around pipe with necessary steel etc complete		
	Dia of A.V		
26.0	Dia of Air Valve 50mm & MS Pipe	Nos	3,112
26.1	Dia of Air Valve 80mm & MS Pipe	Nos	4,350
26.2	Dia of Air Valve 100mm & MS Pipe	Nos	5,543
26.3	Dia of Air Valve 150mm & MS Pipe	Nos	7,792
26.4	Dia of Air Valve 200mm & MS Pipe	Nos	10,122



Item No.	Description	Unit	Rate for 2021-22
27	Designing, providing and casting reinforced concrete M-35 design mix box, including providing and casting steel cutting edge for front shield, MS rear shield RCC M-20 thrust bed, thrust wess for pushing the box below railway embankment under railway, SH, NH roads under running traffic condition as per contractors own design/ drawing including arrangement for intermediate jacking station with provision of intermediate shield and its connection with the box drag sheet as may be required for smooth controlled pushing etc complete in all respects, including cost of necessary excavation with its all lead and lift for constructing thrust bed at designed level as directed by engineer-in-charge including providing all temporary works as required and approved by Railway or statutory authority, required protection of existing road pavement/ railway track including providing water tight joints in RCC box segments using CC grout with epoxy paint on exposed facing and providing RCC saddles in the box as per details given with drawing for supporting pipe in the box as directed, including all plants machinery, equipments, all labour material and all temporary works in all respects, dismantling and removal of temporary work, restoring ground to its original profile on completed work. Rate is inclusive of construction of pushing pit, receiving pit and intermediate pit if required and inclusive of all tools & tackle etc complete.		
27.1	Size 2.0 x 2.0 in all strata of Soil	RMT	136,878
27.2	Size 2.5 x 2.5 in all strata of Soil	RMT	213,872
27.3	Size 2.5 x 3.0 in all strata of Soil	RMT	256,647
27.4	Size 3.0 x 3.0 in all strata of Soil	RMT	307,976
27.5	Size 3.0 x 3.5 in all strata of Soil	RMT	359,306
27.6	Size 3.5 x 3.5 in all strata of Soil	RMT	419,189
27.7	Size 4.0 x 4.0 in all strata of Soil	RMT	547,512



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