

TenderNo.:1of 2023-2024

**OFFICE OF THE CHIEF ENGINEER, ZONE – I,
PUBLIC HEALTH ENGINEERING DEPARTMENT**

**TENDER DOCUMENT, VOLUME–II FOR
SURVEY, DESIGN,
SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF
*SEWERAGE & SEPTAGE TREATMENT WORKS FOR ZONE 7,
AIZAWL CITY SMALL BORE SEWER, TUIKUAL LUI***

(UNDER AMRUT 2.0)



Tender amount	Rs. 39,22,00,000
Earnest money	Rs. 49,22,000
Last date of sale of tender	Dt. 12.1.2024
Last date of submission of tender	Dt. 16.02.2024
Date of opening	Dt. 19.02.2024
Cost of tender document	Rs. 5,000
Time allowed for execution of work	24 months

BILL OF QUANTITIES (FINANCIAL BID)

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FORM OF FINANCIAL BID

Name of Work: _____

Bid No:

To

_____ [Employer]

_____ [Address]

Sir,

We, the undersigned, hereby submit our financial offer for the above mentioned works as follows;

Sl.No	Description	Bid amount (in Indian Rupees)	
		Figure	In words
1	Small Bore Network System		
2	House Service Connection		
3	3.5MLD Sewerage tyreatment Plant including 30 KLD Feacal Sludge Treatment Plant		
4	Operation and maintenance for 2 years		

1. We under take to abide by the final amount comingout of the correction of arithmetical errors.
2. We understand that you are not bound to accept the lowest or any tender you may receive.

Signature of authorized signatory.....

Name.....

Title.....

Date

Schedules

Bill of Quantities

Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, Conditions of Contract, Specifications and Drawings.
2. For the construction of works, the quantities given in the Bill of Quantities are estimated quantities, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the agreed individual item rates. Bills will be raised monthly. The method of measurement shall be as per norms laid out by the Bureau Of Indian Standard's publication IS :1200 (Latest Editions with updated amendments).
3. For the Project's Environmental Management Plan (EMP), the contractor shall raise an invoice every quarter, listing out the actual costs for the implementation of environmental measures. These bills will be paid out of Provisional Sums.
4. A rate or price shall be entered against each item in the Priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor has failed to enter a price or rate shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. The whole cost of complying with the provisions of the contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of work.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. Reference to relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
7. The rates and prices tendered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the Contract, include all constructional plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out in the Contract. Import duty and excise duty on materials and goods to be imported shall not be included in the Unit Rates and the Employer shall issue certificates exempting the Contractor from payment of these duties.
8. Arithmetic errors will be corrected by the Employer as follows:

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- a. if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
 - b. if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
 - c. if there is a discrepancy between words and figures, the Amount (In INR) in words shall prevail, unless the Amount (In INR) expressed in words is related to an arithmetic error, in which case the Amount (In INR) in figures shall prevail subject to (a) and (b) above.

BILLOF QUANTITITES(BOQ)
for
SEWERAGE &SEPTAGE TREATMENT WORKS FOR ZONE 7,
AIZAWL CITY
SMALL BORE SEWER, TUIKUALLUI AMRUT 2.0

PROFORMA OF SCHEDULES

The following schedules are to be executed as per requirement:

SCHEDULE‘A’: **SCHEDULEOF QUANTITIES**

I.SEWERLINE				
Sl No	Description	Qty	Unit	Amount
1	Earth work in excavation in foundation, trenches manholes, road side chambers etc. including dressing of sides and ramming of bottoms, including getting out the excavated material and refilling after laying pipes/ foundation and disposal of surplus excavated material at a lead upto 50 m at suitable site as per direction of Engineer for following depths, below natural ground/ road top level.			
a)	In all types soils such as moorum, sand, sandy silt, clay, black cotton soil, kankar,etc.			
	Depthupto1.5m	21280.65	cum	
b)	In ordinary rock/soft disintegrated rock, laterite, soft rock or kankar, not requiring blasting.			
	Depthupto1.5m	416.51	cum	
c)	Excavation in Hard Rock (Blasting prohibited)			
	Depthupto1.5m	244.62	cum	
2	Removal of unserviceable soil , loading and disposal at safe dumping site designated by appropriate authority.			
	Depthupto1.5m	2240.96	sqm	

I.SEWERLINE				
Sl No	Description	Qty	Unit	Amount
3	Providing pipe at site, lowering & laying in trenches, aligning & jointing of PN 4 class HDPE pipe in PE 80 Material as per IS: 14333:1996 (amended up to date) at all depths with appropriate fittings for connecting pipe to manholes as per drawings, sectional testing of the sewer pipe line (including cost of conveyance of water to site)etc., complete as per specification or as directed by Engineer.			
	110mmHDPE	26220.14	m	
	125mmHDPE	683.82	m	
	160mmHDPE	1791.20	m	
	200mmHDPE	869.57	m	
	250mmHDPE	900.47	m	
	315mmHDPE	945.59	m	
4	Restoration of public/private/etc properties damaged during execution of works			
			Lump sum	
5	Providing barricadingfortrenches using80–100mm dia wooden ballies as vertical post, at least 1.5 m above ground level and at least 30-45 cm below ground level at a spacing of3 m. Two rowsof80-100 mm wooden ballies as horizontal members securely tied by coconut strings with the vertical members. Both vertical and horizontal members shall be painted in red and white colour. Rate are inclusive of removal and cleaning of site complete in all respect.			
		11307.88	m	
6	Providing and fixing minimum 0.63mm thick GI corrugated sheets (minimum width of each sheet shall be 60 cm) for covering the barricading in one/two rows one above another and painting in red and white stripes as per the specifications and directions of the Engineer-in-Charge with proper fixing arrangements with GI limpet washers, nuts and bolts complete in all respect.			
		7838.59	m	

I.SEWERLINE				
Sl No	Description	Qty	Unit	Amount
7	Awareness campaign given in different localities covered under the project to educate the stakeholders regarding the benefits of the project, which may be in the form of media, advertising, flyers, brochures, booklets, announcements, meetings, etc.			
			Lump sum	
8	Dismantling of road, pavement, etc by mechanical/manual means using pneumatic tools, cutter, etc breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials at safe dumping site designated by appropriate authority.			
	110mmHDPE	5899.53	cum	
	125mmHDPE	153.86	cum	
	160mmHDPE	403.02	cum	
	200mmHDPE	208.70	cum	
	250mmHDPE	216.11	cum	
	315mmHDPE	226.94	cum	
	Totalroadcuttingquantity	7108.16	cum	
9	Providing, laying and spreading of granular sub-base by providing coarse graded material, spreading in uniform layers with motor grader on prepared surface, mixing by MIX IN PLACE METHOD with rotavator at OMC, and compacting with vibratory roller to achieve the desired density and bringing back to its original position for restoration of road, pavement, etc.			
	110mmHDPE	1966.51	cum	
	125mmHDPE	51.29	cum	
	160mmHDPE	134.34	cum	
	200mmHDPE	69.57	cum	
	250mmHDPE	72.04	cum	

I.SEWERLINE				
Sl No	Description	Qty	Unit	Amount
	315mmHDPE	75.65	cum	
	Total quantity	2369.39	cum	
10	Providing, laying, spreading and compacting stone aggregates of specific sizes to Water Bound Macadam specification including spreading in uniform thickness; hand packing, rolling with power roller 8-10 tonnes, instages to proper grade and camber, applying and brooming requisite type of screening (Table 400-8), binding materials to fill up the interstices of coarse aggregates, watering (with water browser) and compacting to required density, making necessary earthen bund to protect edges as per clause 404 of MoRT & H specification including all material, labour, machinery, lighting, guarding and maintenance of diversion complete.			
	110mmHDPE	1966.51	cum	
	125mmHDPE	51.29	cum	
	160mmHDPE	134.34	cum	
	200mmHDPE	69.57	cum	
	250mmHDPE	72.04	cum	
	315mmHDPE	75.65	cum	
	Crusher broken–Grade-II(63-45mm)	2369.39	cum	
	Crusher broken–Grade-III(53-22.4mm)	2369.39	cum	
11	Providing and applying tack coat on the prepared surface with bitumen emulsion as per IS: 8887 and approved quality @ 0.2 kg/sqm with the help of spray set fitted on bitumen container(boiler) after cleaning the surface with brooms or soft brushes and finally dusting with old gunny bags and compressed air to receive bituminous treatment complete as per clause 502 of MoRT&H specification including all material, labour, machinery, lighting, guarding and maintenance of diversion road.			
	110mmHDPE	19665.10	sqm	
	125mmHDPE	512.87	sqm	

I.SEWERLINE				
Sl No	Description	Qty	Unit	Amount
	160mmHDPE	1343.40	sqm	
	200mmHDPE	695.66	sqm	
	250mmHDPE	720.38	sqm	
	315mmHDPE	756.47	sqm	
	Normal Bituminous Surface	23693.87	sqm	
	Extra for additional bitumen emulsion used in above item for every 1 kg per 10 sqm	23693.87	sqm	
12	Providing and laying open graded premix carpet 20 mm thick (compacted), on prepared surface in a single course as wearing course, composed of specified graded crushed stone aggregate as per Table500-23,premixedwithbituminousbinder@14.60kg/10sqm (including cost of anti-stripping compound wherever required), including loading of material with F.E. loader, hot mixing of stone aggregate and bitumen in 9omputerized hot mix plant, transporting the mixed material by tippers to paver and laying with paver finisher fitted with electronic sensor control to the required level and grade, compacting smooth wheeled roller 8-10tonnecapacityand finishing to required level to achieve the desired density as per clause 511 of MoRT&H specification including all material, labour, machinery, lighting, guarding and maintenance of diversion but excluding cost of tack coat/ seal coat.			
	Withbitumenofgrade60/70	23693.87	sqm	
13	Providing and applying premixed sealcoat Type “B” comprising ofthinapplicationoffineaggregate0.06cum/10sqmpremixwith bitumen binder @6.8 Kg/ 10 sqm(including cost of anti-stripping compound wherever required) laying with paver finisher with electronic sensor control and rolling with power roller 8-10 tonnes completeasperclause513ofMoRT&Hspecificationincludingall material, labour, machinery, lighting, guarding and maintenance of Diversion road.			
	With bitumen of grade60/70	23693.87	sqm	

I.SEWERLINE				
Sl No	Description	Qty	Unit	Amount
14	<p>Construction of Manhole: Providing and constructing of brick masonry circular manholes with internal diameter 0.90m and depth upto 1.65m having 230 mm thick brick masonry wall in cement sand mortar 1:3, including concreting PCC M-10 grade (1:3:6) for 250 mm thick foundation including curing compaction and form work etc complete, PCC M 15 for benching and channel portion, RCC M 20 for 200 mm thick cover slab including reinforcement, PCC M 20 manhole frame and cover using stone aggregate 20mm nominal size, 20mm thick inside and outside plaster in C.M. 1:3, inside plaster finished with floating coat of neat cement, vata in CM 1:1 around pipe entering and leaving the manhole and also at the junction of masonry and concrete slab, providing and fixing of SFRC footsteps of approved make at every 0.25m height fixed in CM 1:3, supplying and fixing heavy duty RCC M 20 cover having clear opening of 560 mm, including refilling of jhiri, including curing, watering, Ramming, hydro testing of man hole, conveyance & cost of water, and dewatering complete as directed by the Engineer.</p>			
	110mm to 315mm Sewer Main			
a	Upto 1.5m Height	622.00	No	
b	Clean Out	319.00	No	
15	<p>Provision for restoration of damaged water line and sewer line. Replacement of UG utilities including cost of pipe, EW, BT/CT, cutting, refilling, laying, jointing & testing etc., completed. By the Departmental officers. (Ref.No.D-15015/1/2016-E-in-C/PHE/20 + No.W-12015/19/2008-E-in-C/PHE/105)</p>			
a	20 mm Dia GI Pipe	2356.00	m	
b	40 mm Dia GI Pipe	2040.00	m	
c	50 mm Dia GI Pipe	1728.00	m	
	Sub-Total-I			

II.HOUSESERVICECONNECTION				
SINo	Description	Qty	Unit	Amount
	Providing House Service Connection: Supplying, laying jointing and testing HDPE pipe including earthwork excavation for trenches in hard stiff clay, stiff black cotton, hard red earth, shales, murams, gravel, stoney earth and earth mixed with small size boulders and hard gravelly soil, depositing the earth on banks with initial lead of 10 m, lowering the pipes into the trenches, aligning, refilling the trenches with excavated earth in layers of not more than 23 cm thick, watering, ramming to consolidation and disposal of surplus earth etc., complete.			
1	110mm HDPE pipe–Outside property line	63880.00	m	
2	Construction of Inspection Chamber	3194.00	No	
	Sub-Total-II			

III. SEWAGE TREATMENT PLANT cum FEACAL SLUDGE TREATMENT PLANT		
SINo	Description	Amount
1	Sewage Treatment Plant (3.5MLD) : Survey, design, construction works, supplying and installation of machineries and electrical with SCADA system complete for Sequential Batch Reactor technology and online monitoring system for effluents outlet COD, BOD,TSS, Ammoniacal Nitrogen & pH with individual 4-20 mA out put, treatment plant facility at site including excavation of earth, fencing, installation of transformer, charging and connection from the nearest HT line, etc complete.	
2	Faecal Sludge Treatment Plant (30 KLD) : Survey, design, construction works, supplying and installation of machineries and electrical system complete for Sequential Batch Reactor technology treatment plant facility at site including excavation of earth, fencing, installation of transformer, charging and connection from the nearest HT line, etc complete.	
3	Office cum Laboratory at Treatment Plant Site, Tuikuallui : Providing, arranging, managing and maintaining 500 sq.ft. well furnished office and well equipped laboratory equipments consisting of renowned standard apparatus of IS standard for testing pH, BOD ₅ , COD , total suspended solids, ammoniacal nitrogen, total nitrogen, total phosphorus, faecal coliform and total coliform with 10 chairs (Godrej), 2 steel almirah (Godrej), 3 tables (Godrej), one complete set of computer with printer to the satisfaction of the Executive Engineer including electrical utilities, water expenses etc complete.	
4	Site Development: Excavation of earth including jungle clearance, metalling of approach road, levelling of earth to desired area and elevation, disposal of excess to designated disposal site, barbed wire fencing of entire premises including Provision of security gate, lighting, drain, etc, complete.	
	Sub-Total-III	

IV. OPERATION & MAINTENANCE FOR 2 YEARS

SI	Items	Unit	Nos.	Rate	Amount
	Operation and maintenance of Pipe Networks, 3.5 MLD STP based on Sequential Batch Reactor technology, 30KLD FSTP including supply of chemical and consumables, disposal of plant residuals (e.g Screenings, Grit and Dewatered sludge), manpower required, general maintenance of civil structures, preventive and breakdown maintenance of mechanical equipments, electrical items, field instruments, etc. Cost of collection, analysis, reporting, monitoring and maintaining record of samples from raw sewage and treated sewage daily collected at least for one time a day from the entry and exit of the STP units, etc complete for 24 months as a whole.				
A	CHEMICALS				
i	Supply of Chlorine Tonners	MT	6388		
ii	Supply of Dewatering Polyelectrolyte	kg/lit	664.3		
	Total for first year				
i	Supply of Chlorine Tonners	MT	6388		
ii	Supply of Dewatering Polyelectrolyte	kg/lit	664.3		
	Total for second year				
	Sub-Total (A)				
B	MANPOWER				
1	Plant Manager	12	1		
2	Electrical/Instrumentation Engineer	12	1		
3	Chemist	12	1		
4	Plant Operators	12	3		
5	Welder	12	3		
6	Sweeper	12	2		
7	Electrician	12	3		
8	Security	12	2		
9	Lineman	12	8		
10	Driver	12	1		
	For first year				
1	Plant Manager	12	1		
2	Electrical/Instrumentation Engineer	12	1		
3	Chemist	12	1		
4	Plant Operators	12	3		
5	Welder	12	3		
6	Sweeper	12	2		
7	Electrician	12	3		

8	Security	12	2		
9	Lineman	12	8		
10	Driver	12	1		
	For second year				
	Sub-Total(B)				
C	TOOLS				
1	Double Ended SpannersinmmFrom10to18	Set	1		
2	BoxSpannersInmmFrom6to24	Set	1		
3	Single open Ended Spannerinmm	Set	1		
4	Allen Key Spanners1.5mmtto16mm	Set	2		
5	Pipe Wrenches 2nos.Each300m &450mm long	Nos	2		
6	Pipe Die Set With Wrenches BSP	Nos	2		
7	threads12mm - 50mm	Set	1		
8	ScrewSpanners200mm/250mm/300mmSizeoneeach	Set	1		
9	SteelHammersWithwoodenhandles0.25kg/0.5kg/1kgEach	Set	1		
10	Ratchet Die Set Complete threaded upto100m	Set	1		
11	Torque Wrenches 50kgm & 100kgm	Nos	1		
12	Set of tube Cutter For tubes upto 12mm	Nos	1		
13	Coupling Puller Suitable For Main Drive Coupling	Nos	1		
14	Grease gun	Nos	2		
15	300mm Steel Frame Hacksaw with 12nos.Hss blades	Nos	2		
16	Heavy duty Screwdriver with Full Size insulated handle 200 mm	Nos	2		
17	Heavy duty Screwdriver with Full Size insulated handle 250 mm	Nos	2		
18	Heavy duty Screwdriver with Full Size insulated handle 300 mm	Nos	2		
19	Vaccuum Cleaner For Periodical Cleaning Of Equipments, Cleaner operating on 230 volts 50 HZ AC Supply complete with Cable and all Standard and optional accessories.	Nos	1		
20	Free Floor Standing Cupboard fabricated from2.5mm thickM. S. Plate and epoxy painted with lockable arrangement having size of 2000mm*1000mm*500mm	Nos	1		
21	Office table of Steel with Drawers	Nos	1		
22	Steel Chairs	Nos	6		
23	Cupboards	Nos	2		
24	Portable lighting equipments	Nos	20		
25	Portable Air Blower	Nos	20		
26	Jack Hammer	Nos	10		
27	HDPE pipe jointing machine	Nos	2		
28	Gas Mask	Nos	20		
29	Diver's suit	Piece	4		
30	Inhalator machine	Nos	20		
	Total per year				
	Total for 2years				
	Sub-Total(C)				

D	VEHICLES				
1	Inspection vehicles	Nos	1		
2	Trailer Mounted Sewer Jetting Machine 5000litre capacity ,Operating Pressure 200bar	Set	1		
3	Trailer Mounted Sewer Sucker machine, Operating Pressure 120 bar ,tank capacity 5000 litres	Set	1		
4	Petroleum Oil Lubricant	Month	24		
	Sub-Total(D)				
E	SAFETY EQUIPMENTS				
1	Danger notices as per requirements	Nos	6		
2	First Aid box with Following Standard Contents				
a	Tincture Iodine				
b	Tincture basins				
c	Firosin Tube				
d	Burnol				
e	Iodex				
f	Boric powder	Nos	2		
g	Pottasium Permaganate				
h	Smeeling Salt				
i	Cotton				
j	Tape				
k	Bandage				
L	Scissors				
3	Fire Buckets including GI Pipe Stand Locking Arrangments etc. Complete as per requirements	Unit	4		
4	4KG Carbondioxide portable fireextinguisher with clamps & Support	Nos	5		
5	Rubber insulating corrugated mat 12mm thick & 1m wide & 1.5m pieces	m	20		
6	First Aid instuction Chart in Wooden Frame with Lamination	Nos	2		
7	Hand Gloves For 11KV Switch gear Operation	Nos	4		
	Total per year				
	Total for 2years				
	Sub-Total(E)				
F	MISCELLANEOUS COST				
	For 1st Year	L.S	1		
	For 2nd Year	L.S	1		
	Sub-Total(F)				
SUB-TOTAL-IV					
GRAND TOTAL					
SAY					

SCHEDULE 'B'

Schedule of materials to be issued to the contractor:-Note: No materials will be issued to the contractor.

SCHEDULE-'C'

Tools and plants to be hired to the contractor:-Note: Tools and Plants should be arranged by the contractor.

SCHEDULE 'D'

Extra schedule for specific requirements/document for the work, if any

SCHEDULE 'E'

Reference to General Conditions of Contract.

Name of Work: Survey, design, supply, installation, testing and commissioning of Sewerage & Septage Treatment Works for Zone 7, Aizawl City Small Bore Sewer, Tuikual Lui (Under AMRUT 2.0)

- | | |
|------------------------------|---|
| (i) Estimated cost of work: | Rs.39,22,00,000 |
| (ii) Earnest Money: | Rs. 49,22,000 (20 lakhs+1% of the Tendered Amount in excess of rupees 10 Crore) |
| (iii) Performance Guarantee: | Rs.1,96,10,000(5% of Tendered Amount) |
| (iv) Security Deposit: | Rs.1,96,10,000(5% of Tendered Amount) |

SCHEDULE 'F'

Reference to General Conditions of Contract.

