Bihar Urban Infrastructure Development Corporation Ltd.

(A Govt. of Bihar Enterprises)

Request for Proposal

for

EMPANELMENT FOR SUPPLY OF SOLID WASTE MANAGEMENT EQUIPMENT (GOODS) FOR URBAN LOCAL BODIES IN BIHAR

VOLUME-2 of 3

SCHEDULE OF SUPPLY

(Ref. Notification Number: BUIDCo/SIU-1/YO-38/16-51, Date: - 14.09.2017)

Bihar Urban Infrastructure Development Corporation Limited

(A Govt. of Bihar Undertaking)

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S.No.	Equipment/Goods
1	Truck Chassis Mounted Integrated Road Sweeping Machine
2	Mini Road Sweeping Machine
3	Auto Tipper without Bin Lifter
4	Auto Tipper with Bin Lifter
5	Loader Backhoe
	i) 45-55 HP
	ii) 90-95 HP
6	Twin Bin Dumper Placer Compatible with 2.5 Cum and 3.0 Cum Capacity Containers
7	Vehicle Mounted Combined Sewer Cleaning Suction cum Jetting Machine of 4000 Liters
8	Vehicle Mounted Combined Sewer Cleaning Suction cum Jetting Machine of 8000 Liters
9	Vehicle Mounted Sewer Cleaning Jetting Machine of 3000 Liters
10	Super Sucker with 1 Main Unit & 2 Dump Tank
11	Mini Super Sucker of 3 Cum
12	Mini Super Sucker of 8 Cum
13	Hydraulic Platform of 9.0 Meters Working Height
14	Hydraulic Platform of 13.0 Meters Working Height
15	Closed Top Tipper 5 Cum capacity
16	Closed Top Tipper 10 Cum capacity
17	Refuse Compactor 8 Cubic Meter Capacity
18	Refuse Compactor 14 Cubic Meter Capacity
19	Portable Compactor 10/16 Cum Capacity
20	Hook Loader for 10/16 Cum Portable Compactor
21	Hydraulic Trolley for Tractor
22	Tractor
	i) 12 HP - 16 HP
	ii) 20 HP – 28 HP
	iii) 35 HP - 40 HP
	iv) 45 HP – 55 HP
23	Portable Fogging Machine
24	Vehicle Mounted Fogging Machine
25	Automatic Organic Waste Converter 50 to 500 KG
26	Skid Steer Loader
27	Tracked Excavator
28	Auto-Rickshaw mounted sewer cleaning jetting machine of 500 Litres capacity
29	Chain Mounted Open Drain Cleaning Machine
30	Manhole Desilting Machine
31	Cattle Catcher
32	Containerised Tricycle Rickshaw with 8 bins plastic containers

33	Hand Cart with 6 bins
34	MS Wheel Barrow
	i) 85 Litre
	ii) 110 Litre
	iii) 140 Litre
35	G.I Wheel Barrow
	i) 85 Litre
	ii) 110 Litre
	iii) 140 Litre
36	MS Container / Bin 1.1 Cum Capacity with Wheels or without Wheels
37	G.I. Container / Bin 660 Litre Capacity with Wheels or without Wheels
38	G.I. Container / Bin 1.1 Cum Capacity with Wheels or without Wheels
39	MS Container / Bin 2.5 Cum Capacity
40	MS Container / Bin 3.0 Cum Capacity
41	Stainless Steel Single Pole Mounted Bins
	i) 60 Litre
	ii) 80 Litre
	iii) 100 Litre
42	Plastic Secondary Storage Bins 660 Litre
43	Plastic Secondary Storage Bins 1100 Litre
44	Plastic Hand Cart
	i) 65Litre
	ii) 110Litre
	iii) 250 Litre
45	Domestic Polyethylene Bins with flap lid
	i) 10 Litres Capacity
	ii) 20 Litres Capacity
46	House Hold Bucket- 15 Litre with Foot Pedal
47	Twin Pole Mounted Bin with MS Frame 100/125 Litres
48	Two Wheeled Dustbin Plastic 240L Capacity
49	Underground Bin System for 1.1 Cum
50	Free Stand Litre Bin
51	Hot Dip Galvanize Container- 660/1100 Litre Capacity
52	Portable Toilet /Urinal Block
	i) Single User
	ii) Four User
53	Portable Bio Toilet
	i) 1 Pan
	ii) 2 Pan
	iii) 4 Pan
	iv) 10 Pan
54	Bunk House Community Toilet
	i) 1 Toilet & 4 Urinal (size 10 x 8 x8.5 min.)

	ii) 3 Toilet & 3 Urinal (size 10 x 8 x8.5 min.)
	iii) 3 Toilet &10 Urinal (size 20 x 10 x8.5 min.)
	iv) 6 Toilet & 4 Urinal (size 20 x 10 x8.5 min.)
	v) 3 Toilet & 7 Urinal & 1 Bathroom (size 20 x 10 x8.5 min.)
	vi) 12 Toilet (size 40 x 8 x8.5 min.)
	vii) 12 Bathroom (size 40 x 8 x8.5 min.)
55	Mobile Toilet
	i) 4 Seater
	ii) 6 Seater
	iii) 10 Seater
56	Mobile Bio Toilet
	i) 4 Seater
	ii) 6 Seater
	iii) 10 Seater
57	Drinking Water Hut
58	Prefabricated Drinking Water ATM
59	Trailer Mounted Water Tanker
	i) Stainless Steel 4000L Capacity
	ii) MS 4000L Capacity

Delivery and Completion Schedule

Delivery of Goods and Related Services should be carried out as per provisions of Purchase Order after mutually discussed between Supplier & BUDCO which may be issued by the Purchaser time to time for such quantity as may be required by the concerned Urban Local Bodies in Bihar or any other department in Bihar.

G A Drawing:

GAD with all dimensions and makes of accessories shall be submitted to purchaser for approval.

Note: All Photographs are indicative only.

Technical Specifications –

Truck Chassis Mounted Integrated Road Sweeping Machine

Specification of integrated road sweeping machine			
1	Working width with two side brushes	Mm	2200-3400
2	Working width with central brush	Mm	1400-2300
3	Central cylindrical brush diameter	Mm	500-600
4	Side disc brushes diameter	Mm	500-750
5	waste debris tank capacity (volume)	liter	4500-5100
6	Maximum hopper dumping height	Mm	950 -1600
7	Air flow of turbine which create suction	m3/hr	14000
8	Mode of lifting debris liters		Through full vacuum
9	Filter type & surface area	class/m2	PM10
10	Suction motor/ turbine power	Kw	55
11	Engine power	hp/kw	74/55
12	Engine revolution	Rpm	2200
13	Engine power displacement	Cc	4400
14	Turbocharger engine for better fuel autonomy	make	JCB Ecomax 444 Stage 4
15	Fuel		Diesel
16	Fuel tank capacity	Ltr	190
17	Fuel diesel consumption	ltr/hr	2 (for sweeping)
18	Maximum forward/ transportation speed	km/hr	100
19	Effective sweeping speed	km/hr	15-18
20	Maximum gradient with empty hopper	Degree	53 degree
21	Machine turning radius	Mm	Chassis dependent
22	Service & relief brake		Hydraulic
23	Parking brake		Mechanical
24	Rear wheels drive		Mechanical
25	Suspension		Leaf spring
26	Machine height control		On the wheel
27	Frame chassis		8 mm thick, material FE360
28	Machine rear visibility (optional)		Provided
29	Accessibility to engine		Tilting cabin
30	Quality standard of sweeping machine	global/international	Global
31	Installation base	no.	1
32	Availability of spares & consumables	Year	5
33	Warranty of machine	Year	2 Years With Operator
34	After sales support	local office	At Patna, Bihar
35	Comprehensive Maintenance		5 Years excluding warranty period including spare parts

GENERAL DESCRIPTION

The vehicle chassis mounted, vacuum assisted Mechanical / Power road sweeper designed to clean with efficiency, City Roads, large parking lots, market and commercial areas, residential blocks etc.

The equipment will be provided with a 5.0 cum hopper. The swept material will be collected and stored in Debris Hopper. A centrally located Main Brush, positioned below and across the width of the hopper will carry out the toughest sweeping operation within its travel path. Two side Channel Brushes will be located on each side of the equipment to clean the curb side areas.

Positioned immediately behind each side brush is a suction nozzle, which is connected to the debris hopper, by a heavy-duty flexible rubber, suction duct hose. The dirt is to be lifted off the ground by suction and collected in the debris hopper. All brushes will be operated by a low speed, high torque hydraulic motor.

The auxiliary engine driving the complete system will be adequately rated to meet the power demands of the total connected load. It will be capable of handling solid & semi solid waste.

Further to this, to avoid noise emission the auxiliary engine and the exhauster fan have been protected with soundproof installation.

A suitable flexible hose will be provided, as attachment and water spraying system will be utilized to suppress the dust through path inside the unit.

All electric & electro-hydraulic functional switches, gauges and controls will be provided and ergonomically located inside the driver's cabin. The sweeping unit will have an automatic adjustment system to bypass horizontal & vertical obstacle.

This high-performance Road Sweeper will be easy to operate and simple to maintain, with very low dB level of operation.

TECHNICAL SPECIFICATION

1)	Type:	Road and Curb suction sweeper
2)	Sweeping width:	With one broom: 2300mm
3)	Container volume:	5.0 CU.M.
4)	Container discharge:	By tipping: Tipping angle 53O
5)	Dumping Height:	950mm (chassis dependent)
6)	Channel brush: Dia.	500 mm Channel Brush Stock with Alloy Steel Tines
7)	Wide Sweep brush:	Dia. 340 mm Poly Segment Brush Stocks
8)		Suction hose: Heavy duty, Flexible hose, and 200mm diameter having an adequate length of 3 to 4 Mtrs.
9)		Dust suppression: Water spraying system in the front and around brush enclosures and suction nozzles
10)	Cleaning of footpaths & Gully Pits	: Suction hose.
11)	Auxiliary engine:	Diesel Engine, direct injection in- line, multi cylinder.
12)		Transmission: Blower drive through an auxiliary engine over a fluid drive coupling and a compact step-up gearbox
13)	Sweeping speed:	A max of 15 KM/H

VEHICLE CHASSIS

The complete equipment will be mounted on an 11 Ton GVW, Vehicle chassis having a maximum wheel base of 3600mm and a minimum output rating of not less than 100 hp.

Preferred Model: TATA/Ashok Leyland/Eicher/Mahindra

Additional charges will be levied if the above is not complied with.

Approximate Dimensions & Weight

Overall length of the equipment:	6150mm – chassis dependent
Overall width of the equipment:	2285mm
Overall height of the equipment:	2880mm – chassis dependent
Overall sweeping width, one broom:	2300mm
Wheel Base:	3300 to 3600mm – maximum
GVW with empty Hopper:	7600kg – chassis dependent

SYSTEMS' COMPONENTS

1. Debris Hopper
2. Auxiliary engine

3. Exhauster fan
4. Sweeping equipment
5. Dust suppression system - Water tank and spraying system
6. Hydraulic and pneumatic systems
7. Electrical System
8. Control panel

1. DEBRIS HOPPER

The Debris Hopper will be fabricated out of heavy-duty 4mm thick, stainless steel plates. Access door will be provided for removal of the refuse on both sides of the Debris Hopper. The tipping cylinder will be utilized for the discharge.

The Debris Hopper is of a self-supporting shell construction type. The volumetric capacity will be of 5cu.m. The rear door is opened and closed by a hydraulic cylinder.

A 3 points system guarantees the perfect closing of the rear door. The rear door opening will be 125o. The hopper shall discharge its contents by being tipped to an angle of 53o. A removable type filter mesh will be provided inside the container to prevent the ingress of larger materials, such as plastics etc., in the suction system. The mesh located in the hopper to render easy maintainability.

An integral part of the Debris Hopper assembly and with the Debris Hopper lowered the engine and blower configuration will get fully encapsulated as a noise reduction encasement.

2. AUXILIARY ENGINE

Drive for the suction fan and the hydraulic pump will be drawn from a suitably rated, independent auxiliary diesel engine mounted on the chassis.

The auxiliary engine will drive the suction blower through a step-up gearbox and a fluid coupling, an important feature for the safety of the complete drive train and blower. The blower operational speed will be variable between 2400 to 3500 RPM to suit operation

The diesel engine selected to drive the blower will be an in-line, 4 stroke, and multi-cylinder, water-cooled diesel engine.

It will be suitably rated to meet the combined power demands of all the systems' components, and also to ensure that the system does not stall during extreme operating conditions.

Engine Data:

Make:	JCB
Model:	Ecomax 444,
Gross rated power:	85 kW @ 2200rpm
Maximum torque:	440 Nm @ 1300 rpm
Legislation compliance:	NRMM Stage 3a

3. EXHAUSTER FAN

The suction will be of the centrifugal type. The rotor will be of a heavy-duty construction, dynamically balanced and be provided with multi-vane, self-cleaning, abrasion resistant blades.

The blower operational speed will vary between 2400 RPM AND 3500 RPM to suit the sweeping operation.

4. SWEEPING EQUIPMENT

- Suction nozzle
- Channel brush diameter 500mm in Alloy Steel Tines.
- Central roller brush diameter 340mm Poly Segmented
- Lifting and lowering functions are pneumatically operated from the driver's cabin.
- The brush is provided with manual adjustable spindles to adjust the inclination of the brush to meet all road conditions.
- Variable speed control for brushes, nominal speed of Channel (side) Brushes and Central Brush upto 120 rpm and 160 rpm respectively.
- The suction nozzles are made in wear resistant Al alloy.

- Suction Nozzle width 750mm; trunk diameter: 250mm; Nozzle carriage with 250 mm diameter solid rubber wheels.

5. WATER TANK AND SPRAYING SYSTEM

The water storage tank is manufactured from stainless steel plate with a capacity of 1360 lt. Capacity. The water tank incorporates anti-surge baffles and an 'A' type water hydrant fill provision will be incorporated.

A dust spray pump of 35 l/min at 3.5 bar pressure rating is incorporated in the dust suppressant system. The pump feed line is provided with isolation valve and suction filter. Spraying nozzles will be mounted under the front bumper, the brushes and inside the suction nozzles. The system will be controlled from a console located in the driver's cabin.

6. HYDRAULIC AND PNEUMATIC SYSTEMS

The Hydraulic System provides the motive power for the brushes.

The system is basically divided into two sections:

- Oil for Debris Hopper tip, and
- Rear door activation, and
- The second section powers the brushes.

A cab controlled flow-dividing valve regulates brush speed. The central brush speed control is regulated by external flow dividing valve.

A Hydraulic oil tank capacity of 75 litres, a suction filtration of 125 micron and return filtration of 20 micron with pressure bypass is provided with the equipment.

The Hydraulic Cylinders ruggedly constructed with hard chrome plated rods and are provided with heavy-duty spherical bearings to ball joints where required to minimize rod ends side loads.

Plug-in diagnostic points are provided for quick gauge connections.

An additional, battery operated hydraulic power-pack will be provided in the equipment to allow the tank tipping and rear door opening operations without having to start the truck's or the auxiliary engine.

The Pneumatic System obtains its air from the truck chassis braking system through a priority safety regulator. Pneumatics are used for various power actuation and lifting functions:

1) Nozzles lift / lower
2) Wide sweep brush suspension

7. ELECTRICAL SYSTEM

- 24 Volts D.C.

8. CONTROL PANEL

Cab mounted master control panel with the main electrical control and status indicator lamps for the auxiliary engine and sweeping functions, these being engine key switch:

- ♦ Auxiliary engine cooling water (lamp)
- ♦ Auxiliary engine oil pressure (lamp)
- ♦ Alternator (lamp)
- ♦ Hour meter
- ♦ Engine speed indicator
- ♦ Engine speed control
- ♦ Suction nozzle control
- ♦ Wide sweep control (side brushes)
- ♦ Central brush control
- ♦ Ground pressure brush control
- ♦ Disc brush inclination control
- ♦ Spraying nozzles control
- ♦ Work lamp (on request)
- ♦ Beacon

- ♦ Air pressure control
- ♦ Emergency stop

9. COATING

Corrosion resistant paint of international standards will be given on the external part of the chassis as per the customer's choice.

SCOPE OF WORK-FOR 2 YEARS OPERATION & FIVE YEARS COMPERHENSIVE MAINTENANCE

Truck Mounted Road Sweeping Machine on Operation for two years and maintenance for five years in Patna Municipal Corporation area for total number of 600 shifts per year per Unit. These unit will be utilized at various sites within Patna Municipal Corporation limits for attending complaint oriented works as well as for systematic cleaning of sewer lines running along various lanes & by-lanes. The contractor shall work as per the guidelines given by the concerned Municipal Engineers.

1. **Operating Staff per shift**:

   The contractor shall appoint the following staff for Operation and Maintenance of equipment –

   i. Driver-cum-Operator: 01 No, / Unit
   ii. Helper / Labour: 01 Nos. / Unit

2. **Duties of Supervisor**:
   The Supervisor shall act as a 'Co-ordinator' between Operating Staff & Municipal Engineer. He will receive the guidelines from the concerned Municipal authority. He will have to submit all log-sheets duly signed by site supervisor after satisfactory completion of work to Municipal Engineers.
3. **Duties of Driver cum Operator and labours**:
   As directed by the Municipal Engineers, Driver cum operator and labours shall carry out the actual operation of the Unit at the site as directed by PMC Engineer, by taking the Machines to site & completing the work allotted to them satisfactorily. The driver cum operator shall have valid heavy motor vehicle license. One of the labours provided on the unit shall act as cleaner of the vehicle when in operation
4. **Operation**:

   i. The contractor shall equipment in minimum one shift per day for seven days. Each shift will be of 8 hours
   ii. The contractor shall unload/dump the material sucked by the units to the designated place as directed by Municipal Engineer at the end of every shift.
   iii. If the operation of the unit is required at time on any day including Sundays & Holidays in addition to the routine programme, it would be the responsibility of the contractor to provide the staff along with the Unit as directed by concerned Engineer.

5. **Maintenance**:

The contractor shall carry out the preventive maintenance of equipment on every Saturday of the week. The cost of which will be borne by the contractor. The maintenance log sheets shall be submitted to Patna Municipal Corporation Engineer at the end of every month. The contractor shall maintain the Maintenance Register and shall be made available whenever demanded.

2. Mini Road Sweeping Machine

General:

The Road Sweeping Machine shall be Diesel Engine Operated, Ride-On Type, Hydrostatic Driven. The machine should be capable of sweeping and picking up the fine dust and pebbles.

Application:

Cleaning of City/ Colony Roads, Parking & other Paved Areas.

Dimension:

Sweeping Width with Two Side Brushes and Wandering Brush: 2000 mm (Minimum)
Central Brush Length: Minimum 1200 mm
Side Brush Diameter: Minimum 500 mm

Design:

Frame Description: Heavy Duty Steel Frame suitable for mounting of Diesel Engine, Vacuum Exhauster and other Electro-Hydraulic/ Electro-Pneumatic components of the system. The Frame & machine components should be provided with suitable Vibration Dampners.

Engine: Engine should be of reputed make, four cylinder water cooled electric start diesel engine capable of developing minimum 33 HP at 1800 RPM.

Hydraulic System: The engine should drive the Hydraulic Pump. Individual Hydraulic qmotors should run the sweeping brushes. The tipping operation and dump door opening & closing shall be hydraulically actuated.

Sweeping System: The Road Sweeper should be capable to sweep in Dry Mode without spraying water. The machine should have efficient filters, which are cleaned continuously during the sweeping operation with Compressed Air Jets. The machine should be equipped with Central Brush and Two Side brushes. All brushes should be operated hydraulically and should be adjustable for pressure and wear.

Sweeping Speed: 05-08 Km/Hr.

Dirt Hopper Capacity: 400 litre or more

Dumping Height: 1500 mm or more

The dumping operations should be hydraulically operated. Hopper door opening & closing to facilitate dumping shall be Hydraulically acuated.

Filter System/ Dust Control System:

It should comprise of Cartridge Filter system with continuous reverse compressed air jet purging cleaning during sweeping. It should have provision for compressed Air for cleaning filters provided through inbuilt air compressor. High efficiency suction fan should also be provided.

Tyres: Solid rubber tyres.

Travel Speed: 0-12 Km/Hr.

Instrument Panel/ Indicators: The Design of operator's Cabin should be Ergonomic to have easy, single man operation and should also facilitate monitoring of Engine Oil Pressure/Engine Cooling Liquid Temperature Gauge, Fuel gauge, Operating Hour Meter.

Driver's Cabin: The machine should be provided with All weather Driver's Cabin with operator all around visibility.

Operational Control: Complete control system should be operated through Programmable Logic Controllers (PLC).The Hydraulic Operations of the machine should be by push buttons and levers.

Colour:

Equipment shall be painted with initial coat of red oxide and thereafter finally coated with minimum 2 coats of automobile paint to provide uniform shade and colour as specified by the purchaser.

G A Drawing:

GAD with all dimensions and makes of accessories shal be submitted to purchaser for approval.

Guarantee:

The equipment shall be guaranteed against any manufacturing defect for at least two years from the date of commissioning of the equipment.

3. Auto Tipper without Bin Lifter

Fabricated on four-wheel chassis with factory installed cabin. The Hopper should be capable to collect the garbage from the door to door having capacity minimum 1.75 cum. The Hopper should be hinged on two nos. Of arm to capable the hi-raised tipping and suitable to unload the garbage directly into the compactor. The Chassis should be of the following specifications.

Specifications	Values	Range
Engine HP	HP	50-70
Engine CC	CC	1200-2550
Payload	Kgs	1000-1500
Torque Max.	Nm	120-185
GVW	Kg	2100-2650
Hopper Capacity	CUM	1.8 to 2.0 Cum
Steering type		Power

Hydraulically operated tipping arrangement

a) Main Frame

Main Frame should be box type, made of pressed steel sections ISMC75x40mm mounted on vehicle chassis through rolled steel channel sub-frame.

b) Tipping Ram:

One no. of double acting type tipping cylinder having capacity of 2.0 tonne with linkage arrangement. The ram to have removable glands for easy dismantling and hard chrome plated rods.

c) Control Valve:

Monoblock Type Spool Direction valve is to be provided for operation with lever easily

for Easy & comfortable operation. Spools should be self- centring type. A pressure

relief valve is to be provided to safe guard the hydraulic circuit and to prevent excess

loading. Hydraulic pump should be coupled with the vehicle PTO/ vehicle engines

capable to lift the 2.0-ton Garbage.

d)Paint:

To protect the Hopper from rust and water **rubber coating** paint to be applied. All members of the hydraulically operated mechanism should be first cleaned either by appropriate method, and then two coats of primer are to be applied and then finally two or more coats of synthetic enamel paint of approved colour by purchaser to be applied.

GAD & QAP

The bidder should provide GAD & QAP of the good /equipment proposed

with the bid and the selected bidder would be required to submit the GAD& QAP for approval of the purchaser at the time of contact execution.

4. Auto Tipper with Bin Lifter

Fabricated on four-wheel chassis with factory installed cabin. The Hopper should be capable to collect the garbage from the door to door having capacity minimum 1.75 cum. The Hopper should be hinged on two nos. Of arm to capable the hi-raised tipping and suitable to unload the garbage directly into the compactor. The Hopper having following specifications.

Specifications	**Values**	**Range**
Engine HP	HP	50-70
Engine CC	CC	1200-2550
Payload	Kgs	1000-1500
Torque Max.	Nm	120-185
GVW	Kg	2100-2650
Hopper Capacity	CUM	1.8 to 2.0 Cum
Steering type		Power

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relief valve is to be provided to safe guard the hydraulic circuit and to prevent excess loading. Hydraulic pump should be coupled with the vehicle PTO/ vehicle engines capable to lift the 2.0-tonGarbage.

d)Paint:

To protect the Hopper from rust and water **rubber coating** paint to be applied. All members of the hydraulically operated mechanism should be first cleaned either by appropriate method, and then two coat of primer is to be applied and than finally two or more coats of synthetic enamel paint of approved color by purchaser to be applied.

Bin Lifter: The lifter should be reliable system with proven technology. Tipping of 1.1in'container directly in the hopper.

This should be done without any damages to the container. The lifter should be able to unload Garbage from bin of size

1100 Litres. Should be light weight for high legal payloads. A safety valve should be provided in the system to avoid sudden descent of bin lifter in a case of failure in hydraulic system.

Stabilizers: Two nos. independent Controlled stabilizers should be provided to keep the vehicle levelled even on the un-even terrain and to balance the vehicle during loading/unloading of garbage into the compactor

GAD & QAP

The bidder should provide GAD & QAP of the good /equipment proposed with the bid and the selected bidder would be required to submit the GAD& QAP for approval of the purchaser at the time of contact execution.

5 . Loader Backhoe

General Description

The Loader Backhoe shall be rugged with proper distribution of loader, backhoe and axle induced stressed. The frame/chassis shall be fully welded/ bolted. The machine shall comprise of diesel engine of 96 HP (appox) with Turbocharger, excavator bucket, multipurpose bucket and with standard cabin with provision of helper to sit. The machine should be capable to perform various works like excavation, loading, garbage spreading, dozing etc. It will be used for various miscellaneous municipal works.

Basic Specification

The Excavator Loader shall meet following specifications:

Gross Vehicle Weight	:	Minimum 7500Kgs
Engine	:	96 HP (approx). at rated RPM. BS-III Model.
Max Torque	:	36 Kg-m ± 2 Kg-m, Battery: 12 V.
Hydraulic Pump Gear type	:	210 bar pressure and Flow 100 Lpm (min).
Final Drives	:	4-wheel drive with electrical operation 2-WD to 4WD
Steering	:	Hydrostatic power steering and manual in the event of engine or hydraulic power failure.
Transmission	:	Fully synchromesh gear box with 4 speed and 3/4 speed reverse, Excavator Bucket: Excavator bucket of 0.24cum capacity with locking/bolted teeth and side cutters suitable with extending dipper extended up to 1 meter when compared with standard one. Ground Reach from slew centre: min. 6.0 m Digging Depth: min. 5.4 m Slew Ground Clearance: min. 0.35 m
Bucket Digging Force	:	min. 5500-kgf Dipper tear out force- min. 3000kgf.

Loader Bucket	:	6-in-1 type multipurpose bucket (with bolt type teeth) having 0.98 cum capacity and capable to do digging, dozing, grabbing, grading, loading and spreading.
Dump Height	:	min. 2.6-m
Load Over Height	:	min. 3.2-m Loader arm break out force- min. 3750kgf.
Maximum reach at full height	:	min. 0.8-m
Lift capacity to full height	:	min. 2600kgs.
Dumping angle	:	more than 40 degree.

Cabin: All round visible cabin confirming ROPS and FOPS standards. Cabin should provide easy two door access with plenty of leg room to allow operator to work un-interruptedly for long hours. Instrumentation panel on right-hand-side with audio & visual indicator & alarm systems. Fully adjustable operator seat with high back. Safety belts. Toolbox cum cushion seat to accommodate operator and all direction face fan inside cabin. Minimum two fixed and two rear adjustable light outside cabin for illumination.

Painting:
The body should be sand blasted prior to coating/painting. The body shall be coated with one coat of zinc rich primer & then with two coats of synthetic enamel paint to ensure long lasting structure suitable for use under hostile conditions. Colour shade/make of paint shall be as specified by the purchaser. The logo of concerned ULB, capacity of equipment and any other information asked by the purchaser shall be painted on the body. The paint shall be of good quality and ICI / Asian / Johnson & Nicholson / Burger make.

GAD
General Arrangement Drawing of the equipment including all dimensions and make of all accessories/bought out items shall be submitted to purchaser for approval.

It will be used for various miscellaneous municipal works.

i. **JCB 2DX or equivalent (JCB/CASE/Terex etc)**
ii. **JCB 3DX or equivalent (JCB/CASE/Terex etc)**

Rate should be quoted separately for each capacity.

6. Twin Bin Dumper Placer compatible with 2.5 Cum and 3.0 Cum Capacity Containers

General Description

The Dumper Placer/ Carrier Vehicle (Chassis and Cab) shall be rugged and durable, shall incorporate the latest technological features offered by the manufacturer/supplier. The truck chassis shall support hydraulically operated hoisting mechanism to load, offload and tip the twin containers of 2.5 cum to 3.0 Cum capacity. The dumper placer shall comprise of two pairs of lift arms each actuated by double acting high pressure rams, manually operated tipping hooks, hydraulic ball & plate type stabilizers and hydraulic system duly mounted on truck chassis with cab & PTO. Lifting arrangement shall be on the sides of the vehicle.

The equipment shall confirm to the following requirements:

Basic specification:

Complete chassis kerb weight with cab only (with spare wheel and tools) shall be as per IS 9211.

a) Make	:	Tata/Ashok Leyland/Eicher/Force
b) GVW	:	Not less than 7200 Kg and 7800 kg.

c) Engine	:	Euro IV, Turbo charged, minimum 85 HP and 90 HP
d) Clutch	:	Single Plate dry friction type
e) Gear Box	:	Synchromesh type
f) No. of gears	:	5 forward and 1 reverse.
g) Frame	:	Ladder type heavy duty frame with welded/ riveted/bolted cross members, side members of channel sections.
h) Suspension	:	Semi elliptical leaf spring at front and rear with auxiliary springs at rear only.
i) Cab	:	All steel, semi forward / full forward control driver's cab. Cabin should have minimum two nos. foam padded adjustable seats with seat belts. Cab should have all standard accessories provided by the chassis manufacturer and required under Motor Vehicles act.
j) Painting	:	Complete truck chassis along with dumper placer mechanism and the platform shall be thoroughly cleaned as per standard industrial practice and then applied with primer paint followed by two coats of automobile grade Paint of colour shade specified by the purchaser.

Hydraulically-operated hoisting mechanism:

Main frame	:	Main frame shall be box type, made from pressed steel sections mounted on vehicle chassis through rolled mild steel channel sub-frame.
Rear end	:	It shall be aesthetically pleasing and provide greater ground clearance using fix geometry for stabilizing arm movement.
Bed	:	The bed shall be made with adequate number of horizontal and longitudinal ISMC sections. 3-mm thick MS sheet shall be welded on top of the frame.
Boom rams	:	Two sets of double acting type boom rams suitable to handle twin containers shall be provided. The cylinders shall be of minimum 100-mm dia.
Boom arms	:	Two heavy-duty booms, having length as per design requirement of the equipment and complying with CMVR. These booms should be of welded construction.
Cylinder Guards	:	Cylinder guards shall be provided along the chassis length to protect lifting cum tipping cylinders on either side of the chassis.
Stabilizers	:	Two nos. independently controlled stabilizers, ball and plate type operating through hydraulic cylinder shall be provided to keep the vehicle levelled even on un-even surface and to balance the vehicle during loading/ unloading of containers.
Hydraulic Cylinders:		Hydraulic cylinders shall be manufactured out of Tubes confirming to DIN standard and shall have adequate capacity to undertake loading/unloading of containers 20 cum capacity when full and stabilizers without any adverse effect on the dumper placer or failure of cylinders.

Control Valve

Spool Type hydraulic control valve is to be provided for all operations with levers accessible from driver's seat in the cabin for easy & comfortable operation. All spools should be self-centring type. A pressure relief valve is to be provided in the hydraulic circuit.

7. Vehicle Mounted Combined Sewer Cleaning Suction cum Jetting Machine of 4000 Liters

GENERAL

The 4000 liters combined tank capacity, HCV truck chassis mounted, combined suction-cum-jetting unit is capable of de-silting and de-choking civil/industrial drains and sewer lines of diameters 300 mm to 450 mm.

The equipment consists of suction and a high-pressure water jetting equipment integrated to complete the Suction-cum-Jetting Combination unit.

De-choking and de-silting of the sewer and drain water lines and chambers will be carried out by the High-Pressure Jetting System working on the principal of hydrodynamic cleaning by injecting high pressure water into the lines through a suitably dimensioned sewer jetting hose and special cleaning nozzles.

Aspiration of the effluent from sewer and drain water lines and chambers will be carried out on the principle of generating high vacuum in the sludge compartment for siphoning out effluents, liquids slurry, sludge and other materials from depths of about approximately 7 to 8 meters, depending on the specific gravity of the effluent.

The equipment will extract the sludge and slurry under high vacuum through a suction hose connected to the tank by a quick release hose coupling.

The contents of the sludge tank will then be transported to any desired destination for disposal and emptied by means of hydraulic tipping of the tank.

FEATURES OF THE EQUIPMENT

1. Equipment is fitted with an exhauster/compressor that can be operated in both pressure and vacuum mode. The pressure mode can be used to discharge the tank's contents under pressure without effecting the rear door opening, and also for blowing back pressurized air into the chamber/line to agitate and dislodge Sediments / sludge in the liquid effluent.

2. Truck's engine power is utilized to drive the jetting pump as well as the exhauster/compressor through a manually operated Full Torque PTO fitted between the vehicle's Gear Box and the Rear Axle.

3. Independently driven hydraulic pump. This system of drive has a distinct advantage over the conventional system of driving the hydraulic pump in tandem with the jetting pump as it eliminates the risk of water starvation for the jetting when the tank has to be tipped/hose reel has to be attended to with the water storage tank empty.

4. The sludge tank's rear door opening will be affected hydraulically through two hydraulic cylinders.

5. Emptying of the sludge tank will be affected by hydraulic tipping of the same. This facilitates emptying with necessity of man entry.

6. Sewer Jetting Hose is made of lightweight, abrasive resistant, thermoplastic material for better handling during jetting operations.

MOUNTING OF EQUIPMENT

The complete equipment will be mounted on a minimum 7 Ton GVW, Vehicle chassis following BS-IV norms having a minimum output of 120 hp & wheelbase of 3800 mm.

COMBINED SLUDGE AND CLEAN WATER STORAGE TANK

The tank will be fabricated from 5 mm thick M.S. Plate confirming to IS-2062 Grade 'A' standard and will have a combined volumetric capacity of about 4000 liters. It shall be designed to withstand conditions prevailing from the operating vacuum and pressure conditions.

The tank will be of a cylindrical design with torrispherical-dished ends to ensure a complete and fast off-loading of the collected material. Mounted on a heavy C-sectioned sub-frame to provide additional structural strength to the chassis frame, the tank will be supported at the rear end by two heavy-duty hinge arrangements to facilitate its hydraulic tipping of 30^{O} for unloading the collected material at appropriate disposal grounds. The tipping cylinder will be front end mounted and will of a multistage design to achieve the required tipping angle. The forward end of the tank will be fitted with robust saddle supports, which will rest firmly on the sub-frame.

The tank's rear door will be of a fully open able type, and its, as also the shell's perimeter will be reinforced for structural integrity. Two heavy-duty hinges will support the tank's rear door. Two suitably dimensioned double acting hydraulic cylinders will affect raising and lowering of the door. The door will be raised through a minimum angle of 80^{O} to the vertical. Locking and sealing of the rear door will be done by hand wheel operated bolts, which will be of a robust design located circumferentially on the tank's rear end of the shell.

A High-quality hollow "D" section type door sealing neoprene rubber gasket will be used to ensure the door to be leak proof.

Tank Fittings:

(A) FRESH WATER COMPARTMENT

1. 1 no. 2" Ball valve at the forward end of the compartment to facilitate draining.
2. 1 no. 2” Ball valve to isolate the tank from the jetting system to facilitate maintenance even with a water-filled tank.
3. Level glass fitted in a convenient position to enable the operator to gauge the content's level inside the tank.
4. Manhole for tank filling and to allow man-entry in the tank for routine cleaning and inspection.
5. A tank breather will be fitted on the tank top to allow the compartment to be constantly vented to the atmosphere during jetting operations.

(B) SLUDGE COMPARTMENT

1. 1 no. 100 mm Knife Gate Valve located at the bottom most position at the rear-dished end for draining the tank's contents.

2. Level glass fitted in a convenient position to enable the operator to gauge the content's level inside the tank.

3. A Ball Float type, Primary shut-off to prevent water from entering the pumping system due to an accidental overflow.

4. 1 no. Pressure relief valve.

Technical Data

Capacity	:	4000 Ltrs. (2500 Ltrs Clean Water + 1500 Ltrs Sludge)
Max. Operating Pressure	:	-0.9 to 1 bar
Construction	:	Cylindrical shell with torrispherical dished ends.
Material	:	5 mm thick plates as per IS 2062 Grade - 'A' for shell and rear dished ends.

TANK MOUNTING

The Sludge Collection Tank will be mounted on a sub-frame, fabricated from ISMC 150 channel sections.

This arrangement distributes the weight of the equipment and payload evenly over the chassis long-bearers and renders the arrangement torque resistant when operating in off-road conditions existing at disposal sites.

SUCTION SYSTEM

Vacuum Pump (Exhauster/Compressor)

The Equipment will be fitted with a Rotary Sliding Vane, positive displacement type Exhauster/Compressor known for its unmatched performance and for its trouble free and cost-effective service throughout the life of the equipment. The pump will be fitted with high temperature resistant, asbestos free vanes, shall have a minimum free airflow capacity of 8000-9000 LPM.

The exhauster/compressor will be of an imported origin, manufactured by M/S JUROP SPA/BATTIONNI, Italy, Europe's leading pump manufacturers.

The Exhauster/Compressor will be provided with:

- Convection Air-cooling
- Forced oil Lubrication pump
- Incorporated Check valve
- Incorporated 4 - way valve

<u>TECHNICAL DATA</u>

Make	:	BATTIONNI, ITALY / JUROP. ITALY
Type	:	Rotary Sliding Vanes; Positive displacement
Model	:	MEC 8000(BATTIONNI) /. PN84 (JUROP)
Delivery	:	8000-9000 LPM @1350 RPM
Max Vacuum	:	92%
Max. Operating vacuum	:	200 m bar (80% Vacuum)
Max Pressure	:	1.5 bar (abs)
Lubrication	:	Forced Oil Lubrication.
Cooling	:	Convection Air- cooling

The 4-way change over valve will enable the unit to change quickly from the pressure to the suction mode and vice versa.

A pump inlet Filter of adequate capacity will be incorporated in the system for the protection of the pump against any ingress of foreign particles, in both the suction and the overpressure modes of operation.

Pressure relief and vacuum relief valves will be line mounted to protect the equipment and system from over pressure and excessive vacuum respectively. The valves will be factory set to control the operating pressure and vacuum parameters of the system.

OPERATIONAL HIGHLIGHTS:

BLOW BACK ARRANGEMENT

This arrangement is utilized for the following operations:

A) Stirring up the silt before commencing the suction operation.
B) Discharging the sludge/silt from the tank under pressure.

a. **SLUDGE STIRRING:** The blow back pressure mode is utilized to stir up the sewer content. This result in the homogenous mixing of the particles in the water content and all the heavier particles/materials deposited at the bottom of the tank are brought up and kept in circulation, before commencing the suction operation. The suction operations under this stage will effectively clean out the complete sludge particles stagnated in the manhole section/sewer lines.

b. **SLUDGE BLOW BACK:** The blow back arrangement is also effective in discharging the sludge/silt from the tank under pressure.

Suction Hose, Hose Connection and Stowage

one single length of 100 mm diameter & 15 meters long, heavy duty, light and easy to handle PVC hose along with quick connects hose-end fittings, shall be provided for the suction application.

A 100-mm dia. suction hose end nozzle attached to one of the hoses and a suction end 100 mm strainer both fitted with suitable quick release couplings will be provided with the equipment as standard accessory.

JETTING SYSTEM

High Pressure Jetting Pump

The equipment will be fitted with a triplex plunger, reciprocating pump having a flow and pressure rating of minimum 140 LPM at minimum pressure of 140 bars. The pump will be of an imported origin, manufactured in Italy/USA.

TECHNICAL DATA:

Country of Orgin	:	ITALY / U.S.A.
Type	:	Triplex Plunger Pump
Delivery capacity	:	Minimum 140 LPM
Pressure drive	:	Minimum 140 Bar.

Hose and Hose Reel

Fitted on the rear end of the equipment, the hose reel will be of fixed type. The hose reel will be designed to store 60 meters of the supplied sewer jetting hose.

Delivery and recovery of the jetting hose will be done via a low speed, high torque hydraulic motor drive.

TECHINICAL DATA

Make	:	Polyhose, Thermoplastic, low weight
Length	:	60 M
ID	:	¾"
Max. Working Pressure	:	170 bar (2500 psi)
Min. Bursting Pressure	:	430 bar (6250 psi)

DRIVE SYSTEM

Drive for the high-pressure jetting pump, as also the vacuum pump will be tapped from a new generation total power take off (split shaft P.T.O.). The total power take off will be fitted with two independent auxiliary output drive shafts and the complete unit will be mounted in the center of the auxiliary frame and between the vehicle's gearbox and the differential.

The hydraulic pump will be independently driven by the factory fitted lateral/ axial PTO fitted onto the vehicle's gearbox.

The total power take-off is entirely designed and manufactured by M/s. VAS/ PZB/OMSI. The design allows drawing of all the power from the vehicle engine. The P.T.O. will be provided with one main transmission and two independent auxiliary output drive shafts. The engagement and disengagement of the P.T.O. outputs will be effected manually through an air control valve fitted in the driver's cabin.

TECHINICAL DATA

Manufactured By	:	M/s PZB / OMSI / VAS
Throughput Torque	:	400 KGM
No. of Outputs (auxiliary)	:	Two.

HYDRAULIC PLANT

A hydraulic pump of ample capacity to meet the operational requirements of the system will be of DOWTY make, manufactured by DYNAMATIC TECHNOLOGIES LTD, under the brand name of DOWTY, UK.

Hydraulic motor required to drive the hose reel will be that of Danfoss.

The hydraulic system will be provided with an oil-storage tank of suitable capacity, suction and return line filters, direction control valves and an online pilot operated check valve for the rear door opening circuit to ensure safety against creeping back of the tank door.

All hydraulic connections will be a combination of high-pressure seamless pipes and flexible hoses, to facilitate easy replacements/repairs.

PAINTING/FINISHING OF THE COMPLETE UNIT

Both, exterior and interior of the tank will be sanded prior to spray painting.

The tank exterior shall be spray-painted with two coats of superior quality anti-corrosive primer and two coats of enamel metal paint of a reputed make. The colour shade will be as per the customer's choice.

To resist corrosion, the clean water compartment will be internally coated with two coats of anti-corrosive primer and two coats of gray enamel paint.

The Sludge compartment tank will be internally coated with two coats of epoxy paint to resist corrosion due to weak acids.

ACCESSORIES AND SAFETY FEATURES INCORPORATED IN THE SUCTION SYSTEM

A. **Pressure Relief Valve** - Fitted in a suitable position, this device provides safety to the storage tank as well as the complete system. The valve is of a spring loaded adjustable type and provides continuous relief when the system's pressure exceeds the preset limit.

B. **Vacuum Relief Valve** - It is set to function at a desired operating value and protects the pump as also the complete system from operating under high, undesired vacuum conditions. As the system reaches the set vacuum level, this valve lifts and ventilates the system by virtue of allowing the air outside to enter.

C. **Suction Filter** - Incorporated in the airflow circuit between the secondary shut-off and the pump, is a stainless steel, basket type Safety Filter designed to handle the pump's flow rating and filter out solid and semi-solid particulate impurities of size beyond that of the pumps handling capacity.

D. **Exhaust Silencer** - will be fitted on the pump's exhaust side of the airflow circuit. This device dampens the airflow with minimum back pressure in the system, thus reducing the operational noise levels considerably.

ACCESSORIES AND SAFETY FEATURES INCORPORATED IN THE JETTING SYSTEM

The high-pressure jetting system will come equipped with all the necessary accessories and safeties as below.

A. Safety Valve

Also fitted on the pressure side of the pump, the SAFETY VALVE operates to limit the pressure at the maximum working pressure of the system. The valve will come factory set and sealed from the pump manufacturer.

When the maximum working pressure is exceeded, the valve opens and discharges the total pump flow in the atmosphere, thus eliminating the high pressure in the system.

B. Suction Strainer

A Basket type filter, the SUCTION STRAINER is fitted on the water inlet side of the Jetting Pump.

It protects the pump from ingress of foreign matter, traps the same, which can be drained off at regular intervals through a drain plug, provided at its bottom.

8. Vehicle mounted combined sewer cleaning suction cum jetting machine of 8500 liters:

General

The Sewer cleaning suction cum jetting machine shall consist of a twin compartment tank of 8500 litres capacity along with suction pump and a jetting pump. The tank shall be divided in two compartments of 5000 litres for fresh water and 3500 litres for Sludge/ sewage. The complete equipment shall be mounted on a truck chassis of GVW not less than 16 tons and an engine Horse Power rating of not less than 120 HP. The high power jetting system shall be provided to dislodge/ clear the obstructions/ chokages from the application point. The equipment should be capable of sucking out the sludge / slurry from depth up to 8 meters.

Tank:

The tank shall be mounted with an arrangement for rear tipping and shall have a total internal volume of 8500 Liters. The tank shall be made of steel plates 6 mm thick confirming to IS 2062 Grade 'A' Standard. The tank shall be electrically welded with anti surge baffle plates welded internally. The inside of the tank shall be coated with epoxy paint. The compartment should be divided in two compartments of 5000 liters for fresh water and 3500 liters for Sludge / sewage. Level indicators of transparent acrylic tubing with thick wall shall be provided on each of the compartments. A 65mm filling line and 50mm drain valve shall be provided at a suitable position on the fresh water compartment. The rear door shall be top hinged openable with two double acting hydraulic cylinders. The door of the tank shall be such that it remains secure in the raised
position by an incorporated pilot check valve, in the hydraulic system. For internal maintenance of the water tank compartment a man entry opening with a lid should be provided on top of each compartment. Adequate sealing and locking arrangement shall be provided to make the door leak proof. At the rear end door, the tank shall be provided with 100 mm suction cum drain valve at the bottom most position. The drain/ suction valve shall be of carbon steel, three piece construction, having a stainless steel ball. Hydraulic cylinder shall be mounted below the tank for emptying. The tank tipping angle shall be about 30 degrees. To prevent the tank from creeping down when in the raised position, a line mounted pilot operated check valve should be fitted into the hydraulic circuit. The tank shall be mounted on an auxiliary frame and shall be adequately strengthened to render it torque resistant. The auxiliary frame should be manufactured to the size of the vehicle's chassis and should be of an all electrically welded construction.

TECHNICAL DATA:

Total Capacity : 8500 Litre

Fresh Water Capacity : 5000 Litre

Sludge Compartment : 3500 Litre

Construction : Cylindrical shell with torrispherical dished end

Material : 6 mm thick plates for shell, dished end and internal compartment walls as per
IS 2062 Grade - 'A'.

Vacuum pump (exhauster/ compressor):

The exhauster/ compressor shall have a minimum capacity of 525 cum per hour of free air flow. It shall be capable of creating a vacuum of 90% and should empty chambers with depths up to 8 meters. The exhauster compressor should be provided with the following:

a. Air Cooling System.

b. Lubricating Oil Pump

c. Check valve

d. 4 - way valve

The unit shall be of a dry, rotary sliding vane type and vanes made form asbestos free, spark proof material. The vacuum pump shall be mounted on frame and installed under the chassis without disturbing the original configuration of the chassis.

The system should be provided with a float valve and a moisture trap/ secondary shut-off valve to doubly protect it from accidental ingress of waste water into the system.

The exhauster / compressor working in suction and overpressure modes through the tank shall be provided with safety devices like primary shut – off ball float valve to prevent over suction, secondary shut – off cum moisture trap, cyclone, stainless steel filter mesh.

(i) Primary Shut off: fitted inside the sludge compartment to protect the exhauster / blower from any accidental ingress of sludge and other foreign particles caused due to an overflow from the storage compartment.

(ii) Secondary Shut-off / Moisture Trap: The shut-off/moisture trap protects the blower/exhauster from ingress of foreign matter and dirty water particles which may be drawn into the system due to the up streaming effect caused on the water surface, due to high vacuum conditions existing within the sludge compartment. The Cyclonic effect within this device separates out and accumulates the water particles in the airflow, which may be drained out at regular intervals through the drain valve.

TECHNICAL DATA
Delivery : min 430 cum/ hr free air flow;

Vacuum : min 90 %

Max. Pressure: 2 bar

Lubrication : Automatic lubrication

Cooling : Air - Cooled

Derrick arm (hydraulic siphon boom) & suction hose:

A 100 mm diameter spring loaded, counter - balanced suction boom arm with a capability of slewing through an angle of 300 degrees and having raising and lowering by hydraulic/ pneumatic power. It should preferably be fitted on the top rear end of the sludge compartment. hydraulically/pneumatically operated 100 mm shutoff valve with a stainless steel plate and spindle shall be provided outside the tank. 100mm NB non collapsible heavy duty flexible suction hose reinforced with hard spirals of rigid PVC shall be provided in three sections with suction strainer on last section, each fitted with Quick - fix couplings on both ends with a total length of 15m.

High pressure jetting system:
The high pressure jetting machine shall be mounted on top of the auxiliary frame with easy servicing feature. It should be suitable for cleaning Sewers from 100 mm to 900 mm dia. It should be driven by power take off unit and shall have a minimum discharge of 240 liters per minute at 140 bar of pressure. The high pressure jetting system shall have suction filter, relief valves, and unloader valves.

TECHNICAL DATA (Jetting Pump)

Quantity: 1 No.
System :
- Triplex plunger pump
- Double pressure packing
- Vertical-fitted valves
- Water spill venting
- Oil-bath mechanical parts with splash lubrication.

• Drive systems : by pulley or elastic coupling
Material Quality:
• Pump body in cast iron
• Head in chemical-nickel treated spheroidal cast iron.
• Self-adjusting shaft bearings with double roller rim.
• Forged connecting rods with antifriction bearings
• Crankshaft in nitride hardened and tempered alloy steel
• Guide pistons in surface-treated spheroidal cast iron.
• Plungers in stainless steel with ceramic coating
• Valves made in stainless steel and bronze
Delivery Capacity & Pressure: Not less than 200 LPM at 140 bar

Jetting hose and hose reel:

The Jetting Hose should be fitted on the tank's rear door. The hose reel drum should be of the pivoted type. Delivery and recovery of the jetting hose should be hydraulically operated. A single length, minimum 60 meter long with 25mm NB, high pressure thermo - plastic hose shall be provided.
Jetting Hose
TECHNICAL DATA
Length (min) : 60 m
ID (min) : 25 mm
OD (min) : 28 mm
Minimum Working pressure: 140 bar
Minimum Burst Pressure : 400 bar
Construction: Thermoplastic Technopolymer core with a two braided high tensile fiber
pressure reinforcement. Outer cover, made of thermoplastic synthetic technopolymer.

HOSE REEL FOR WASHING DOWN:

A high pressure hose (mechanical) reel of minimum 10 mtrs in length and ½" of diameter with a spray gun fitted on the auxiliary frame should be provided.

Nozzles:

The equipment shall be supplied with following specialized nozzles (one each):-
(i) Bullet - nosed with rearward - facing angled jets to give self propulsion for high pressure nozzle
(ii) As above, but with a additional forward - firing jet nozzle
(iii) Bullet - nosed with rearward - facing angled jets to give self propulsion for High Discharge nozzle as above but with an additional forward firing jet nozzle
(iv) Mini nozzle with rearward - facing angled jet nozzle
(v) As above (iii) with an additional forward - firing jet nozzle - 1 No.

Pump drive:

PRIME MOVER :
The drive for all the pumps will be from the vehicle's engine through a third generation pneumatically actuated split-shaft PTO of reputed make. The PTO Unit shall be split shaft horizontal type, fitted chrome alloy steel gears on Heavy Duty ball and roller bearing in accurately machined housing. The unit shall be
designed for horizontal drive, The RPM and direction of rotation of output shaft shall be the same as that of input shaft.

TECHNICAL DATA:

Throughput Torque (min) : 400 KGM
No. of outputs (auxiliary) : Two
P.T.O. Output Ratios : 1:1 on main shaft;

Hydraulic system:

The hydraulic pump shall be of ample capacity to meet the operational requirements of the system. The hydraulic system shall be provided with an oil-storage tank of suitable capacity, suction and return line filters, direction control and flow control valves. All hydraulic connections should have combination of high pressure seamless pipes and flexible hoses, to facilitate easy replacements/ repairs. Online pilot operated check valves for the tank tipping and rear door opening circuits should be provided besides the basic hydraulic component.

HYDRAULIC PUMP (TECHNICAL DATA)
Type : Gear Pump / Axial Piston Pump

Control panel:
All indicators and control elements required for remote control and monitoring shall be installed in a control panel located at the rear of the vehicle, for easy operation and monitoring.

Piping:
System piping subject to vacuum and high pressure shall be of steel and forged steel fittings. Short lengths of spiral bound heavy duty neoprene rubber suction hoses shall be fitted to provide ease and flexibility in maintenance. These rubber connection hoses should not deform or get damaged due to compressed air heat generated when the equipment is used in the pressure mode. The pipes should be clamped suitably to absorb vibrations and accessible for easy maintenance.

Prime mover:
The equipment offered shall be mounted on a suitable 16 Ton GVW truck chassis with Pneumatically operated PTO for operating pumps. The chassis shall be complete with driver's cabin.

TECHNICAL DATA:
Engine : Water cool, direct injection, 6 cylinder diesel engine
Clutch : Single plate dry type
Gear Box : Synchromesh type 5 forward 1 reverse.

Painting/ finishing:
Both, exterior and interior of the tank will be sand/ shot blasted prior to spray painting. The tank exterior shall be spray painted with two coats of superior quality anticorrosive primer and two coats of enamel metal paint.The tank interior shall be coated with 2 coats of anticorrosive grey epoxy paint to resist corrosion due to weak acids. The whole machine with cabin shall be painted with two coats of enamel paint in golden yellow colour.

Accessories:
The following accessories shallbe supplied with the equipment.

1. Two Sets of Hand Gloves and Apron.
2. Safety Boots – 1 Pair
3. Safety Helmet – 1 No.
4. Safety Goggles – 1 No.
5. Oxygen Mask With Cylinder (5 liters capacity filled with oxygen)
6. Literature and Manual as mentioned below

a) Operational manual.
b) Spare part catalogue.
c) Maintenance manual.
d) Make & detailed specification of out sourced components.

7. Tool Kit comprising of hand tools, mechanical jack, hydraulic jack of suitable capacity. A set of hand tools should have sufficient number of few ring & socket spanner, screw driver, pliers & other hand tool required for operation & maintenance of machine.
8. 3 Gas monitor for H_2S , CO and O_2 -1 set

Guarantee:
The equipment supplied shall be guaranteed against any manufacturing defect for two year from the date of commissioning.

9. Vehicle mounted sewer cleaning jetting machine of 3000 liters.

GENERAL:
The LCV mounted Jetting machine, shall be capable of jetting civil and industrial sewers. It should consist of a cylindrical cross – section tank having a volumetric capacity of 3000 litres. The complete equipment should be mounted on a vehicle chassis of GVW not less than 7 tons (and a rating of not less than 75 HP.

TANK:

The tank should be of cylindrical horizontal/ rectangular cross section with dished ends and should have a capacity of 3000 ltrs. The whole tank should be made of steel plates 5 mm thick confirming to IS 2062 Grade 'A' Standard. The tank should be of electrically welded on struction. The tank should be internally stiffened and 1 no. anti-surge baffle should be provided to give dynamic stability to the vehicle. Level indicators of transparent acrylic tubing thick - walled should be provided on the tank. A 65mm filling line and 50mm drain valve should be provided at a suitable position. For internal maintenance of the tank a man entry opening with a lid should be provided on top of the tank. The tank should be mounted on an auxiliary frame of ISMC 100 section and should be adequately strengthened to render it torque resistant. The auxiliary frame
should be manufactured to the size of the vehicle's chassis and should be of an all electrically welded construction.

TECHNICAL DATA:

Capacity : 3000 LTRS

Construction : Cylindrical, shell with torrispherical dished ends, tank built to ASME code section VIII, DIV - I.

Material : 5 mm thick plates for shell, dished ends & Internal compartment walls as per IS 2062 Grade - 'A'.

HIGH PRESSURE JETTING SYSTEM:

The high pressure jetting machine shall be mounted on top of the auxiliary frame with easy servicing feature. It should be suitable for cleaning Sewers from 100 mm to 400mm dia. It should be driven by power take off unit and shall have a minimum discharge of 120 liters per minute at 140 bar of pressure. The high pressure jetting system shall have suction filter, relief valves, and unloader valves.

TECHNICAL DATA (Jetting Pump)

Quantity : 1 No.

System :

- Triplex plunger pump
- Double pressure packings
- Vertical-fitted valves
- Water spill venting
- Oil-bath mechanical parts with splash lubrication.
- Drive systems : by pulley or elastic coupling

Material Quality :

- Pump body in cast iron
- Head in chemical-nickel treated spheroidal cast iron
- Self-adjusting shaft bearings with double roller rim.
- Forged connecting rods with antifriction bearings
- Crankshaft in nitrided hardened and tempered alloy steel.
- Guide pistons in surface-treated spheroidal cast iron
- Plungers in stainless steel with ceramic coating
- Valves made in stainless steel and bronze

Delivery Capacity & Pressure : 120 lpm at 140 bar

JETTING HOSE REEL:

The Jetting Hose should be fitted on the tank's rear door. The hose reel drum should be of the pivoted type. Delivery and recovery of the jetting hose should be hydraulically operated. A single length, minimum 60 meter long with 25mm NB, high pressure thermo - plastic hose shall be provided.

JETTING HOSE (THERMOPLASTIC)
TECHNICAL DATA:
Length (min) : 60 m
ID (min) : 19 mm
OD (min) : 28 mm
Minimum Working pressure : 140 bar
Minimum Burst Pressure : 400 bar
Construction : Thermoplastic Technopolymer core with a two braided high tensile fibre pressure reinforcement. Outer cover, made of thermoplastic synthetic technopolymer.

HOSE REEL FOR WASHING DOWN:
A high pressure hose (mechanical) reel of min. 10 mtrs in length and ½" of diameter with a spray gun fitted on the auxiliary frame should be provided.

PUMP DRIVE:

Drive for the vacuum pump and the wash water pump shall be taken from power take off (P.T.O.) of the truck. PTO shall have one auxiliary output drive shafts . Changeover of various drives should be pneumatically operated.

TECHNICAL DATA

Throughput Torque : min 400 kgm
No. of outputs (auxiliary): One
P.T.O. Output Ratios : 1:1 on main shaft;

HYDRAULIC SYSTEM:
The hydraulic pump should be of ample capacity to meet the operational requirements of the system. The hydraulic system shall be provided with an oil-storage tank of suitable capacity, suction and return line filters, direction control and flow control valves. All hydraulic connections should be combination of high pressure seamless pipes and flexible hoses, to facilitate easy replacements/ repairs. Online pilot operated check valves for the tank tipping and rear door opening circuits should be provided besides the basic hydraulic component.

HYDRAULIC PUMP (TECHNICAL DATA)

Type : Gear Pump / Axial Piston Pump

NOZZLES:

The equipment shall be supplied with following specialized nozzles (one each):-
(i) Bullet - nosed with rearward - facing angled jets to give self propulsion for high pressure nozzle
(ii) As above but with a additional forward - firing jet nozzle
(iii) Bullet - nosed with rearward - facing angled jets to give self propulsion for High Discharge nozzle as above but with an additional forward firing jet nozzle
(iv) Mini nozzle with rearward - facing angled jet nozzle
(v) As above (iii) with an additional forward - firing jet nozzle - 1 No.

CONTROL PANEL:
All indicators and control elements required for remote control and monitoring will be installed on angle frame a located at the rear of the vehicle
PAINTING / FINISHING
Both, exterior and interior of the tank will be sand/ shot blasted prior to spray painting. The tank exterior shall be spray painted with two coats of superior quality anticorrosive primer and two coats of enamel metal paint.The tank interior shall be coated with 2 coats of anticorrosive grey epoxy paint to resist corrosion due to weak acids. The whole machine with cabin shall be painted with two coats of enamel paint in golden yellow colour.

ACCESSORIES:
The following accessories should be supplied along with the equipment.

1. Two Sets of Hand Gloves and Apron.
2. Safety Boots – 1 Pair
3. Safety Helmet – 1 No.
4. Safety Goggles – 1 No.
5. Oxygen Mask With Cylinder (5 liters capacity filled with oxygen)
6. Literature and Manual as mentioned below
    a. Operational manual.
    b. Spare part catalogue.
    c. Maintenance manual.
    d. Make & detailed specification of main components.
7. Tool Kit comprising of hand tools, mechanical jack, hydraulic jack of suitable capacity. A set of hand tools should have sufficient number of few ring & socket spanner, screw driver, pliers & other hand tool required for operation & maintenance of machine.
8. 3 Gas monitor for H_2S , CO and O_2 -1 set

GUARANTEE
The equipment shall be guaranteed against any manufacturing defect for two years from date of commissioning.

10. Super Sucker with Main Unit & 2 Dump Tank

GENERAL DESCRIPTION

This should be a truck chassis mounted, Jetting cum Suction unit capable of de-silting and de-choking civil / industrial drains and sewer lines of diameters upto 2000mm. The unit should also be capable of creating vacuum for siphoning out effluents, liquids slurry, sludge and other material from sub-soil located drain lines, manhole chambers, sump tanks and other locations from depths of around 15 to 20 Mtrs, **depending on the specific gravity of the effluent.**

An air-mover unit (vacuum generation plant) should be fitted with a high vacuum, high airflow, positive displacement tri-lobe type Vacuum Blower driven by an independent auxiliary diesel engine of a suitable power rating.

The high flow-high pressure Jetting Pumps shall be of the triplex plunger type. De-choking and de-silting of the sewer and drain water lines shall be carried out by injecting high pressure water into the lines through sewer jetting hose and special cleaning nozzles.

The equipment shall be stationed close to the point of application and the sludge and slurry shall be extracted under high vacuum and high flow rate conditions, through a suction hose and a specially designed suction tool, connected to the tank vide a quick-connect hose coupling.

The Equipment should be Designed to meet the following Operational Highlights

Truck's engine power should be utilized to drive jetting pump through a pneumatically actuated Full Torque PTO.

Independently driven hydraulic pump. This system of drive should have a distinct advantage over the conventional system of driving the hydraulic pump in tandem with the jetting pump as it eliminates the risk of water starvation for the Jetting when the hose reel has to be attended to with the water storage tank empty.

A suitably sized Sewer Jetting Hose made of lightweight, abrasive resistant rubber for better handling during jetting operations.

Equipment fitted with a High flow - High Vacuum, continuous rating vacuum blower.

EQUIPMENT MOUNTING

The equipment shall be mounted on TATA/Ashok Leyland/Eicher/Mahindra, etc truck chassis 25 Ton GVW.

THE HIGH FLOW-HIGH PRESSURE JETTING EQUIPMENT

The equipment essentially comprises of the following 3 Main Systems

A. High Pressure Jetting System
B. Suction Plant or the Vacuum Generating System and
C. Hydraulic System.

A. High Pressure Jetting System

Working Principle

De-choking and de-silting of the sewer and drain water lines and chambers shall be carried out by High Pressure Jetting System working on the principal of hydrodynamic cleaning by injecting high pressure - high flow water into the lines through a suitably dimensioned sewer jetting hose and special cleaning nozzles.

The *jetting system should consist of:*

High Pressure Jetting Pump
Drive systems
Hose and Hose. Reel
Sewer Jetting Nozzles
System's accessories and safety equipment

<u>High Pressure Jetting Pump</u>

The equipment shall be fitted with 1 no., triplex plunger, reciprocating pump of specified make having a flow and pressure rating of 250 LPM at 150 bar respectively.

Pump body in cast iron.

The pump head made of chemical-nickel treated spheroidal cast iron. Two, self-adjusting roller bearings with double roller rims.

Forged steel connecting rods and antifriction bearings.

Crankshaft made from nitride, hardened and tempered *alloy steel*

Plungers made of stainless steel with ceramic coating.

Vertically positioned, stainless steel suction and delivery valves.

Double pressure packing's, lubricated by the inlet water and are of leak free design.

TECHNICAL DATA

Type	:	Triplex plunger pump
Make	:	Pratisolli/ Udor (Italy)
Delivery Capacity	:	250 LPM
Pressure	:	150 bar
Drive rating	:	100 HP

<u>Drive system</u>

The high-pressure jetting pump shall be driven by the vehicle's engine, the power of which shall be tapped from a new generation total *power-take-off (split shaft* PTO) which shall be mounted in the center of the auxiliary frame and between the vehicle’s gearbox and the differential.

Full-Torque Split-Shaft-PTO Drive:

The total-power-take off shall be fitted with two independent output drive shafts from which individual drives can .be obtained. Each drive *shall work independently or* simultaneously as desired. The complete unit shall be mounted over suitable AVMs on the sub-frame and between the vehicle's gearbox and the differential.

Changeover of the various drives shall be made effective by independent pneumatic clutches. The total power take-off shall be of renowned PTO manufacturer of reputed make and its design shall allow drawing of the full power/throughput torque of the vehicle engine and drive.

TECHNICAL DATA:

MAKE	:	VAS
Throughput Torque	:	400KGM
No. of outputs	:	Two (one main + one auxiliary)

The hydraulic pump shall be independently driven by the factory fitted lateral *I axial* PTO fitted onto the vehicle's gearbox.

Hose and Hose Reel

Fitted on the rear end of the equipment, the hose reel shall be of the fixed type. The hose reel shall be designed to store 120 meters of the supplied sewer jetting hose.

Delivery and recovery of the jetting- hose shall be done via a low speed, high torque hydraulic motor drive.

The machine shall be delivered *complete with* 120 Mtrs of lightweight high-pressure thermo-plastic sewer jetting hose of 1" in diameter, and in a single length.

Fitted on the rear end of the equipment, the hose reel shall be of the fixed type The hose reel shall be designed to store 120 meters of the supplied sewer jetting hose.

TECHNICAL DATA

Length	:	120 m
I D	:	25.4 mm (1 inch)
OD	:	36.3 mm (1.43 inch)
Max. Working pressure	:	210 bar
Min. Burst Pressure	:	490 bar
Construction	:	Thermoplastic Techno-polymer core with a two braided high tensile synthetic fibre pressure reinforcement. Outer cover made of thermoplastic. Techno-polymer.
Make	:	Polyhose

Sewer Jetting Nozzles

Three each of the following sewer jetting nozzles shall be supplied with the equipment.

- ***Bullet Nozzles***
- ***Round head nozzle*** **f**or de-choking and *general* pipe cleaning applications with forward and reverse Jet.
- ***Conical head high thrust Nozzle*** for high thrust de-choking and general, fast cleaning of pipes

The nozzles shall be by a renowned *Nozzle manufacturer of specified* make.

Accessories and Safety Equipment

The high-pressure jetting system shall come equipped with all the necessary accessories and safeties as below.

A. Pressure Regulating Valve

Fitted to the pressure side of the High-Pressure Jetting Pump the Pressure Regulating Valve should facilitates the following:

(i) Regulation of the operating pressure of the system by releasing the exceeding water volume back to the pump inlet through the by-pass,
(ii) Limiting the pressure in the system to the adjusted value,
(iii) By totally closing the consumer unit, the increase in pressure is limited to the minimum,
(iv) Prevents any overpressure in the system.

The pressure - regulating valve should be manufactured from high quality brass and has a sterile deposited AISI SS420 valve seat.

The valve should be suitably designed and manufactured by pump manufacturer as specified.

B. Safety Valve

Also fitted on the pressure side of the pump, the SAFETY VALVE operates to *limit* the pressure at the maximum working pressure of the system. The valve shall be *factory set and* sealed from the pump manufacturer. When the maximum working pressure is exceeded, the valve opens and discharges the total pump flow in the atmosphere, thus eliminating the high pressure in the system.

The valve made from high quality Brass and stainless-steel valve seats, should be supplied factory set and labeled according to the working pressure stamped on the valve body.

The valve should be suitably designed and manufactured by pump manufacturer as specified and should be able *to withstand* the *pump's flow and pressure ratings.*

C. Suction Strainer

A Basket type filter, the SUCTION STRAINER should be fitted on the water inlet side of the Jetting Pump.

It protects the pump from ingress of foreign matter, traps the same, which can be drained off at regular intervals through a drain plug, provided at its bottom.

The Suction Strainer should be from a pump manufacturer as specified.

Water Storage Tank: - The tank should be fabricated from MS plates of 3 mm thickness, confirming of IS 2062 Grade-A. This should be of Rectangular in shape with welded torrispherical ends and should have a volumetric capacity of 5 cum.

The tank should be mounted on frame for ISMC 150 section and shall be adequately strengthened to render it torque resistant. The frame should be manufactured to the size of the vehicle's chassis and should be of an all electrically welded construction. The storage tank should be fitted with following accessories: -

1. 2" dia Ball valve, at the forward end of the compartment to facilitate draining – 1 No.

2. Suitably sized ball valve to isolate the tank from the jetting system to facilitate carrying out of maintenance on the system even with the tank completely full - 1 No.

3. Level glass fitted in a convenient position to enable the operator to gauge the tank content's level.

4. Manhole with cover to allow man-entry in the tank for routine inspection and cleaning.

5. A tank breather should be fitted on the tank top.

B. Suction Plant – Vacuum Generation

Working Principle

Aspiration of the effluent from sewer and drain water lines and chambers shall be carried out on the principle of generating **high vacuum** in the mobile truck mounted vacuum loader tanks which shall be connected to the vacuum generation plant.

The suction plant consists of:

- Air mover - Injection Air-cooled, Vacuum Blower
- Drive system - Auxiliary Diesel Engine
- Air-material Separation System-Combined Cyclone Separator / shut-off
- System's accessories and safety equipment

Vacuum Blower

The equipment shad be fitted with a continuous rating, Rotary lobe, air cooled positive displacement type, vacuum blower, *free airflow rating of 4200 M3 /hour and shall be capable of achieving maximum vacuum upto 8000mm (Water Column) i.e. vacuum pressure of 80% during suction. The vacuum blower shall be driven by separate diesel engine mounted on machine skid. The entire assembly shall be mounted on a frame with vibration dampeners. The vacuum blower shall be manufactured by Vacuum Blower manufacturer as specified.

The Technical details of vacuum blowers:

Type	:	Positive displacement vacuum blower.
Cooling arrangement	:	Air Cooled.
Air handling capacity	:	4200 M3 hour
Make	:	HIBON FRANCE / JUROP ITALY/TMVT
Minimum vacuum	:	80%

The salient features of the vacuum blower are:

- The precision machined, heavy-duty, lobe rotor profile safely allows for operations at high rpm, and contributes towards the system's negligible pulsation characteristics thus providing outstanding energy-efficiency.
- Cylindrical roller bearings designed to take up the radial forces generated during operations arid in belt transmission arrangements, thus achieving longer operational life.
- Rotor shafts are fitted with the unique well-proven labyrinth seals for effective sealing and low wear.
- Precise synchronization of the rotors is achieved through precise machining of the helical timing gears a major factor contributing to the blower's high volumetric efficiency and smooth and near noiseless operations.
- The air injection cooling system incorporated in the blower ensures cooler continuous duty operations under all vacuums.

Drive System

An independent auxiliary diesel engine with capacity of 196 H.P. TATA/Eicher/ASHOK LEYLAND make mounted on the frame with vibration dampers for drive the high vacuum blower.

It should be suitably rated to meet the power demands of the blower, ensuring that the system does not stall during extreme operating conditions. The engine shall be fitted with the standard engine manufacturer's accessories, safeties and an independent control panel.

Accessories and Safety Equipment

The suction system shall come equipped with all the necessary accessories and safeties as below.

Vacuum Limitation Valve shall be line mounted to protect the equipment and system from excessive vacuum. The valve- shall be factory set to control operating vacuum parameters of the system. As the system reaches the set vacuum level, this valve lifts and ventilates the system by virtue of allowing the air outside to enter the system.

Silencer / Filter - Blower inlet shall be incorporated in the airflow circuit between the cyclones and the blower. It is a stainless steel; basket type **Micro Strainer** designed to handle the pump's flow rating and filter out any particulate matter sizes beyond that of the pumps handling capacity. It should be fitted with automatic cleaning system with reverse compress air Jet Blowing. Further it also serves as a silencer in the system

The micro strainer is a very essential part of the filtration system, as it ensures^ total protection to the blower against ingress of, foreign particulate matter due to accidental damage to the filter bag/s OR any solids such as nuts, bolts and hand tools, which could have been accidentally dropped/left behind in the cyclones of other components in the suction system.

Exhaust Silencer shall be fitted on the blower's exhaust and cooling air-injection ports respectively to effectively reduce the pump's operational noise levels. The air injection silencer / filter shall come fitted with a filter to protect the unit against infiltration of atmospheric impurities, during operation.

A **Check Valve (non-return, plate type)** shall be incorporated at the blower inlet to prevent backflow of air from the atmosphere to the tank when the equipment is stopped, thus disallowing the engine to motor in the opposite direction and also maintain the vacuum in the sludge tank.

Suction Hose and Hose End Nozzle

2 Nos., 150 mm dia., hose sections, each of 15 meters long, shall be supplied along with the equipment. The suction hose shall be of a lightweight, heavy duty, wire reinforced, PVC construction, and shall be renowned manufacturer as specified.

Each section shall be fitted with quick-connect hose couplings at both ends.

1 no. deep suction tool of 150mm dia., and fitted with a quick-connect coupling shall be supplied as a standard accessory.

C. Hydraulic System

A hydraulic pump of ample capacity meet the operational requirements of the system shall also be driven off the Split-Shaft-PTO unit. The hydraulic pump shall be of renowned pump manufacturer as specified.

The hydraulic system shall be provided with an oil-storage tank of suitable capacity, suction and return line filters, and a direction control valve.

All hydraulic connections shall be a combination of high-pressure seamless pipes and flexible hoses, to facilitate easy field replacement / repairs.

The hydraulic motor required to drive the hose reel shall be of specified make.

SURFACE PREPARATION AND FINISH

The equipment's exterior shall be spray-painted with two coats of superior quality anti-corrosive primer and two coats of enamel metal paint of a reputed make. The colour shade shall be that of our choice.

The following general technical specifications shall be complied with: -

(a). All hydraulic circuits shall be fitted with safety valves to avoid pressurization of the system.

(b). All hydraulic lines shall be adequately clamped.

(c). All hydraulic tanks shall have a level sight glass or dip stick level indicator,

(d). All equipements shall be painted after primer coat in two coats or more of enamel paint of colour 'specified by PHED, with monogram of PHED painted prominently with the words PHED in English and Hindi as specified by PHED.

All the equipements supplied should be in ready to use condition in all respect and all operation of the equipment should be from the outside.

TECHNICAL SPECIFICATION OF SUCTION DUMP TANK (CAPACITY 10000 LTRS)

GENERAL

The equipment should be a truck chassis mounted Suction Dump Tank unit. The equipment shall be stationed close to a Suction Machine, which shall evacuate its tank and subject it to vacuum. The sludge and slurry shall be extracted under high vacuum conditions, through a suction hose, connected to the tank vide a quick release hose coupling.

The contents of the sludge tank shall then be emptied/ transported to any desired destination for disposal and emptied by means of gravity or by hydraulic tipping of the tank.

EQUIPMENT MOUNTING

The **SUCTION DUMP TANK** equipment shall be mounted on TATA/Eicher/Ashok Leyland make single axle truck chassis model 16.18 with a wheel base of 4300 mm ,16 Ton GVW. having an output rating of not less than180 hp

Truck chassis shall also be supplied by the manufacturer/supplier of suction dump tank with a gear box mounted auxiliary PTO and a driver's cabin

SLUDGE COLLECTION AND STORAGE TANK

The Sludge Collection Tank shall be fabricated from 6 mm thick M.S. Plate conforming to IS-2062 Grade 'A* standard and shall have a volumetric capacity of 10000 liters. It shall be designed to withstand conditions prevailing from the operating vacuum and pressure conditions.

The tank shall be of a cylindrical design with torrispherical-dished ends to ensure a complete and fast off-loading of the collected material. Mounted on a heavy C-sectioned sub-frame to provide additional structural strength to the chassis frame, the tank shall be supported at the rear end by two heavy-duty hinge arrangements to facilitate its hydraulic tipping for unloading the sludge and effluent at appropriate disposal grounds. The forward end of the body shall be fitted with robust saddle supports, which shall rest on the sub-frame.

The tank shall have arrangements for hydraulic tipping for discharge of material. The tank's rear door shall be of a fully open able type, and its, as also the shell's perimeter shall be reinforced for structural integrity. Two heavy-duty hinges shall support the tank's rear door. The rear door of the

tank shall be fitted with hydraulic cylinders for opening and closing of doors. Locking and sealing of the rear door shall be done by hand wheel operated bolts, which shall be of a robust design located circumferentially on the tank's rear end of the shell. A High-quality hollow "D" section type door sealing neoprene rubber gasket shall be used to ensure the door to be leak proof.

Adequate sealing and hydraulic locking arrangements shall be provided to render the door leak proof.

The discharge door shall be fitted with drain outlets at three heights for separating the water contents of the sludge (125 mm drain pipe). This facility enables the container to discharge the excess water back into the sever fine and to retain the silt/waste material with minimum water contents.

Level indicators made of thick-transparent acrylic sheet shall be provided on the side of the tank indicate the level of sludge inside the tank.

Cyclone Separator

A CYCLONE SEPARATOR - SHUTOFF shall be fitted immediately before the blower inlet.

They function to protect the vacuum blower from any probable carry over of suspended water and sludge particles which may be drawn into the system from the water surface in the sludge compartment due to the high vacuum conditions within. The cyclonic effect thus created within these devices, separates out the heavier water and sludge particles which accumulate and drained regularly after each operation through a drain valve provided at the separator's bottom.

The air stream entering the chamber spirals downwards and the denser water and sludge particles are hurled towards the cyclone wall due to the centrifugal force the particles on hitting the wall separate out from the air stream, which get collected in the cyclone's bottom compartment. A drain valve is provided at the bottom to clean out the accumulated material.

A ball float shut-off arrangement should be incorporated inside the cyclone, far the protection of the blower system from any accidental overflow and carryover of material from the suction dump tank.

In an event of the separator getting filled to a predetermined level, the ball float will rise and seal against the rubber seat provided at the mouth of the cyclone outlet, ensuring that the water and sludge particles do not flow into the blower.

TechnicalData :
Capacity : 10000 ltrs
Construction : Cylindrical shell with torrispherical dished ends.
Material : 6 mm thick, IS:2062

HYDRAULIC SYSTEM

The hydraulic pump shall be of Dowty/ DANFOSS make, manufactured by renowned pump manufacturer as specified.'

The pump shall have an ample pressure and capacity rating to meet the operational requirements of the tank tipping and fear door-opening systems.

The hydraulic system shall be provided with an oil-storage tank of suitable capacity, suction and return line filters, pilot operated check valves and direction control valves.

All hydraulic connections shall be a combination of high-pressure seamless pipes and flexible hoses, to facilitate easy field replacement / repairs.

SURFACE PREPARATION AND FINISH

Both the exterior and interior surfaces of the debris collection tank shall be sand blasted prior to spray painting.

The tank exterior shall be spray-painted with two coats of superior quality anti-corrosive primer and two coats of enamel metal paint of a reputed make. The colour shade shall be that of our choice.

To resist corrosion, the tank interior shall be coated with 2 coats of superior quality anti-corrosive grey epoxy paint.

SAFETY /PROTECTION DEVICES INCORPORATED

Suction System:
-Primary Shut-off

11. Mini Super Sucker of 3 Cum

GENERAL

The 3 CUM liters tank capacity, TATA 407 truck chassis mounted, suction unit is capable of de-silting civil/industrial drains and sewer lines of diameters 250 mm.
Aspiration of the effluent from sewer and drain water lines and chambers will be carried out on the principle of generating high vacuum in the sludge compartment for siphoning out effluents, liquids slurry, sludge and other materials from depths of about approximately 7 to 8 meters, depending on the specific gravity of the effluent.

The equipment will extract the sludge and slurry under high vacuum through a suction hose connected to the tank by a quick release hose coupling.

The contents of the sludge tank will then be transported to any desired destination for disposal and emptied by means of hydraulic tipping of the tank.

FEATURES OF THE EQUIPMENT

1. Equipment is fitted with an exhauster/compressor that can be operated in vacuum mode.

2. Truck's engine power is utilized to drive the suction pump through a manually operated Full Torque PTO fitted between the vehicle's Gear Box and the Rear Axle.

3. Hydraulic pump will be operated through Auxiliary PTO of chassis.

4. The sludge tank's rear door opening will be affected manually.

MOUNTING OF EQUIPMENT

The complete equipment will be mounted on minimum 4T GVW chassis having a minimum output of 90 hp & wheelbase of 3400 mm.

SLUDGE TANK

The tank will be fabricated from 5 mm thick M.S. Plate confirming to IS-2062 Grade 'A' standard and will have a combined volumetric capacity of about 3 CUM. It shall be designed to withstand conditions prevailing from the operating vacuum and pressure conditions.

The tank will be of a cylindrical design with torrispherical-dished ends to ensure a complete and fast off-loading of the collected material. Mounted on a heavy C-sectioned sub-frame to provide additional structural strength to the chassis frame, the tank will be fixed. The forward end of the tank will be fitted with robust saddle supports, which will rest firmly on the sub-frame.

The tank's rear door will be of a fully open able type, and its, as also the shell's perimeter will be reinforced for structural integrity. Two heavy-duty hinges will support the tank's rear door. Locking and sealing of the rear door will be done by hand wheel operated bolts, which will be of a robust design located circumferentially on the tank's rear end of the shell.

A High-quality hollow "D" section type door sealing neoprene rubber gasket will be used to ensure the door to be leak proof.

Tank Fittings:

SLUDGE COMPARTMENT

i. 1 no. 100 mm Knife Gate Valve located at the bottom most position at the rear-dished end for draining the tank's contents.
ii. Level glass fitted in a convenient position to enable the operator to gauge the content's level inside the tank.
iii. A Ball Float type, Primary shut-off to prevent water from entering the pumping system due to an accidental overflow.
iv. 1 no. Pressure relief valve.

TANK MOUNTING

The Sludge Collection Tank will be mounted on a sub-frame, fabricated from ISMC 125 channel sections.

This arrangement distributes the weight of the equipment and payload evenly over the chassis long-bearers and renders the arrangement torque resistant when operating in off-road conditions existing at disposal sites.

SUCTION SYSTEM

Vacuum Pump (Exhauster/Compressor)

The equipment will be fitted with a continuous rating, Rotary lobe, air cooled positive displacement type, vacuum blower, free airflow rating of 720 m3 /hour and shall be capable of achieving maximum vacuum upto 7000mm (Water Column) i.e. vacuum pressure of 50% during suction. The vacuum blower shall be driven through a pneumatically actuated Full Torque PTO. The vacuum blower shall be manufactured by Vacuum Blower manufacturer as specified.

The Technical details of vacuum blowers:

Type	: Rotary Tri-lobe Blower.
Make	: Kaeser (Germany)/JUROP/KAY INTERNATIONAL/TMVT
Model	: Kaeser-PV-62/JUROP- PVT400 / KAY INTL.- KAIV 320
Delivery	: 720 cum/hr free air flow
Max Vacuum	: 60% (7000mmWC)
Max. Pressure	: 1 bar (g) continuous

The salient features of the vacuum blower are:

- The precision machined, heavy-duty, lobe rotor profile safely allows for operations at high rpm, and contributes towards the system's negligible pulsation characteristics thus providing outstanding energy-efficiency.
- Cylindrical roller bearings designed to take up the radial forces generated during operations arid in belt transmission arrangements, thus achieving longer operational life.
- Rotor shafts are fitted with the unique well-proven labyrinth seals for effective sealing

and low wear.

• Precise synchronization of the rotors is achieved through precise machining of the helical timing gears a major factor contributing to the blower's high volumetric efficiency and smooth and near noiseless operations.

• The air injection cooling system incorporated in the blower ensures cooler continuous duty operations under all vacuums. **A PLEATED TYPE PTFE COATED SYNTHETIC FILTERS** of adequate capacity will be incorporated in the system before vacuum pump inlet for the protection of the pump against any ingress of foreign particles, in both the suction and the overpressure modes of operation.

Pressure relief and vacuum relief valves will be line mounted to protect the equipment and system from over pressure and excessive vacuum respectively. The valves will be factory set to control the operating pressure and vacuum parameters of the system.

Suction Hose, Hose Connection and Stowage

5 single length sections of 100 mm diameter & 3 meters long, heavy duty, light and easy to handle PVC hose along with quick connects hose-end fittings, shall be provided for the suction application.

A 100 mm dia. suction hose end nozzle attached to one of the hoses and a suction end 100 mm strainer both fitted with suitable quick release couplings will be provided with the equipment as standard accessory.

TECHINICAL DATA OF SPLIT SHAFT PTO

Manufactured By	:	M/s PZB(ITALY) / OMSI / VAS
CAPACITY	**:**	400 KgM
No. of Outputs (auxiliary)	:	One.

PAINTING/FINISHING OF THE COMPLETE UNIT

Both, exterior and interior of the tank will be sanded prior to spray painting.

The tank exterior shall be spray-painted with two coats of superior quality anti-corrosive primer and two coats of enamel metal paint of a reputed make. The colour shade will be as per the customer's choice.

To resist corrosion, the clean water compartment will be internally coated with two coats of anti-corrosive primer and two coats of gray enamel paint.

The Sludge compartment tank will be internally coated with two coats of epoxy paint to resist corrosion due to weak acids.

ACCESSORIES AND SAFETY FEATURES INCORPORATED IN THE SUCTION SYSTEM

A. **Pressure Relief Valve** - Fitted in a suitable position, this device provides safety to the storage tank as well as the complete system. The valve is of a spring loaded adjustable type and provides continuous relief when the system's pressure exceeds the preset limit.

B. **Vacuum Relief Valve** - It is set to function at a desired operating value and protects the pump as also the complete system from operating under high, undesired vacuum conditions. As the system reaches the set vacuum level, this valve lifts and ventilates the system by virtue of allowing the air outside to enter.

C. **Suction Filter** - Incorporated in the airflow circuit between the secondary shut-off and the pump, is a stainless steel, basket type Safety Filter designed to handle the pump's flow rating and filter out solid and semi-solid particulate impurities of size beyond that of the pumps handling capacity.

D. **Exhaust Silencer** - will be fitted on the pump's exhaust side of the airflow circuit. This device dampens the airflow with minimum back pressure in the system, thus reducing the operational noise levels considerably.

12.Mini Super Sucker of 8 Cum

GENERAL DESCRIPTION

This should be a truck chassis mounted, combined unit Suction & jetting unit. The unit should also be capable of creating vacuum for siphoning out effluents, liquids slurry, sludge and other material from sub-soil located drain lines, manhole chambers, sump tanks and other locations from depths of around 7 to 10 Mtrs, **depending on the specific gravity of the effluent.**

The equipment consists of suction and a high-pressure water jetting equipment integrated to complete the Suction-cum-Jetting Combination unit.

De-choking and de-silting of the drain water lines and chambers will be carried out by the High-Pressure Jetting System working on the principal of hydrodynamic cleaning by injecting high pressure water into the lines through a suitably dimensioned sewer jetting hose and special cleaning nozzles.

An air-mover unit (vacuum generation plant) should be fitted with a high vacuum, high airflow, positive displacement tri-lobe type Vacuum Blower driven thru Split Shaft PTO.

The equipment shall be stationed close to the point of application and the sludge and slurry shall be extracted under high vacuum and high flow rate conditions, through a suction hose and a specially designed suction tool.

The Equipment should be Designed to meet the following Operational Highlights

- Equipment is fitted with an exhauster/compressor that can be operated in both pressure and vacuum mode. The pressure mode can be used to discharge the tank's contents under pressure without effecting the rear door opening, and also for blowing back pressurized air into the chamber/line to agitate and dislodge Sediments / sludge in the liquid effluent.

- Truck's engine power is utilized to drive the jetting pump as well as the exhauster/compressor through a manually operated Full Torque PTO fitted between the vehicle's Gear Box and the Rear Axle.

- Independently driven hydraulic pump.

- Equipment fitted with a High flow - High Vacuum, continuous rating vacuum blower.

The sludge tank's rear door opening will be affected hydraulically through two hydraulic cylinders.

- Emptying of the sludge tank will be affected by hydraulic tipping of the same. This facilitates emptying with necessity of man entry.

- Sewer Jetting Hose is made of lightweight, abrasive resistant, thermoplastic material for better handling during jetting operations.

EQUIPMENT MOUNTING

The equipment shall be mounted on TATA/Ashok Leyland/Eicher/Mahindra, etc Truck chassis *having* 16 Ton GVW.

Drive system

The Suction Blower & Jetting Pump shall be driven by the vehicle's engine, the power of which shall be tapped from a new generation total *power-take-off (split shaft* PTO) which shall be mounted in the center of the auxiliary frame and between the vehicle's gearbox and the differential.

Full-Torque Split-Shaft-PTO Drive:

The total-power-take off shall be fitted with two independent output drive shafts from which individual drives can .be obtained. The complete unit shall be mounted over suitable AVMs on the sub-frame and between the vehicle's gearbox and the differential.

Changeover of the various drives shall be made effective by independent pneumatic clutches. The total power take-off shall be of renowned PTO manufacturer of TATA /PZB/VAS make and its design shall allow drawing of the full power/throughput torque of the vehicle engine and drive.

The hydraulic pump shall be independently driven by the factory fitted lateral *I axial* PTO fitted onto the vehicle's gearbox.

SLUDGE STORAGE TANK

The tank will be fabricated from 6 mm thick M.S. Plate confirming to IS-2062 Grade 'A' standard and will have a combined volumetric capacity of about 8000 liters. It shall be designed to withstand conditions prevailing from the operating vacuum and pressure conditions.

The tank will be of a cylindrical design with torrispherical-dished ends to ensure a complete and fast off-loading of the collected material. Mounted on a heavy C-sectioned sub-frame to provide additional structural strength to the chassis frame, the tank will be supported at the rear end by two heavy-duty hinge arrangements to facilitate its hydraulic tipping of 30^{O} for unloading the collected material at appropriate disposal grounds.

The tipping cylinder will be front end mounted and will of a multistage design to achieve the required tipping angle. The forward end of the tank will be fitted with robust saddle supports, which will rest firmly on the sub-frame.

The tank's rear door will be of a fully open able type, and the shell's perimeter will be reinforced for structural integrity. Two heavy-duty hinges will support the tank's rear door. Two suitably dimensioned double acting hydraulic cylinders will affect raising and lowering of the door. The door will be raised through a minimum angle of 80^{O} to the vertical. Locking and sealing of the rear door will be done by hand wheel operated bolts, which will be of a robust design located circumferentially on the tank's rear end of the shell.

A High-quality hollow "D" section type door sealing neoprene rubber gasket will be used to ensure the door to be leak proof.

Tank Fittings:
FRESH WATER COMPARTMENT

1. 1 no. 2" Ball valve at the forward end of the compartment to facilitate draining.

2. 1 no. 3" Ball valve to isolate the tank from the jetting system to facilitate maintenance even with a water-filled tank.

3. Level glass fitted in a convenient position to enable the operator to gauge the content's level inside the tank.

4. Manhole for tank filling and to allow man-entry in the tank for routine cleaning and inspection.

5. A tank breather will be fitted on the tank top to allow the compartment to be constantly vented to the atmosphere during jetting operations.

SLUDGE COMPARTMENT

i. **1 no.100 mm Knife Gate Valve located at the bottom most position at the rear-dished end for draining the tank's contents.**
ii. **Level glass fitted in a convenient position to enable the operator to gauge the content's level inside the tank.**
iii. **A Ball Float type, Primary shut-off to prevent water from entering the pumping system due to an accidental overflow.**
iv. **1 no. Pressure relief valve.**

Technical Data

Capacity	: 8000 Ltrs.
Max. Operating Pressure	: -0.9 to 1 bar
Construction	: Cylindrical shell with torrispherical dished ends.
Material	: 6 mm thick plates as per IS 2062 Grade - 'A' for shell and rear dished ends.

TANK MOUNTING

The Tank will be mounted on a sub-frame, fabricated from ISMC 150 channel sections.
This arrangement distributes the weight of the equipment and payload evenly over the chassis long-bearers and renders the arrangement torque resistant when operating in off-road conditions existing at disposal sites.

Suction Plant – Vacuum Generation

Working Principle

Aspiration of the effluent from sewer and drain water lines and chambers shall be carried out on the principle of generating **high vacuum** in the sludge tank.

The suction plant consists of:

- Air mover - Injection Air-cooled, Vacuum Blower
- Air-material Separation system-Combined Cyclone Separator / shut-off
- System's accessories and safety equipment

Vacuum Blower

The equipment will be fitted with a continuous rating, Rotary lobe, air cooled positive displacement type, vacuum blower, free airflow rating of 720 m^3 /hour and shall be capable of achieving maximum vacuum upto 7000mm (Water Column) i.e. vacuum pressure of 70% during suction. The vacuum blower shall be driven through a pneumatically actuated Full Torque PTO. The vacuum blower shall be manufactured by Vacuum Blower manufacturer as specified.

The Technical details of vacuum blowers:

Type	: Rotary Tri-lobe Blower.
Make	: JUROP/TMVT/KAY INTERNATIONAL
Delivery	: 1800 cum/hr free air flow
Max Vacuum	: 60% (7000mmWC)
Max. Pressure	: 1 bar (g) continuous

The salient features of the vacuum blower are:

- The precision machined, heavy-duty, lobe rotor profile safely allows for operations at high rpm, and contributes towards the system's negligible pulsation characteristics thus providing outstanding energy-efficiency.
- Cylindrical roller bearings designed to take up the radial forces generated during operations arid in belt transmission arrangements, thus achieving longer operational life.
- Rotor shafts are fitted with the unique well-proven labyrinth seals for effective sealing and low wear.
- Precise synchronization of the rotors is achieved through precise machining of the helical timing gears a major factor contributing to the blower's high volumetric efficiency and smooth and near noiseless operations.
- The air injection cooling system incorporated in the blower ensures cooler continuous duty operations under all vacuums.

Cyclone Separator

A CYCLONE SEPARATOR - SHUTOFF shall be fitted immediately before the blower inlet.

They function to protect the vacuum blower from any probable carry over of suspended water and sludge particles which may be drawn into the system from the water surface in the sludge compartment due to .the high vacuum conditions within. The cyclonic effect thus created within these devices, separates out the heavier water and sludge particles which accumulate and drained regularly after each operations through a drain valve provided at the separator's bottom.

The air stream entering the chamber spirals downwards and the denser water and sludge particles are hurled towards the cyclone wall due to the centrifugal force. The particles on hitting the wall separate out from the air stream, which get collected in the cyclone's bottom compartment. A drain valve is provided at the bottom to clean out the accumulated material.

A ball float shut-off arrangement should be incorporated inside the cyclone, far the protection of the blower system from any accidental overflow and carryover of material from the suction dump tank.

Accessories and Safety Equipment

The suction system shall come equipped with all the necessary accessories and safeties as below.

Vacuum Limitation Valve shall be line mounted to protect the equipment and system from excessive vacuum. The valve- shall be factory set to control operating vacuum parameters of the system. As the system reaches the set vacuum level, this valve lifts and ventilates the system by virtue of allowing the air outside to enter the system.

Silencer / Filter - Blower inlet shall be incorporated in the airflow circuit between the cyclones and the blower. It is designed to handle the Blower's flow rating and filter out any particulate matter sizes beyond that of the Blower handling capacity. Further it also serves as a silencer in the system

Exhaust Silencer shall be fitted on the blower's exhaust and cooling air-injection ports respectively to effectively reduce the pump's operational noise levels. The air injection silencer / filter shall come fitted with a filter to protect the unit against infiltration of atmospheric impurities, during operation.

Suction Hose and Hose End Nozzle

1 No., 150 mm dia., hose of 15 meters long, shall be supplied alongwith the equipment. The suction hose shall be of a lightweight, heavy duty, wire reinforced, PVC construction, and shall be renowned manufacturer as specified.

1 no. deep suction tool of 100mm dia., and fitted with a quick-connect coupling shall be supplied as a standard accessory.

DRIVE SYSTEM

Drive for the vacuum pump will be tapped from a new generation total power take off (split shaft P.T.O.). The total power take off will be fitted with two independent auxiliary output drive shafts and the complete unit will be mounted in the centre of the auxiliary frame and between the vehicle's gearbox and the differential.

The hydraulic pump will be independently driven by the factory fitted lateral/ axial PTO fitted onto the vehicle's gearbox.

The total power take-off is entirely designed and manufactured by M/s. PZB/OMSI./VAS The design allows drawing of all the power from the vehicle engine. The P.T.O. will be provided with one main transmission and two independent auxiliary output drive shafts. The engagement and disengagement of the P.T.O. outputs will be effected manually through an air control valve fitted in the driver's cabin.

TECHINICAL DATA

Manufactured By	:	M/s PZB/OMSI/VAS
Throughput Torque	:	400KGM
No. of Outputs (auxiliary)	:	Two.

Hydraulic System

A hydraulic pump of ample capacity to meet the operational requirements of the system will be of DOWTY make, manufactured by DYNAMATIC TECHNOLOGIES LTD, under the brand name of DOWTY, UK. Hydraulic motor required to drive the hose reel will be that of Vickers. This will be driven thru Auxiliary Power-take-off on the vehicle's gearbox, and
The hydraulic system shall be provided with an oil-storage .tank of suitable capacity, suction and return line filters, and a direction control valve.

All hydraulic connections shall be a combination of high-pressure seamless pipes and flexible hoses, to facilitate easy field replacement / repairs.

The hydraulic motor required to drive the hose reel shall be of specified make.

ACCESSORIES AND SAFETY FEATURES INCORPORATED IN THE SUCTION SYSTEM

A. Pressure Relief Valve - Fitted in a suitable position, this device provides safety to the storage tank as well as the complete system. The valve is of a spring loaded adjustable type and provides continuous relief when the system's pressure exceeds the preset limit.
B. Vacuum Relief Valve - It is set to function at a desired operating value and protects the pump as also the complete system from operating under high, undesired vacuum conditions. As the system reaches the set acuum level, this valve lifts and ventilates the system by virtue of allowing the air outside to enter.
C. Suction Filter - Incorporated in the airflow circuit between the secondary shut-off and the pump, is

a stainless steel, basket type Safety Filter designed to handle the pump's flow rating and filter out solid and semi-solid particulate impurities of size beyond that of the pumps handling capacity.

D. Exhaust Silencer - will be fitted on the pump's exhaust side of the airflow circuit. This device dampens the airflow with minimum back pressure in the system, thus reducing the operational noise levels considerably.

The following general technical specifications shall be complied with: -

(a). All hydraulic circuits shall be fitted with safety valves to avoid pressurization of the system.

(b). All hydraulic lines shall be adequately clamped.

(c). All hydraulic tanks shall have a level sight glass or dipstick level indicator,

(d). All equipments shall be painted after primer coat in two coats or more of enamel paint of color 'specified by Client.

All the equipments supplied should be in ready to use condition in all respect and all operation of the equipment should be from the outside.

SURFACE PREPARATION AND FINISH

- Both, exterior and interior of the tank will be sanded prior to spray painting.
- The tank exterior shall be spray-painted with two coats of superior quality anti-corrosive primer and two coats of enamel metal paint of a reputed make. The colour shade will be as per the customer's choice.
- To resist corrosion, the clean water compartment will be internally coated with two coats of anti-corrosive primer and two coats of gray enamel paint.
- The Sludge compartment tank will be internally coated with two coats of epoxy paint to resist corrosion due to weak acids.

13. Hydraulic Platform of 9.0 Meters Working Height

EQUIPMENT: -

The equipment shall be two boom designs.

CHASSIS

Make – Mahindra /TATA/Ashoke Leyland

Model – Bolero Maxi Truck/Tata Super Ace/Ashoke Leyland Dost

POWER SUPPLY

Power for operating platform shall be provided through D.C. Power Pack which takes supply from Chassis Battery or thru v- belt from vehicle engine.

Hydraulic reservoir shall be incorporated in the main frame and hydraulic circuit shall be fully protected by efficient filters.

HYDRAULIC HOSES

The hydraulic hoses shall be located so that they don’t interfere with the movement of the platform, booms etc. Make of the hoses shall be Aeroquip / Gates or equivalent.

STRUCTURE

The booms shall be made from M.S. structural steel of good quality. Articulated boom section shall be rigid, reinforced tubular section. All fabricated sections shall be rust inhibited from the inside while the exterior shall be pre-treated and finished for a glossy look.

STABLIZERS

Four nos. stabilizers will be provided at the four side of the platform. Each of the stabilizers will be manually operated, independently, to allow levelling on an uneven ground. When stowed, no part of the stabilizers shall protrude beyond the chassis body.

HYDRAULIC CYLINDERS

All the cylinders shall be double acting and of proven design. Cylinder tubes shall be Imported honed precisely and the rods shall be hard-chrome plated for corrosion resistance.

SLEWING

The platform shall be designed for continuous slewing by a high torque, low speed motor, through a reduction gear box up to 360 degrees in either direction continuous, unlimited. Slewing speed shall be precisely controlled by using fine restrictors in the circuit.

The Slew should be mounted on the chassis through a full length sub-frame, between the two axels of the chassis for proper weight distribution.

CAGE LEVELLING

The cage shall be level in all positions, achieved through a mechanical levelling system.

PERSONNEL CAGE

A special designed reinforced fibre-glass basket of suitable size as per norms shall be provided. All attachment points shall be bonded to withstand most arduous use. The non-slip floor with drain holes shall be provided to give the operator safe working conditions. The basket shall be insulated to withstand 600 volts. The basket shall be designed to carry a safe working load of 100 kgs. The hydraulic platform design shall be such that entry and exit into/from cage should be easy.

PLATFORM CONTROL

The hydraulic controls for all functions (except stabilizers) shall be duplicated at the cage as well as the base. All controls levers shall be self-centring and hooded for protection against accidental operations. A hand pump permitting lowering of boom shall be provided at the base in case of vehicle engine/ electrical system failure. The stabilizers controls shall be provided only at the base, on the rear of the vehicle.

SAFETY DEVICES

Pilot operated lock valves shall be incorporated in the stabilizers & Boom hydraulics, to prevent sinking of the cylinders while in operation.

2.	Maximum Height of the cage from the ground	7.5 Mtrs.
3.	Maximum Working Height	9.0 Mtrs.
4.	Safe Load	100 Kgs.
5.	No of Boom	2 Boom
6.	Maximum Out Reach	3 mtr
7.	Outriggers	4 nos.
8.	Leveling of Cage	Positive
9.	Lock valves to be provided	on all cylinders
10.	Slew	360 Degree Continuous

11.	Cage Insulation	600 Volts
12.	Bucket Size	0.663*0.750*0.850 Meter

14. Hydraulic Platform of 13.0 Meters Working Height

EQUIPMENT: -

The equipment shall be two boom designs.

CHASSIS

Make – Eicher /TATA/Ashoke Leyland

Model – Eicher 10.59 XP/Tata 407 LPT/Ashoke Leyland Partner

POWER SUPPLY
Power for operating Hydraulic Pump to operate platform shall be provided through P.T.O. operated by Chassis Engine.

Hydraulic reservoir shall be incorporated in the main frame and hydraulic circuit shall be fully protected by efficient filters.

HYDRAULIC HOSES
The hydraulic hoses shall be located so that they don't interfere with the movement of the platform, booms etc. Make of the hoses shall be Aeroquip / Gates or equivalent.

STRUCTURE
The booms shall be made from M.S. structural steel of good quality. Articulated two boom sections shall be rigid, reinforced tubular section. All fabricated sections shall be rust inhibited from the inside while the exterior shall be pre-treated and finished for a glossy look.

STABLIZERS
Two nos. of stabilizers, hydraulically powered, shall be provided at the rear side of the platform. Each of the stabilizers shall be hydraulically operated, independently, to allow levelling on an uneven ground. When stowed, no part of the stabilizers shall protrude beyond the chassis body. All stabilizers will be fitted with pilot operated check valves in the circuit.

HYDRAULIC CYLINDERS
All the cylinders shall be double acting and of proven design. Cylinder tubes shall be Imported honed precisely and the rods shall be hard-chrome plated for corrosion resistance. Make of cylinders CANARA / DANTAL /K.D./FORT

SLEWING

The platform shall be designed for continuous slewing by a high torque, low speed motor, through a reduction gear box up to 360 degrees in either direction continuous, unlimited. Slewing speed shall be precisely controlled by using fine restrictors in the circuit.

The Slew should be mounted on the chassis through a full length sub-frame, at proper positions for proper weight distribution.

CAGE LEVELLING
The cage shall be level in all positions, achieved through a mechanical levelling system.

PERSONNEL CAGE

A special designed reinforced fibre-glass basket of suitable size as per norms shall be provided. All attachment points shall be bonded to withstand most arduous use. The non-slip floor with drain holes shall be provided to give the operator safe working conditions. The basket shall be insulated to withstand 600 volts. The basket shall be designed to carry a safe working load of 200 kgs. The hydraulic platform design shall be such that entry and exit into/from cage should be easy.

PLATFORM CONTROL

The hydraulic controls for all functions (except stabilizers) shall be duplicated at the cage as well as the base. All controls levers shall be self centering and hooded for protection against accidental operations. A hand pump permitting lowering of boom shall be provided at the base in case of vehicle engine/ electrical system failure. The stabilizers controls shall be provided only at the base, on the rear of the vehicle.

SAFETY DEVICES

Pilot operated lock valves shall be incorporated in the stabilizers & Boom hydraulics, to prevent sinking of the cylinders while in operation.

1. Maximum Height of the cage from the ground	11.5 Mtrs.
2. Maximum Working Height	13.0 Mtrs.
3. Safe Load	200 Kgs.
4. Maximum Out Reach	6 Meters
5. No of Boom	2 Boom
6. Outriggers (Operated Hydraulically)	2 nos.
7. Levelling of Cage	Positive
8. Lock valves to be provided	on all cylinders
9. Slew	360 Degree Continuous
10. Cage Insulation	600 Volts
11. Bucket Size	1.0*0.750*1.1 Meter

15. Closed Top Tipper 5 Cum capacity

TRUCK CHASSIS –

Make – Eicher /TATA/Ashoke Leyland

Model – Eicher 10.59 XP/Tata 407 LPT/Ashoke Leyland Partner

CAPACITY -

Capacity of the closed top tipper will be 5 cubic meters.

SIDES -

Sides will be made from 3 mm M.S sheet supported on M.S Tubular section of 72x72x5 mm for strengthening.

Bottom-

Bottom will be made from 4mm MS sheet supported on M.S Tubular section of 72x72x5 mm for strengthening.

FRONT BOARD-

The front board of the tipper will be made from 4mm MS sheet supported on tubular section of 72x72x5 mm with extra strengthening to be done for mounting of the front-end tipping cylinder.

REAR DOOR-

The rear door of the tipper shall be made from 3 mm M.S sheet properly strengthened by help of tubular section of 72x72x5 mm. The door should be of top hinged type and should be mounted in such a way that whole of the garbage should be tipped in one go without hindrance or without need of the vehicle to move forward and backward. For that the rear door should be mounted at a higher level than the level of the garbage body.

TOP COVERS -

Top covers will be made from M.S sheet of 2mm properly strength with M.S tubular section of 40X40X3 mm. Top covers will be made in two parts which can be opened one on drivers side and others on co-drivers side with the help of 2 set of hydraulic cylinders , chain and gear arrangement and linkages arrangement .The Geometry and the operation of the top covers shall be such that they should fall on the sides perfectly parallel to them so that the top of the tipper should be 100 % open and thus can be filled up from either side of the vehicle without any need to move the loader from one side to other . Also, this design gives an additional advantage over the old design that the overheads wires do not causes hindrance to the doors while in complete open position.

HYDRAULIC CYLINDERS -

The garbage can be emptied from the body by tipping though the rear door by tipping of the body by help of front end mounted telescopic cylinder of Wipro/Tata make. The top covers will be opened with the help of 4 cylinders

HYDRAULIC PUMP -

The make of the hydraulic Pump shall vary with the make of the chassis. However, if the chassis is Tata than the machine will be fitted with Tata/ Wipro/ Usha/dowty make Pumps.

HYDRAULIC SYSTEM -

The Hydraulic system will be having the direction control valve of BADESTNOST/ HYDRO CONTROL/Wipro. All hydraulic hoses will be of imported make of GATES/ MARKWELL/ YOKOHAMA having operating pressure of 2500 PSI and bursting Pressure of 7500 PSI. All the metal pipes used will be seamless having dia of 12.5 mm

HYDRAULIC TANK -

The machine will be equipped with a hydraulic tank of 80 litres capacity including the Servo. First fill. The tank assembly will have a suction filter, a return line filter, an air breather assembly, a gate valve and a drain plug. The tank will be fitted on the frame properly so that it does not vibrate and at a suitable height so that the it gives proper supply of oil to the pump. The hydraulic tank will be filled with hydraulic oil HD-6**8**

Note: Dimension Tolerance is ±5%.

16. Closed Top Tipper 10 Cum capacity

CHASSIS:

Make – Eicher /TATA/Ashoke Leyland

Model – Eicher Pro 5016/Tata LPT 1613/Ashoke Leyland 1616

CAPACITY -

Capacity of the closed top tipper will be 10 cubic meters.

SIDES -

Sides will be made from 3 mm M.S sheet supported on M.S Tubular section of 72x72x5 mm for strengthening.

Bottom-

Bottom will be made from 4mm MS sheet supported on M.S Tubular section of 72x72x5 mm for strengthening.

FRONT BOARD-

The front board of the tipper will be made from 4mm m.s sheet supported on tubular section of 72x72x5 mm with extra strengthening to be done for mounting of the front-end tipping cylinder.

REAR DOOR-

The rear door of the tipper shall be made from 3 mm M.S sheet properly strengthened by help of tubular section of 72x72x5 mm . The door should be of top hinged type and should be mounted in such a way that whole of the garbage should be tipped in one go without hindrance or without need of the vehicle to move forward and backward. For that the rear door should be mounted at a higher level than the level of the garbage body.

TOP COVERS -

Top covers will be made from M.S sheet of 2mm properly strength with M.S tubular section of 40X40X3 mm. Top covers will be made in two parts which can be opened one on drivers side and others on co-drivers side with the help of 2 set of hydraulic cylinders , chain and gear arrangement and linkages arrangement .The Geometry and the operation of the top covers shall be such that they should fall on the sides perfectly parallel to them so that the top of the tipper should be 100 % open and thus can be filled up from either side of the vehicle without any need to move the loader from one side to other . Also this design gives a additional advantage over the old design that the overheads wires do not causes hindrance to the doors while in complete open position.

HYDRAULIC CYLINDERS -

The garbage can be emptied from the body by tipping though the rear door by tipping of the body by help of under body telescopic cylinder of wipro/tata make. The top covers will be opened with the help of 4 cylinders

HYDRAULIC PUMP -

The make of the hydraulic Pump shall vary with the make of the chassis. However if the chassis is Tata than the machine will be fitted with Tata/ Wipro/ Usha/dowty make Pumps.

HYDRAULIC SYSTEM -

The Hydraulic system will be having the direction control valve of BADESTNOST/ HYDRO CONTROL/wipro. All hydraulic hoses will be of imported make of GATES/ MARKWELL/ YOKOHAMA having operating pressure of 2500 PSI and bursting Pressure of 7500 PSI. All the metal pipes used will be seamless having dia of 12.5 mm

HYDRAULIC TANK -

The machine will be equipped with a hydraulic tank of 80 litres capacity including the Servo. First fill. The tank assembly will have a suction filter, a return line filter, an air breather assembly, a gate valve and a drain plug. The tank will be fitted on the frame properly so that it does not vibrate and at a suitable height so that the it gives proper supply of oil to the pump. The hydraulic tank will be filled with hydraulic oil HD-6**8**

17. Refuse Compactor of 8 cum capacity for 1.1 cum containers

General:

The Refuse Compactor Vehicle (RCV) should be a universal type and suitable for changing fields of operation. It should be easy to handle and should allow the loading personnel to operate the vehicle with minimum physical effort and maximum safety. Hand lever arrangement for operation of Compaction Cycle should be provided along with the electronic push button operating system.
The vehicle should be capable of automatically unloading garbage from closed containers of 1100 Litres capacity within 15 sec, with facility for automatic opening of Bin Lid / Cover when in fully lifted condition in compactor hopper, with inbuilt link arrangement of Bins.
The Loading Height should not be more than 1.2 Mtr from the ground level. The body should consist of Front bearings, ejection plate, Tailgate with hopper, slide plate, packer plate and Bin lifter.

The bidder will have to specify the make of important component along with technical specifications. Regarding quality of steel and other material relevant Code (if any) should be followed.

Bearing of the Refuse Collection Body:

The bearing of the refuse collection body should consist at its front, one support structure each (right and left) for the rubber hollow spring bearing to connect the body frame with the chassis frame. In the backward area, the continuous body frame should be directly screwed to the chassis frame by means of sliding brackets.

Refuse Collection Body:

The refuse collection body should be in torsion-free steel construction of capacity 8 m3. The bottom group, the sidewalls and the top must form a box-type design. The sidewalls as well as the top should be in reinforced frame steel construction. The tailgate bearing and automatic tailgate locking should be integrated into the rear frame of the body. At its front, a traversing bar should be welded to the bottom and top, which serves as a bearing for the telescopic ejection cylinder.
Roof panelling thickness: minimum 3 mm
Side panelling thickness: minimum 3 mm
Flooring thickness: minimum 4 mm
Rear cross bar thickness: minimum 6 mm
Superstructure Member thickness: Box section minimum 4 mm
Base Frame Member thickness: minimum 6 mm

Ejection Plate:

The ejection plate should run on a synthetic guide block within the lateral longitudinal guides of the boat-type bottom group of the refuse collection body and must be operated by a telescopic hydraulic ram. It must serve during loading as a resistance for the refuse compaction process.

The ejection plate should be of steel plate of minimum 4 mm thickness and of suitable grade to meet the operational requirements. A hydraulic control unit should regulate the withdrawal of the ejection panel during the loading process, so that the compaction is optimised.

The mechanism should consist of a profile-reinforced, wear-resisting plate of great sturdiness and the guide frame with the guide blocks.
Alignment of ejection plate should be proper during forward & reverse movement.

Tailgate:
The tailgate should form the main part of the refuse collection vehicle. The Tailgate should be made of by three main groups:
Tailgate with Hopper: The tailgate with hopper should form the basic structure to which the functional parts, slide plate and packer plate should be attached. The tailgate shall unlock automatically and raise, to permit ejection of refuse from RCV hopper when hydraulic valve is actuated. It should be equipped with Automatic-locking system between tailgate and RCV Hopper body through long hole and hooks. This locking system should be completely liquid-proofed between tailgate and body by using double lips rubber seal.
The hopper should be able to take the refuse from the garbage bins of 1100 liters capacity. The hopper should have a capacity of minimum 1.10 M3. At its top, it should be fixed to the refuse collection body by means of two slotted hinges and should be supported by two hydraulic rams and two locking hooks mounted to the rear frame of the body. These bearing points and the locking hook should take up the compression forces. The profile-reinforced side walls of the frame should constitute the bearing for the two hydraulic rams which automatically release the locking mechanism and then lift the loading system for refuse discharge up to the final stop.

The hopper used to take in the refuse should be permanently welded in between the side walls and should consist of highly solid fine-grained constructional steel made of High resistance steel.
The carriage plate should be robust profile reinforced steel construction supplied with a wear-resistant cover plate made of high resistant Steel. The thickness of side plate should be of suitable grade material. It should be actuated by two hydraulic cylinders, and must run on suitable number of sliding blocks. At the bottom end of the slide plate a moveable packer plate should be Embedded.
The packer plate should consist of highly solid steel and the strongly Reinforced lateral bearing arms for the attachment of the hydraulic rams. It should clear the hopper and initiate the primary compaction within the hopper. On completion of the swivel movement the compaction of the refuse and its transportation into the refuse collection body should begin. The packer plate should be made of special High resistance steel of suitable grade and should be actuated by 2 hydraulic cylinders.
Side panelling thickness: minimum 3 mm
Rear side of hopper plate thickness: minimum 6 mm
Hopper bottom plate thickness: minimum 6 mm
Superstructure Member thickness: minimum 6 mm

Lifter System:
The Lifter System should be capable of lifting and unloading garbage from 1100 ltrs. capacity bins. It should be light weight for high legal payloads. It should be reliable system with proven technology. There should be optimum system for the collection of various types of refuse within one collection point and its low rave rail should permit the hand loading of bulk refuse items as well as the easy emptying of wheel bins. Tipping of 1.1 m^3 container and simultaneously working of the compacting mechanism must be possible without moving back the lifter. This should be done without any damages to the container.

During compaction operation, loading / unloading of bins and travel of Truck should be able to operate continuously to continue to save operation time. The Tailgate lifting and closing as well as the compaction operation will be controlled with Hydraulic Lever System placed on rear side of the vehicles.
The lifter system shall be provided with four cylinders i.e. two cylinders for leveling and lifting of Bin, and two cylinders for tipping operation.

Mounting:
The lifter should be integrated at the rear end of the tailgate.

Chassis:
Make: TATA/ Ashok Leyland
Payload: Minimum 7500 Kg
GVW: Minimum11000 Kg
Wheel Base: minimum 3800 mm
Engine: Minimum 110 HP, BS-III model
Transmission: 5 speed synchromesh gear box
Steering: Power steering
Tyres: 10.00 x 20 - 16 PR, Front-2, rear-4, Spare-1(Lockable)
Dumping Operation:
Tailgate Operation:
Tailgate opening and closing for dumping should be controlled from driver's cabin Optional hand lever for manual operation.
The tailgate hydraulic valves should be electro-hydraulic/ electro-pneumatic for rugged operation

Ejector Plate operation:
This operation should be controlled from driver's cabin
Optional hand lever for manual operation
The ejector plate hydraulic valve should be electro-hydraulic/ electro-pneumatic.

Actuation:
Hydraulic actuation via hydraulic pump driven by the P.T.O. of the vehicle chassis.

Pump:
The hydraulic system should be driven through a dual-pump, Large circuit for the compaction and Small circuit for ejection plate and lifter.

The large pump circuit should feed the hydraulic rams of the compaction unit. The small pump circuit should feed the lifting rams of the tailgate (the lifting rams should also be used for the locking mechanism), the telescopic ram of the ejection panels and the lifting device of the system.

Rams/ Cylinders:
11 Hydraulic Cylinders shall be installed covering following operation
1 three-stage telescopic ram, double-acting for the ejection panel.
2 hydraulic rams, double-acting for the slide plate
Double acting Slide-cylinders (for compacting) shall be located outside of the sidewalls.
The cylinders are mounted in pushing position.
2 hydraulic rams, double-acting for the packer plate
2 hydraulic rams, double-acting for the tailgate (lifting/lowering and automatic locking).
The lifter shall be integrated in the tailgate and have
2 levelling and lifting cylinders
2 Tipping cylinders
All Cylinders shall be of reputed make from ISO certified organization. Cylinders should be equipped with lubricating bearing.

Control blocks:
1 control block for the compaction system
1 control block for lifting/lowering the tailgate and refuse ejection

Tank:
The Hydraulic oil tank shall be of minimum 140 Liters capacity equipped with a suction strainer, a return line filter with steel cartridge and a level indicator. First fill of hydraulic oil and other consumables to be provided in the equipment by the supplier.

Electric:
Automatic operation (continuous cycle) by pushing electric operated push-button, compacting mechanism should be running till you switch off through the push button. Optional Manual operation by hand lever facility to be provided.

The automatic cycles should be controlled with 4 proximity switches together with the hydraulic integrated control-group. Further 2 emergency stop switches should be provided.

The control system should be only operated by hydraulic and electric.
Optionally one should be also able to operate the whole compactor with a hand-lever,
which comes out directly from the main-control-block
Emergency electric stops to be provided.

Signal-system to the driver's cab to be provided
On each side there should also be 1 switch for the signal system to the driver's cab. The system should encompass all installations relevant for the functioning of the entire bodywork and the distribution voltage should be tapped from the electrical system of the chassis vehicle.
Lights: Double light-system at the rear are provided:
Working light
Rotation Beacon light.
Parking Light
Stop Light
Back light
Direction Indicator
Number Plate Light

Selector switch:
Single/continuous-cycle (right hand) - One
Main Switch – One
Working Light (Cab) – One
Finishing [Rotating Light] (Cab) – One

Push button:
Engine Accelerator – One
Emergency Stop (Right Hand) – One

Safety Features:
Hose burst valve shall be fitted to the system to prevent the tailgate descending in the event of the hydraulic failure. There shall be a body prop provided on the tailgate to hold the tailgate in the open position for safety of workshop personnel when entering the body for maintenance or repair.

Painting
The entire unit shall be painted with two coats of superior quality anit-corrosive primer with two coats of approved quality paint to ensure long lasting, resistance to rust, weathering and breakage. The color shade should be purchaser's choice.
Drawing:
G.A. drawing should be submitted by the supplier.

18. Refuse Compactor of 14 cum capacity for 1.1 cum containers

General:
The Refuse Compactor Vehicle shall be of universal type and suitable for changing fields of operation. It should be easy to handle and should allow the operating personnel to operate the vehicle with minimum physical effort and maximum safety.

The vehicle should be capable of automatically unloading garbage from closed containers of 1100 Litres capacity within 15 secs, with facility for automatic opening of Bin Lid / Cover when in fully lifted condition in compactor hopper, with inbuilt link arrangement of Bins.

The Loading Height should not be more than 1.05 Mtrs from the ground level.

The body should consist of: Front bearings, ejection panel, Tailgate with hopper, slide plate, packer plate and Bin lifter.

Refuse Collection Body:
The refuse collection body should be in torsion-free steel construction of capacity 14 cum. The bottom, the sidewalls and the top must form a box-type design. The sidewalls as well as the top should be in reinforced frame steel construction. The tailgate bearing and automatic tailgate locking should be integrated into the rear frame of the body. At its front, a traversing bar should be welded to the bottom and top, which serves as a bearing for the telescopic ejection cylinder.

Roof panelling thickness: minimum 2 mm
Side panelling thickness: minimum 3 mm
Flooring thickness: minimum 4 mm
Rear cross bar thickness: minimum 6 mm
Superstructure Member thickness: Box section minimum 4 mm
Base Frame Member thickness: minimum 6 mm

Ejection Panel:
The ejection panel shall run on a synthetic guide block within the lateral longitudinal guides of the boat-type bottom group of the refuse collection body and must be operated by a telescopic hydraulic ram. It must act during loading as a resistance for the refuse compaction process.

The ejection plate shall be wear resistant steel plate of minimum 4 mm thickness of suitable grade with adequate strength to meet the operational requirements. The withdrawal of the ejection panel during the loading process shall be through hydraulic control to ensure optimum compaction.

Tailgate:
The tailgate should form the main part of the refuse collection vehicle. The Tailgate should be comprise of three main groups:

Tailgate with Hopper: The tailgate with hopper should form the basic structure to which the functional parts, slide plate and packer plate are attached. It should be equipped with Automatic-locking system through long hole and hooks. This locking-system should be
completely liquid-proof between tailgate and body by using double lip rubber seal.

The hopper should be able to take the refuse from the garbage bins. The hopper should have a capacity of minimum 1.80 cum. At its top, it should be fixed to the refuse collection body by means of two slotted hinges and should be supported by two hydraulic rams and two locking hooks mounted to the rear frame of the body. These bearing points and the locking hook should take up the compression forces. The profile reinforced side walls of the frame should constitute the bearing for the two hydraulic rams which automatically release the locking mechanism and then lift the loading system for refuse discharge up to the final stop.

The hopper should be permanently welded in between the side walls and should consist of highly solid fine-grained constructional steel made of High resistance steel.

The carriage plate should be of robust profile reinforced steel construction supplied with a wear-resistant cover plate made of high resistant Steel. The thickness of side plate should be of suitable grade material. It should be actuated by two hydraulic rams, and must run on suitable number of sliding blocks. At the bottom end of the slide plate a moveable packer plate should be Embedded.

The packer plate should consist of solid steel and the strongly Reinforced lateral bearing arms for the attachment of the hydraulic rams. It should clear the hopper and initiate the primary compaction within the hopper. On completion of the swivel movement the compaction of the refuse and its transportation into the refuse collection body should begin. The packer plate should be made of special steel of suitable grade.

Side panelling thickness: minimum 3 mm
Rear side of hopper plate thickness: minimum 6 mm
Hopper bottom plate thickness: minimum 6 mm
Superstructure Member thickness: minimum 6 mm

Lifter System:
1. The lifter should be reliable with proven technology. There should be optimum system for the collection of various types of refuse within one collection point and its low rave rail should permit the hand loading of bulk refuse items as well as the easy emptying of wheel bins. Tipping of 1.1 m^3 container and simultaneously operation of the compacting mechanism must be possible without moving back the lifter. It should be possible to undertake simultaneous operation of compaction and loading/unloading or compaction and movement of truck to save operational time. The lifter should be able to unload Garbage from bin of 1100 Litre capacity. The bin lifter shall be suitable to lift the standard containers (HDPE Bins/ Metal Bins) of size 120 liter, 240 liter, 660 liter and 1100 liters.

A safety valve shall be provided in the system to avoid sudden descent of bin lifter in case of failure in hydraulic system or failure of automatic system.

Chassis:
Make: TATA/ Ashok Leyland
Payload: Minimum 12000 Kg
GVW: Minimum16000 Kg
Wheel Base: minimum 4200 mm
Engine: Minimum 120 HP, BS-IV model
Transmission: 5 speed synchromesh gear box
Steering: Power steering
Tyres:10.00 x 20- 16 PR,Front-2, rear-4,Spare-1(Lockable)

Dumping Operation:
Tailgate Operation:
Tailgate opening and closing for dumping should be controlled from driver's cabin Optional hand lever for manual operation.
The tailgate hydraulic valves should be electro-hydraulic/ electro-pneumatic for rugged operation
Ejector Plate operation:
This operation should be controlled from driver's cabin
Optional hand lever for manual operation
The ejector plate hydraulic valve should be electro-hydraulic/ electro-pneumatic.

Actuation:
Hydraulic actuation via hydraulic pump driven by the P.T.O. of the vehicle chassis

Hydraulic Pump:
The hydraulic system should be driven through a dual-pump, Large circuit for the compaction and Small circuit for ejection plate and lifter.

The large pump circuit should feed the hydraulic rams of the compaction unit. The small pump circuit should feed the lifting rams of the tailgate (the lifting rams should also be used for the locking mechanism), the telescopic ram of the ejection panels and the lifting device of the system.

Electrical System:
All required electrical and fully integrated logical system and printed circuit board shall confirm IP66 weatherproof norms and located on the body.

Rams/ Cylinders:

- 1 three-stage telescopic ram, double-acting for the ejection panel.
- 2 hydraulic rams, double-acting for the slide plate
- Double acting Slide-cylinders (for compacting) should be located outside of the sidewalls. The cylinders are mounted in pulling position/ pushing position.
- 2 hydraulic rams, double-acting for the packer plate.
- 2 hydraulic rams, double-acting for the tailgate (lifting/lowering and automatic locking).
- The lifter should be integrated in the tailgate and have 2 lifting / tipping cylinders.
- All cylinders should be of reputed make.

Control blocks:
1 control block for the compaction system
1 control block for lifting/lowering the tailgate and refuse ejection
Tank:
Hydraulic fluid tank of adequate capacity equipped with a suction strainer, a return line filter and a level indicator.
Filters:
Return line filter with steel cartridge.
Filter for hydraulic tank.
Electric:

- Automatic operation (continuous cycle) by pushing electric operated push-button, compacting mechanism should be running till you switch off through the push button.
- Optional Manual operation by hand lever facility to be provided.
- The automatic cycles should be controlled with 4 proximity switches together with the hydraulic integrated control-group. Further 2 emergency stop switches should be provided.
- The control system should be only operated by hydraulic and electric systems.
- Optionally one should be also able to operate the whole compactor with a hand-lever, which comes out directly from the main-control-block

Emergency electric stops to be provided.
Signal-system to the driver's cab to be provided
 It shall be provided with electro-pneumatic throttle control system, which maintains engine speed automatically, when hydraulic power consumption increases.
 It shall be provided with Electro – pneumatic operated spool valves to control all system functions separately, with inbuilt dump valve for retraction process.
 It shall be provided with automatically adjusted high and low pressure system to give efficient and smooth working of the system and protect the system from over stress and to obtain better fuel efficiency.
Sweeping cylinder with spherical bearings shall be provided in such a way that it protect the piston rod from direct contact of acidic waste/garbage.

Selector switch:
Single/continuous-cycle (right hand) - One
Main Switch – One
Working Light (Cab) – One
Finishing [Rotating Light] (Cab) – One
Push button:
Engine Accelerator – One
Emergency Stop (Right Hand) – One
Drawing:
The compactor shall meet with all statutory requirements of Motor vehicles act and MSW rules 2000. The supplier shall submit G.A. drawing of complete unit for approval of purchaser.

19. PORTABLE COMPACTOR 10/16 Cu. Mt.

A. General Description: For 10 Cu. Mt.

Portable Compactor is a compactor capable of being transported from one location to another and placable at any place for the refuse collection, compaction & transferring. It will come as an integral unit incorporating the Container and the Compaction unit.

The Portable Compactor will be such that can be lifted by a specially designed Hook Loader, unit mounted on a Truck chassis for transportation and unloading of compacted garbage.

One hydraulically operated tipping device mounted on Compaction unit, to receive and unload the waste in to Compaction unit to compact it in to the Container – which is called Tip Cart.

Features of Portable Compactors:

1. The Portable Compactor shall be of front loading type with a hydraulic operated device to receive waste from hand cart / tricycle vans/ small tippers etc.
2. The Portable Compactor shall be provided with leachate collection tray for collection of leachate during compaction of garbage & shall be with suitable drainage system to unload nearby drain. leachate will not drop on road during transportation due to leak proof sealing at rear door.
3. The size of the charge chamber of the compaction unit shall be of 1.5 Cum.
4. Compaction unit shall be powered by Hydraulic power unit, energy saving, low noise level.
5. Entire body shall be Rectangular with Curved sides, for an easy discharge of waste and ensure complete filling.
6. Container Body of the compactor shall be completely smooth, without any reinforcement ribs on the body surface, to reduce material stress and keep the strength of the body intact and avoid deformation due to weld joints.
7. Body bottom shall be flat enough to accommodate Body runner's (bottom long members) to support the Compactor Body on Hook Loader.
8. Dish end type back door assembly shall be top hinged with vertical travel to unlock the door.
9. Door assembly shall have 180-degree swivelling movement w.r.t. top hinge, and attached with bottom metallic rollers to avoid direct contact with garbage floor.
10. Compaction unit shall be incorporated with Special rear door rubber to ensure the sealing of the compactor and can be demountable
11. Automatic operated covering system, while loading of waste it opens up automatically and remain close when there is no loading.
12. Tip cart mechanism shall be equipped with DIN arm arrangement, which holds the Tip cart positively s while unloading the garbage in to the Compaction unit for 10cbm machine only.
13. Compactor body shall be manufactured out of high tensile steel IS-2062 Grade.
14. Compactor body shall be provided with minimum one leachate drainage outlets with leak proof aluminium cam lock couplings of minimum 2-inch diameter.
15. Compaction of garbage shall achieve up to a density of 750 Kg / Cum.
16. All electro-hydraulic functions and working principle of machine shall be PLC based, will have provision of audio and visual warning during full capacity loading complete.
17. Inspection door at one side of the compaction unit shall be provided.
18. A reinforced front inspection gate installed with a rubber for easy maintenance access to the cylinders.
19. Hydraulic Power Pack shall be accommodated within the compaction unit and same shall be mounted on rails to facilitate maintenance & repair as & when required, from outside of the machine.

20. Control panel of operating system shall be equipped with display screen, emergency stop, main switch, connecting socket and operating push buttons.
21. The compactor shall operate only by a special key to protect the machine from unauthorized operation.
22. The compactor shall be equipped with hydraulic drive unit, protected in a separate tunnel, to ensure the daily operations in even severe conditions.
23. All electrical circuits shall be enclosed in control box with start & stop buttons.
24. Control panel is located outside the operating area, safe for the operator.
25. Construction of entire compactor shall be robust and enough sturdy to maintain its structure throughout its service life.
26. Rear frame, front frame, rear door and structure of compaction unit shall be of high strength steel.
27. Floor of charge chamber shall be minimum 5 mm thick and made of high strength steel and shall be supported by longitudinal members and intermediate bracing.
28. Container shall be of Rectangular with Curved sides shape to ensure good compaction ratio, light weight, Hi-strength longer life, and easier discharging of all refuse after compaction.
29. The work flow of the arrangement shall be such that - loading the waste in to Tip Cart by collection vehicle - loading the waste in to Compactor by Tip Cart - handling the full container with hook loader - transport the container to dump yard - discharging the waste.

B. <u>SAFETY FEATURES</u>:

1. All safety features would be included in the unit like start/stop buttons.
2. Indicating lights would be provided to indicate the status of the operation.

C. <u>TECHNICAL PARAMETERS</u>:

We are furnishing technical parameters of 10 cbm Mobile Compactors:

Sl. No	**Description**	**Value**
1	Body Volume in Cum	10
2	Compaction ratio base on Indian waste (approx.)	0.7
3	Pressure (Bar)	200
4	Power (KW)	5
5	Voltage (V)	(380) 440
6	Ton/Hour with Tipping device 10 20	10
7	Tip Cart capacity	1100 L (separate)
8	Compactor weight with Hydraulics(Kg)	4150

General Description: For 16 Cu. Mt.

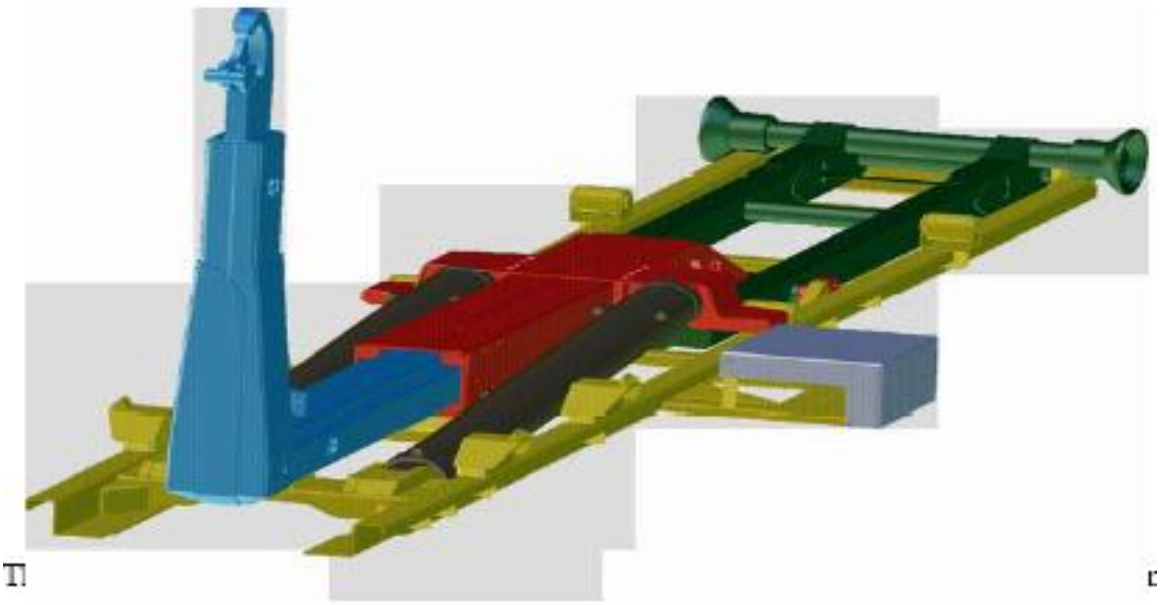
Technical Specification:

Container volume	:	16 cubic metres
Compaction Force	:	340 Kn
Stroke Volume	:	1.3 cubic metres
Ram Penetration	:	450mm
Compaction Ram	:	Parabolic type Height 500 mm Width 1950mm
Hydraulic Cylinders	:	Twin HP units
Loading aperture	:	Height 1350mm Width 2050mm Length 1700mm
Loading Height	:	1350mm
Cycle Time	:	38 seconds
Electric Motor	:	5.5 kw
Electrical Supply	:	3-phase 415v 32 amp
Weight	:	5022 kg
Dimensions	:	Length 6650mm Width 2500mm Height 2560mm
TRUCK CHASSIS	:	25 Ton GVW Truck

20. HOOK LOADER for 10/16 Cum Portable Compactor

General Specification for 10 Cum:

Hook Loaders are fabricated in accordance to the machine regulations and ensures the safety of its operator and its environment.



Hook Loader

Bottom Frame

The bottom frame comprises two longitudinal main runners and cross reinforcement. To the rear of the system the pivot point of the tipping frame is attached. The pivot point is situated as low as possible into the bottom frame. Hence the tipping capacity of the cylinders is augmented.

The bottom frame has several container rollers divided over the full length, which supports the container's lower main frame. As well at the front of the bottom frame high tensile steel slide supports are placed to support the container over a big surface.

At the front of the frame the cylinder bridge construction is located, providing a strong and solid attachment for the main cylinders. The tipping frame automatically locks onto the bottom frame during the unloading procedure.

Tipping Frame:

The tipping frame enables the system to tip the containers. The tipping frame rotates at the rear of the system's bottom frame and has its high tensile anti-wear rollers on which the container is supported. At the tipping frame, a steel locking device is constructed in order to lock to the main off-loading frame. These two components are locked together for tipping the container.

Off – loading frame:

The off-loading frame has the hook mast, which slides front and backwards. The off-loading frame enables the system to roll off the container. The off-loading frame rotates in the middle of the main frame at the front of the tipping frame. During the operation, the hook masts moves backwards and unlocks the off-loading frame from the tipping frame. After this the two double, acting main cylinders will rotate the off-loading frame and enables the system to roll-off the container.

Hook Mast

The hook mast can move front – and backwards inside the off-loading frame. By this the system is able to transport different various length of container. The hook mast will also unlock the off-

loading frame from the tipping frame, which enables the system to roll – off the container. Further the system has synthetic bearing to have the maintenance free bearing of the sliding.
The high tensile wear resistance steel hook mounted into the hook mast is been placed at a height of 1570 mm. a special designed lock ensures that the hook eye of the container will be secured during tipping, on and off rolling and thus cannot be dropped out.

Hook with container safety lock

HYDRAULIC SPECIFICATIONS -

- Hydraulic Pump - Wipro-Axial Piston Pump, 72 LPM
- Hydraulic cylinder –
  - **Make**- Fort/K.D.
  - **Size**

Boom Cylinder –

ID	160 mm
OD	180 mm
Rod	80 mm

Telescopic Arm cylinders –

OD	115 mm
ID	100 mm
Rod	56 mm

Stabilizer cylinder

OD	115 mm
ID	100 mm
Rod	63 mm

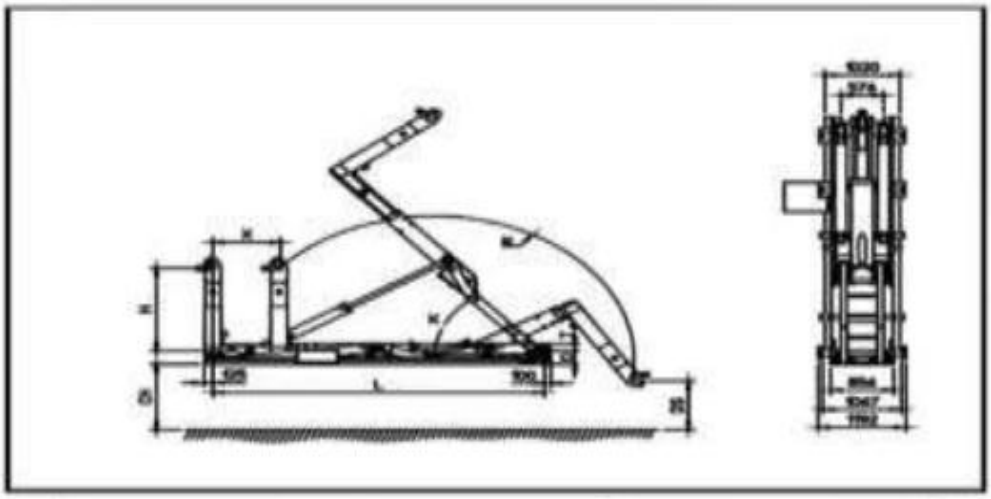
Lock cylinder

OD	50 mm
ID	40 mm
Rod	25 mm

General Specification for 16 Cum:

Wheel Base: 4200 mm ~ 4700 mm

The follow detailed specifications of the hook lift of a system with a capacity of 140 kN, Hook Height of 1570 mm and be mounted on a chassis height of 1050 mm



TYPE:	14-47S
X (mm)	1000
L (mm)	4700
O (mm)	277
K	50°
R (mm)	2880
T (mm)	130
Weight[1] (kg)	1930
DS (mm)	1006
Min./max. container length (mm)	3750 – 5800
Loading (time)[2] (s)	28
Unloading (time)[2] (s)	35
Tipping (time)[3] (s)	30
Fast unloading (time)[2] (s)	16

H = Hook height, **CH** = Chassis height, **DS** = Lowest pick up point (depending on hook- and chassis height)

- Rough estimation based on a standard system, filled with oil and without mounting kit accessories.
- Rough estimation based on PTO type C, pump 60 l/min., motor 1200rpm, PTO transmission i = 1.0 and dependent on cylinder thickness

PRODUCT DESCRIPTION:

Truck Mounted Hook Loader, suitable for lifting the Portable Compactor with integral container unit of 10.5 Cum Volume hydraulically, is designed to pick up the loaded or empty compactor unit, transport, dumping of material by hydraulic Tipping and thereafter unload the Portable Compactor safely at the collection site.

The telescopic Jib enables proper load distribution on the chassis.

TECHNICAL FEATURES:

Designed to handle Portable Compactor with integral container unit of 10 cum. The dumping mode is achieved by operating the main rams, actuating arm and tilting frame, with jib extended, pivoting around the rear shaft

- A sub-frame made out of bend steel plates and cross members is mounted on the truck chassis frame.
- A tilting frame hinged to the sub frame with a steel shaft carry the rear centering rollers.
- A main arm hinged on the tilting frame with a mechanical locking mechanism allows the dumping mode.
- A telescopic jib, sliding in the arm, supporting a wide-open lifting hook enables loading of container.

HYDRAULIC SPECIFICATIONS:

Pump - High Performance Vane Type Pump

Controls - Hydraulic – Manual

Filter - 10 micron, return line with replaceable cartridge

Arm cylinders (lift cylinders) - 2 Nos., double acting, equipped with counter balance valves and built in by pass valves.

Jib cylinder (slide cylinders) – 1 No. Double acting, equipped with built in counter balance valves, Hoses, tubes & fittings.

Container Locking Cylinder - 1 No., Double Acting

Boom Locking - Spring actuated Mechanical Locking arrangement
Stabilizers are provided at suitable locations along the rear of the vehicle to ensure vehicle stability during the loading & unloading cycle of operation.
All Hydraulic Cylinders, allied components and all hydraulic pumps shall be supplied from
manufacturer of ISO 9001:2008 certified company.

SAFETY DEVICES - Safety valve prevents jib operation during dump Mode
- Automatic locks on arm
- Slide through container catches.

WELDING
Structure welding confirming to relevant IS standards.

HOOK FOR LIFTING
The hook for lifting the Compactor Unit would be integral to the structure. It shall be provided with the necessary reinforcement to handle the design weight for lifting with adequate factor of safety.
The shape and size would as per design of the lifting tackle.

TRUCK CHASSIS
The equipment shall be suitable to be mounted on 2 Axle Truck Chassis as per details given below:-
Make: TATA Motors/Ashok Leyland/Eicher/Mahindra/AMW or equivalent BS IV
GVW: 16 T or Equivalent
Wheel Base: 4200 mm ~ 4700 mm

21. Hydraulic Trolley for Tractor

Technical Specifications

The technical specifications of the equipment required by the purchaser are indicated in preceding paragraph. The Bidders shall complete the technical specifications for the Goods offered in their entirety so as to demonstrate their compliance with the requirements of the bidding documents

General:

Tractor, trolley and water tankers shall be used for day to day multi activities by the municipal authority.

Tractor

General:

The Tractor should be rugged and durable, and designed for ease of manoeuvrability and proper distribution of tractor, and axle induced stresses. The frame/chassis should be either fully welded or rigidly bolted to achieve this, in accordance with the manufacturer's standard procedures. It should be suitable for working under adverse site conditions, and the power train should be designed for this purpose.

Basic Specification:

a) Type: tractor complete with trolley attachment provision.

b) Structure: Rugged, fully welded, durable and designed for durability and proper distribution of induced stresses.

c) Engine: Minimum Euro 2, fuel efficient, Turbo charged, 4 stroke OHV direct injection diesel engine. Minimum Gross Horsepower Rating : 35 HP (27 KW) at manufacturer's rated RPM.

d) Cylinder: Minimum three cylinders vertical in line – 3 Cylinder DI Engine with Integral

cylinder head.

e) Fuel Injection: In line fuel injection pump with variable speed mechanical governor-Mechanical.

f) Fuel System: Gravity and forced feed, Fuel tank capacity not less than 30 litres and fuel filtration should be dual stage.

g) Air Cleaner: should be of oil bath type with cyclone type transparent pre-cleaner.

h) Lubrication: Forced feed and splash type with full flow filter paper element

i) Cooling: Impeller type water pump, fan and radiator, forced feed water circulation.

j) Compression Ratio: More than 17:1

k) Transmission: 8 forward and 2 reverse gears

l) Clutch: Single/Double plate dry friction type

m) Gear: 4 forward and 1 reverse

m) Steering: Worm and nut type with re-circulating balls

n) Brakes: Shoe/Disk Type, Emergency brakes: hand brake with parking latch

o) Electric System: Voltage: 12 volts, Battery capacity: 12 volts, 60 Amps/hr @ 5 hr rating, Alternator capacity: minimum 12 volts 13 Amp, Head lights: 2 nos. 12 V -36 W, Brake light: 2, nos. 12 V-21, Rear light: (Plough lamp) -01

p) Instrument Panel: it should have tachometer and hour meter, water temperature gauge, oil pressure gauge, ampere meter, fuel gauge, high beam indicator, left and right turn indicators, hazard warning switch, hand and foot accelerator etc.

q) Seat: longitudinal adjustable with back rest and hydraulic shock absorber.

r) Wheel and Tyres: No. of wheels: Front: 2, Rear: 2.

s) Hydraulics: Hydraulic system with ADDC, single acting cylinder position and mixed Control, provision for external circuit for double acting cylinders.

t) Painting: Paint process and paint should be superior quality to ensure long lasting structure resistant to rust, weathering and breakage. The bidder should get the colouring paint/ name & slogan writing approved from the purchaser.

u) After Sales Support:

a) Free service in the first year with a warranty for the machine for 1 year from the date of
b) Commissioning.
c) To demonstrate capabilities of giving proper service and spaces after the expiry of warranty period.

Should be capable of proposing maintenance contract for subsequent years at respective ULBs.

The Manufacturer/Supplier should provide following with each vehicle:

(a) Manufacturer's standard tools for maintenance with lockable security box.

(b) Operator's manual

(c) Workshop and service manual

(d) Spare parts catalogue

(e) Technical details, drawing and operation manual

(f) Warranty card for one year

(i) Battery warranty card for 1 year.

Warning System and Essential Accessories:

(a) Digital Hour mete

(c) Fuel gauge

(d) water temperature gauge

(e) Engine oil pressure gauge with warning light

(f) Ammeter supported with warning light

(g) Horn- 2 pieces

(h) External rear view mirrors

(I) Radiator protection grill

(j) Head and tail lights, cabin lights, reversing light and traffic indicator

(k) Spare wheel with tyre and inner tube

(l) Jack and wheel wrench

(m) Anti-theft steering lock

(p)Speedometer

The following genuine obligatory spares to be supplied along with each equipment:

Should be capable of proposing maintenance contract for subsequent years at respective ULBs.

The Manufacturer/Supplier should provide following with each vehicle:

(a) Manufacturer's standard tools for maintenance with lockable security box.

(b) Operator's manual

(c) Workshop and service manual

(d) Spare parts catalogue

(e) Technical details, drawing and operation manual

(f) Warranty card for one year

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(a) Digital Hour mete

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(e) Engine oil pressure gauge with warning light

(f) Ammeter supported with warning light

(g) Horn- 2 pieces

(h) External rear view mirrors

(I) Radiator protection grill

(j) Head and tail lights, cabin lights, reversing light and traffic indicator

(k) Spare wheel with tyre and inner tube

(l) Jack and wheel wrench

(m) Anti-theft steering lock

(p)Speedometer

The following genuine obligatory spares to be supplied along with each equipment:

Oil Filter - 3 no.

- Diesel Filter Primary - 3 no.
- Diesel Filter Secondary - 3 no.
- Hub, Packing - 4 no.
- Rear Wheel Oil seal - 4 no.
- Split Pin - 4 no.
- Fuse - 3 no.
- Bulb - 2 no.
- Wheel Nut - 4 no.
- Tapper covers packing -2 no.
- Air cleaner rubber - 2 no.
- F.I.P. packing - 1no.
- Air Breather - 1no.
- Gaskit elbow -1no.

Drawings:

The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution.

Tractor Trolley

General:

The Tractor trolley should be rugged and durable, and designed for ease of manoeuvrability and proper distribution of tractor, and axle induced stresses. Tractor drawn Tipping Trolley should have box type load body having minimum 3 cum capacity, suitable to transport and unload up to 3 tones for all types of road gradient.

Basic Specification

a) Type: Trolley complete with proper attachment provision with tractor.

b) Structure: Rugged, fully welded, durable and designed for durability and proper distribution of induced stresses.

c) Main Chassis: I SMC 150x75 mm channel - 1 set.

d) Sub Frame: ISMC 125x65 mm - 2 Nos.

e) Hitch Beam: Fabricated from MS plate- press formed and welded I SMC channel 1 No.

f) Cross Member: I SMC 75x40 mm channel -10 Nos.

g) Eye Hitch: Forged steel and heat treated– 1 No.

h) Rear Doors: 3.00 MM HR sheet with reinforcement of 75x40 ISMC

i) Axle: EN -8 – 63 mm sq.

j) Wheels: Ring Type – 8mm thick – 2 Nos.

l) Breaks: Parking breaks – 1 set

m) Tyres: 900x20-16 ply – 2 Nos. of standard make (approved by purchaser)

n) Hydraulic Jacks: Single ram 5 - ton capacity hydraulic jack with minimum tipping angle of 50 degree

Painting and Lettering:

The entire surface should be first cleaned by sand blasting or any other appropriate method and given a coat of anti corrosive primer. Bituminous or any other anticorrosive paint shall be applied to the inside surface of the body, whereas outside surface shall be finished with two or more coats of Air drying enamel paint of desired shade and color as approved by purchaser. The bidder should get the colouring paint/ name & slogan writing

approved from the purchaser.

Drawing:

The bidder should provide drawings of the Goods/Equipment (including openable cover)

proposed by them with his bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution.

22. Tractor -

Technical Specifications

The technical specifications of the equipment required by the purchaser are indicated in preceding paragraph. The Bidders shall complete the technical specifications for the Goods offered in their entirety so as to demonstrate their compliance with the requirements of the bidding documents

General:

Tractor, trolley and water tankers shall be used for day to day multi activities by the municipal authority.

Tractor

General:

The Tractor should be rugged and durable, and designed for ease of manoeuvrability and proper distribution of tractor, and axle induced stresses. The frame/chassis should be either fully welded or rigidly bolted to achieve this, in accordance with the manufacturer's standard procedures. It should be suitable for working under adverse site conditions, and the power train should be designed for this purpose.

Basic Specification:

a) Type: tractor complete with trolley attach ment provision.

b) Structure: Rugged, fully welded, durable and designed for durability and proper distribution of induced stresses.

c) Engine: Minimum Euro 2, fuel efficient, Turbo charged, 4 stroke OHV direct injection diesel engine. Minimum Gross Horsepower Rating: at manufacturer's rated RPM.

d) Cylinder: Minimum three cylinders vertical in line – 3 Cylinder DI Engine with Integral cylinder head.

e) Fuel Injection: In line fuel injection pump with variable speed mechanical governor. -

Mechanical.

f) Fuel System: Gravity and forced feed, Fuel tank capacity not less than 30 liters and fuel filtration should be dual stage.

g) Air Cleaner: should be of oil bath type with cyclone type transparent pre-cleaner.

h) Lubrication: Forced feed and splash type with full flow filter paper element

i) Cooling: Impeller type water pump, fan and radiator, forced feed water circulation.

j) Compression Ratio: More than

k) Transmission: 8 forward and 2 reverse gears

l) Clutch: Single/Double plate dry friction type

m) Gear: 4 forward and 1 reverse,

m) Steering: Worm and nut type with re-circulating balls, power steering type.

n) Brakes: Shoe/Disk Type, Emergency brakes: hand brake with parking latch, Oil immersed brake.

o) Electric System: Voltage: 12 volts, Battery capacity: 12 volts, 60 Amps/hr @ 5 hr rating, Alternator capacity: minimum 12 volts 13 Amp, Head lights: 2 nos. 12 V -36 W, Brake light: 2, nos. 12 V-21, Rear light: (Plough lamp) -01

p) Instrument Panel: it should have tachometer and hour meter, water temperature gauge, oil pressure gauge, ampere meter, fuel gauge, high beam indicator, left and right turn indicators, hazard warning switch, hand and foot accelerator etc.

q) Seat: longitudinal adjustable with back rest and hydraulic shock absorber.

r) Wheel and Tyres: No. of wheels: Front: 2, Rear: 2.

s) Hydraulics: Hydraulic system with ADDC, single acting cylinder position and mixed Control, provision for external circuit for double acting cylinders.

t) Painting: Paint process and paint should be superior quality to ensure long lasting structure resistant to rust, weathering and breakage. The bidder should get the colouring paint/ name & slogan writing approved from the purchaser.

u) After Sales Support:

- Free service in the first year with a warranty for the machine for 1 year from the date of
- Commissioning.
- To demonstrate capabilities of giving proper service and spaces after the expiry of warranty period.

- Should be capable of proposing maintenance contract for subsequent years at respective ULBs.

The Manufacturer/Supplier should provide following with each vehicle:

(a) Manufacturer's standard tools for maintenance with lockable security box.

(b) Operator's manual

(c) Workshop and service manual

(d) Spare parts catalogue

(e) Technical details, drawing and operation manual

(f) Warranty card for one year

(i) Battery warranty card for 1 year.

Warning System and Essential Accessories:

(a) Digital Hour mete

(c) Fuel gauge

(d) water temperature gauge

(e) Engine oil pressure gauge with warning light

(f) Ammeter supported with warning light

(g) Horn- 2 pieces

(h) External rear view mirrors

(I) Radiator protection grill

(j) Head and tail lights, cabin lights, reversing light and traffic indicator

(k) Spare wheel with tyre and inner tube

(l) Jack and wheel wrench

(m) Anti-theft steering lock

(p)Speedometer

(q) GPS system for tracking

The following genuine obligatory spares to be supplied along with each equipment:

- Oil Filter - 3 no.
- Diesel Filter Primary - 3 no.
- Diesel Filter Secondary - 3 no.
- Hub, Packing - 4 no.
- Rear Wheel Oil seal - 4 no.
- Split Pin - 4 no.
- Fuse - 3 no.

- Bulb - 2 no.
- Wheel Nut - 4 no.
- Tapper covers packing -2 no.
- Air cleaner rubber - 2 no.
- F.I.P. packing - 1no.
- Air Breather - 1no.
- Gasket elbow -1no.

Specification	**12-16 HP**	**20-28 HP**	**35-40 HP**	**45-55 HP**
Engine Cylinders	1 Cylinder	2 Cylinder	3 Cylinder	3 to 4 Cylinder
Clutch	Single	Single	Single	Dual
Brake	Dry Disc	Dry Disc	Dry Disc	Dry Disc
Steering	Mechanical	Mechanical	Mechanical	Power Steering
No. of Gears	8 Front, 2 Revers	8 Front, 2 Revers	8 Front, 2 Revers	8 Front, 2 Revers
Front Tyre	5.20x14	6.00x16	6.00x16	7.50x16
Rear Tyre	8.00x18	12.4x28	13.6x28	16.9x28
Hyd. Lift Capacity	500 Kg	1200 Kg	1200 Kg	1600 Kg

Rate should be quoted separately for each capacity.

23. Portable Fogging Machine

The technical specifications of the equipment required by the purchaser are indicated in preceding paragraph. The Bidders shall complete the technical specifications for the Goods offered in their entirety so as to demonstrate their compliance with the requirements of the Contract Agreement.

i. **Portable Fogging Machine**

FOGGING SPRAYER AF 2000 NT	
Size	As per manufacturer's Design
Solution Tank	5 Ltr
Solution Tank Material	Stainless Steel 304L
Fuel Tank	1.5 Ltr Stainless Steel 304 L
Power Output	18.6 Kw
Fuel consumption	1.5 Ltr/Hour
Flow rate	8-42 Ltr/Hour
Starting Method	Manual Pumping
Battry	6 Volt (1.5V X 4)
Pressure in solution tank	0.25 Bar
Pressure in Gasoline Tank	0.06 Bar
Paint	Chemical Resistant epoxy paint
Weight	7.9 Kg

FOGGING SPRAYER AF 2000 NK - AUTO	
Size	230 x 1,350 x 340 MM

Solution Tank	8 Ltr
Solution Tank Material	Stainless Steel 304
Fuel Tank	1.8 Ltr Stainless Steel 304
Power Output	18.6 Kw
Fuel consumption	1.5 Ltr/Hour
Flow rate	40 Ltr/Hour
Ignition	electronic Ignition coil fed by 12 V battery
Starting Method	Push Button
Battry	12 Volt
Pressure in solution tank	0.2 bar
Pressure in Gasoline Tank	0.1 bar
Principal Engine	Single minimum 30 HP Pulse-Jet
Control	All controls at operatorshand
Paint	Staineless steel material no Painting
Weight	10 Kg
Make	Korea

24. Vehicle Mounted Fogging Machine

FOGGING SPRAYER AF 4000 NK-VM	
Size	710 x 1,330 x 490 MM
Solution Tank	100 Ltrs Stainless steel
Solution Tank Material	Stainless Steel 304
Fuel Tank	16 Ltrs
Engine Capacity	45 KW
Filters	In Fuel and formulation Lines
Fuel consumption	3.3 L/H
Flow rate	60-190 Ltr/Hours according to Nozzles Used
Droplet Size Range	<20µm(oil)
Ignition	Electronic Ignition Coil fed by car battery
Starting Method	Fully Automatic Complete remote Control
Battry	12 Volt
Minimum Output	approximately 3000 cum/min
Principal Engine	single minimum 30 HP Pulse-Jet / Double minimum 60

	HP Pulse - set
Control	All controls at operators hand
Paint	Staineless steel material no Painting
General	Thermal Aerosal Fog
Weight	45 kg + 35Kg = 80 Kg
Make	Korea

FOGGING SPRAYER AF 4000 NK-VM with 3 wheel or 4 Wheel Vehicle	
FOGGER	
Size	710 x 1,330 x 490 MM
Solution Tank	100 Ltrs Stainless steel
Solution Tank Material	Stainless Steel 304
Fuel Tank	16 Ltrs
Engine Capacity	45 KW
Filters	In Fuel and formulation Lines
Fuel consumption	3.3 L/H
Flow rate	60-190 Ltr/Hours according to Nozzles Used
Droplet Size Range	<20µm(oil)
Ignition	Electronic Ignition Coil fed by car battery
Starting Method	Fully Automatic Complete remote Control
Battry	12 Volt
Minimum Output	approximately 3000 cum/min
Principal Engine	single minimum 30 HP Pulse-Jet / Double minimum 60 HP Pulse - set
Control	All controls at operators hand
Paint	Staineless steel material no Painting
General	Thermal Aerosal Fog
Weight	45 kg + 35Kg = 80 Kg
Make	Korea
CHASSIS	
Make	Tata Ace/Mahindra/Ashoke Leyland
Gross Vehicle Weight	Minimum 1500 kg
Pay Load	735 Kg
Engine	Fuel efficient, 4-stroke, Indirect injection Diesel Engine delivering around 13 HP at rated RPM BS-IV Model
Clutch	Single Plate dry friction type
Gear Box Type	Synchromesh
No of Gears	4 Forward and 1 reverse
Steering	Mechanical
Service Breakes	Dual circuit Hydraulically activated
Parking Break	Cable Operated on rear wheel
Engine Exhaust Break	Pneumatically operated with foot control valve
Suspension	Parabolic leaf spring at front and rear

Shock absorber	Hydraulic double acting telescopic type both front & rear.

25. Automatic Organic Waste Converter 50 to 500 KG

Machinery and Equipment	Specifications
OWC-30.	1. Power Connection : 2.5 HP (Main Motor & Chopper Motor) 2. Brim Capacity : 30 Liters 3. Waste Batch Size : 10 Kg 4. Batch Duration : 15 minutes 5. Material of Construction : All contact parts of SS-304 6. MOC of Outer Cover : MS Powder Coated
OWC-60.	1. Power Connection : 4 HP (Main Motor & Chopper Motor) 2. Brim Capacity : 60 Lit. 3. Waste Batch size : 25 Kg. 4. Batch Duration : 15 min. 5. MOC : All contact parts of SS-304. 6. MOC of Outer Cover : MS Powder Coated 7. Trolley : One No. of MS.
OWC-130	1. Power Connection : 8 HP (Main Motor & Chopper Motor) 2. Brim Capacity : 130 Lit. 3. Waste Batch size : 50 Kg. 4. Batch Duration : 15 min. 5. MOC : All contact parts of SS-304. 6. MOC of Outer Cover : MS Powder Coated 7. Trolley : One No. of MS Powder Coated.
OWC-300.	a) Power Connection : 13.5 HP (Main Motor & Chopper Motor) b) Brim Capacity : 300 Lit. c) Waste Batch size : 125 Kg. d) Batch Duration : 30 min. e) MOC : All contact parts of SS-304. f) Trolley : One No. of SS-304
OWC-500.	a) Power Connection : 16 HP (Main Motor & Chopper Motor) b) Brim Capacity : 500 Lit. c) Waste Batch size : 170 Kg. d) Batch Duration : 25-30 min. e) MOC : All contact parts of SS-304. f) Trolley : One No. of SS-304. g) Mobility arrangement : Suitable mobility arrangement for the equipment for movement on the plain flooring.
Double Shredder	Shredder is required if garden waste like plant pruning's is to be converted into organic manure as also will take care of meat bones. Double Shredder of M.S. Contact parts, having feed cross section of 130 mm x 300 mm and depth of 100 mm complete with 2 H.P. Drive geared motor and

	mounted on fabricated frame for easy working. Note: The cutters are made of C.S duly carburized and hardened. The two shafts holding the cutters operate at differential speeds i.e. 100 R.P.M and 70 R.P.M to facilitate self cleaning. Body Cover SS 304 and Mobility Arrangement.
Single Curing System	**Capacity: 100 Kg of Organic Waste per day.** 1. 50 No. of HDPE crates of size 54x36x26 cm, laminated with aerating net. 2. One number of four shelf folding storage rack of size 365x120x255 cm. 3. 2 Nos. of Leach ate collection tray of G.I. of size 150x55x7 cm. 4. Double Fogger: Moisture control fogging system consisting of 70 foggers, Disc Filter, Ball Valve, 1 No of Laxmi Make Pump, Time Control unit for spray and frequency control, One number of pressure gauge, and other accessories like piping, valves etc.
Double Curing System	**Capacity: 200 Kg of Organic Waste per day.** 1. 100 No. of HDPE crates of size 54x36x26 cm, laminated with aerating net. 2. One number of four shelf folding storage rack of size 365x120x255 cm. 3. 4 Nos. of Leach ate collection tray of G.I. of size 150x55x7 cm. 4. Double Fogger: Moisture control fogging system consisting of 140 foggers, Disc Filter, Ball Valve, 1 No of Laxmi Make Pump, Time Control unit for spray and frequency control, One number of pressure gauge, and other accessories like piping, valves etc.

26. Skid Steer Loader

i. 46 HP to 50 HP

Description	JCB 135	Bobcat S450	Case SR130	New Holland L213	Volvo MC60C
Performance					
Rated operating load, standard(lbs)	1,350	1,300	1,300	1,300	1,350
Operating load with optional counterweight (lbs)	--	--	1,400	--	--
Tipping load, standard (lbs)	2,989	2,600	2,600	2,600	2,989
Height to bucket pin (in)	118"	109.5"	112"	112"	118"
Dump height @ bucket discharge (in)	89"	84.9"	88.4"	88.4"	89"
Dump reach @ max height (in)	36"	20.8"	22.7"	18.5"	22"
Max dump angle @ full height(deg)	42°	40°	40.2°	40°	42°
Bucket rollback at ground level(deg)	30°	26°	26.1°	26°	30°
Bucket breakout (lbs)	4,012	2,776	4,180	4,180	4,012
Lift type: Radial (R) or Vertical (V)	R	R	R	R	R
Arm lifting force (lbs)	3,175	2,765	2,850	--	3,175
Engine					

Engine make	Perkins	Bobcat	ISM	ISM	Kohler
Engine model	Perkins 404D-22	1.8L	N844L-F	N844L Tier 4F	KDI 1903 TCR - Tier 4F
Gross power (hp)	46	49	49	49	48
Net power (hp)	--	--	46	46	47.2
Drive Train					
Max travel speed (mph)	7.5	7.1/9.2	7.4	7.4	7.5
Tire size	10 x 16.5	10 x 16.5	10 x 16.5	--	10 x 16.5
Hydraulics					
Standard pump flow (gpm)	18.5	16.7	18	17.5	18.5
Optional pump flow (gpm)	26.4	--	--	--	--
Hydraulic pressure (psi)	3,335	3,300	3,050	3,046	3,335
Dimensions					
Overall length w/bucket (in)	137"	124.9"	125"	119.2"	137.4"
Width over tires (in)	59"	58.6"	59.8"	59.8"	59.8"
Height to top of ROPS (in)	78"	77.8"	75.5"	75.5"	78"
Ground clearance (in)	8.3"	8.4"	7.0"	7"	8.3"
Rear angle of departure (deg)	25°	23°	22°	22°	25°
Wheelbase (in)	42"	35.4"	37"	37"	42.1"
Capacities					
Fuel tank (gal)	25.9	14.4	16	16	25.9
Hydraulic system/tank (gal)	11.1 / --	5.5 / 1.4	8	7.73	11.5
Weight					
Operating weight (lbs)	5,988	5,027	5,180	5,070	6,153

ii. 56 HP to 61 HP

Description	JCB 155	Case SR160	New Holland L216	Volvo MC70C	Rhino Equipment RS60-S
Performance					
Rated operating load, standard(lbs)	1,550	1,600	1,600	1,550	1,543
Operating load with optional counterweight (lbs)	--	1,700	--	--	--
Tipping load, standard (lbs)	3,100	3,200	3,200	3,100	3,499
Height to bucket pin (in)	118"	112"	112"	118"	118.4"
Dump height @ bucket discharge (in)	89"	88.4"	88.4"	89"	87.0"
Dump reach @ max height (in)	36"	22.7"	18.5"	22"	17.7"

Max dump angle @ full height(deg)	42°	40.2°	40°	42°	45°
Bucket rollback at ground level(deg)	30°	26.1°	26°	30°	31°
Bucket breakout (lbs)	4,012	5,270	5,270	4,012	--
Lift type: Radial (R) or Vertical (V)	R	R	R	R	R
Arm lifting force (lbs)	3,902	3,310	--	3,902	--
Engine					
Engine make	Kohler	ISM	ISM	Kohler	Rhino II
Engine model	KDI 1903 TCR	N844LT-F	N844LT Tier 4F	KDI 1903 TCR - Tier 4F	RS60-A4988PG
Gross power (hp)	56	60	60	56	61
Net power (hp)	--	57	57	55.7	61
Drive Train					
Max travel speed (mph)	11.5	7.4	7.4	7.5 / 11.5	7
Tire size	10 x 16.5	10 x 16.5	--	10 x 16.5	10-16.5 x 10PR
Hydraulics					
Standard pump flow (gpm)	18.5	18	18.4	18.5	16.1
Optional pump flow (gpm)	26.4	--	--	26.4	--
Hydraulic pressure (psi)	3,335	3,050	3,046	3,335	3,124
Dimensions					
Overall length w/bucket (in)	137"	125"	119.2"	137.4"	132.3"
Width over tires (in)	63"	59.8"	59.8"	63"	63.8"
Height to top of ROPS (in)	78"	75.5"	75.5"	78"	82.3"
Ground clearance (in)	8.3"	7.0"	7"	8.3"	7.9"
Rear angle of departure (deg)	25°	22°	22°	25°	20°
Wheelbase (in)	42"	37"	37"	42.1"	42.2"
Capacities					
Fuel tank (gal)	25.9	16	16	25.9	19
Hydraulic system/tank (gal)	11.1 / --	8	7.73	11.5	18
Weight					
Operating weight (lbs)	6,190	5,645	5,510	6,355	6,173

27. Tracked Excavator

i. **JS 205LC Tracked Excavator or equivalent (JCB/CASE/Terex etc)**
ii. **JS 140LC Tracked Excavator or equivalent (JCB/CASE/Terex etc)**

Rate should be quoted separately for each capacity.

28. Auto-Rickshaw mounted sewer cleaning jetting machine of 500 litres capacity

JETTING PUMP

Capacity : Min 13 LPM and pressure up to 207 bar

Pump R.P.M. : 3400 Max.

Construction & Material Quality:

- Forged brass pump head and conrods with high mechanical resistance and corrosion proof.
- S.S. check valve and piston guide
- Solid ceramic plunger highly corrosion and abrasion proof.
- High quality double sealing gasket (For high and low pressure) in Buna textile "V" packing.
- Anodised aluminium DIE-CAST crank case fins that ensure optimal oil temperature.
- Having hollow shaft of 25mm NB & J flange for direct coupling to engine.

TANK

Capacity : 500 Litres
Shape : Cylindrical horizontal fitted tank.
Material : High Density Polyethylene (Roto-moulded)

ENGINE

Performance : Min 10 H.P. 3000 RPM Diesel Operated.
Type : Electric Start
Starter (optional) : Battery operated 12 V. power taken from vehicles battery.

JETTING HOSE:

Type : Special High-pressure jetting house.
Housing I.D. : dia ¼"
Minimum working pressure :220 bar
Minimum bursting pressure :440 bar
Hose length : 30 Mtrs.
Construction
Core : Thermoplastic
: Techno polymer
Pressure : Two Braided High Tensile
Reinforcement : Synthetic Fibre
Outer Level : Thermoplastic Technopolymner
Temperature : (400 C to 1200 C)

Fitting :S.S. Fitting on both sides of sewer jetting house and fitted with high pressure self-propagating heavy duty S.S. Jetting Nozzle.

HOSE REEL

- Manual
- Fitted with heavy duty S.S. Rotary Joint.
- Capable of winding 30 mtrs. Long sewer jetting house.
- Also capable to accommodate 60 mtrs. Long jetting house.

AUXILIARY SPRAYING GUN.

Spray Gun : Adjustable type to spray water / pesticide water mixture, max. discharge 25 Lpm at 250 bar. Inlet G3/ 8F with lense adapter. Inlet Size. G1/4m.

Out let : M 22 x 1.5

Size of lense with nozzle inlet : M 22 x 1.5

Size of Nozzle (min) 1.2 mm dia

Type :Special high pressure house fitted with spraying gun.

House I.D. : dia ¼"

Application : 10 Mtrs.

VALVE

- Lever operated 3 way high pressure ball valve for main house reel.
- Lever operated 3 way high pressure ball valve for auxiliary spraying gun.
- Drain valve : 25 mm Ball valve

ACCESSORIES & SAFETY DEVICES

a) Heavy Duty glycerine filled pressure gauge.

b) Flexible water level indicator

c) Unloader valve.

Max. flow : 30 Lpm

Outlet : M 22 x 1.5 m

Inlet : G3 / 8 M

Bypass : G3 / 8 M

d) Water level alarm audio / visual

e) Suction gate valve

f) Focus light at front & rear

g) Search light with extendable wire

h) Tank filling Cap atop of the tank

i) Safety valve.

Pressure Range : 220 Bar

Discharge : 24 Lpm max.

Inlet : G3/ 8 F

Bypass : G3/ 8F

j) Inlet filter of mesh 50, cartridge Dia 50 x 150 mm, polypropylene body, epdm gasket, polypropylene cartridge frame, working pressure 10 bar max

k) Pesticide injector

Inlet : 3 / 8F

Outlet : 3 / 8M

Nozzle : 2.1 MM

SIDE PANELING

Structure made from either M.S. Square pipe or M.S. Angle and covered with 18 G. Aluminium sheet.

REAR DOOR

Hinged Type rear door with locking arrangement to protect the pump, engine, hoses etc. from mishandling.

PAINTING

1) Two coats of zinc based red oxide paint
2) Two coats of shade polyethylene paint as per choice

OVERALL DIMENSION

Overall Length	: 2930 mm appox.
OVERALL WIDTH	: 1490 mm appox.

Diesel Three-Wheeler Chassis

Make	:- BAJAJ-GC-1000 / PIAGGIO ape D600 / Equivalent
Engine	: Pear Engine (Diesel)
Type	: Single cylinder four stroke, direct injection, diesel Engine
Displacement	: 395 CC
Maximum Power	: 8.0 B.H.P. @ 3600 rpm
Fuel Efficiency	: 36 + 4 KM / LTR.
Maximum Speed	: 50 KM / HR
Starting	: Electric, Self-Start
Cooling	: Forced air cooled
Gear Box	: 4 Forward + 1 Reverse
Chassis	: Chassis shall be of reputed make having 950- 1000 kgs.GVW. The specifications shall be as per the standards of the chassis manufacturer
Suspension	
Front	: Dual action hydraulic telescopic shock absorber with helical springs.
Rear	: Independent suspensions triangular arm, rubble compression spring & dual action hydraulic shock absorbers.
Steering	: Handle bar type
Breaks	:Tandem master cylinder, Hydraulically operated, internally expanding shoe type on all wheels.
Fuel Tank	: 10.5 Ltrs.
Weight & Dimension	
SVW	: 975 Kgs. Maximum
Maximum Length	: 2930 mm
Maximum Width	: 1490 mm
Maximum Height	: 1635 mm
Wheel Base	: 1920 mm
Turning Radius	: 2750 mm
Track Width	: 1260 mm
Cargo Bed	: 1480 mm x 1400 mm
Tyres	: 4.5 x 10, 8PR
Wheels	: 3 Stud type
Axles	: Rear wheel drive by 2 propeller shafts
Min. Ground clearance	: 165 mm
Front Axle	: Non driven stub axle
Rear Axle	: Independent drive
Driver's cabin	: Manufacturer's original complete closed type driver cabin having two doors with windows & locks, light weight made out of pressed sheet.

29. Chain Mounted Open Drain Cleaning Machine

TECHNICALS SPECIFICATIONS

Operating weight with canopy (with rubber tracks)	:	kg 1.730
Travelling speed km/h	:	1^a : 0 ÷ 2,2 / 2^a : 0 ÷ 4,2
Slew speed	:	rpm 12

ENGINE

Power (2.100 rpm)	:	kW - HP 11,2 - 15,2
Displacement	:	cc 854
Number of cylinders	:	n° 3
Cooling	:	water
Alternator	:	V (A) 12 (35)
Battery	:	V (Ah) 12 (65)

HYDRAULIC SYSTEM

Pump type	:	variable flow
Pump displacement	:	cc 8+8+6,5
Pump capacity	:	lt/min 17,6+17,6+14,3
Max. circuit calibration pressure	:	bar 210
Auxiliary system:		
Max capacity	:	lt/min 36,
Max pressure	:	bar 210

PERFORMANCES

Max digging depth standard arm (optional arm)	:	mm 2.300 (2.500)
Max dumping height with canopy standard arm (optional arm)	:	mm 2.700 (2.850)
Max dumping height with cab standard arm (optional arm)	:	mm 2.530 (2.635)
Bucket breaking force (standard arm) ISO 6015	:	daN 1.550
Arm breaking force (standard arm) ISO 6015	:	daN 1.050
Traction force	:	daN 1.500
Ground bearing pressure with rubber tracks and canopy (with cabin)	:	kg/cm^2 0,32 (0,33)
Max slope	:	60% - 30°

DIMENSIONS

Maximum width	:	mm 990 - 1.300
Total height	:	mm 2.357
Rear rotation radius	:	mm 650
Digging arm length standard (optional)	:	mm 1.150 (1.350)
Tracks width	:	mm 230
Rollers number (for each side)	:	n° 3

FILLINGS

Fuel tank	:	lt 18
Hydraulic oil tank	:	lt 20
Hydraulic circuit capacity	:	lt 30
Cooling system capacity	:	lt 4
Engine oil	:	lt 2,8

CONTROLS

Boom, dipper stick, bucket and turret swing	:	2 pilot joysticks
Track movements (included counter rotation)	:	2 levers
Dozer blade	:	1 lever
Auxiliary circuit (simple or double effect)	:	left pedal
Boom swing	:	right pedal

LIFTING CAPACITY Opening arm from the rotation's center (m) Lifting capacity (kg) at 1.0 m height					
	1,5	2	2,5	3	MAX
Frontal and lowered dozer blade	660	440	360	310	250
Frontal and lifted dozer blade	610	410	280	205	180
Lateral, open undercarriage	610	410	235	195	160

The Machine should have provision for widening the under carriage & blade ensuring greater stability & complete operating mobility.

The Machine should have zero tail.

30. Manhole Desilting Machine

Hydraulic operated cum Winch Drive De-silting Grab Bucket System developed either on 4-wheeler (LCV) is the ideal solution for cleaning of manholes and wet wells. The machine can easily and effectively collect the sludge from a depth of 30' / 35' without having the person to enter into manholes and wet wells. Complete hydraulic winding of ropes, swiveling of boom, extending of boom and hydraulic hopper. Fully equipped machine is provided with Extendable Boom for extended reach, rear hopper to avoid multiple handling of the sludge. No need to empty / discharge the silt at road in open thus avoiding creating unpleasant environment and spread of bad odor, as the sludge can be collected in the rear hopper of the vehicle and can be hydraulically emptied in big containers.

TECHNICAL SPECIFICATION

Chassis – Mahindra /TATA/Ashoke Leyland

Model – Bolero Maxi Truck/Tata Super Ace/Ashoke Leyland Dost

Prime mover	Power required for hydraulic system is taken from vehicle's engine.
Performance	
Max traveling depth	9 mt.
Safe load to be lifted	20 kg
Swing angle	90 degree on both side
Boom lifting angle	45 degree
Boom extension	Manual extension 600mm min.
Grab bucket	
Type	Hydraulic operated MS steel casting mould.
Capacity	20 ltrs
Material	8mm thk Casted Steel
Boom	
Type	Manual extendable type
Size	Outer boom : 100x100 x3 mm MS square pipe Inside pipe: 72x72x3mm MS sq pipe
Wire rope	
Make	USHA MARTIN or equivalent
Size	6mm dia.x 40 ft length
Wire reel	
Type	Hydraulic operated
Size	140 mm ID
Hose reel	
Type	Hydraulic operated with rotary joint.
Hydraulic cylinder	
Numbers	Grab bucket cylinder-1 no Hopper cylinder-1 no Swing cylinder-1 no Boom cylinder-1 no
Material	Tube : M S honed tube Rod : induction hardened ,deep, ground chrome plated from EN 8
Hydro motor	
Make	SAME/M+S or reputed make
Capacity	12.5cc /rev.

Control valve	
Make	Hydro control/Badesnost or equivalent make
Flow rate	40 LPM
Flexible hose	
Make	Parker or equivalent make
Type	R2
Oil tank	
Capacity	20 ltrs approx.
Accessories	Suction strainer, return line filter, oil level dipstick
Hopper	
Capacity	0.5 cu.m
Material	The hopper bucket is made from galvanized sheet with adequate reinforcement.
Loading height	1320 mm approx.
Unloading height	1185mm approx.
Paint	Two coat of zinc based red oxide Two coat of synthetic enamel

31. Cattle Catcher

CHASSIS

Make – Eicher /TATA/Ashoke Leyland

Model – Eicher 10.59 XP/Tata 407 LPT/Ashoke Leyland Partner

Loading capacity: -

The equipment will have a loading capacity of approx. one ton.

Hydraulic Cylinders: -

The equipment shall have two no of double acting single stage cylinders made from imported honed tube having bore dia 63 mm and shaft dia 50 mm. The cylinders shall have imported seals of Bushak Shamban/castas/Technolan/

Hydraulic System: -

Hydraulic System shall have imported valves of Hydrocontrol/Badesnost make having a flow rate of 35 LPM. Hydraulic pump must be gear type of Dowty/Vickers make having a flow rate of 3.5 GPM. All the H.P Hoses must be of imported make Gates/ Markwell/ Yokohama/ Aeroquip. All the MS Pipes used must be seem less. A pilot operated load holding valve must be incorporated in the system to avoid collapsing of the cylinders during Engine / Hose failure.

Hydraulic Tank: -

The system shall have a hydraulic tank of capacity not less than 40 Ltrs including the first fill. The tank shall incorporate return line filter, Suction filter, air breather, level indicator and a drain plug. It should be fixed with the chassis of the equipment at an appropriate height to avoid starving of hydraulic pump.

Hydraulic oil: -

Hydraulic oil used in the system shall be of servo HD-68

Frame: -

The equipment shall have a fixed frame fixed to each side of the body of the chassis made from MS channel of 100*50*50. The frames shall be joined in the cross through M.S channel of 100*50*50. The cylinders shall be bolted inside these fixed frames and can be removed from the top of the frame and not from the bottom of the frame. And the cylinder movement shall be made precise through guiding mechanism. The machine shall also have movable frames made from 125*65*65 M.S. channel. The movement of this movable frame shall also be made accurate through a proper guiding mechanism.

Platform: -

The loading platform shall be made from M.S. Channel 100*50*50 and the flooring shall be done by chequered plate of 5 mm. to avoid slipping of animal during loading and unloading. Proper railing shall be provided on the floor to avoid jumping of animal during the operation.

Channel & Wire-Rope: -

Tested M.S. Chain of ½" dia of reputed make shall be given so that the platform can be kept perfectly horizontal during loading and unloading. The wire-rope of 16 mm dia and the pulley arrangement shall be provided in the platform to fold the platform and to convert it into the rear door. Necessary locking arrangement shall be given in the door during transit of the machine.

Pins and Bushes: -

All the M.S. bushes shall be provided with self-lubricating bushes. All the pins must be made of EN-8 material and hardened.

Painting: -

As per Customer's choice.

32. Containerized Tricycle Rickshaw with 8 bins

Containerized Tricycle fabricated out of MS angle, Tee and Flats, suitable to accommodate 8 Bins of 25 litre capacity & ideal for solid waste collection and transfer to central collection collectors. The Tricycle shall be strong & sturdy and suitable to satisfy the critical needs of waste collection and transportation. The Tri-Cycle frame shall be suitable for placing 8 nos. of 25 litres capacity HDPE bins in 8 slots made with iron frame of MS Angle of size 30x30x5mm and flat of 30x5mm. The Tri-Cycle shall also have standard bell, cycle locks, reflector, hooks, toolkit, locker, seat with cover, hangers for broom, wiper etc. as per following specifications

General:	Supply of Heavy Duty Tri-Cycle shall have pneumatic wheels with 32 nos. heavy duty spokes at rear and front with 8nos. of HDPE waste bins of 25 litres capacity required for door to door garbage collection as per approved design conforming to the Technical Specifications:
	The tricycle shall have three pneumatic wheels with 32 Nos heavy duty spokes at rear and front. The Tri-Cycle shall have locking arrangement. The Tri-Cycle frame shall be suitable for placing 8 nos. of 25 litres capacity bins in 8 slots made with iron frame of MS Angle of size 30x30x5mm and flat of 30x5mm. The Tri-Cycle shall also have standard bell, cycle locks, reflector, hooks, toolkit, locker, seat with cover, hangers for broom, wiper etc. All the steel work shall be properly painted with approved paint and colour after application of primer as per approved drawing. The supplier shall submit detailed drawing of the Trycycle and get approved before manufacture
Material: **Material of Bin**	M.S. Angle, Flat & Pipe. The body of the bins shall be made of High Density Polyethylene (HDPE) grade conforming to IS 10146-1982 suitable for injection/ roto moulding applications where good mechanical properties, gloss, dimensional stability & good ESCR are required. The physical characteristics & typical properties of raw material shall be as per BIS/ ASTM standard.
Handle:	Handle bar shall be of Heavy duty chrome plated nickel & shall conform to IS: 625/1993 and the size shall not be less than 410mm between the two handle grips. The front forks shall be as per IS:2061/1995 and it shall be of reputed make like Hero, Atlas, KW, Avon. Special standard C P rounded with rubber grip should be provided in the handle.
M.S. Name Plate:	For identification of containerized Tri-Cycle rickshaw, M.S. plate of 150x120 mm of 22 gauge shall be welded at the front side of the Hand Cart.
Frame, Fork with fitting:	Mild steel heavy duty tubular frame with 5 tubes, made from tube of size 28.6mm x 1.63mm confirming to IS: 2039/1991 of reputed make like Hero, KW, Atlas, Avon.
Pedal:	Heavy duty paddle of reputed make like Hero, Atlas, KW, Avon.
Chain Wheel & Crank:	Heavy duty Chrome plated chain wheel & cranks confirming to IS: 1281/1996 of reputed make like Hero, Atlas, KW, Avon.
Chain:	212-links-heavy duty-extra strong chain confirming to designation 083-1 of IS: 2403/1991 of reputed make like Hero, Atlas, KW, Avon.
Chain Cover:	Quarter Chain Cover black, of thick gauge of size 18 Gauge x 3.5" width of reputed make like Hero, Atlas, KW, Avon.
Mud Guard:	Front mud guard of 18 gauge with steel stays of reputed make like Atlas, KW, Avon.
Hub:	64 X 10 Gauge Front - BCP.
Fork Guard:	Heavy duty, black painted with clip

Cotter Pin:	Standard Zinc plated 9.5 mm.
Seat:	Good Quality, Scooter type
Brake:	With heavy duty shoe and clip.
Rear Rim:	28" x 1.5" heavy -10 Gauge chrome plated Nickel - 1.6 Kg of reputed make like Atlas, KW, AVON.
Front Rim:	3.25 x 16Gauge Bullet rim – 16 " dia Hub bearing 2204/2205 with MS round spokes of heavy duty.
Rear Mud Guard:	Heavy duty ,16 gauge steel mud guard
Bell:	1 no. 80mm round , Heavy Duty.
Lock:	1 No. good quality with 7 levers
Reflectors:	Red reflector at the rear.
Finish:	The frame of tricycle and mudguards, other exposed mild steel components of chassis shall be thoroughly cleaned by suitable means to remove rust, scale and oily substances. These shall be then chemically rust proofed and stove enamelled, spray painted or otherwise finished to give a glossy finish. The colour shall be black/ dark green or any other shade as agreed between purchaser and supplier. All the metallic parts other than those painted as mentioned above shall have a smooth finish and shall be plated chromium over nickel in accordance with grade No. 3 of IS: 1068/1993.

HDPE containers of 25 liter capacity

a) General requirements:-

- Moulded in one piece from virgin grade of Polyethylene Material, smooth, strong & sturdy.
- The internal shape and surface of the container shall be such that it will not trap the contents
- There shall be no sharp edges anywhere on the container.
- The internal & external surfaces shall be smooth and non porous, free from cracks, splits, dents, distortion, blisters, voids and other surface blemishes or defects.
- The bins are expected to be used in outdoor conditions. They should be able to withstand outdoor worst weather conditions in India. They shall be UV protected.
- The bins shall conform to the colour code and have of ULB logo embossed and other markings as asked by fixing a sticker / screen printing.
- The bins shall be provided with adequate stiffeners/ribs on all sides and at bottom for enhancing the structural strength of the bin.

b) Dimensions and other particulars: The hand cart or tricycle bins shall conform to the following:

1	Volume	25 Ltrs.
2	Shape	Square or Circular
3	Process of moulding	Injection/ Blow moulding in one tough piece.
4	Container Dimensions:	
a)	Top	300 to 325 x 300 to 325mm (clear inside dimensions) or 300 to 325 mm internal dia.
b)	Bottom	280 to 295 x 280 to 295mm (clear inside dimensions) or 250 to 280mm dia.
C)	Height	300 to 400mm (clear dimensions)
5	Thickness (minimum)	Sides :3mm; Bottom: 4mm
6	Strengthening projection	Of not more than 40 mm height on the circumference.
7	Embossing	Logo of the ULB to be embossed on one side of the container
8	Colour	Blue or green (separately)
9	Four holes at the bottom	10 mm dia. each

10	Handle	Suitable stainless steel or chrome plated steel handle of 8mm dia strong enough to lift the load of 20 Kg.
11	Cover/Lid	Suitable lid welded with hinges for the bins
12	Locking	Locking arrangement to be provided to lock the container with cart.

c) **Material specifications and Body Construction :** The body of the bins shall be made of virgin grade of polyethylene conforming to IS 10146-1982 or equivalent, absolutely non-toxic, free from contamination, chemical resistant & blended with special grade of stabilizers of approximately 0.25%, anticorrosive & anti acidic conforming to the following:

S.No	Property	Testing Method	Unit	Value
1	Density	IS-7328-1992	gm/cm2	Should be between 0.94 to 0.96
2	Melt Flow Index	IS-2540-1963	gm/10min	0.8 to 8
3	Tensile Strength	IS-8543, part-4/Sec 7- 1984	Kg/ cm2	224 to 255
4	Flexural Modulus	IS-13360 Part 5/Sec 7- 1996	MPa	900 to 1000
5	Hardness (Shore)	IS-13360 Part 5/Sec 1-1992	D Scale	>D 50
6	Vicat Softening Temp	IS-13360, Part 6/Sec 1-1992	Deg. C	> 90
7	Impact Strength (2.5kg/1 mts)	IS-12701-1996	J/mm2	No sign of cracking, puncture /damage of sample
8	Weathering	IS-22530-1963	-	No 4 gray scale
9	Colour fastness to Artificial light/Rating	IS-2454: 1985	As per guidelines of IS 2454 (using sun test) CPs +Instrument	
10	Accelerated Ultra Violet Test (QU.V)	ASTM-G-53, (50˚ C)	Should be tested with QUV test type accelerated weather meter for 200 hours. Tensile strength and flexural modules should each be not less than 70% of the values before exposure.	

d) Tests for bins:

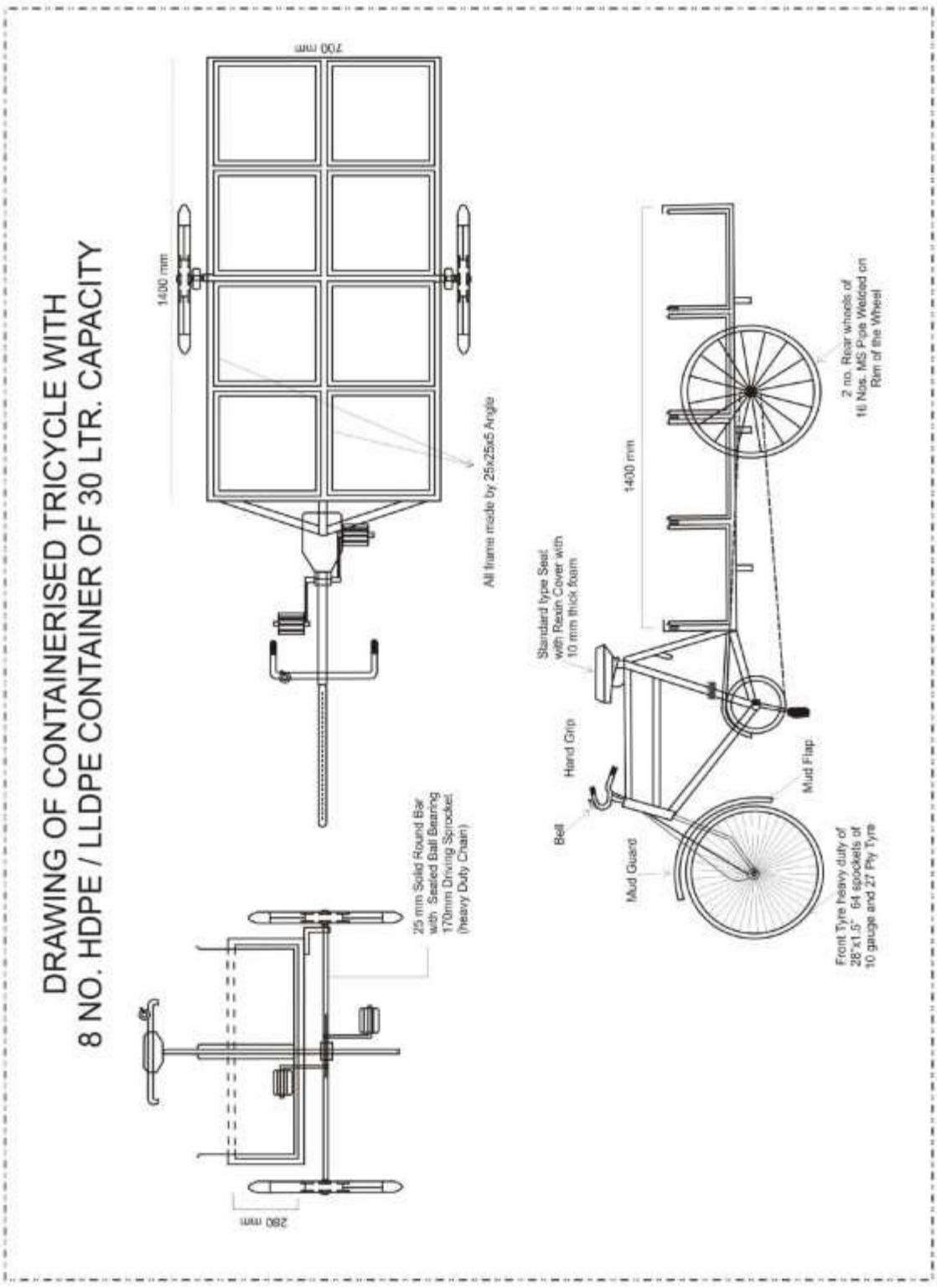
- The bin container shall be free from defects like de-shaping, holes, cuts/cracks etc.
- The thickness is to be checked by ultrasonic gauge.
- The density test/ MFI/ tensile strength/ flexural modulus / impact / hardness/weathering (colour fastness) and accelerated ultra violet tests (QUV) on bin material and bins are to be carried out at Government approved laboratory only and the testing charges shall be borne by the supplier.
- 1 sample per supply lot shall be collected at random by the inspecting authority in the presence of supplier and got tested.
- Any other tests on container/ lid/ MS frame/ Finish or any other component as decided by the purchaser.

e) **Dimensioned Drawings:**

The dimensions indicated in the specifications are a broad indication of the minimum requirements. The supplier shall furnish detailed dimensioned drawings to the purchaser for approval before taking up manufacturing.

Photograph is indicative only

A typical drawing of the Tri-Cycle with 8 Nos. of PE bins



33. Containerized Hand Carts with 6 bins

Containerized hand cart fabricated out of MS angle, Tee and Flats, suitable to accommodate 6 Bins of 25 litre capacity & ideal for solid waste collection and

transfer to central collection collectors. The cart shall be strong & sturdy and suitable to satisfy the critical needs of waste collection and transportation. The Hand Cart should be of minimum size 1010 mm x 700 mm x 250 mm with 6 Compartments for accommodating 6 Nos of HDPE bins of 25 litres capacity as per following specifications

- **Main frame:** 25mm x 25mm x 3mm thick MS angle in all directions. The frame should be suitable to fit 6 bins of 25-30 litre capacity.
- **Bottom:** 50mm x 50mm x 6mm thick M.S 'T' section; one placed at the centre longitudinally and two placed laterally.
- **Top:** 25mm x 5 mm thick M.S flats one number longitudinally at the center and two numbers laterally.
- **Sides:** 25mm x 5 mm thick M.S flats 6 nos vertically and the front portion covered with M.S Sheet of 18 gauge thick welded properly which shall be used as Name Plate for identification of Hand Cart.
- **Handle:** The handle of the same width of Cart at about 890 mm height from the base/ground at maximum angle of 45^0 made of 20 mm dia M.S pipe of 16 gauge thicknesses fitted with the cart by means of 25 mm x 25 mm x 5 mm M.S angle & supporting angles. Special rounded rubber grip of about 150 mm length should be provided on the handle for easy holding.
- **Wheels:** The Handcarts should be fitted with two numbers of strong & sturdy wheels fabricated out of MS Tee. Wheels to be provided with rubber on circumference should be about 500 mm dia with support of MS flat of 40 x 5 mm with 25 x 25 mm single axle double bearing provided on two sides. One number of HMHDPE rear wheel with 200mm dia x 75 mm width should be provided with proper CI hub, shaft etc.
- **Painting:** Painting with two coats of anticorrosive paint as per colour approved by the purchaser. The front side MS sheet shall be painted with two coats of anticorrosive paint with identification No., name of ULB, slogans etc.

Materials specifications and Body Constructions of Bin : The body of the bins shall be made of High Density Polyethylene (HDPE) grade conforming to IS 10146-1982 suitable for injection/ roto moulding applications where good mechanical properties, gloss, dimensional stability & good ESCR are required. The physical characteristics & typical properties of raw material shall be as per BIS/ ASTM standard.

Details of M.S. sections:

S. No.	Material	Size	Details	No
1	M.S.ANGLE	25X25X3 mm	Top Frame	----
2	M.S.ANGLE	25X25X3 mm	Bottom Frame, standing support	------
3	M.S.Tee	50x50x6 mm	Bottom Frame	3
4	M.S.Tee	40x40x6	Banding wheel	2
6	M.S.Flat	40x6	Support wheel & hub	12
7	M.S.Flat	20x5mm	For Axle Bracket	2

8	M.S.Flat	25x5 mm	Barrow Section Flat	----
9	M.S.Square bar	25x25 mm	Axle	1
10	Round Head Rivet	32x10	Riveting	2 wheel
11	Round Head Rivet	25x8	Riveting	2 wheel
12	Round Head Rivet	20x6	Joint Frame & Handle	2 Side
13	Haxagonal Bolt	40x10	Axle & Braket	2 Side
14	M. S. Washer	21x46mm-6Gauge Thick	Inside and outside hub	2 Side
15	Cotter Pin	6x50 mm Length	To Joint	2 Side
16	C.I.Hub	Complete with axle Hole 20 mm hole 6 Nos with turning etc., the weight of each hub 3.5 Kg	Each Side	2 Side
17	HMHDPE rear wheel	200mm dia x75 mm	Rear side	1 Side
18	Bearing	SKF/NBC or equivalent standard make 6204 zz	For wheels	2 Side
19	Galvanise MS Tube with rounded rubber grip	20 mm, 16 gauge 'B' Grade	For Handle	-------
21	M.S.Bush	ID=21 mm wall Thickness- 3 mm	For two sides of the wheel	2 Side
22	M.S.Angle	25x25x5 mm	For Handle	2 No.
23	M.S.FLAT	50X6 mm	Front wheel Clamp	1 No.
24	M..S.Pin with washer 16 g.	Pin-1" ϕ 5"Length Washer ID 27 mm OD 50 mm ϕ	For Front wheel Fixing one side pin	1NO 2NO
25	Cotter Pin	6x50 mm length	Fixing pin other side	1 NO
26	Hard Rubber lining	25x25 mm	Hard Rubber lining should be fixed on MS wheel	2 nos.

All the MS Material used for fabrication of hand cart shall be of reputed manufacturers such as SAIL, TISCO or equivalent.

34. MS Wheel Barrow 85 Litre/110 Litre/140 Litre

Capacity: - Capacity of hand cart will be 85/110/140 Ltrs.

Material- Material of construction should be as follows.

Steel sheet- Body sheet thickness will be 16 gauge.

Construction of Body - The body will be constructed from MS sheet of 16 Gauge, the joints properly secured

through welding. MS angle of 35×35×5 will be run on the top face and MS angle 25x25x3 on taper face.

The body will be fixed to the frame by welding. The body will be designed so that the center of gravity aids the

forward motion of the hand cart when in use, filled to its full capacity, with normal inclination to the

horizontal without causing spillage.

Chassis -The chassis frame will be made from MS angle of 25x25x3 mm. It will have the provision of handles

for lifting of 35x35x5mm which towards the end are rolled into round form so that it can be lifted easily

without hurting the hand of the operator. The handles should be strengthened by providing a M.S flat of 32x5 in

a bow form. The chassis will also have 2 stands made of MS angle of 35x35x5 properly strengthen by flat

35x5 mm with adequate strength and length so that it can take load while the cart is standing and do not

create problem while use.

Wheel: - Rubber wheel of 10”x 2” will be fitted with provision of having two bearing for smooth operation.

Wheel Bracket: - The wheel will be attached with main body with help of M.S angle of 35x35x5 strengthen

with help of 25x25x3.

Axel: - 1” M.S. round properly machined on both end for fitting of bearings.

Painting: - As per requirement.

35. G.I Wheel Barrow 85 Litre/110 Litre/140 Litre

Capacity: - Capacity of hand cart will be 85/110/140 Ltrs.

Material- Material of construction should be as follows.

Steel sheet- Body sheet thickness will be 16 gauge.

Construction of Body - The body will be constructed from GI sheet of 16 Gauge, the joint s properly secured

through welding. MS angle of 35×35×5 will be run on the top face and MS angle 25x25x3 on taper face.

The body will be fixed to the frame by welding. The body will be designed so that the cent er of gravity aids the

forward motion of the hand cart when in use, filled to its full capacity, with normal inclina tion to the

horizontal without causing spillage.

Chassis -The chassis frame will be made from MS angle of 25x25x3 mm. It will have the p rovision of handles

for lifting of 35x35x5mm which towards the end are rolled into round form so that it can b e lifted easily

without hurting the hand of the operator. The handles should be strengthened by providi ng a M.S flat of 32x5 in

a bow form. The chassis will also have 2 stands made of MS angle of 35x35x5 properly str engthen by flat

35x5 mm with adequate strength and length so that it can take load while the cart is stan ding and do not

create problem while use.

Wheel: - Rubber wheel of 10”x 2” will be fitted with provision of having two bearing for s mooth operation.

Wheel Bracket: - The wheel will be attached with main body with help of M.S angle of 35x 35x5 strengthen

with help of 25x25x3.

Axel: - 1” M.S. round properly machined on both end for fitting of bearings.

Painting: - As per requirement.

36. MS Container/Bin 1.1 Cum capacity with Wheels or without Wheels

General:

Steel Garbage Containers for waste collection shall be provided with 4 Castor Wheels with Blocking System. The Garbage Collection Bins shall be of 1100 Ltrs Capacity. The Bin construction should be of Pressed Steel Sections for ensuring adequate structural strength required for handling with the Compactor Bin Lifter. Bin shall be designed to be lightweight and with facility to be easily handled by two Bin Handlers.

Capacity: 1100 Litre. (1.1 m3)

Base Material:

Body	Mild Steel (2mm); Bottom (3mm)
Lid	Mild Steel (1.6mm)
Dead weight	Minimum 125 kgs
Capacity	1000 kgs (Approx.)

Other Requirements:

a) Four heavy duty swivel castors (360® turning) capable to bear up to 1125 Kg weight without failure, including two wheels with locking device and steering guides.

b) Manual lid for easy opening and closing. Container shall be compatible with compactor handling.

c) Rubber or metallic profile on the lid, which should protect fingers before closing the lid of sections min 3 cms between body and lid

d) Handles on body and lid

f) Painted Green / Blue/ Black as specified. The entire unit should be painted with two coats of superior quality anti-corrosive primer with two coats of approved quality paint. The bidder should get the colouring paint/ name & slogan writing approved from the client.

h) Wheels should of heavy duty, able to withstand rough and heavy operations by Compactor.

i) Square Pipe of 32X32X2mm

ii) MS Container / Bin 1.1 Cum Capacity without Wheels

General:

Steel Garbage Containers for waste collection shall be provided with 4 Castor Wheels with Blocking System. The Garbage Collection Bins shall be of 1100 Ltrs Capacity. The Bin construction should be of Pressed Steel Sections for ensuring adequate structural strength required for handling with the Compactor Bin Lifter. Bin shall be designed to be lightweight and with facility to be easily handled by two Bin Handlers.

Capacity: 1100 Litre. (1.1 m3)

Base Material:

Body	Mild Steel (2mm); Bottom (3mm)
Lid	Mild Steel (1.6mm)
Dead weight	Minimum 125 kgs
Capacity	1000 kgs (Approx.)

Other Requirements:

a) Four Nos MS Round Pipe 4" B –Class for stand.
b) Manual lid for easy opening and closing. Container shall be compatible with compactor handling.

c) Rubber or metallic profile on the lid, which should protect fingers before closing the lid of sections min 3 cms between body and lid

d) Handles on body and lid

f) Painted Green / Blue/ Black as specified. The entire unit should be painted with two coats of superior quality anti-corrosive primer with two coats of approved quality paint. The bidder should get the colouring paint/ name & slogan writing approved from the client.

h) Wheels should of heavy duty, able to withstand rough and heavy operations by Compactor.

i) Square Pipe of 32X32X2mm

37. (i) G.I. Container / Bin 660 Litres Capacity with Wheels

General:

G.I. Garbage Containers for waste collection shall be provided with 4 Castor Wheels with Blocking System. The Garbage Collection Bins shall be of 660 Ltrs Capacity. The Bin construction should be of Pressed Steel Sections for ensuring adequate structural strength required for handling with the Compactor Bin Lifter. Bin shall be designed to be lightweight and with facility to be easily handled by two Bin Handlers.

Capacity: 660 Litre.

Base Material:

Body	G.I (2mm); Bottom (3mm)
Lid	G.I Steel (1.6mm)
Dead weight	Minimum 100 kgs
Capacity	1000 kgs (Approx.)

Other Requirements:

a) Four heavy duty swivel castors (360® turning) capable to bear up to 1125 Kg weight without failure, including two wheels with locking device and steering guides.

b) Manual lid for easy opening and closing. Container shall be compatible with compactor handling.

c) Rubber or metallic profile on the lid, which should protect fingers before closing the lid of sections min 3 cms between body and lid

d) Handles on body and lid

f) The bidder should get the name & slogan writing approved from the client.

h) Wheels should of heavy duty, able to withstand rough and heavy operations by Compactor.

i) Square Pipe of 32X32X2mm

(ii) G.I. Container / Bin 660L Capacity without Wheels

General:

G.I. Garbage Containers for waste collection shall be provided with 4 Castor Wheels with Blocking System. The Garbage Collection Bins shall be of 660 Ltrs Capacity. The Bin construction should be of Pressed Steel Sections for ensuring adequate structural strength required for handling with the Compactor Bin Lifter. Bin shall be designed to be lightweight and with facility to be easily handled by two Bin Handlers.

Capacity: 660 Litre.

Base Material:

Body	G.I (2mm); Bottom (3mm)
Lid	G.I Steel (1.6mm)
Dead weight	Minimum 100 kgs
Capacity	1000 kgs (Approx.)

Other Requirements:

a) Four Nos MS Round Pipe 4“ B –Class for stand.

b) Manual lid for easy opening and closing. Container shall be compatible with compactor handling.

c) Rubber or metallic profile on the lid, which should protect fingers before closing the lid of sections min 3 cms between body and lid

d) Handles on body and lid

f) The bidder should get the name & slogan writing approved from the client.

h) Wheels should of heavy duty, able to withstand rough and heavy operations by Compactor.

i) Square Pipe of 32X32X2mm

38. (i) G.I. Container / Bin 1.1 Cum Capacity with Wheels

General:

G.I. Garbage Containers for waste collection shall be provided with 4 Castor Wheels with Blocking System. The Garbage Collection Bins shall be of 1100 Ltrs Capacity. The Bin construction should be of Pressed Steel Sections for ensuring adequate structural strength required for handling with the Compactor Bin Lifter. Bin shall be designed to be lightweight and with facility to be easily handled by two Bin Handlers.

Capacity: 1100 Litre. (1.1 m3)

Base Material:

Body	G.I (2mm); Bottom (3mm)
Lid	G.I Steel (1.6mm)
Dead weight	Minimum 125 kgs
Capacity	1000 kgs (Approx.)

Other Requirements:

a) Four heavy duty swivel castors (360® turning) capable to bear up to 1125 Kg weight without failure, including two wheels with locking device and steering guides.

b) Manual lid for easy opening and closing. Container shall be compatible with compactor handling.

c) Rubber or metallic profile on the lid, which should protect fingers before closing the lid of sections min 3 cms between body and lid

d) Handles on body and lid

f) The bidder should get the name & slogan writing approved from the client.

h) Wheels should of heavy duty, able to withstand rough and heavy operations by Compactor.

i) Square Pipe of 32X32X2mm

(ii) G.I. Container / Bin 1.1 Cum Capacity without Wheels

General:

G.I. Garbage Containers for waste collection shall be provided with 4 Castor Wheels with Blocking System. The Garbage Collection Bins shall be of 1100 Ltrs Capacity. The Bin

construction should be of Pressed Steel Sections for ensuring adequate structural strength required for handling with the Compactor Bin Lifter. Bin shall be designed to be lightweight and with facility to be easily handled by two Bin Handlers.

Capacity: 1100 Litre. (1.1 m3)

Base Material:

Body	G.I (2mm); Bottom (3mm)
Lid	G.I Steel (1.6mm)
Dead weight	Minimum 125 kgs
Capacity	1000 kgs (Approx.)

Other Requirements:

a) Four Nos MS Round Pipe 4" B –Class for stand.

b) Manual lid for easy opening and closing. Container shall be compatible with compactor handling.

c) Rubber or metallic profile on the lid, which should protect fingers before closing the lid of sections min 3 cms between body and lid

d) Handles on body and lid

f) The bidder should get the name & slogan writing approved from the client.

h) Wheels should of heavy duty, able to withstand rough and heavy operations by Compactor.

i) Square Pipe of 32X32X2mm

39. MS Container / Bin 2.5 Cum Capacity

The container having compatibility with the Dumper Placer Carrier Vehicle shall be closed type having minimum capacity of 2.5 Cum. The vertical height of long side of the container (dumping side) should not be more than 1.10 meter and maximum height of the top of the container should not be more than 1.50 meter. The sides of container shall be fabricated out of 3.15 mm thick MS sheet and bottom out of 5 mm thick MS sheet. The rear door shall be fabricated out of 2.5-mm MS sheet and fixed to the container with heavy-duty hinges. The container should have mechanical locking arrangement for preventing falling of waste during transit.

Minimum 4 -side opening doors of size 700mm x 400 mm each to be provided to dump the garbage. These shall be fabricated out of 2-mm thick MS sheet and fixed to the container with heavy duty hinges and having handles made out of 12-mm round steel bars.

All sides of the containers should be properly reinforced with IMC 75 mm x 40 mm and ISA 40mm x 40mm x 5mm and should have continuous welding. The entire surface shall be first cleaned by sand blasting or any other appropriate method and given a coat of anti-corrosive primer. Bituminous or any other anti-Corrosive paint shall be applied to the inside surface of the container and outside surface of the container finished with two or more coats of synthetic enamel paint of specified shade and colour. The container should have suitable arrangement for lifting, emptying & placing on vehicle.

40. MS Container Bin of 3.0 Cum Capacity

The container having compatibility with the Dumper Placer Carrier Vehicle shall be closed type having minimum capacity of 3.0 Cum. The vertical height of long side of the container (dumping sides) should not be more than 1.10 meter and maximum height of the top of the container should not be more than 1.50 meter. The sides of container shall be fabricated out of 3.15 mm thick MS sheet and bottom out of 5 mm thick MS sheet. The rear door shall be fabricated out of 2.5-mm MS sheet and fixed to the container with heavy-duty hinges. The container should have mechanical locking arrangement for preventing falling of waste during transit.

Minimum 4-side opening doors of size 700 mm x 400 mm each to be provided to dump the garbage. These shall be fabricated out of 2-mm thick MS sheet and fixed to the 19 containers with heavy duty hinges and having handles made out of 12-mm round steel bars.

All sides of the containers should be properly reinforced with IMC 75 mm x 40 mm and ISA 40mm x 40mm x 5mm and should have continuous welding. The entire surface shall be first cleaned by sand blasting or any other appropriate method and given a coat of anti- corrosive primer. Bituminous or any other anti-Corrosive paint shall be applied to the inside surface of the container and outside surface of the container finished with two or more coats of synthetic enamel paint of desired shade and colour. The container should have suitable arrangement for lifting, emptying & placing on vehicle.

41. Stainless Steel Single Pole Mounted Bins

i. **Steel Single Pole Mounted Bins - 60 Liters**

General Specifications:

Stainless Steel Single Pole Mounted Bins are elegantly designed Litter collecting bins, fabricated in Stainless Steel, hardening grades, possesses good corrosion resistance, toughness, high hardness and strength, smooth and sanitary, provided with fully openable Lid with flap arrangement. Must be fabricated with heavy duty stainless steel Permanent Structure having no resale value; which is fabricated with plate at Bottom which is to be grouted in the ground; ideal for Road Side collection and Storage of Raw Garbage to satisfy critical needs of Solid Waste Management.

Basic Qualities

1. Fabricated from Stainless Steel.
2. % Rust Free and Maintenance free.
3. Safe in handling as No corrosion, cracking, blistering etc. Elegant. Easy to handle.
4. Hygienic and Easy to clean
5. Strong and Durable

Detail Specifications:

Application	:	For Litter collection at Road sides / Community areas.
Capacity	:	60 Litres.
Material	:	fabricated in Stainless Steel, hardening grades, possesses good corrosion resistance, toughness, high hardness and strength, smooth and sanitary,
Dimensions	:	(Litter Bin)
	:	Top : 335 x335 mm Bottom : 240 x 240 mm Height : 800.
Dimensions	:	(Stainless Steel Structure) Width: 450 mm Height: 1270 mm Bottom Plate: 100 x 100 mm fabricated at bottom
Section	:	Section must be square in shape and Moulded from heavy duty Stainless Steel Materials
Square	:	30 MM O.D.
Design	:	Oscillating arrangement for easy unloading of Garbage. Specially moulded projections for extra strength Rough & Tough. User friendly design without sharp corners or welds.
Lid	:	Fully openable lid with flap arrangement, open from either side for easy garbage drop.
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Printing	:	Shall be printed as per client's requirement.
Drawing	:	Enclosed herewith

ii. Steel Single Pole Mounted Bins Single Pole Mounted Bin 80 Litres.

General Specifications:

Stainless Steel Single Pole Mounted Bins are elegantly designed Litter collecting bins, fabricated in Stainless Steel, hardening grades, possesses good corrosion resistance, toughness, high hardness and strength, smooth and sanitary, provided with fully openable Lid with flap arrangement. Must be fabricated with heavy duty stainless steel Permanent Structure having no resale value; which is fabricated with plate at Bottom which is to be grouted in the ground ; ideal for Road Side collection and Storage of Raw Garbage to satisfy critical needs of Solid Waste Management

Basic Qualities

Fabricated from Stainless Steel.

100 % Rust Free and Maintenance free.

Safe in handling as No corrosion, cracking, blistering etc. Elegant. Easy to handle.

Hygienic and Easy to clean

Strong and Durable

Detail Specifications :

Application : For Litter collection at Road sides / Community areas.

Capacity : 80 Litres.

Material : fabricated in Stainless Steel, hardening grades, possesses good corrosion resistance, toughness, high hardness and strength, smooth and sanitary,

Dimensions : (Litter Bin)

: Top : 380 x 380 mm

Bottom : 285 x 285 mm

Height : 830mm.

Dimensions : (Stainless Steel Structure)

Width : 500 mm

Height : 1270 mm

Bottom Plate : 100 x 100mm fabricated at bottom

iii. Steel Single Pole Mounted Bins Single Pole Mounted Bin 100 Litres

General Specifications:

Stainless Steel Single Pole Mounted Bins are elegantly designed Litter collecting bins, fabricated in Stainless Steel, hardening grades, possesses good corrosion resistance, toughness, high hardness and strength, smooth and sanitary, provided with fully openable Lid with flap arrangement. Must be fabricated with heavy duty stainless steel Permanent Structure having no resale value; which is fabricated with plate at Bottom which is to be grouted in the ground ; ideal for Road Side collection and Storage of Raw Garbage to satisfy critical needs of Solid Waste Management.

Basic Qualities

Fabricated from Stainless Steel.

100 % Rust Free and Maintenance free.

Safe in handling as No corrosion, cracking, blistering etc. Elegant. Easy to handle, Hygienic and Easy to clean, Strong and Durable

Detail Specifications :

Application : For Litter collection at Road sides / Community areas.

Capacity : 100 Litres.

Material : fabricated in Stainless Steel, hardening grades, possesses good corrosion

resistance, toughness, high hardness and strength, smooth and sanitary,

Dimensions : (Litter Bin)

Top : 475 x475 mm

Bottom : 335 x 335 mm

Height : 850 mm.

Dimensions : (Stainless Steel Structure)

Width : 600 mm

Height : 1285 mm

Bottom Plate : 100 x 100 mm fabricated at bottom

42. Plastic Secondary Storage Bins 660 Littre

General Specifications:

WHEELED WASTE BINS AS PER EN STANDARD

Wheeled Waste Bins must be elegantly designed one piece moulded plastics bins made out of state of the art injection Moulding process manufactured from High Density Polyethylene material, Non toxic, free from any contamination,

chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant and free from joints, welds or rims, provided with fully openable top lid and 4 Nos. of wheels; ideal for Roadside, bulk Collection and storage of Raw Garbage to satisfy critical needs of Solid Waste Management.

Basic Qualities

Moulded from Special grade of HDPE material.
100 % Rust Free and Maintenance free.
Safe in handling as No corrosion, cracking, blistering etc. Colourful and Elegant.
Light Weight an Easy to handle.
Hygienic and Easy to clean
Strong and Durable
Photograph:

Dimensional Details:

Capacity (Ltr)	:	660
Height (mm)	:	1200
Width (mm)	:	780
Depth (mm)	:	1405
Wheel Diameter(mm)	:	200 (+/-5mm)

43. Plastic Secondary Storage Bins 1100 Litre

WHEELED WASTE BINS AS PER EN STANDARD

General Specifications:

Wheeled Waste Bins must be elegantly designed one piece moulded plastics bins made out of state of the art injection Moulding process manufactured from High Density Polyethylene material, Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant and free from joints, welds or rims, provided with fully open able top lid and 4 Nos. of wheels; ideal for Roadside Collection and storage of Raw Garbage to satisfy critical needs of Solid Waste Management.

Basic Qualities:

Molded from Special grade of HDPE material

100 % Rust Free and Maintenance free.

Safe in handling as No corrosion, cracking, blistering etc. Colorful and Elegant.

Light Weight an Easy to handle. Hygienic and Easy to clean

Strong and Durable

44. Plastic Hand Cart – 65Litre/110Litre/250 Litre

Specifications For Plastic Hand Cart – 65Litre

Heavy Duty Wheel Barrows are moulded in one tough piece by state of the art Rotational Moulding process manufactured from Virgin Grade of Polyethylene material; Nontoxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant, blended with stabilizers and free from joints, welds or rims, with Heavy duty M.S. Jacket (Structure) fabricated from M.S. Angles and Flats & provided with two handles and two Heavy Duty Rubber Wheels; designed especially for Semi Urban and Rural areas to store and handle Raw Garbage to satisfy critical needs of Solid Waste Management.

Basic Qualities:

- Moulded from special UV Stabilized grades of Polyethylene
- 100% Rust free and maintenance free.
- Safe in handling as No Corrosion, cracking, blistering etc. Colourful and Elegant.
- Light weight and easy to handle. Hygienic and Easy to clean. Strong and Durable.

Detail Specifications:

Application	:	Door to Door collection and transportation of segregated garbage from households / offices / shops etc.
Capacity	:	Water capacity should not less than 85 ltrs.
Material	:	Virgin grade of Polyethylene material, absolutely non-toxic, free from any contamination, chemical resistant

Dimensions:

For 65 Ltr Bucket

	Top	: 530x530mm. Approx (Outside)
	Bottom	: 460x460 mm. Approx (Outside)
	Height	: 280 mm Approx of Bucket
Design	:	Specially Moulded Ribs on all sides for Strength Moulded rounded projections on sides User friendly design without sharp corners or welds. Ergonomic Handles
Wheels	:	Two No. of Strong & Sturdy MS Wheels to resist heavy impact loads and move smooth on patchy Roads
Colour	:	Blue / Green

Durability : Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM

Printing : Shall be printed as per client's requirement.

General Specifications For Plastic Hand Cart – 110 Ltr

Heavy Duty Wheel Barrows are moulded in one tough piece by state of the art Rotational Moulding process manufactured from Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982; Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant, blended with stabilizers and free from joints, welds or rims, with Heavy duty M.S. Jacket (Structure) fabricated from M.S. Angles and Flats duly coated with proper Anti Corrosive powder coating; provided with two ergonomic handles and two Heavy Duty Rubber Wheels; designed specially for Semi Urban and Rural areas to store and handle Raw Garbage to satisfy critical needs of Solid Waste Management

Basic Qualities:

Moulded from special UV Stabilized grades of Polythylene
100% Rust free and maintenance free.
Safe in handling as No Corrosion, cracking, blistering etc. Colourful and Elegant.
Light weight and easy to handle.
Hygienic and Easy to clean. Strong and Durable.
Detail Specifications:

Application:

Door to Door collection and transportation of segregated garbage from households/offices/shops etc.

Capacity : Waste Containers can carry minimum of 50 to 60 Kgs. of Garbage.

Material : Virgin grade of Polyethylene material, absolutely non-toxic, free from any contamination, chemical resistant confi rming to the requirement of IS 10146 – 1982.

(Tolerance +/- 5 %)

Dimensions:

Top : Should not be less than 700x600 mm. (Outside)
Bottom : Should not be less than 400x400 mm. (Outside)
Height : Should not be less than 350 mm.

Design : Specially Moulded Ribs on all sides for Strength Moulded rounded projections on sides User friendly design without sharp corners or welds.
Ergonomic Handles

Wheels : Two No. of Strong & Sturdy MS Wheels to resist heavy impact loads and move smooth on patchy Roads of approx. 500 mm Dia fabricated out of MS Angle of 35x35x5 mm. (+/- 5%) Tolerance.

Colour : Blue / Green

Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Printing	:	Shall be printed as per client's requirement.
Drawing	:	The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution

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General Specifications For Plastic Hand Cart –250 Ltr

Application	:	Door to Door collection and transportation of segregated garbage from house holds / offices / shops etc.
Capacity	:	Waste Containers can carry minimum of 100 to 150 Kgs. of Garbage.
Material	:	Virgin grade of Polyethylene material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of IS 10146 – 1982.

Dimensions:

Top	:	Should not be less than 1100 mm.
Bottom	:	Should not be less than 700 mm.
Height	:	Should not be less than 400 mm. (Tolerance +/- 5 %)
Design	:	Specially Moulded Ribs on all sides for Strength, Moulded rounded projections on sides, User friendly design without sharp corners or welds. Ergonomic Handles
Wheels	:	Two No. of Strong & Sturdy Rubberized CI Wheels to resist heavy impact loads and move smooth on patchy Roads of approx. 12 " Dia ad 2" Width. (+/- 5%) Tolerance.
Colour	:	Blue / Green
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM

Printing	:	Shall be printed as per client's requirement.
Drawing	:	The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution.

45. Domestic Polyethylene Bins with flap lid of 10/20 Litres Capacity

General Specifications:

One Piece Moulded, Heavy Duty Waste Bin of approx. 10/20 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Blow Moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and from joints, welds or rims; provided with 2 Nos. of built in flexible HDPE Handles on two sides. The lifting handles are moulded in one piece with Waste Bin for longer life. Provided with moulded Lid to prevent spread of smell, mosquitoes etc. ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 1000.

Basic Qualities:

Moulded from Special UV Stabilized grades of Polyethylene.
Round in Shape without sharp corners to prevent sticking of Garbage.
100 % Rust Free and Maintenance free. Colorful and Elegant.
Light Weight and Easy to handle. Hygienic and Easy to clean
Strong and Durable

Detail Specifications :

Application	:	For collection and Storage of Solid Wastes/Bio-Medical Waste and suitable for being lifted by hand.	
Capacity	:	10/20 Litres.	
Material	:	Virgin grade of Polyethylene material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of IS 10146 – 1982.	
Dimensions	:	**For 10 Litres**	
Top	:	Should not be less than	290 mm.
Bottom	:	Should not be less than	240 mm
Height	:	Should not be less than (Only Container)	330 mm
Height	:	Should not be less than (With Flap Lid)	450 mm
		For 20 Litre Bin: -	
Top	:	Should not be less than	328 mm.
Bottom	:	Should not be less than	274 mm
Height	:	Should not be less than	360 mm

		(Only Container)
Height	:	Should not be less than 450 mm (With Flap Lid)
Design	:	Specially moulded projections for extra strength High Impact strength; Rough & Tough. User friendly design without sharp corners or welds. Moulded, Built-in Bottom Grip (2 Nos.) for easy lifting of bin and unloading of waste.
Lid	:	Inverted U type oscillating Flap Lid.
Colour	:	Blue / Green
Handle	:	HDPE Handles - Moulded in one tough piece # 2 Nos.
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Drawing	:	The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution.

46. House Hold Dustbin-15 Ltr with foot padal

Technical Specifications of House Hold Waste Bin

General Specifications:

One Piece Moulded, Heavy Duty Waste Bin of approx. 15 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Blow Moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and from joints, welds or rims. Provided with moulded projections and provided with moulded Lid to prevent spread of smell, mosquitoes etc. meant for segregation of waste at source in Bio-degradable and Recylable waste in Green and Blue colour ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 2000.

Basic Qualities

Moulded from Special UV Stabilized grades of Polyethylene.
Lid opening with foot padal

Round in Shape without sharp corners to prevent sticking of Garbage. Must be designed for segregation and storage of Garbage at House Hold. 100 % Rust Free and Maintenance free.

Colourful and Elegant.

Light Weight and Easy to handle. Hygienic and Easy to clean Strong and Durable

Detail Specifications :

Application	Segregation for Storage and handling of Solid Waste at House Holds / offices / shops etc.

Capacity	15 Litres.
Material	Virgin grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D-543-04.

Material should have more than 250 Kg/CM2 of Tensile strength (as per ASTM D 638) and Izod impact strength of not less than 25 Kg-Cm/Cm as per ASTM D256; The ESCR as per ASTM D 1693 must be greater than > 500 (T50 HR).

Dimensions:

Capacity	Overall Dimensions (MM)		
Litres	Top Dia	Bottom Dia	Height
15	242	212	340
			(+/- 5 %)

Design	:	Specially moulded projections for extra strength High Impact strength; Rough & Tough. Twist type lockable Lid. User friendly design without sharp corners or welds. Moulded, Built-in Bottom Grip (2 Nos.) for easy lifting of bin and unloading of waste.
Lid	:	Fully/partial openable with the help of foot pedal
Colour	:	Blue / Green
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Printing	:	Shall be printed as per client's requirement.
Drawing	:	The bidder should provide drawings of the Goods/ Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution

47. Twin Pole Mounted Bin with MS Frame (100/125 Litres)

General Specifications: For 100 Litres

"Litter Bins with Permanent Structure" are elegantly designed Litter collecting bins, moulded in one tough piece by state of the art Rotational Moulding process manufactured from Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982; Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant, and free from joints, welds or rims, provided with

fully openable Lid; open from either side for easy garbage drop even from distance and mounting accessories. Permanent Structure duly painted with proper anti corrosive paint, can be provided along with a plate welded at Bottom which is to be grouted in the ground ; ideal for Road Side collection and Storage of Raw Garbage to satisfy critical needs of Solid Waste Management.

Basic Qualities

Moulded from Special UV Stabilized grades of Polythylene.
100 % Rust Free and Maintenance free.
Safe in handling as No corrosion, cracking, blistering etc.
Colourful and Elegant.
Light Weight an Easy to handle.
Hygienic and Easy to clean
Strong and Durable

Detail Specifications :

Application : For Litter collection at Road sides / Community areas.

Capacity : 100 Litres.

Material : Virgin grade of Polyethylene material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of IS 10146 – 1982.

Dimensions : (Litter Bin)

Overall Dimensions (MM) (GBR 10-01)		
Top	Bottom	Height
500x500 mm	350x350 mm	Not less than 690 mm

(+/- 5 %)

Permanent Structure : Width : Not less than 600 mm
Bottom Plate : Not less than 100 x 100 mm welded at Bottom
(Tolerance + / - 5 %)

Design : Oscillating arrangement for easy unloading of Garbage.
Specially moulded projections for extra strength
High Impact strength; Rough & Tough.
User friendly design without sharp corners or welds.

Lid : Fully openable lid, open from either side for easy garbage drop even from distance

Colour : Blue / Green

Durability : Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM

Printing : Shall be printed as per client's requirement.

Drawing : The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution

General Specifications: For 125 Litres

"Litter Bins with Permanent Structure" are elegantly designed Litter collecting bins, moulded in one tough piece by state of the art Rotational Moulding process manufactured from Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982; Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant, and free from joints, welds or rims, provided with fully openable Lid; open from either side for easy garbage drop even from distance and mounting accessories. Permanent Structure made out of heavy pultruded plastics square section to be provided along with a plate fabricated at Bottom which is to be grouted in the ground ; ideal for Road Side collection and Storage of Raw Garbage to satisfy critical needs of Solid Waste Management.

The Plastics Pole arrangement to be of Two Vertical members of square section and one horizontal support with Suitable MS oscillation mounting arrangement made to the vertical members of both poles for ensuring proper positioning of Bin immediately after unloading. Bins must be fixed with plate on both sides and outside plate to be fabricated with round Rod. Plastics Pole Sections must be manufactured from Glass Fiber and Resin by pultrusion process; The Square Section must be anti Corrosive, Chemical resistant, having no resale value must be provided along with a plate fabricated at Bottom which is to be grouted in the ground. All the square sections are to be fabricated with the help of MS plates of not less than 1.5 mm thick and nut and bolts

Basic Qualities

Moulded from Special UV Stabilized grades of Polythylene.
100 % Rust Free and Maintenance free.
Safe in handling as No corrosion, cracking, blistering etc. Colourful and Elegant.
Light Weight an Easy to handle.
Hygienic and Easy to clean
Strong and Durable

Detail Specifications :

Application : For Litter collection at Road sides / Community areas. Capacity

: Not less than 125 Ltrs

Material : Virgin grade of Polyethylene material, absolutely non- toxic, free from any contamination, chemical resistant confirming to the requirement of IS 10146 – 1982.

Dimensions : (Litter Bin)

Overall Dimensions (MM)		
Top	Bottom	Height
500x500 mm	350x350 mm	Not less than 1050 mm with Lid

(+/- 5 %)

Heavy Duty Plastics Structure :

The Plastics Pole shall be of square section of size 50 MM x 50 MM x 3 MM thickness having total height of 1200 MM which shall be fitted with horizontal member of same material section and 2 MS Plates at the at bottom. The plastics square Sections must be fabricated with the help of suitable MS Plates, Nuts, bolts, rivets etc to make the same sturdy.

Pole : Square section of Pole, must be moulded from Pultrusion process manufactured out of Glass Fiber and Resin. High impact strength, absolutely Corrosion free, contamination free, Good Thermal resistance, Anti Acidic, chemical resistance, UV stabilized without weathering effect having no resale value.

Square : 50 MM x 50 MM

Height : 1200 MM Thickness

: 3 MM

Permanent : Width : Not less than 550 mm

Structure Bottom Plate : Not less than 100 x 100 mm welded at Bottom

(Tolerance + / - 5 %)

Design : Oscillating arrangement for easy unloading of Garbage. Specially moulded projections for extra strength High Impact strength; Rough & Tough. User friendly design without sharp corners or welds

Lid : Fully openable lid, open from either side for easy garbage drop even from distance

Colour : Military Green

Durability : Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM

Printing : Shall be printed as per client's requirement.

Drawing : The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution

48. Two Wheeled Dustbin Plastic 240L Capacity

GeneralSpecifications:

Wheeled Waste Bins are elegantly designed one piece moulded plastics wheeled waste bins of 240 Litres capacity manufactured out of state of the art Blow Moulding process for higher impact strength; manufactured from High Molecular High Density Polyethylene material confirming to the requirement of IS 7328 – 1992; Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic, absolutely smooth and sanitary, chemical resistant, and free from joints, welds or rims, provided with fully openable top lid made out of High Molecular High Density Polyethylene material from Thermoforming process for High Impact Strength and 2 Nos. of wheels; ideal for Roadside Collection and storage of Raw Garbage to satisfy critical needs of Solid Waste Management.

BasicQualities

Moulded from Special UV Stabilized grades of Polythylene.
100 % Rust Free and Maintenance free.
Safe in handling as No corrosion, cracking, blistering etc.
Colourful and Elegant.
Light Weight an Easy to handle.
Hygienic and Easy to clean
Strong and Durable

DetailSpecifications:

Application	:	For Litter collection at Road sides / Community areas and public places.
Capacity	:	240 Litres.
Material	:	Virgin grade of High Molecular High Density Polyethylene (HMHDPE) material, absolutely non-toxic, free from any contamination, chemical resistant confirming to the requirement of ASTM D – 543-04. Material should have more than 250 Kg/CM^2 of Tensile strength (as per ASTM D 638) and Izod impact strength of not less Than 25 Kg-Cm/Cm as per ASTM D 256; The ESCR as per ASTM D 1693 must be greater than > 500 (T50 HR)

Dimensions	:	Top : Should not less than 650 x 550mm Bottom : Should not less than 300x 460 mm Height : Should not less than 1060 mm (Tolerance : +/- @5%)
Design	:	Tilt and easy to move design High Impact strength; Rough & Tough. Fully openable Top lid – (Black Colour) User friendly design without sharp corners or welds. Ergonomic Handle for easy tilting and movement of bin. Unique Front Design not less than 50 mm height and not less than 40 mm depth for extra strength.
Lid	:	Fully openable provided with a moulded strengthening Ribs; made out of Virgin grade of LLDPE material; moulded in one piece from unique Rotational moulding process in Black (UV) stabilized colour.
Wheels	:	Diameter : Not less than 225 mm (+/- 5mm) Width : Not less than 40 mm (+/- 5 mm) Material : Special Polymeric material
Colour	:	Blue / Green for Bin.
Durability	:	Reusable, Washable, absolutely smooth and sanitary to satisfy the critical needs of SWM
Printing	:	Shall be printed as per client's requirement.
Drawing	:	The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution

49. Underground Bin System for 1.1 Cum

This system should be designed to promote and manage separate waste collection through the creation of stations where several waste bins are housed inside a single unit. This system uses 1100 litres bins on wheels WITHOUT LIDS, designed for manual handling and emptying by rear-loading.

This system should fit perfectly into the urban context and in its normal resting position, only the towers for the waste introduction are visible. This system should be suitable for areas where space is limited for waste collection.

Product Summary

i. The system should allow the underground recovery of rear loader bins up to the capacity of 1100litres.
ii. The structure should be composed of a lower Bins platform on which are positioned the 1100L bins. The upper Cap platform is where the towers and funnels are installed.
iii. Two versions; ACTIVE with a main power electricity connection or PASSIVE with hydraulic power supplied by the collection vehicle.
iv. The lifting system device should allow a separate movement between the Bins platform and the Cap platform: this patented telescopic lifting movement allows for any residual waste within the funnel to fall into the bin when the platform is raised.
v. When the equipment is lifted, the bins should be at the street level; in this way, the bins can be moved by the operators to the collection vehicle for efficient waste removal.

Technical Specifications

i. Telescopic between the Bins platform and the Cap platform by an adjustable tray which is connected to the lifting device.
ii. Device lifting by means of a pantograph action using vertical simple effect cylinders as a hydraulic and mechanical force distributor.
iii. The Cap platform is made waterproof board and a bituminous layer in order to prevent waste fermentation.
iv. Flooring on the Cap platform is optional; steel plate finishing or paving.
v. The Cap platform loading capacity in static position is 150Kg/sq.mt.
vi. The Bins platform is covered by non-skid steel plates.
vii. The structure is manufactured from tubular steel.
viii. Structure comes complete and housed.
ix. The forces of the units are discharged only on the base of the concrete pit.

PASSIVE Power: Hydraulic power is supplied by the collection vehicle for waste removal.

Safety

i. Emergency lock valve on cylinder (PASSIVE version).
ii. All units are assembled and pre-tested in the factory.

50. Free Stand Litter Bin

Technical Specifications of Waste Bins

One Piece Moulded, Heavy Duty Waste Bin of approx. 100 Litres capacity made out of FDA approved virgin grades of Polyethylene material manufactured from Rotational Moulding Process / Blow Moulding Process absolutely smooth and sanitary, chemical resistant, blended with stabilizers, Anti Corrosive, Anti Acidic, Non toxic and free from joints, welds or rims; provided with fully openable unique lid, open from either side for easy garbage drop even from distance, ideal for Storage and Handling of Solid Waste to satisfy the critical requirements of MSW 2000.

Basic Qualities

Moulded from Special UV Stabilized grades of Polyethylene.
Rounded Corners to prevent sticking of Garbage.
100 % Rust Free and Maintenance free.
Colourful and Elegant.
Light Weight and Easy to handle.
Hygienic and Easy to clean. Strong
and Durable.

Photograph:

Detail Specifications:

Name	:	Waste Container
Application	:	For Storage and handling of Solid Wastes at roadsides, community areas and in municipal areas.
Capacity	:	Container of not less than 100 Litres capacity should adequately handle Solid Waste of at least 60 Kgs.
Material	:	Virgin Grade of Polyethylene material confirming to the requirement of IS 10146 – 1982, Non toxic, free from any contamination, chemical resistant, blended with stabilizers, Anti Corrosive and Anti Acidic.
Dimensions	:	Top Should not be less than 490 mm. Bottom Should not be less than 340 mm Height Should not be less than 690 mm
Lid	:	Half round design without sharp corners, designed with two openings for easy garbage drop even from distance.
Colour	:	Blue and Green
Durability	:	The Basket is One Piece Moulded, Non Toxic, Strong and Sturdy, Reusable, Washable, absolutely smooth and

		sanitary to satisfy the critical needs of SWM 2000.
Locking	:	Locking arrangements has to be provided with Container to lock the Container with Wheel Barrow or Tricycle.
Printing	:	Shall be printed as per client requirement.

51. Hot Dip Galvanized Bins 1100 Litre

Technical Specification of Hot Dip Galvanized Bins 660/1100 Litre

The Hot dipped galvanized bins shall be fabricated of steel sheets withsuitable forming to give proper strength to the containerThe steel sheets shall be of 1.6mm thick. The top frame shall be ofminimum 2.5mm.The bins shall be provided with front striker plates and wheel bracket toavoid damage to the body during operations.Water drainage shall be provided at the bottom for easy cleaning.The bins shall have lifting trunnion made of metal rods for being lifted bybin lifters EN/DN standard and handles for easy transportation.The bins shall be designed to be lifted by compactors having universal binlifters of DIN standards.The bin shall be Hot Dip Galvanized to prevent corrosion.The weight of the bin with wheels and lid will be 127 kg.

Measurements :

For 660 Litre

Overall Height: 1320mm
Width Length(with Lift hocks): 1265mm
Width Length(without Lift hocks): 1200mm
Depth: 740 mm

For 1100 Litre

Overall Height: 1380mm
Width Length(with Lift hocks): 1270mm
Width Length(without Lift hocks): 1200mm
Depth : 1000 mm

Lid	:	The bin shall have a cover of M.S fabricated sheet hinged at one end, which shall open freely while unloading. Lid shall be Hot Dip Galvanized to prevent corrosion
Wheels	:	The bins shall have 4 wheels made of one piece fiber of 200mm diameter and shall have swiveling through 360 degrees. The wheel shall be resistant to corrosion.
Drawing	:	The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution

52. Portable Toilet /Urinal Block

ii. Single User

Description:

The prefabricated PORTOLET toilet shall be suitable for mounting on plain ground. The components shall be fabricated and assembled at factory. The cabin shall be made by using FRP as per the detailed specifications given herein.

Overall Size: 810 mm (w) x 965 mm (D) x 1900 mm (H) (Approx)

Floor / Base:

The base shall be single peace moulded with required outlets. Special handle shall be provided on two side of toilet block for easily shifting, loading and un-loading the whole block. The floor should be made up of fibreglass.

Wall / Roof (Superstructure):
The superstructure of toilet shall be of rectangular shape. A special top cap shall also be fixed on top of toilet for natural light and air vent. The wall/roof/WC/Doors should be made up of fibreglass.

Sanitation & Plumbing work:

1 No. Plastics Urinal /pot shall be provided inside.
1 No. FRP Washbasin shall be provided.
1 No. Tap shall be provided.

Electrical Work:

1 No. Bulb Point with switch shall be provided inside the toilet.

iii. Four User

Description:

The prefabricated PORTOLET toilet shall be suitable for mounting on plain ground. The components shall be fabricated and assembled at factory. The cabin shall be made by using FRP as per the detailed specifications given herein.

Overall Size of each unit: 810 mm (w) x 965 mm (D) x 1900 mm (H) (Approx)

Floor / Base:

The base shall be single peace moulded with required outlets. Special handle shall be provided on two side of toilet block for easily shifting, loading and un-loading the whole block. The floor should be made up of fibreglass.

Wall / Roof (Superstructure):
The superstructure of toilet shall be of rectangular shape. A special top cap shall also be fixed on top of toilet for natural light and air vent. The wall/roof/WC/Doors should be made up of fibreglass.

Sanitation & Plumbing work:
1 No. Plastics Urinal /pot shall be provided inside each unit.
1 No. FRP Washbasin shall be provided in each unit.
1 No. Tap in each unit.

Electrical Work:

1 No. Bulb Point in each unit with switch shall be provided inside the toilet.

53. Portable Bio Toilet

1. **1 Pan**
2. **2 Pan**
3. **4 Pan**
4. **10 Pan**

Description

Prefabricated toilet shall be suitable for mounting on plain ground. The components shall be fabricated at factory for easy to assembly at site.
Size

a) 1 Pan Toilet : 1.15 mt x 1.17 mt x 2.1 mt -
b) 2 Pan Toilet : 1.81 mt x 0.84 mt x 2.1 mt -
c) 4 Pan Toilet : 2 Units Back to Back 1.81 mt x 0.84 mt x 2.1 mt
d) 10 Pan Toilet : 5 Units Back to Back 1.81 mt x 0.84 mt x 2.1 mt

Structure

The supported Structure like corner column, Door frame etc. shall be made out with 1 mm thick Powder coated MS folded sections.

Wall Panel

The insulated walls shall be made of Sandwich panels. The sandwich panels shall be made out of 0.25mm thick Pre-coated steel sheet (white colour) on both side of PUF (Polyurethane foam). The total thickness of panel shall be 40mm.

Roof Panel

The insulated Roof cladding shall be done with sandwich type panels. The panels shall be made out with 0.25 mm thick Pre-coated Profile steel sheet at outer side and 0.25 mm thick Pre-coated sheet at inner side of PUF. Thickness of roof panel shall be Min. 20 mm. The roof shall have minimum projection of 0.25m from the eaves wall and 0.15m from the gable walls.

Toilet Seat

The I.W.C. type Toilet sheet shall be made out with FRP Material. 1 No. P trap shall be provided with each toilet seat. This seat is kept on Bio digester tank.

Wash basin

1 no. SS wash basin at outside of toilets shall be provided in each toilet.

Door

The door frame shall be made out with 1mm thick Powder coated MS Folded section. The shutter shall be made out with Pre-coated steel sheets both side of PUF. The door shutter shall be fixed with the door frame with hinges. The door shutter shall be provided with 1 No. AL drops at outside, 1 no. Tower bolts at the centre inside and handles shall be provided on both the sides.

Water Tank

Plastics Loft tank (Black) for water storage shall be provided at rear side of Toilet blocks. The tank shall be installed on proper Suppurated MS stand.

For 1 Pan toilet : 300 liters capacity tank (1 No) shall be provided.
For 2 Pan toilet : 500 liters capacity tank (1 No) shall be provided
For 4 Pan toilet : 1000 liters capacity tank (500 Ltr x 2 nos) shall be provided.
For 10 Pan toilet : 2500 liters capacity tank (625 Ltr x 5 nos) shall be provided.

Bio digester Tank

1 No plastics, Bio digester tank shall be supply with each toilet block. The bio digester tank shall be made out with Plastics material including internal partition, media etc. The tank should have an inlet and outlet pipe etc.

For 1 Pan toilet : 500 liters capacity Bio tank (1 No) shall be provided.
For 2 Pan toilet : 1000 liters capacity Bio tank (1 No) shall be provided
For 4 Pan toilet : 2000 liters capacity Bio tank (1000 Liter x 2 nos) shall be provided

For 10 Pan toilet : 5000 liters capacity Bio tank (1000 Liter x 5 nos) shall be provided

Accessories for Sanitation

The require PVC pipes for drainage and water line shall be provided with each unit.

The following items shall be provided for each toilet.

a) 1 No. small exhaust fan
d) 1 No. lamp

54. Bunk House Community Toilet

- **i. 1 Toilet & 4 Urinal**
- **ii. 3 Toilet & 3 Urinal**
- **iii. 3 Toilet & 10 Urinal**
- **iv. 6 Toilet & 4 Urinal**
- **v. 3 Toilet & 7 Urinal & 1 Bathroom**
- **vi. 12 Bathroom**
- **vii. 12 Toilet**

PRODUCT:

Steel Fabricated Insulated Container Type Bunk House

M.S. STRUCTURE

The M.S. Structure Like column, Base frame, Supported Runner & Top frame etc. shall be made out with Combination of Rolled / Folded Section / Tube Section.

FLOOR:
The floor shall be made with 18mm thick Commercial Plywood sheet / Cement sheet. The sheet shall be covered with 1mm thick Vinyl sheet.

PUF INSULATED WALL
The insulated walls shall be made of Sandwich panels. The sandwich panels shall be made out of 0.35mm thick Pre-coated steel sheet on both side of PUF (Polyurethane foam). The total thickness of panel shall be 40mm. The panels are join together by tongue and groove method.
Inner Partition Wall Height 2.0 mt & Urinal Partition Wall Height 0.91 mt shall be Provided.

PUF INSULATED ROOF
The insulated Roof cladding shall be done with sandwich type panels. The panels shall be made out with 0.35 mm thick Pre-coated Profile steel sheets at outer side and 0.35 mm thick Pre-

coated plain sheet at inner side of PUF (Polyurethane foam). Total thickness of roof panel shall be 30 mm. Suitable Flushing shall be made out from Pre-coated steel sheets. As per shown in the Drawing.

DOOR

The door frame shall be made out with MS Folded section. The shutter shall be made out with Pre coated steel sheets both side of PUF. The door shutter shall be fixed with the door frame with hinges. The door shutter shall be provided with 1 No. AL drops at out side, 1 no. Tower bolts at the center inside and handles shall be provided on both the sides.
For Less than 1mt wide Door the Frame shall be made out with Light Aluminium Section.

AIR VENTILATOR:

Readily available aluminium air ventilator shall be provided.

TOILET FITING

Ceramic EWC Tub, Urinals Tub, Wash-basin & RMTB IWC shall be provided in Toilet Block as per shown in the Drawing. The all water line shall be carry out with PVC Pipe and accessories. The Plumbing work within Bunk House Only main line Connection not in our Scope.

ELECTRIFICATION

The Unit (for Bunk House) shall be completed with all the electrical fittings with Casing Ca Ping System on Wall,01 No Tube light, 1 Nos. Ex. fan ,02 Nos 5/15 Amp Power Socket for all Equipment's. 01 Nos Distribution Board & 1 Nos Bulkhead fittings shall be provided.

PAINTS

The Expose Structure shall be painted with one coat primer and two coat enamel paint.
Scope of work.

55. Mobile Toilet

I. 4 Seater

DETAIL SPECTFICATION OF STANDARD 04 SEATER MOBILE TOILET VAN

S NO.	DESCRIPTION	SIZE (Normal Design)
1	Length of Van	8'5''
2	Breadth of Van (including fixed walk way)	8
3	Height of Van	10
6	Sludge Tank (FRP) Approx.	800 ltrs
7	Water tank	500ltrs
8	Door size H/W	1'10"x5'11"
9	Panel size-	33" x 35"

MATERIAL TO BE USED

1. BASIC SUPERSTRUSTURE:-

S NO.	DESCRIPTION	
1	-Long Member- MS CHANNEL	100X50mm
2	-Cross member- MS CHANNEL	75X38mm
3	-Gussets- MS CHANNEL	75X38mm

2. DOORS CENTER PILLARS,W.C. SUPPORT & FRAMES:-

S NO.	DESCRIPTION	
1	Door pillar- Hollow Sq. Pipe	25x50
2	W.C. Support MS Channel-	75X38mm
3	-Frame- MS Hollow Sq. Pipe	25x25
	-	-

3. SLUDGE TANK:-

S NO.	DESCRIPTION	
1	FRP Tank.	800 litres

4. LADDER & WALKWAY:-

S NO.	DESCRIPTION	
1	Ladder width	27 inch
2	Ladder nos.	02 Nos.
3	Walk way aluminium thick.	2mm

5. PANEL,ROOF & FLOORING:-

S NO.	DESCRIPTION	
1	Panel type	= Single FRP Panel , thickness APPROX-3 MM
2	Roof type	=FRP sheet in G.I. Profile, thickness 2mm.
3	Inside Flooring type.	= FRP Integrated IWC

6. SLUDGE DISPOSAL ARRANGEMENT:-

S NO.	DESCRIPTION	Old Model
1	Valve type – Gate valve/butterfly valve/other (specify)	
2	Disposal pipe arrangement- PVC Flexible Pipe 3”	4.0 Mtr.

7. PAINT MATERIAL TYPE?-

S NO.	DESCRIPTION	Old
1	NC PUTTY	ASIAN
2	PREMIER - 2 COTTED	ASIAN
2	ENAMEL PAINT – 2 COTTED	ASIAN

8. ELECTRICAL & OTHER FITTING:-

S NO.	DESCRIPTION
1	Inside Bulbs points
2	Outside Tube light points
3	Door type(material)
4	Mirror

SANITARY FITTING:-

S NO.	DESCRIPTION	
1	Water tank	500 litre
3	wash Basin (FRP)	1 no.
4	Towel rod	1no.
5	Soap tray	1 no.
7	Taps	5 no.

9. WHEEL ARRANGEMENT:-

S NO.	DESCRIPTION	
1	Axle type and size – Sq.	45 MM-02
2	Bearing Hub –Standard Appropriate size	04
3	Heavy duty Spring leaf.	04
4	TYRE	04
5	TUBE	04
6	RIM	04

II. 6 Seater

DETAIL SPECTFICATION OF STANDARD MOBILE TOILET VAN (6 SEATER)		
S NO.	**DESCRIPTION**	
1	Length of Van	12’8”
2	Breadth of Van (including fixed walk way)	8'9"
3	Height of Van	10
6	Sludge Tank (FRP) Approx.	750 ltrs
7	Water tank	500
8	Door size H/W	1'10"x5'11"
9	Toilet Sheet (Indian + WC)	06

10	Wash basin	02

MATERIAL TO BE USED

1. BASIC SUPERSTRUSTURE:-

S NO.	DESCRIPTION	
1	-Long Member- MS CHANNEL	100X50mm
2	-Cross member- MS CHANNEL	75X38mm
3	-Gussets- MS CHANNEL	75X38mm

2. DOORS CENTER PILLARS,W.C. SUPPORT & FRAMES:-

S NO.	DESCRIPTION	
1	Door pillar- Hollow Sq. Pipe	25x50
2	W.C. Support MS Channel-	75X38mm
3	-Frame- MS Hollow Sq. Pipe	25x25
4	-	-

4. LADDER & WALKWAY:-

S NO.	DESCRIPTION	
1	Ladder width	27 inch
2	Ladder nos.	02 Nos.
3	Walk way aluminium thk.	2mm
4	MS Angle	35X5
5	MS ANGLE	25X3
6	MS FLAT STRIP	25X3

5. PANEL,ROOF & FLOORING:-

S NO.	DESCRIPTION	
1	Panel type	= Single FRP Panel , thickness APPROX- 3 MM
2	Roof type	=FRP sheet in G.I. Profile, thickness 2mm.
3	Inside Flooring type.	= FRP Integrated IWC

6. SLUDGE DISPOSAL ARRANGEMENT:-

S NO.	DESCRIPTION	
1	Valve type – Gate valve/butterfly valve/other (specify)	
2	Disposal pipe arrangement- PVC Flexible Pipe 3”	6.0 Mtr.

7. PAINT MATERIAL TYPE

S	DESCRIPTION	

NO.		
1	NC PUTTY	ASIAN
2	PRIMER - 2 COTTED	ASIAN
2	ENAMEL PAINT – 2 COTTED	ASIAN

8. ELECTRICAL & OTHER FITTING:-

S NO.	DESCRIPTION	
1	Inside Bulbs points	3 no.
2	Outside Tube light points	2 no.
3	Door type(material)	FRP
4	Mirror	2 no.

SANITARY FITTING:-

S NO.	DESCRIPTION	
1	Water tank	500 ltr
3	wash Basin (FRP)	2 no.
4	Towel rod	2 no.
5	Soap tray	2 no.
7	Taps	8 no.

9. WHEEL ARRANGEMENT:-

S NO.	DESCRIPTION	
1	Axle type and size – Sq.	50 MM-02
2	Bearing Hub	04
3	Heavy duty Spring leaf	04
4	TYRE	04
5	TUBE	04
6	RIM	04

III. 10 Seater

DETAIL SPECTFICATION OF STANDARD MOBILE TOILET VAN(05 for Ladies Compartments & 05 For Gents Compartments

S NO.	DESCRIPTION	SIZE (Non-Bio Toilet Design)

1	Length of Van	19'7"
2	Breadth of Van (including fixed walk way)	9'2"
3	Height of Van	10
6	Sludge Tank (FRP) Approx.	1300 ltrs
7	Water tank	750 ltrs
8	Door size H/W	1'10"x5'11"

MATERIAL TO BE USED

1. BASIC SUPERSTRUSTURE:-

S NO.	DESCRIPTION	
1	-Long Member- MS CHANNEL	100X50mm
2	-Cross member- MS CHANNEL	75X38mm
3	-Gussets- MS CHANNEL	75X38mm

2. DOORS CENTER PILLARS,W.C. SUPPORT & FRAMES:-

S NO.	DESCRIPTION	
1	Door pillar- Hollow Sq. Pipe	25x50
2	W.C. Support MS Channel-	75X38mm
3	-Frame- MS Hollow Sq. Pipe	25x25

4. LADDER & WALKWAY:-

S NO.	DESCRIPTION	
1	Ladder width	30 inch
2	Ladder nos.	02 Nos.
3	Walk way aluminium thick.	2mm

5. PANEL,ROOF & FLOORING:-

S NO.	DESCRIPTION	
1	Panel type	= Single FRP Panel , thickness APPROX- 3 MM

2	Roof type	=FRP sheet in G.I. Profile, thickness 2mm.
3	Inside Flooring type.	= FRP Integrated IWC

6. SLUDGE DISPOSAL ARRANGEMENT:-

S NO.	DESCRIPTION	
1	Valve type – Gate valve/butterfly valve/other (specify)	
2	Disposal pipe arrangement- PVC Flexible Pipe 3”	6.0 Mtr.

7. PAINT MATERIAL TYPE

S NO.	DESCRIPTION	
1	NC PUTTY	ASIAN
2	PRIMER - 2 COTTED	ASIAN
2	ENAMEL PAINT – 2 COTTED	ASIAN

8. ELECTRICAL & OTHER FITTING:-

S NO.	DESCRIPTION	
1	Inside Bulbs points	5 no.
2	Outside Tube light points	1 no.
3	Door type(material)	FRP
4	Mirror	2 no.

SANITARY FITTING:-

S NO.	DESCRIPTION	
1	Water tank	750 ltr
2	Wash Basin (FRP)	2 Nos.
3	Towel Rod	1 Nos.
4	Shop Tray	2 Nos.
5	Taps	12 Nos.

9. WHEEL ARRANGEMENT:-

S NO.	DESCRIPTION	Up.
1	Axle type and size – Sq.	45 MM-02
2	Bearing Hub –Standard Appropriate size	04
3	Spring	4
4	TYRE	04
5	TUBE	04
6	RIM	04

56. Mobile Bio Toilet

I. 4 Seater

DETAIL SPECTFICATION OF STANDARD 04 SEATER BIO-MOBILE TOILET VAN

S NO.	DESCRIPTION	SIZE (Bio- Design)
1	Length of Van	8’5’’
2	Breadth of Van (including fixed walk way)	8
3	Height of Van	10
6	Bio Digester Tank (FRP) Approx.	800 ltrs
7	Water tank	500 ltrs
8	Door size H/W	1'10"x5'11"
9	Panel size-	33" x 35"

MATERIAL TO BE USED

1. BASIC SUPERSTRUSTURE:-

S NO.	DESCRIPTION	
1	-Long Member- MS CHANNEL	100X50mm
2	-Cross member- MS CHANNEL	75X38mm
3	-Gussets- MS CHANNEL	75X38mm

2. DOORS CENTER PILLARS,W.C. SUPPORT & FRAMES:-

S NO.	DESCRIPTION	
1	Door pillar- Hollow Sq. Pipe	25x50
2	W.C. Support MS Channel-	75X38mm
3	-Frame- MS Hollow Sq. Pipe	25x25
	-	-

4. LADDER & WALKWAY:-

S NO.	DESCRIPTION	
1	Ladder width	27 inch
2	Ladder nos.	02 Nos.
3	Walk way aluminium thick.	2mm

5. PANEL,ROOF & FLOORING:-

S NO.	DESCRIPTION	
1	Panel type	= Single FRP Panel , thickness APPROX- 3 MM
2	Roof type	=FRP sheet in G.I. Profile, thickness 2mm.
3	Inside Flooring type.	= FRP Integrated IWC

6. SLUDGE DISPOSAL ARRANGEMENT:-

S NO.	DESCRIPTION	Old Model
1	Valve type – Gate valve/butterfly valve/other (specify)	
2	Disposal pipe arrangement- PVC Flexible Pipe 3”	4.0 Mtr.

7. PAINT MATERIAL TYPE?-

S NO.	DESCRIPTION	Old
1	NC PUTTY	ASIAN

2	PREMIER - 2 COTTED	ASIAN
2	ENAMEL PAINT – 2 COTTED	ASIAN

8. ELECTRICAL & OTHER FITTING:-

S NO.	DESCRIPTION	Old
1	Inside Bulbs points	2 no.
2	Outside Tube light points	2 no.
3	Door type(material)	FRP
4	Mirror	1 no.

SANITARY FITTING:-		
S NO.	**DESCRIPTION**	
1	Water tank	500 litre
3	wash Basin (FRP)	1 no.
4	Towel rod	1no.
5	Soap tray	1 no.
7	Taps	5 no.

9. WHEEL ARRANGEMENT:-

S NO.	DESCRIPTION	
1	Axle type and size – Sq.	45 MM-02
2	Bearing Hub –Standard Appropriate size	04
3	Heavy duty Spring leaf.	04
4	TYRE	04
5	TUBE	04
6	RIM	04

II. 6 Seater

DETAIL SPECTFICATION OF STANDARD MOBILE BIO TOILET VANS (6 SEATER)		
S NO.	**DESCRIPTION**	**SIZE**
1	Length of Van	12'4"
2	Breadth of Van (including fixed walk way)	8'9"

3	Height of Van	10
6	Bio Digester Tank (FRP)	1200 ltr
7	Water tank	500
8	Door size H/W	1'10"x5'11"

MATERIAL TO BE USED

1. BASIC SUPERSTRUSTURE:-

S NO.	**DESCRIPTION**	
1	-Long Member- MS CHANNEL	125X62mm
2	-Cross member- MS CHANNEL	75X38mm
3	-Gussets- MS CHANNEL	75X38mm

2. DOORS CENTER PILLARS,W.C. SUPPORT & FRAMES:-

S NO.	**DESCRIPTION**	
1	Door pillar- Hollow Sq. Pipe	25x50
2	W.C. Support MS Channel-	75X38mm
3	-Frame- MS Hollow Sq. Pipe	25x25

3. SLUDGE TANK:-

S NO.	**DESCRIPTION**	
1	Bio Digester	1200 ltrs

4. LADDER & WALKWAY:-

S NO.	**DESCRIPTION**	
1	Ladder width	27 inch
2	Ladder nos.	02 Nos.
3	Walk way aluminium thk.	2mm

5. PANEL,ROOF & FLOORING:-

S NO.	**DESCRIPTION**	
1	Panel type	= Single FRP Panel , thickness APPROX- 3 MM
2	Roof type	=FRP sheet in G.I. Profile, thickness 2mm.
3	Inside Flooring type.	= FRP Integrated IWC

6. SLUDGE DISPOSAL ARRANGEMENT:-

S NO.	DESCRIPTION	
1	Valve type – Gate valve/butterfly valve/other (specify)	
2	Disposal pipe arrangement- PVC Flexible Pipe 3”	4.0 Mtr.

7. PAINT MATERIAL TYPE

S NO.	DESCRIPTION	
1	NC PUTTY	ASIAN
2	PRIMER - 2 COTTED	ASIAN
3	ENAMEL PAINT – 2 COTTED	ASIAN

8. ELECTRICAL & OTHER FITTING:-

S NO.	DESCRIPTION	
1	Inside Bulbs points	3 no.
2	Outside Tube light points	1 no.
3	Door type(material)	FRP
4	Mirror	1 no.

SANITARY FITTING:-

S NO.	DESCRIPTION	
1	Water tank	500 ltr
3	wash Basin (FRP)	1 no.
4	Towel rod	1 no.
5	Soap tray	1 no.
7	Taps	6 no.

9. WHEEL ARRANGEMENT:-

S NO.	DESCRIPTION	
1	Axle type and size – Sq.	45 MM-02
2	Bearing Hub –Standard Appropriate size	04
3	Heavy duty Spring leaf 900mm Long.	04
4	TYRE	04
5	TUBE	04
6	RIM	04

III. 10 Seater

DETAIL SPECTFICATION OF STANDARD MOBILE BIO TOILET VAN		
S NO.	**DESCRIPTION**	**SIZE (Bio Toilet Design)**
1	Length of Van	19'7"
2	Breadth of Van (including fixed walk way)	9'2"
3	Height of Van	10
6	Bio Digester Tank (FRP) Approx.	2300 ltrs
7	Water tank	1000 ltrs
8	Door size H/W	1'10"x5'11"
MATERIAL TO BE USED		
1. BASIC SUPERSTRUSTURE:-		
S NO.	**DESCRIPTION**	
1	-Long Member- MS CHANNEL	100X50mm
2	-Cross member- MS CHANNEL	75X38mm
3	-Gussets- MS CHANNEL	75X38mm
2. DOORS CENTER PILLARS,W.C. SUPPORT & FRAMES:-		
S NO.	**DESCRIPTION**	
1	Door pillar- Hollow Sq. Pipe	25x50
2	W.C. Support MS Channel-	75X38mm
3	-Frame- MS Hollow Sq. Pipe	25x25
3. Bio Digester TANK:-		
S NO.	**DESCRIPTION**	
1	FRP Tank.	2300 ltrs
4. LADDER & WALKWAY:-		
S NO.	**DESCRIPTION**	
1	Ladder width	30 inch

2	Ladder nos.	02 Nos.
3	Walk way aluminium thick.	2mm
5. PANEL,ROOF & FLOORING:-		
S NO.	**DESCRIPTION**	
1	Panel type	= Single FRP Panel , thickness APPROX- 3 MM
2	Roof type	=FRP sheet in G.I. Profile, thickness 2mm.
3	Inside Flooring type.	= FRP Integrated IWC
6. SLUDGE DISPOSAL ARRANGEMENT:-		
S NO.	**DESCRIPTION**	
1	Valve type – Gate valve/butterfly valve/other (specify)	
2	Disposal pipe arrangement- PVC Flexible Pipe 3”	6.0 Mtr.
7. PAINT MATERIAL TYPE		
S NO.	**DESCRIPTION**	
1	NC PUTTY	ASIAN
2	PRIMER - 2 COTTED	ASIAN
2	ENAMEL PAINT – 2 COTTED	ASIAN
8. ELECTRICAL & OTHER FITTING:-		
S NO.	**DESCRIPTION**	
1	Inside Bulbs points	5 no.
2	Outside Tube light points	1 no.
3	Door type(material)	FRP
4	Mirror	2 no.
SANITARY FITTING:-		
S NO.	DESCRIPTION	
1	Water Tank	1000 ltr
3	Wash Basin (FRP)	2 no.

4	Towel Rod	1no.
5	Shop Tray	2 n0.
7	Taps	12no.
9. WHEEL ARRANGEMENT:-		
S NO.	**DESCRIPTION**	**Up.**
1	Axle type and size – Sq.	55MM-02
2	Bearing Hub –Standard Appropriate size	04
3	Heavy duty Spring leaf -13 Nos.x900mm Long.	4
4	TYRE	04
5	TUBE	04
6	RIM	04

57. Drinking Water Hut

Description:

prefabricated Drinking water HUT shall be suitable for mounting on Ready-made floor or plain ground. The components shall be fabricated at factory for easy to assembly at site.

Design Code:

a) SIPL – DWS – 500 – 01
b) **SIPL – DWS – 500 – 01 (WR)**

Size : 1.5 mt Dia. X 2.7 mt. Height - as per enclosed drawing.

Base:

The Base of water Hut shall be made out of moulded plastics. The base shall be moulded in single piece with 4 nos. basin etc. complete. The waste coupling and waste pipe shall be fixed in all basins for drain waste water; these waste pipes shall be connecting to a main pipe. One outlet shall be provided at bottom of base for drain waste water.

Roof :

The Roof of water station shall be made out of durable plastics material. The roof shall be moulded in single piece in require size and shape as per shown in the

drawing. The roof shall be rest on proper MS structure and fixed with suitable fasteners.

MS Structure:

The supported MS Structure shall be made out with combination of Rolled and tube sections. The MS Structure shall be painted with two coats of synthetic enamel paint.

Water Tank:

Plastics water tank having capacity of 500 liters shall be provided with each unit. This tank shall be kept on MS Structure. The tanks have 4 nos. Push type Tap at four sides for water drinking.

58. Prefabricated Drinking Water ATM

The Water ATM should be Coin and RFID Card Operated. The machine should be precisely designed by advanced manufacturing unit following industry defined guidelines.

Features:

- Sturdiness
- Superior performance
- Corrosion-resistance

Specification:

- Power : 100-270VAC
- Solenoid: 12VDC (Internal)
- Flow Sensor: Pulse Type
- Level Sensing: Treated Water Level Floaty
- Display: 2.8" TFT, Monochrome
- Programming Keys: 5
- Activation: Coin are used 1,2 and 5 Rupees / RFID Card (Smart card)
- Programming/ Card Charging: Locally as well as through hand held programmer (Optional).
- Size: 250 (W) X 300(H) X135(D) mm
- Water Inlet Connection: ¾” Solvent Cementable
- Water Outlet Connection: ¾” Solvent Cementable.
- Water Column: 1 m (min)

59. Trailer Mounted Water Tanker

i. Stainless Steel 4000L Capacity

General

Tanker Chassis Channel Size - 100mm x 50mm x length as required heavy duty

Tanker Chassis, Boom Channel Size- 100mmx50mm heavy duty with rotating Hitch

Tanker Body 3.0 mm S.S. grade 304, Dia & Sheet Size as per 4000 Ltrs. capacity.

Axle 1 ½ "square, heavy duty.

Leaf Spring 8mm x 65mm x 1 Mtr. = 04 nos.

RIM Size 7:50 x 16 = 02 Nos., Central Plate = 04 nos.

Tyre Tube 7:50 x 16 make MRF/CEAT = 4 Nos.

2" valve for Water Filter = 01 no.

Water Tap = 02 nos.

ii. MS 4000L Capacity

General

Tanker Chassis Channel Size - 100mm x 50mm x length as required heavy duty

Tanker Chassis, Boom Channel Size- 100mmx50mm heavy duty with rotating Hitch

Tanker Body 3.0 mm MS, Dia & Sheet Size as per 4000 Ltrs. capacity.

Axle 1 ½ "square, heavy duty.

Leaf Spring 8mm x 65mm x 1 Mtr. = 04 nos.

RIM Size 7:50 x 16 = 02 Nos., Central Plate = 04 nos.

Tyre Tube 7:50 x 16 make MRF/CEAT = 4 Nos.

2" valve for Water Filter = 01 no.

Water Tap = 02 nos.