



MORBI MUNICIPAL CORPORATION

Request for Proposal (RfP) for Establishment of 250 TPD MSW Processing Plant with 15 years O&M on PPP (DBFOT) basis at Morbi (Third Call).

Volume III: Project Information Memorandum

2026

Morbi Municipal Corporation (MRMC)

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PROJECT INFORMATION, SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

1 Project Overview and Background

1.1 Introduction

MRMC intends to establish an Integrated Municipal Solid Waste (MSW) Processing Facility of 250 Tons per Day (TPD) capacity at Morbi, Gujarat, for scientific management, processing and resource recovery from municipal solid waste generated within its jurisdiction.

The Project shall be implemented on a Public Private Partnership (PPP) basis under the Design, Build, Finance, Operate and Transfer (DBFOT) model with a 15-year Operation and Maintenance (O&M) period.

The proposed facility shall comprise a Material Recovery Facility (MRF) for segregation and recovery of recyclables and Refuse-Derived Fuel (RDF) from mixed municipal solid waste, and a Compressed Biogas (CBG) Plant for biomethanation of the organic fraction of waste, along with all necessary civil, electrical, mechanical, and utility systems for its operation.

This volume of the Tender document provides details of the project, including technical requirements, scope of work, design standards, and performance parameters for reference of the Concessionaire. The Selected Bidder may propose suitable modifications, alternate specifications, equipment, or design configurations as deemed necessary for the efficient, safe, and reliable performance of the Processing Facility. However, any such deviation or modification shall be pursuant to proper justification, approval of the Authority and the Tender conditions.

1.2 About Morbi City

Morbi is a major industrial and commercial hub situated in the Saurashtra region of Gujarat, located on the banks of the Machhu River. The city lies along the Rajkot–Kandla Highway, providing strategic connectivity to Rajkot, Jamnagar, Ahmedabad, and the ports of Kandla and Mundra.

Morbi was upgraded to a Municipal Corporation in 2025, encompassing a total area of 112.36 sq. km and a population of approximately 5.52 lakh (as per the City Solid Waste Action Plan under SBM-U 2.0). The city is widely recognized as the “Ceramics Capital of India,” hosting one of the world’s largest clusters of ceramic tile and sanitaryware industries.

Rapid industrialization and population growth have increased the generation of municipal solid waste, placing significant pressure on the existing waste management infrastructure and necessitating a scientifically planned processing facility.

1.3 Need of the Project

At present, the only limited quantum of municipal solid waste generated in Morbi is segregated and/or treated. To comply with the Solid Waste Management Rules, 2016, the directives of the Gujarat Pollution Control Board (GPCB) and the National Green Tribunal (NGT), and to achieve sustainable and scientific waste processing, MRMC proposes to develop a modern integrated MSW processing facility.

The Project will:

- Enable scientific processing of 250 TPD mixed municipal solid waste.
- Facilitate recovery of recyclables, production of Refuse-Derived Fuel (RDF), and generation of renewable energy through biomethanation.
- Ensure compliance with statutory norms and environmental standards.
- Reduce the volume of waste requiring landfilling.
- Support the Swachh Bharat Mission (Urban) 2.0 objectives for 100% waste processing and resource recovery.

1.4 Project Objectives

The key objectives of the project are as follows:

- Establish an environmentally sustainable and financially viable waste processing system in Morbi.
- Maximize material and energy recovery from municipal solid waste through segregation, recycling, and biomethanation.
- Minimize waste disposal to landfill and reduce greenhouse gas emissions.
- Ensure long-term operational efficiency and compliance with applicable laws and standards.
- Encourage private sector participation under a PPP model to bring innovation and efficiency.

1.5 Project Components

The proposed Integrated Waste Processing Facility will comprise the following major components:

Sr. No.	Component	Description
1	Material Recovery Facility (MRF)	For segregation of mixed waste into recyclables, RDF, organics, and inerts.
2	Compressed Biogas (CBG) Plant	For anaerobic digestion of approximately 100 TPD of segregated wet waste to produce biogas, upgraded to CBG as per IS 16087:2016.
3	Utilities and Ancillary Facilities	Effluent treatment plant, fertiliser preparing facility, power supply system, water system, odour control system, weighbridge, administrative block, internal roads, parking, stormwater drainage, laboratory, and safety systems.

1.6 Project Implementation Model

The Project shall be developed through a Public-Private Partnership (PPP) arrangement under the Design, Build, Finance, Operate and Transfer (DBFOT) framework.

- Construction Period:** 12 months from contract execution date (3 months for compliance of Concessionaires Condition Precedents and 9 months for construction)
- Operation & Maintenance Period:** 15 years from Commercial Operation Date (COD)
- Authority's Support:** MRMC shall provide a capital grant equivalent to **40% of the capital cost** and **40% support in O&M cost**, as per terms of the Concession Agreement.

- d) **Transfer:** The Project assets shall be transferred to MRMC at the end of the Concession Period.

1.7 Project Site

- The proposed project site is located at Jodhpur (Nadi) Village, Morbi. The site is accessible by an all-weather road.
- Project Site Location:** R.S. No.300 p, Jodhpur (Nadi) Village, Near Rafaleshwar Mahadev Temple, Morbi Dist.
- Project Site Coordinates:** Lat-Long - 22.778796, 70.888268
- Refer to the Appendices of this document for site layout and satellite image overlay
- Important Note:** MRMC reserves the right to change the project site prior to execution of the contract. The Selected Bidder shall be bound to execute the work at the changed location without any additional cost due to relocation.

1.8 Summary of Project Features

Parameter	Description
Project Title	Establishment of 250 TPD Integrated Municipal Solid Waste (MSW) Processing Plant with 15 Years Operation & Maintenance on Public Private Partnership (DBFOT) Basis at Morbi.
Implementation Model	PPP (DBFOT) with 15 Years O&M
Processing Capacity	250 TPD Mixed Waste
Technology	Segregation + Biomethanation + CBG Upgradation
CBG Output	Approx. 3 TPD
Other Outputs	Recyclables, RDF, Organic Manure/Digestate
Project Cost	Capital Cost: INR 41.76 Crore O&M Cost (15 years): INR 110.97 Crore Total Cost: INR 152.73 Crore
Implementation Period	12 Months Construction + 15 Years O&M
Project Site	R.S. No.300/1 paiki, Near Rafaleshwar Mahadev Temple, Jodhpur (Nadi) Village, Morbi Dist.
Authority Support	40% of CAPEX + 40% of OPEX

2 Scope of Work for the Concessionaire

2.1 General Scope

The Concessionaire shall be responsible for the Design, Engineering, Procurement, Construction, Financing, Commissioning, Operation and Maintenance of the Integrated Municipal Solid Waste Processing Facility of 250 TPD capacity at Morbi, Gujarat, for a Concession Period of 15 (fifteen) years, including 12 (twelve) months of construction and commissioning period.

The Concessionaire shall design and execute the Project in accordance with the requirements set forth in this Volume and the provisions of the Concession Agreement (Volume II). The Project shall be implemented on a Design–Build–Finance–Operate–Transfer (DBFOT) basis.

The Concessionaire shall be solely responsible for:

- a) Arranging all finances required for the Project.
- b) Designing the facilities in compliance with prescribed standards.
- c) Procuring all equipment, machinery, and materials.
- d) Obtaining necessary approvals and clearances.
- e) Constructing, testing, and commissioning the plant.
- f) Operating and maintaining the facilities for the specified O&M period.
- g) Ensuring safe, efficient, and environmentally compliant operations.
- h) Handing over the facility to MRMC in good working condition at the end of the Concession Period.

2.2 Design and Engineering

The Concessionaire shall carry out detailed design and engineering of all project components in accordance with good industry practices and relevant Indian and international standards.

Key design requirements include:

- a) The facility shall be designed for processing 250 TPD of mixed municipal solid waste with flexibility to handle variations in quantity and composition.
- b) The design shall ensure smooth integration of MRF, CBG Plant, and utility systems.
- c) Equipment selection, sizing, and layout shall consider maintainability, safety, and energy efficiency.
- d) The design shall incorporate provision for odour control, leachate management, stormwater drainage, fire safety, and worker safety.
- e) Structural and civil designs shall comply with National Building Code (NBC) and relevant BIS standards.
- f) Detailed engineering drawings (civil, mechanical, electrical, instrumentation, process flow diagrams, etc.) shall be submitted to MRMC for approval prior to commencement of construction.

2.3 Construction, Supply, Erection, and Commissioning

The Concessionaire shall:

- a) Supply, install, test & commission 250 TPD mixed MSW processing plant including 100 TPD input capacity CBG plant
- b) Construct and develop the entire processing facility including but not limited to sheds, digesters, tanks, foundations, effluent treatment plant, administrative buildings,

internal roads, weighbridge, water supply and drainage systems, firefighting system power systems, laboratory, control room, compound wall, gates and all other ancillary works as per approved designs.

- c) Undertake all civil, structural, mechanical, electrical, plumbing, and instrumentation works necessary for successful plant commissioning.
- d) Procure, install, and commission all mechanical, electrical, and instrumentation equipment required for full functionality of the plant.
- e) Supply, install, test & commission of Material Recovery Facility (MRF) equipment including but not limited to Trommel screens, Magnetic separator, Air classifier, Conveyor system, Shredder, baler, and other equipment as per requirement.
- f) Supply, install, test & commission Compressed Biogas (CBG) Plant including but not limited to Feed mixer and pulper, Anaerobic digesters, Gas holders, Biogas purification and upgrading system (VPSA), Gas compressor and cascade storage, Flare system etc. as per requirement
- g) Supply, installation, and commissioning of Digestate Treatment System including but not limited to Solid-liquid separator, volute press, Composting and drying area etc. as per requirement
- h) Supply, installation, and commissioning of Odour Control & Mist Spray Systems, etc. as per requirement
- i) Supply, installation, and commissioning of Electrical & Instrumentation Works including but not limited to transformer substation with internal power distribution, MCC panels, starter panels, PLC-based control, and automation, DG sets with AMF and acoustic enclosure, SCADA-enabled monitoring for process parameters, Power and lighting system for all plant areas, CCTV surveillance etc. as per requirement.
- j) The work shall have to be executed in accordance with the drawings / layouts / FEED (prepared by Concessionaire) and approved by the Authority and shall have to meet high standards of workmanship, safety and security.
- k) Concessionaire shall strictly comply with the fire & safety norms and all equipment shall be suitable for the requirement of applicable classification of Hazardous zone wherever required.
- l) Complete all works within the prescribed Construction Period of 12 months from the Contract Execution Date.
- m) Carry out trial operations for a minimum of 60 consecutive days (or as specified in Volume 02 (DCA) of this RfP) to demonstrate performance standards before issue of the Acceptance Certificate by the Authority.
- n) Provide adequate infrastructure for internal roads, stormwater drainage, and parking in the facility.
- o) The technology suggested / offered shall follow all applicable standards as per prevailing regulations of pollution control and solid waste management rules in force.
- p) Ensure compliance with all statutory and environmental norms during construction.

2.4 Operation and Maintenance

The Concessionaire shall be responsible for operation and maintenance (O&M) of the entire facility for a period of 15 years after successful commissioning.

The O&M responsibilities shall include, but not be limited to:

- a) Operation and maintenance of the processing plant and its machinery for the entire concession period of 15 years as per agreed terms and conditions.

- b) Day-to-day operation of the MRF and CBG plant in accordance with design capacity and environmental standards.
- c) Segregation, processing, and disposal of all incoming waste streams in accordance with the SWM Rules, 2016.
- d) Proper handling, storage, and sale of RDF, recyclables, and CBG output.
- e) Scientific handling of digestate, leachate, and residues.
- f) Deployment of qualified manpower, engineers, plant operators, and technical staff.
- g) Routine and preventive maintenance of all equipment, buildings, and utilities.
- h) Periodic replacement of consumables (chemicals, filters, lubricants).
- i) Maintenance of weighbridge and daily waste receipt records.
- j) Maintenance plant input and output logs as per the approved formats.
- k) Construction and manufacturing defects during O&M period shall be attended by the Concessionaire at his own cost.
- l) Tools and tackles required for operation and maintenance should be provided by the Concessionaire.
- m) Implementation of Environmental Management Plan (EMP) and Occupational Health & Safety (OHS) measures.
- n) Regular monitoring of emissions, effluents, and odour.
- o) Periodic calibration of instruments and energy management.
- p) Submission of monthly performance and compliance reports to MRMC on throughput, product sales, and environmental performance.
- q) Cooperation with inspections, audits, and performance evaluations conducted by MRMC or its authorized agencies.

- r) Reading and recording various meters and gauges including adjusting and operating controls and filling/writing daily log sheet of the installation as per directions of Authority.
- s) Use of any tools or plants for operation and maintenance of the installation and up-keeping all such tools and plants, equipment, stores and other items of inventory in safe custody and be readily accessible in times of necessity.
- t) Issue necessary operating instructions to operators of different installations.
- u) Tightening of foundation bolts, checking of oil, lubricating, greasing, preventing leakage, cleaning the equipment every day whenever required.
- v) The installations shall be manned and operated on all the 365 days and 7 days of the week irrespective of holidays and Sundays and 24-hours a day.
- w) All stoppages shall be repaired expeditiously.
- x) Daily charts of the personnel are to be displayed in the premises. Biometric system shall be installed for daily attendance. The representatives of Authority shall be authorised to inspect the attendance record.
- y) The Concessionaire is expected to employ reserve operators in performance of contract consequent to labour regulations /statute on working of personnel on National Holidays etc., and also on any day when operator(s) is/are absent from duty.
- z) The Concessionaire shall be responsible for the payment of statutory levies & other charges and to maintain the record thereof.
- aa) The cost of repairs / modifications necessary due to negligence of operator shall be borne by the Concessionaire. If the Concessionaire fails to repair within the given period, the Authority reserves the right to get it repaired through other agency at the risk and cost of the Concessionaire.

- bb) The operating personnel shall be qualified and experienced in the job for which he is employed. The Concessionaire shall produce certificates of qualifications and experience to the satisfaction of the MRMC.
- cc) The operating personnel shall have thorough knowledge of safety precautions during emergency cases and also be conversant with the IE Act/ Rules and Indian Factory Act/Rules and other rules & regulations in force.
- dd) The Concessionaire shall provide a Notice Board on which the precautions to be taken by operation and maintenance staff have to be exhibited.
- ee) Total number of staff members required for safe and compliant operations and maintenance of the facility is 78 persons, as provided in this volume of the RfP document. However, optimization of the number of staff members required may be permitted, provided all performance, safety, statutory and operational requirements are fully met.

2.5 Workforce Requirement for plant operations

The successful operation of the Integrated Waste Processing Facility at Morbi depends on the deployment of modern machinery along with an adequately trained and motivated workforce. The manpower planning has been carried out keeping in view:

- a) Continuous 24x7 operation of the CBG plant.
- b) Two-shift (16 hours/day) operation of the MRF.
- c) Preventive maintenance requirements for heavy mechanical equipment.
- d) Statutory compliance in terms of occupational safety, environmental monitoring, and record-keeping.
- e) Integration of informal sector workers into formalized roles within the MRF.

The indicative workforce required for operation and maintenance shall be as follows;

Category	Designation	Nos.	Remarks
Management	Plant Manager	1	Overall in-charge
	Admin & HR	1	HR, payroll, liaison
	Accountant	1	Maintain Accounts
	Store Keeper	1	Inventory Management
Skilled Operators	CBG Operator	3	1 / shift (3 shift)
	CBG Mechanic + Fitter	3	1 / shift (3 shift)
	Crane, forklift & Baler operator	6	3 / shift (2 shifts)
	Electrician	1	-
	ETP Operator	3	1 / shift (3 shifts)
	ETP Helper	2	1 / shift (2 shifts)
	Fertiliser Production Workers	5	2 shifts
	MRF Plant Operator	3	1 / shift (3 shift)
	MRF Mechanic + Fitter	1	-
	Fertiliser Equipment Operator	3	1 / shift (3 shift)
	Weighbridge Operator	2	2 shifts
Sorting Staff	Cleaning & Sorting Labour	30	15 / shift (2 shifts)

Category	Designation	Nos.	Remarks
Support Staff	Office attendant	1	-
	Security Guards	6	2 / shift (3 shifts)
Technical Staff	Chemist	1	Quality Testing
	EHS officer	1	Env., health & safety Compliance
	Engineer (Mechanical)	2	Maintenance & utilities
	Helper	1	Maintenance
Total Workforce		78	

2.6 Performance Requirements

The Concessionaire shall operate the facility in compliance with the following minimum performance standards:

Parameter	Requirement
Throughput	Facility shall process 100% of the Acceptable Waste delivered by MRMC up to 250 TPD.
Plant Availability	Minimum 330 days annual plant availability (excluding Force Majeure).
CBG Yield	Minimum 50% CBG generation efficiency as specified in Volume 02 (DCA) of this RfP
Inert Waste	Maximum 20% of input waste shall be diverted to landfill for disposal.
Environmental Compliance	Operations shall meet GPCB emission, noise, and effluent discharge norms.
Safety Compliance	Adherence to Fire, OHS, and Hazard Management standards.

Detailed Key Performance Indicators (KPIs) shall be as per Article 21 of the Volume-II (Draft Concession Agreement) of this RfP.

2.7 Statutory Approvals and Compliance

The Concessionaire shall obtain, maintain, and periodically renew all necessary statutory approvals, clearances, and consents from competent authorities, including but not limited to:

- Consent to Establish and Consent to Operate under the Water and Air Acts from GPCB;
- Authorization under SWM Rules, 2016;
- PESO certification, Fire NOC, and Factory License (as applicable);
- Labour law compliances and safety permits;
- Any other approvals required during the concession period.

An overview of the necessary approvals involved is provided in the table below:

Sr. no.	Permit / Approval (Indicative)	Applicable Authority	Stage of Requirement	Renewal Requirement
1	Land use conversion / NA permission (if required)	Revenue Dept.	Before construction	Not applicable
2	Building plan approval	Local Authority	Before construction	Not applicable
3	Consent to Establish (CTE)	Gujarat Pollution Control Board (GPCB)	Before construction	Valid for construction period; once project is ready, apply for CTO
4	Filling and Storage of CBG (explosive item)	Petroleum & Explosives Safety Organisation (PESO), Ministry of Commerce & Industry, GOI	Before construction / Before operations	Required
5	Fire Safety NOC	Gujarat Fire & Emergency Services	Before construction / during construction	Required
6	Consent to Operate (CTO)	Gujarat Pollution Control Board (GPCB)	Before operations	Required
7	Factory license (if applicable under Factories Act)	Directorate of Industrial Safety & Health (DISH), Govt. of Gujarat	Before operations	Required
8	Fertilizer license under FCO, 1985 (for digestate marketing)	Dept. of Agriculture & Cooperation (State Agriculture Dept.)	Before operations	Required
9	Labour registration	Labour Dept., Govt. of Gujarat	During construction	Valid for project duration only
10	Registration under ESI & EPF Acts (for workers)	Employees' State Insurance Corporation (ESIC) & EPFO	Before operations	Ongoing compliance

All statutory payments, fees, and obligations during the Concession Period shall be borne by the Concessionaire.

2.8 Environmental and Safety Management

The Concessionaire shall adopt and maintain systems for environmental protection, pollution control, and safety in accordance with the Environmental Management Plan (EMP) and applicable laws.

Key requirements include:

- a) Leachate and effluent treatment through ETP to meet CPCB/GPCB standards.
- b) Installation of odour control and air pollution control systems.
- c) Safe handling of digestate, RDF, and residues.
- d) Implementation of fire safety and emergency response measures.
- e) Provision of personal protective equipment (PPE) and periodic health check-ups for workers.
- f) Regular environmental monitoring and record-keeping.

2.9 Performance Monitoring and Reporting

The Concessionaire shall:

- a) Maintain records of daily waste quantities received, processed, and output generated.
- b) Submit monthly performance reports including CBG output, material recovery, downtime, and environmental compliance.
- c) Facilitate independent monitoring by the Authority Representative.
- d) Immediately report any environmental incidents, accidents, or deviations.
- e) Provide unrestricted access to the Authority for inspections.

Please refer Article 20 of the Volume-II (Draft Concession Agreement) of this RfP for conditions related to O&M Monitoring & Reporting.

2.10 Handback Requirements

At the expiry or early termination of the Concession Period, the Concessionaire shall:

- a) Hand over the entire Project Facility, including all structures, equipment, and utilities, to MRMC in good working condition.
- b) Conduct a joint inspection with MRMC and rectify any deficiencies identified before handback.
- c) Furnish all as-built drawings, operation manuals, and maintenance records.

Ensure the facility meets Hand-back Requirements defined in the Article 30 of the Volume-II (Draft Concession Agreement) of this RfP.

2.11 Exclusions

The following activities are excluded from the Concessionaire's scope unless otherwise agreed:

- a) Primary waste collection and transportation from source to the Project Site (to be carried out by MRMC or its contractors).
- b) Development and/or operation of the Sanitary Landfill for inert waste.

3 Technical Specifications and Design Requirements

3.1 The civil, mechanical, and electrical specifications, designs, drawings, and layouts provided in this RfP are indicative in nature and are intended solely for reference and guidance of the Bidders. The Selected Bidder may propose suitable modifications, alternate specifications, equipment, or design configurations as deemed necessary for the efficient, safe, and reliable performance of the Processing Facility. However, any such deviation or modification shall:

- a) be supported with detailed technical justification and documentation;
- b) meet or exceed the performance standards, output parameters, and service levels prescribed in this RfP; and
- c) be implemented only after obtaining the prior written approval of the Authority.

The Authority reserves the right to accept or reject any proposed deviation or modification, in whole or in part, at its sole discretion.

3.2 General Design Philosophy

The Integrated MSW Processing Facility shall be designed and constructed to process 250 Tons per Day (TPD) of mixed municipal solid waste generated within the jurisdiction of MRMC.

The design and engineering shall conform to Good Industry Practice, ensure long-term reliability, operational efficiency, worker safety, and compliance with environmental standards.

The facility shall be developed as a combination of:

- Material Recovery Facility (MRF) for segregation and resource recovery, and
- Compressed Biogas (CBG) Plant for treatment of the biodegradable fraction through anaerobic digestion and biogas upgrading.

The Concessionaire shall ensure that all systems are:

- Modular, easily maintainable, and adaptable to variations in waste characteristics.
- Environmentally sustainable with minimum odour, leachate, and emissions.
- Compliant with all statutory standards including SWM Rules 2016, CPHEEO Manual 2016, IS/BIS Standards, and GPCB norms.

3.3 Material Recovery Facility (MRF)

3.3.1 MRF Design Capacity

The MRF shall be designed for segregation and processing of the entire 250 TPD mixed waste, with capacity flexibility of $\pm 20\%$ to accommodate fluctuations in waste supply.

The MRF shall handle mixed waste, segregate it into recyclable, organic, RDF, and inert fractions.

3.3.2 Functional Requirements

- a) The MRF shall perform mechanical and manual segregation of incoming waste into:
 - i. Organic (biodegradable) fraction
 - ii. Recyclable fraction (plastics, paper, metals, glass, etc.)
 - iii. RDF fraction (combustible non-recyclables)
 - iv. Inert fraction (silt, stones, fines)

- b) Provision shall be made for screening, shredding, magnetic separation, air separation, and baling as required.
- c) Dust suppression and odour control systems shall be provided across the facility.
- d) Adequate covered areas shall be provided for storage of recyclables, RDF, and inerts.
- e) Internal roads and floor slabs shall be suitable for heavy vehicular loads.

3.3.3 Key Equipment of MRF (Indicative List)

S.No.	Processing units	Equipment used	Remarks
1	Initial unloading of mixed MSW	Waste Receiving Hopper	RCC pit with adequate storage
2	Waste conveying and feeding	Belt Conveyor System	Rubber/nylon belt 800–1200 mm width as per requirement
3	Screening / Segregation by particle size	Disc screens or trommels or Vibratory screens as per requirement	For separation of wastes into two or more size distributions
4	Ferrous metal separation	Magnetic separators	Electromagnetic, inline over-belt type
5	Separation of RDF/light fraction	Air Density Separator	Separation of lighter materials from heavy material, specifically for separating out lightweight plastics and paper from the mixed stream
6	Manual sorting	Manual sorting conveyer	Despite the advancement of automated technologies, manual sorting remains a crucial part of MSW segregation, where human sorters manually remove specific items
7	Size reduction	Shredder	To reduce too large sorted materials to smaller sizes
8	Compression of recyclables/RDF	Baler	For compaction and binding of RDF/ recyclables
9	Sorted waste storage	Storage Bins	Storage bin as per requirement
10	Dust control in dry zone	Dust Suppression System	Water spray/misting with nozzles
11	Weighing	Weighbridge and weighing scale	Weighing of large and small quantities of incoming and outgoing materials from the site
12	Loading and Unloading	Loaders and forklifts	For loading of waste to process lines and movement of stored materials

3.3.4 Indicative Technical Specifications

Please refer the Indicative Layout of MRF provided in the Appendices of this document.

- a) Working
 - i. The MRF will segregate mixed municipal solid waste in a hands-free manner.

- ii. The waste is segregated in as-is-condition instantly without any wait time or storage.
- iii. The waste is not required to be pre-processed nor subject to drying or retention.
- iv. Any type of culture or water is not required to be added and the basic bio-chemical nature of the waste is not altered.
- v. Skid loader may be used for feeding the waste into the hopper.
- vi. Equipment shall be with protection mechanisms for voltage, current, frequency fluctuations, phase reversal or phase failure etc.

b) Output

- i. The Segregated output streams shall be ferrous metals, organic output, inorganic output (plastics, paper) and rejects like sanitary napkins, diapers, etc.
- ii. The organic output will have approx. 80-90% segregation efficiency.
- iii. There is provision for pre-sorting of restricted input like C&D waste, hazardous waste, big size waste has been provided.
- iv. The outputs will be dropped from a height by conveyors which may be collected in vehicle or heaped on the floor which can be moved by skid loader.
- v. The dry output will be integrated with conveyer belt for further manual sorting as per requirement.
- vi. The cutters of the shredder shall be made from special alloy such that they do not crack with metals or stones.

Conveyor-1

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	Chevron
3	Belt width	1200mm
4	Belt Thickness	8mm
5	Conveyor Lenght	7000mm
6	Motor power	10 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-2

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	Chevron
3	Belt width	1200mm
4	Belt Thickness	8mm
5	Conveyor Lenght	11000 mm
6	Motor power	10 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent

9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Pre Processing Unit

S.No.	Description	Parameter
1	Booster type	Size based
2	Motor Power	20 HP
3	Motor	TGPL/BB/Crompton/Equivalent
4	Gear box	TGPL/Power build/Equivalent
5	Belt	Continental/Dunlop/Western/Jagruti/Equivalent
6	Quantity	1 Nos

Conveyor-3

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	Rubber
3	Belt width	2000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	10000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-4

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	Rubber
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	8200 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-5

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor

2	Belt Type	Rubber
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	8500 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Bag Breaker

S. No.	Description	Parameter
1	Cutting area	2200 X 1400mm
2	No of shafts	Single
3	Bearing	Pillow block Bearing/ Tapper roller bearing
4	Motor power	50 HP
5	Quantity	1 Nos

Conveyor-6

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	Rubber
3	Belt width	1500 mm
4	Belt Thickness	8 mm
5	Conveyor Length	8000 mm
6	Motor power	7.5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Booster Unit-1

S.No.	Description	Parameter
1	Booster type	Size based
2	Motor Power	15 HP
3	Motor	TGPL/BB/Crompton/Equivalent
4	Gear box	TGPL/Power build/Equivalent
5	Belt	Continental/Dunlop/Western/Jagruti/Equivalent
6	Quantity	1 Nos

Conveyor-7

S.No.	Description	Parameter
1	Conveyor Type	Horizontal conveyor
2	Belt Type	Rubber
3	Belt width	2000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	10000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-8

S.No.	Description	Parameter
1	Conveyor Type	Horizontal conveyor
2	Belt Type	PVC
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	10500 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-9

S.No.	Description	Parameter
1	Conveyor Type	L Conveyor
2	Belt Type	PVC
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	15000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-10

S.No.	Description	Parameter
1	Conveyor Type	L Conveyor
2	Belt Type	PVC

3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	12000 mm
6	Motor power	7.5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-11

S.No.	Description	Parameter
1	Conveyor Type	Horizontal conveyor
2	Belt Type	Rubber
3	Belt width	1200 mm
4	Belt Thickness	8 mm
5	Conveyor Length	2700 mm
6	Motor power	7.5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-12

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	PVC
3	Belt width	1500 mm
4	Belt Thickness	8 mm
5	Conveyor Length	2500 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-13

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	PVC
3	Belt width	1200 mm
4	Belt Thickness	5 mm
5	Conveyor Length	7200 mm

6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-14

S.No.	Description	Parameter
1	Conveyor Type	L Conveyor
2	Belt Type	PVC
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	15000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Bag breaker-2

S. No.	Description	Parameter
1	Cutting area	1800 X 1000mm
2	No of shafts	Double
3	Bearing	Pillow block Bearing/ Tapper roller bearing
4	Motor power	60 HP
5	Quantity	1 Nos

Conveyor-15

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	PVC
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	10,000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Booster Unit-2

S.No.	Description	Parameter
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1	Booster type	Size based
2	Motor Power	10 HP
3	Motor	TGPL/BB/Crompton/Equivalent
4	Gear box	TGPL/Power build/Equivalent
5	Belt	Continental/Dunlop/Western/Jagruti/Equivalent
6	Quantity	1 Nos

Conveyor-16

S.No.	Description	Parameter
1	Conveyor Type	Horizontal conveyor
2	Belt Type	Rubber
3	Belt width	1200 mm
4	Belt Thickness	5 mm
5	Conveyor Length	8000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-17

S.No.	Description	Parameter
1	Conveyor Type	L Conveyor
2	Belt Type	PVC
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	15000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-18

S.No.	Description	Parameter
1	Conveyor Type	Inclined conveyor
2	Belt Type	PVC
3	Belt width	1000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	10,000 mm
6	Motor power	5 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent

9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

Conveyor-19

S.No.	Description	Parameter
1	Conveyor Type	Horizontal conveyor
2	Belt Type	PVC
3	Belt width	2000 mm
4	Belt Thickness	5 mm
5	Conveyor Length	14,000 mm
6	Motor power	10 HP
7	Motor	TGPL/BB/Crompton/Equivalent
8	Gear box	TGPL/Power build/Equivalent
9	Belt	Continental/ Dunlop/ Western/Jagruti/Equivalent
10	Quantity	1 Nos

3.4 Compressed Biogas (CBG) Plant

3.4.1 Design Capacity

The CBG plant shall process approximately 100 TPD of segregated organic waste received from MRF to produce ~3 Tons of CBG per day.

3.4.2 Process Description

The CBG facility shall be based on Anaerobic Digestion (AD) technology, preferably Continuous Stirred Tank Reactor (CSTR) or any proven technology suitable for mixed organic waste.

The process flow shall generally include:

- Feed Preparation and Slurry Formation – Mixing of organic waste with water.
- Anaerobic Digestion – Controlled microbial breakdown under mesophilic or thermophilic conditions to produce biogas.
- Gas Collection and Purification – H₂S removal, moisture separation, CO₂ separation, and CH₄ enrichment.
- Gas Compression and Bottling – Compression to 250 bar as per IS 16087:2016 for sale as CBG.
- Digestate Handling – Dewatering of digestate through volute press and drying for use as manure or soil conditioner.

3.4.3 Input and output of CBG plant

S. No	Parameters	Value	Units
1	Mixed MSW	250	Tons/day
2	Organic fraction	100	Tons/day
3	Total Solids (28%)	28.00	Tons/day
4	Volatile solid (80% of TS)	22.40	Tons/day
5	Biogas	Approx. 9000	m ³ /day
6	Compressed Biogas	Approx.3000	Kg/day
7	Solid fertilizer	Approx. 59	Tons/ day

S. No	Parameters	Value	Units
8	Liquid fertilizer	Approx. 174	m3/ day

3.4.4 Key Equipment (indicative)

Sr. No.	Equipment	Description
1	Feed Hopper & Screw Conveyor	For feeding organic waste
2	Bio-Grinder / Shredder	Particle size reduction
3	Mixing Tank	Homogenization of feed
4	Anaerobic Digester (CSTR)	RCC/steel tank
5	Agitators / Mixers	For mixing
6	Gas Holder (Double Membrane)	Gas Storage
7	VPSA Unit / Water Scrubber	Biogas purification & CO ₂ removal
8	CBG Compressor & Cascade	250 bar, IS 16087:2016 compliant
9	Flare Unit	Safety flaring for excess gas
10	Dewatering Unit (Volute Press)	Digestate dewatering
11	Odour Control System	Activated carbon and biofilter type
12	Instrumentation & Control	PLC-SCADA based monitoring system

3.4.5 Indicative Specifications of Key Equipment

Following are the indicative specification of the key equipment of the CBG plant.

S. No.	Equipment	Specifications	Qty.
1	Pre treatment	Hopper x 2 Nos Screw Conveyor x 2 Nos Hammer Mill/Bio-grinders x 2 Nos Product Conveyor x 2 Nos Capacity : 8 TPH	2 lot
2	Unloading tank mixer	Capacity - 75m ³ Mixer with motor, Gearbox and all accessories MOC: Impeller & Shaft - SS 304, Type: Slow speed central driven agitator Mounting: Side wall mounting on RCC Make: SMS/equ	02
3	Transfer pump to feed tank/Hydrolysis tank	Type: Progressive Type MOC: SS304 / Nitrile /CS Capacity: 30 m3/hr Head: 10 m Make: Netzsch/Rotomac/Roto Pump/ Equivalent Motor: ABB/Siemens/CG/Equivalent. Qty.: 2 Nos. (1W+1 S)	02
4	Feed cum hydrolysis tank mixer	7.5 Kw, 3-phase-motor 415 V,50 Hz, 1450 rpm, protection class IP68 / Insulation class F = 155°C, Thermo-control per phase as overheat protection, Motor case out of stainless steel (1.4301), Cast iron gear casing	1 lot

S. No.	Equipment	Specifications	Qty.
		and motor cover coated with 2- component plastic lacquer, Propeller speed 300 rpm, slide ring sealing with wolfram carbide rings, Electric cable 10m with coalesced screwing, with expansion body in longitudinal cable direction as moisture guard, special PU- outside sheathing, Guide slide bearing out of stainless steel - V2A - SAE 304 (1.4301). Make: Stalkamp/EYS/Equ	
5	Reactor feed pump	Type: Progressive Type MOC: SS304 / Nitrile /CS Capacity: 30 m3/hr Head: 20 m Make: Netzsch/ Rotomac/ Roto Pump/ Equivalent Motor: ABB/Siemens/CG/Equivalent. Qty.: 2Nos. (1W+1S) Macerator x 1 Nos	02
6	Reactor accessories	Hot water System - Heat Pump - 1 No Hot water SS 304 Coiling - 1 Lot Stair Case for Reactors - 1 Lot, Air compressor - 1 No	01 lot
7	Reactor double membrane	Dia: 22 mt. Operating pressure: 5 mbar Double-sided PVC coated polyester fiber fabric; U V microbial- abrasion Biogas resistant, flame retardant B1 according to DIN4102, built with strips of membrane cut. Air blower Gas Over pressure and Ultrasonic type level sensor with 4-20 m Amp o/p signal including all accessories Make: Europe Fabrics	02
8	Reactor mixing system	Type: Advanced Turbo Liquid Gas Mix System (TLGMs) Capacity:30 KW, Head 20m MOC: Pump Housing/ impeller: CI/ENGJL-250, Shaft-AISI4340 Mechanical Seal: Silicon Carbide Motor Rpm: 1465, Voltage: 400V/50Hz Protection Class: IP55 Mixing Diffusers - 1 Lot Qty: 3 Nos / Reactor	06
9	Reactor membrane air blower	As per requirement	04
10	Digestate tank mixer	7.5 Kw, 3-phase-motor 415 V,50 Hz, 1450 rpm, protection class IP68 /	01 lot

S. No.	Equipment	Specifications	Qty.
		Insulation class F = 155°C, Thermo-control per phase as overheat protection, Motor case out of stainless steel (1.4301), Cast iron gear casing and motor cover coated with 2- component plastic lacquer, Propeller speed 300 rpm, slide ring sealing with wolfram carbide rings, Electric cable 10m with coalesced screwing, with expansion body in longitudinal cable direction as moisture guard, special PU- outside sheathing, Guide slide bearing out of stainless steel - V2A - SAE 304 (1.4301). Make: Stalkamp/EYS/Equ	
11	Transfer pump to Solid liquid separator	Type: Progressive Type MOC: SS304 / Nitrile /CS Capacity: 30 m3/hr Head: 10 m Make: Netzsch/Rotomac/Roto Pump/ Equivalent Motor: ABB/Siemens/CG/Equivalent. Qty.: 2 Nos. (1W+1 S)	02
12	S/L separator & accessories	Capacity: 20 m3/hr. Type: Screw press Make: WAM / equ	02
13	SLS filtrate tank mixer	7.5 Kw, 3-phase-motor 415 V,50 Hz, 1450 rpm, protection class IP68 / Insulation class F = 155°C, Thermo-control per phase as overheat protection, Motor case out of stainless steel (1.4301), Cast iron gear casing and motor cover coated with 2- component plastic lacquer, Propeller speed 300 rpm, slide ring sealing with wolfram carbide rings, Electric cable 10m with coalesced screwing, with expansion body in longitudinal cable direction as moisture guard, special PU- outside sheathing, Guide slide bearing out of stainless steel - V2A - SAE 304 (1.4301). Make: Stalkamp/EYS/Equ	01 lot
14	Sludge pumps to Volute press tank	Type: Progressive Type MOC: SS304 / Nitrile /CS Capacity: 30 m3/hr Head: 10 m Make: Netzsch/Rotomac/Roto Pump/ Equivalent Motor: ABB/Siemens/CG/Equivalent. Qty.: 2 Nos. (1W+1 S)	02

S. No.	Equipment	Specifications	Qty.
15	Poly dosing system and Volute press & accessories	Poly dosing system as per requirement Volute Capacity: 20 m3/hr. Type: Volute Make: Avalon/ Equ	02
16	Liquid fertilizer Transfer pumps	Type: Centrifugal MOC: CI / SS304 Capacity: 30 m3/hr @ 2.0 Kg/cm2 Pressure Make: KBL/Johnson/Equ Motor: ABB/Siemens/CG/Equ	02
17	Effluent treatment plant	Min. 50 KLD / as per requirement. The Concessionaire shall design the ETP based on actual effluent/leachate characteristics. Treated water quality should be within the limits as per the norms of CPCB / GPCB for further utilization / disposal.	01
18	Composting packing machine with accessories	Capacity: 3 TPH Screening - 1 NO Weighing Scale and Packing System - 1 Nos	1 lot
19	Water tank	Volume: 100 KL MoC: Zinc Aluminium Size: Dia 5.9 mt X Ht. 4.0 mt	01
20	Water pumps	Type: Centrifugal MOC: CI / SS304 Capacity: 30 m3/hr 2.0 Kg/cm2 Pressure Make: KBL/Johnson/Equ Motor: ABB/Siemens/CG/Equ	02
21	Fire Hydrant pumps	Type: Centrifugal MOC: CI / SS304 Capacity: 30 m3/hr 2.0 Kg/cm2 Pressure Make: KBL/Johnson/Equ Motor: ABB/Siemens/CG/Equ The Concessionaire shall design and provide the fire hydrant system, including pump capacity, in accordance with the applicable building bylaws, fire safety norms, and Fire Authority requirements, and obtain the necessary approvals from the competent authority.	02
22	Flare stack	Capacity: 450 m3/hr Type: Aspirated Type Open Type MOC: MS with Epoxy painted, Flame Burner: SS 316 & 304	01
23	Double membrane gas holder for raw biogas	Volume: 1000 m3 Operating Pressure: 05 mbar	01

S. No.	Equipment	Specifications	Qty.
		Specification: Double-sided PVC coated polyester fiber fabric; U V microbial- abrasion Biogas resistant, flame retardant B1 according to DIN4102, built with strips of membrane cut. Air Blower with accessories (2 Nos), Inspecting Window, air regulating valve, flexible hose, Gas Over pressure, Ultrasonic type level sensor with 4-20 m Amp o/p signal including all accessories Fabrics: Europe Make,	
24	Water & Dry Scrubber	Cap: 500 m3/hr	01 lot
25	Biogas blower	Cap: 500 m3/hr	02
26	Biogas upgradation plant	Capacity: 500 m3/hr. Type: VPSA System with all purification systems The Concessionaire may adopt VPSA or any other suitable biogas upgradation technology (including water scrubbing), provided the system meets the required CBG quality as per applicable standards and complies with statutory norms. The Concessionaire may propose equivalent or superior CBG purification technologies, subject to compliance with performance standards and statutory norms.	01 lot
27	Double membrane gas holder for purified biogas	Volume: 1000 m3 Operating Pressure: 05 mbar Specification: Double-sided PVC coated polyester fiber fabric; U V microbial- abrasion Biogas resistant, flame retardant B1 according to DIN4102, built with strips of membrane cut. Air Blower with accessories (2 Nos), Inspecting Window, air regulating valve, flexible hose, Gas Over pressure, Ultrasonic type level sensor with 4-20 m Amp o/p signal including all accessories Fabrics: Europe Make,	01
28	Odourizer unit	Capacity - 1500 m3/hr Pressure - 13 bar 1 No. of storage tank, Compact Panel with a Metering Pump PRV for tank blanketing and Pump Operation Inter connecting Tubing and injection Probe assembly Qty - 1 Lot	01 lot
29	High pressure compressor system	Capacity: 300 m3/hr Pressure: 250 bar Operation: VFD	01

S. No.	Equipment	Specifications	Qty.
		High Pressure Compressor System - 2 Nos Filling Manifold c/w accessories - 1 Nos Make: Burkhardt/ Bauer/ Elgi/Equ	
30	Cylinder cascades	3000 ltrs, 40 cylinders each 75 ltr Cylinder cascades are required if the Concessionaire opts for transportation of CBG through mobile cascades. In case the Concessionaire proposes injection of CBG into an authorized gas grid, cylinder cascades and transportation vehicles shall not be required, subject to compliance with applicable statutory requirements and prior approval of the competent Authority.	05
31	Electrical control room	Electrical Control Panel with SCADA System, Type: Welded type CRCA Panel, IP54 Semi-Compartmental with bottom Entry, Double front non-Draw out type panel, 1. DOL Feeder - SFU, Contactor, OLR, Push Buttons, Hour meter and ELCB. 2. S/D Feeder - SFU, Contactors, OLR, Push Buttons, Hour meter, Digital Ammeter, Ct's, Timer and ELCB. 3.VFD Feeder - SFU, VFD, Digital Ammeter, Ct's and Push Buttons. Control transformer secondary rating 110AC , Fault Level - 50kA for incomer and Bus bar Switch Gears: ABB/L&T /Equ	01 lot
32	Electrical cables & accessories	Copper Armored Cable Power Cable: XLPE Extruded PVC type ST-2 sheathed as per IS:7098(Part 1)1988 and Instrument and control Cables with accessories. Make: KEI / Polycab / Equ. Local Push Buttons - 1 Lot Glands, Earthing Materials - 1 Lot Cable Tray with accessories - 1 Lot	01 lot
33	Pipes, valves & Fittings	Substrate Lines - HDPE/SS/ UPVC Gas Line - HDPE/SS Water Line Pipe GI/UPVC Valves - 1 Lot Pipe support Materials - 1Lot Paint for structures - 1 Lot Bolts and nuts - 1 Lot	01 lot
34	Utilities	Fire extinguishers x 1 Lot Gas Detector x 1 Lot Gas analyser x 1 Lot	01 lot

S. No.	Equipment	Specifications	Qty.
		Online dew point x 1 Lot Lagoon Membrane x 1 Lot Fire Hydrant x 1 Lot	
35	Instruments	Make: E&H/ waree/ forbes marshall/ Equ	01 lot
36	Odour Control System for MRF/Segregation unit	Dimension: L100 mt x W 45 mt x H 21 mt	01
37	Raw Biogas Flow Transmitter	As per requirement	01
38	Product Gas Flow Transmitter	As per requirement	01
39	Three Point CNG Filling Header	As per requirement	01
40	Lab Equipment	As per requirement	01
41	Weigh Bridge	50 ton	01

3.5 Utilities and Ancillary Facilities

3.5.1 Electrical and Instrumentation System

- HT power supply with step-down transformer and LT distribution.
- Automatic Power Factor correction and load management.
- PLC-SCADA system for process monitoring and data logging.
- DG set (minimum 250 kVA) for emergency power backup.
- Lightning protection, earthing grid, and CCTV surveillance system.

3.6 Civil and Structural Works (Indicative)

Unit No.	Name Of The Unit	MoC	Suggestive Size / Spec.
1.	MSW Segregation Shed	RCC Foundation + PEB shed	Approx. 75.5 mt. x 66 mt.
2.	Pre-treatment Area shed	RCC Foundation + PEB shed	Approx. 25.5 mt. X 16 mt.
3.	SLS & volute press shed	RCC Foundation + PEB shed	Approx. 19.3 mt. x 11 mt.
4.	Gas up-gradation shed	RCC Foundation + PEB shed	Approx. 75.5 mt x 31 mt.
5.	Weigh Bridge foundation	RCC	Approx. 32 mt. x 3.5 mt.
6.	Gas storage balloon-1 (for Raw Gas) foundation	RCC	14 mt. dia
7.	Gas storage balloon-2 (for Sweet gas) foundation	RCC	14 mt. dia
8.	Fire Water tank	RCC foundation + SS tank	Approx. 11.5 mt. x 6.5 mt.
9.	Effluent treatment plant	RCC	Approx. 20 mt. X 7.75 mt.

Unit No.	Name Of The Unit	MoC	Suggestive Size / Spec.
10.	Digester-1	RCC	22 mt. dia & 11 mt. height
11.	Digester-2	RCC	22 mt. dia & 11 mt. height
12.	Mixing Tank-1 (75 m3)	RCC	5 mt. x 5 mt. x 3.5 mt.
13.	Mixing Tank-2 (75 m3)	RCC	5 mt. x 5 mt. x 3.5 mt.
14.	Hydrolysis Tank (200 m3)	RCC	6 mt. dia & 7.7 mt. height
15.	Digestate tank (200 m3)	RCC	7 mt. dia & 5.7 mt. height
16.	SLS filtrate tank (200 m3)	RCC	7 mt. dia & 5.7 mt. height
17.	Liquid fertilizer tank (100 m3)	RCC	10 mt. x 4 mt. x 3 mt.
18.	Laboratory & control pannal	RCC	10 mt. x 20 mt.
19.	Main Admin Building including rest room, laboratory & DG room	RCC	Approx. 45.45 mt. x 8.18 mt.
20.	Parking area	RCC	Approx. 46 mt. x 9 mt.
21.	Electric Panel room	RCC	4 mt. x 4 mt.
22.	Security Cabin	Metal Sheet	POTA CABIN
23.	Internal road	RCC	6 to 12 mt. wide as required
24.	Boundary wall	RCC	Approx. 800 Running meter

3.7 Water Supply and Drainage

- Bore well / municipal connection for process and domestic use.
- Separate stormwater and leachate drainage systems.
- Effluent Treatment Plant (ETP) to treat leachate and wash water to meet CPCB discharge norms..

3.8 Fire and Safety Systems

- Fire hydrant network with pump and water storage tank.
- Portable extinguishers and sand buckets at critical locations.
- Flame arresters and gas detectors in CBG section.
- Compliance with NBC Part 4 and PESO guidelines.

3.9 Design and Performance Standards

System / Component	Design Standard / Code	Requirement
Civil & Structural Works	IS 456, IS 3370, IS 800, IS 875	RCC/steel structures for 20-year design life
Electrical Systems	IS 3043, IS 732, IE Rules	Earthing, wiring, and load safety
Biogas Plant	IS 16087:2016	CBG quality and compression standards
Fire Safety	NBC Part 4, PESO	Fire protection and explosion safety
Environmental Compliance	SWM Rules 2016, GPCB norms	Emission, odour, leachate standards
Noise & Odour	CPCB Standards	Noise < 75 dB(A) daytime, Odour < 5 OU/m ³

Occupational Safety	Factory Act & OSHA guidelines	PPE, emergency plan, health checks
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3.10 Environmental, Health and Safety (EHS) Requirements

- Air Quality: Dust suppression and odour control system in all waste-handling areas.
- Water Quality: Leachate and effluent treated in ETP and reused for process.
- Noise Control: Equipment to include silencers and acoustic enclosures wherever applicable.
- Occupational Safety: Workers to be provided with PPE, safety training, and medical checkups.
- Fire Protection: Gas sensors, hydrants, and fire-fighting systems as per standards.
- Monitoring: Regular environmental monitoring for air, water, noise, and leachate quality.

3.11 Design Documentation

The Concessionaire shall prepare and submit the following documents for approval:

- Layout Plans including MRF and CBG
- Mass and Energy Balance
- Process Flow Diagrams and P&IDs
- Construction Schedule (Gantt Chart)
- General Arrangement Drawings (GADs)
- Detailed Design and Drawings
- Electrical Single Line Diagram (SLD)
- Quality Assurance and Inspection Plan
- Operation & Maintenance Manuals

All design documents shall be submitted in both hard and soft copies to MRMC for review and approval prior to execution as specified in Volume 02 (Draft Concession Agreement) of this RfP.

Note: While the minimum design/section requirements for the civil/mechanical components are specified, the successful bidder is not limited to considering only those components. They are encouraged to propose modifications or their own proven design based on their expertise and experience in Design engineering.

Warranty and Certification: Warranty period for the processing facility supplied should be for 01 Years from the date of installation including periodic maintenance.

4 Project Implementation Framework

4.1 Overview

The Project shall be implemented on a Design, Build, Finance, Operate and Transfer (DBFOT) model under a Public-Private Partnership (PPP) framework. The Concessionaire shall be responsible for the complete life-cycle of the project, from design and engineering through construction, commissioning, operation, maintenance, and handback of the facility to Morbi Municipal Corporation (MRMC) at the end of the Concession Period.

The overall implementation of the Project shall be carried out in accordance with the timelines, milestones, and provisions stipulated under Articles 14, 15 and 16 of the Draft Concession Agreement (Volume-II of this RfP).

4.2 Project Phases

The Project implementation shall broadly consist of the following sequential phases:

Phase	Description	Duration	Responsibility
Phase-I: Pre-Construction Activities	Completion of Conditions Precedent (CP), approvals, site handover, design approvals, financial closure & Detailed engineering	3 months from Contract Execution Date	Concessionaire & MRMC (as applicable)
Phase-II: Design and Construction	Procurement, civil works, mechanical & electrical installation, utilities, trial run preparation	09 months from Appointed Date/ CP Completion	Concessionaire
Phase-III: Commissioning & Acceptance	Completion of construction, trial operation for 60 days (or as specified in the Vol-II (DCA) of RfP), performance verification, issue of Acceptance Certificate		Concessionaire
Phase-IV: Operation & Maintenance (O&M) Period	Full operation of plant for 15 years, performance monitoring, compliance reporting, and maintenance	15 years from COD	Concessionaire
Phase-V: Handback	Transfer of assets to MRMC after inspection and satisfaction of Handback Conditions	End of Concession Period	Concessionaire

4.3 Project Milestones

The Concessionaire shall adhere to the milestone schedule defined under Article 14 and Article 22 of the Volume-II (Draft Concession Agreement) of this RfP.

The following milestones are provided for reference:

Milestone	Activities required to be completed for payment of respective grant instalments	Scheduled Project Milestone Completion Date
Milestone 01	- Approval of Concessionaire's Applicable Permits - Submission and approval the Detailed Project Report including plant layout, process flow diagram, mass & energy balance, P&ID and detailed engineering documents like structural designs calculation/report, architectural drawings, general arrangement drawings (GAD) and structural drawings.	90 Days from Execution date
Milestone 02	Commencement of civil work and commencement of procurement of the plant equipment / machineries	30 days from the Appointed date
Milestone 03	Commencement of supply of plant equipment / machineries	90 days from the Appointed date

Milestone 04	Completion of Civil Work including Digester, plant office, sheds, foundation for machineries, bio-sludge tank, compound wall, underground trenches, and other items as per the approved construction plan.	150 days from the Appointed date
Milestone 05	Complete of Installation of equipment / machineries including MRF plant, gas up-gradation system heating system, compressor & cooling tower, filters, clarifiers, DG set, pipelines & valves, flair stack and other equipment as per the approved construction plan.	195 days from the Appointed date
Milestone 06	Commencement of the Trial run & testing of plant	210 days from the Appointed date
Milestone 07	After Commercial Operations Date (COD)	270 days from the Appointed date

Delays in achieving milestones shall attract penalties or actions as prescribed under Clause 14.8 of the Volume-II (Draft Concession Agreement) of this RfP.

5 Key Performance Indicators (KPIs)

The performance of the Integrated MSW Processing Facility shall be governed by specific Key Performance Indicators (KPIs) that define the minimum acceptable service levels and operational standards to be maintained by the Concessionaire during the Operation and Maintenance (O&M) Period.

These KPIs shall serve as measurable benchmarks for assessing the technical and environmental performance of the Project.

The detailed methodology for performance evaluation, and liquidated damages associated with non-achievement of the KPIs shall be as prescribed under Article 21 of Volume-II (Draft Concession Agreement) of this RfP.

Sr. No.	KPI Parameter	Description / Measurement Basis	Minimum Performance Requirement	Monitoring / Reporting Frequency	Reference Clause of DCA
1	Waste Throughput	Quantity of Acceptable Waste received and processed daily as recorded at weighbridge	100 % of Acceptable Waste delivered by MRMC up to 250 TPD	Daily log and monthly summary	Clause 21.1(a) of Volume-II (DCA) of this RfP
2	Residual Inert Matter Disposal	Quantity of rejects / inerts sent for disposal	≤ 20 % of total input waste	Daily log and monthly summary	Clause 21.1(b) of Volume-II (DCA) of this RfP
3	CBG Production Efficiency	Quantity of CBG produced from the	63 tons per month	Daily generation data and	Clause 21.1(c) of Volume-II

		biodegradable feedstock		monthly summary	(DCA) of this RfP
4	Liquid digestate / waste discharge	No liquid digestate / leachate / liquid waste should be discharge in environment without treatment	Near zero liquid discharge from the facility	Monthly	Clause 21.1(d) of Volume-II (DCA) of this RfP

6 Drawings and Layouts

6.1 General

The Drawings and Layouts included in this Volume are intended to provide the conceptual design framework and indicative spatial arrangement for the Integrated MSW Processing Facility at Morbi.

The drawings are provided for reference and guidance only, to convey the design intent and minimum spatial requirements. The Concessionaire shall be required to carry out detailed engineering and develop “Good for Construction” drawings in conformity with:

- The approved site boundaries and area allocated by MRMC,
- The technical specifications set out in this Volume, and
- The functional requirements defined under the Draft Concession Agreement (Volume II).

6.2 Purpose of Drawings

The provided drawings are intended to:

- Illustrate the conceptual site layout and zoning for various project components.
- Depict the material and process flow of the proposed waste processing operations.
- Define approximate footprints and inter-relationships of major facilities.
- Facilitate bidders in understanding the overall design approach and spatial constraints.
- Assist in estimation of quantities, infrastructure requirements, and utility planning.

The Concessionaire shall be responsible for reviewing and updating these drawings based on its final design and shall obtain approval from MRMC prior to construction.

6.3 List of Drawings and Diagrams

The following drawings shall form part of this Volume-3 of the RfP document:

Appendix	Title / Description	Purpose / Content Summary
1.	Overall Site Layout Plan	Indicative layout showing MRF, CBG plant, utilities, administration building, parking, etc.
2.	Process Flow Diagram (PFD) - MRF	Flow of materials from waste reception to output products (recyclables, RDF, organic waste, inerts)
3.	Process Flow Diagram (PFD) - CBG	Process flow of anaerobic digestion, biogas purification, compression, and storage

Appendix	Title / Description	Purpose / Content Summary
4.	Mass Balance	Indicative quantitates of material flowing through various stages of the CBG plant.
5.	Civil Structure Drawings	<p>Indicative detailed drawings of the civil structures;</p> <ul style="list-style-type: none"> i. Mixing Tank ii. RCC Digester iii. Hydrolysis Tank iv. Digestate Tank v. SLS Tank vi. Weighbridge vii. Admin Building viii. Fertiliser Tank ix. MRF Shed x. Pre-treatment shed xi. SLS shed xii. Internal roads xiii. Compound Wall xiv. Gas Holders xv. PSA Shed

Appendices

(Appendices containing the Drawings and Diagrams listed in the Clause 6.3 of the Volume-3 of this RfP document, are provided in a separate PDF document.)