GMR AERO

Your caring gateway to a connected world

PRESENTED BY

GMR Hyderabad International Airport Limited

HYD RAJIV GANDHI INTERNATIONAL AIRPORT

GMR AERO ENTERPRISE

CII National Award for
Environmental Best Practices 2026

Integrated Waste Management and Circular Resource Recovery System

Waste Management & Pollution Control

Regd No: 8915

Date: 08.10.2026

PRESENTERS

Raghavendra Gondkar
Deputy General Manager – Estate Management

Uma Devi Madiraju
Associate Manager – Environmental Compliance & Sustainability

Integrated Waste Management and Circular Resource Recovery System

WHAT TRIGGERED THE PROJECT & WHY IT WAS UNDERTAKEN

Zero Waste to Landfill

Advance GHIAL's vision by maximizing waste diversion and resource recovery

Regulatory Compliance

Ensure alignment with SWM Rules 2026 and applicable environmental norms

Safer Airport Ecosystem

Improve food-waste management to minimize bird, rodent and wildlife attraction around airport operations, contributing towards bird and wildlife mitigation measures

Waste to Resource

Convert organic waste into compost and channel dry waste for recycling

Circular Economy

Reduce landfill dependency and keep valuable materials within the resource cycle

MILESTONES ALIGNED TO THE PROJECT

Baseline	Design	Deploy	Digitise	Integrate	Scale
1	2	3	4	5	6
Airport waste survey & characterization	Land, DPR, statutory roadmap & GFC drawings	Phase I: 7 OWC units; 14 TPD capacity	Demand based clearance, traceability & dashboards	Mechanized segregation system for wet & dry waste	Future-ready expansion provision to 40 TPD

Integrated Waste Management and Circular Resource Recovery System

PROJECT ROAD MAP

2022-23
Conceptualization of Integrated SWM system

2023
Land Identification & Design of IWMF

2024
Development of 2,785.87 sq.m IWMF

2025
Installation of 7 nos. of OWCs (14 TPD)

2026
Waste Segregation & Recycling framework

2026
Four-Colour Bin System implementation

2036
Expansion provision up to 40 TPD





Integrated Waste Management Facility (IWMF), RGIA

UNIQUENESS OF THE PROJECT

- Compost from food waste in 24 hrs
- Aviation safety through waste management
- Dry waste recycling through authorized vendors
- Material circularity
- Integrated airport-wide waste management
- Waste-to-Landscape model
- Bird strike mitigation
- 82% diversion from landfill

Tangible Benefits from Wet Waste Composting

14 TPD
Phase I capacity – 100% wet waste converted to compost

40 TPD
Designed future expansion capacity

1,370 tons
Wet waste treated annually

343 tons
Compost generated annually

82%
Reported landfill diversion

24 hrs
Waste processing time

Aircraft Safety
Lower bird & pest attraction

Compliance
SWM Rules 2026 and other norms

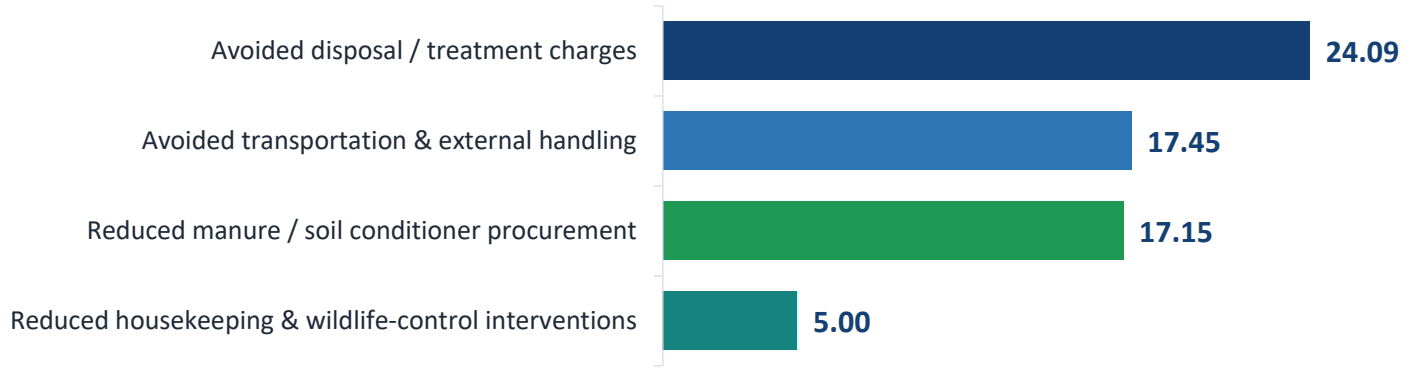
ESTIMATED ANNUAL SAVINGS

₹ 63.69 lakh

₹12.38 crore
Capital investment

~19 years
Indicative payback

Benefit components (₹ lakh / year)



Intangible Benefits

Value delivered beyond direct financial savings

Environmental

- ✓ Reduced greenhouse gas emissions
- ✓ Reduced transportation emissions
- ✓ Minimized synthetic fertilizer consumption
- ✓ Improved carbon sequestration

People & Society

- ✓ Cleaner airport environment
- ✓ Enhanced passenger experience
- ✓ Improved stakeholder confidence

Airport Safety

- ✓ Reduced bird congregation
- ✓ Reduced wildlife attraction
- ✓ Lower aircraft bird strike risk

Governance & ESG

- ✓ Strong ESG performance
- ✓ Improved regulatory compliance
- ✓ Supports circular economy implementation

Organizational

- ✓ Enhanced sustainability leadership
- ✓ Improved environmental culture
- ✓ Recognition through international awards

Global recognition
ACI Green Airports Recognition

GOLD — ACI Green Airports Recognition
Single Use Plastic Elimination
2023

GOLD — ACI Green Airports Recognition
Solid Waste Management
2018

Wet Waste: from 10-day Handling to a 24-hour Resource Loop

Food waste → Compost → Airport landscaping and green belts

BEFORE: manual, extended handling — **~10 days**





Grinding, rack storage, re-mixing and a further curing period required approximately **10 days** before manure could be used.

AFTER: OWC-enabled circular loop — **~24 hrs**



- ✓ Feed & Forget automation
- ✓ Inbuilt shredding
- ✓ Moisture sensing & odour control
- ✓ Leachate treatment
- ✓ Zero-curing composting

Processing time reduced to approximately **24 hours**

COMPOST BACK INTO THE AIRPORT ECOSYSTEM









Integrated Solid Waste Management Facility Photographs





PEB compost plant with natural daylighting & natural ventilation



Workers room & washroom



Office building



Electrical switch yard with HT panel – Transformer 800 KVA & 315 KVA



Electrical room for LT panels

Dry Waste: Visible, Traceable, Demand-based

A disciplined journey from source segregation to verified material recovery — enhanced through digital operations

01

Segregate

Four-colour bins guide source-level separation across waste generators

02

Track

Route-map checklists and bin/vehicle tracking make handling transparent

03

Respond

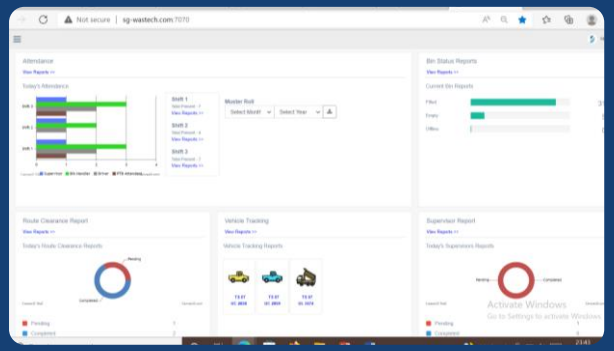
Sensors at prime locations trigger demand-based cleaning activity

04

Recover

Authorised vendors return materials to the circular economy

Source segregation • Sensor-enabled response • Authorised recycling



Digitisation converts cleaning into an operating system

Moved from schedule-based emptying to demand-based service decisions, backed by route compliance, sensor signals and management visibility

OPERATING OUTCOME

Cleaner touchpoints, better resource use

C&D Waste Management

RGIA converted construction debris from a disposal obligation into an **auditable resource-recovery loop** embedded in contracts, billing and future infrastructure procurement

1. **Contract annexure & declaration**
2. **Clear debris with safety controls**
3. **Weighment slips gate billing**
4. **GHMC-authorized recycler**
5. **Buyback into future works**



C&D processing and aggregate recovery at RGIA

19,835 tons
cleared & recycled

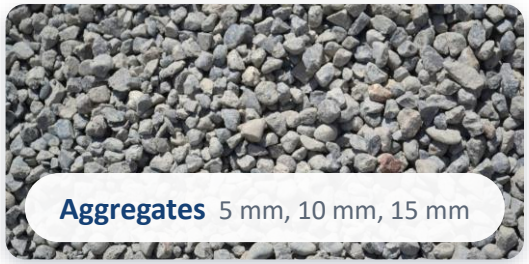
400 t CO_2
avoided

100%
contract coverage

Zero
violations post-implementation

RECYCLED PRODUCTS







All recycled products are certified and lab tested by an **NABL accredited laboratory**

Replication Potential of Project within GMR Group

The operating model has been replicated across GMR locations (**Goa, Bhogapuram Airports** etc.) and adapted for other high-footfall, mixed-waste environments:

- **Airports**
- **Airport cities**
- **Commercial complexes**
- **Maintenance facilities**
- **Construction projects**

THE REPLICABLE OPERATING MODEL

Source segregation → **Centralised organic waste treatment** → **Resource recovery**
Authorised recycling, compost reuse & C&D buyback → **Digital traceability & dashboards** → **Landfill diversion**

COMMON FOUNDATION: waste characterisation • governance • authorised partners • KPI-led operating rhythm

WHY IT TRAVELS WELL

- ✓ Modular technology
- ✓ Low operating complexity
- ✓ Strong financial and environmental returns

REPLICATION PLAYBOOK

Design from data → **Segregate at source** → **Process locally** → **Verify recovery** → **Share learning**

Replication Potential of Project with Other Sectors

SECTORS WHERE THE MODEL CAN BE REPLICATED

- Airports
- Industrial Townships
- Metro Rail
- Universities
- Railway Stations
- Hospitals
- Ports
- Hotels
- Smart Cities



Why easily replicable?

- ✓ Modular OWC technology
- ✓ Scalable capacity
- ✓ Low operational complexity
- ✓ Strong financial and environmental returns

Knowledge Sharing Initiatives

- CII Sustainability Forums
- ESG Reporting Platforms
- Airport Sustainability Platforms
- ACI Knowledge Sharing Programs
- Environmental Conferences

Challenges Faced and Brief on Countering

Challenge area	Key Challenges Encountered	Countermeasure / control
Technical & Infrastructure	Mixed waste generation, odour management; large-scale organic waste handling; future capacity needs; safe C&D waste management	4 bin waste collection, 7 OWCs; IWMF; leachate management system; scalable design up to 40 TPD; C&D annexure in contracts
Stakeholder & Administrative	Passenger awareness; multi-stakeholder coordination; compliance requirements	Awareness campaigns; stakeholder meetings; vendor engagement; environmental audits
Operations & Maintenance	Segregation quality; material traceability; timely waste processing	Dedicated O&M team; preventive maintenance; tracking records; authorized recyclers
Environmental Sustainability	Wildlife attraction risks; plastic dependency; increasing waste generation	Source segregation; SUP reduction; circular resource recovery; landfill diversion
Digital Monitoring	Real-time monitoring and reporting needs	Digital dashboards; KPI tracking; benchmarking; AI-ready analytics



Core lesson: Sustainable waste management in operational airports requires a balanced approach combining robust infrastructure, stakeholder participation, operational excellence, digital monitoring, and continuous capacity enhancement.

Achieving National Benchmarks & Global Standards

Benchmark / standard	RGIA project position	Environmental management relevance
SWM Rules 2026 + C&D Waste Management Rules 2024	Four-colour bins plus C&D annexure, declaration, weighment and authorized-recycler controls.	Supports segregation, recovery, contract-linked traceability and scientific disposal with ~82% landfill diversion
National Building Code 2016 & National Building Construction Standards 2026	Waste intensity reported at ~0.2 kg/pax/day	Within stated 0.2–0.6 kg/capita/day commercial-establishment reference range
ISO 14001:2015 EMS	Audits, inspections, records and continual-improvement actions are described	Supports structured environmental aspect / impact management and compliance
United Nations Sustainable Development Goals (UN SDGs)	SDG 11, 12, 13 and 15 referenced in project application	Sustainable infrastructure (USGBC LEED Platinum rated Passenger Terminal Building), responsible consumption, climate action and biodiversity / wildlife interface

RGIA OPERATING BENCHMARKS

14 TPD	82%	~24 h
Installed capacity	Landfill diversion	Composting cycle

PEER-BENCHMARKING IMPLICATION

Leading airports demonstrate diversion above 95% through recovery-led systems. RGIA's next value pool is to scale the proven model while strengthening traceability and circular uses.

Priority Plans for the Next Two Years

YEAR 1 — Consolidate & Standardize

+1 Year: consolidate, measure, standardize

- 100% Source Segregation
- Sanitary Waste Excellence
- Digital Traceability
- Process Optimization
- Stakeholder Engagement
- Capability Building

YEAR 2+ — Scale & Replicate

+2 Years: scale capacity and share the model

- Capacity Expansion
- C&D Circularity
- Resource Optimization
- Replication Framework
- Programme Governance
- Zero Waste to Landfill

Performance-Driven Governance

- Segregation
- Recovery
- Compost Use
- C&D Recycling
- Compliance
- Wildlife Risk Management

Top Ten Best Practices

01
Source segregation with colour coding

02
Waste quantification & characterization and implementation of 4R

03
Dedicated integrated facility zoning

04
Automatic organic waste treatment in ~24 hours

05
Compost reuse in landscapes & green belts

06
Leachate capture and STP routing

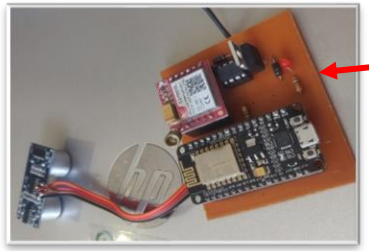
07
Odour management & landscaped buffer

08
Scientific recycling through authorized recyclers

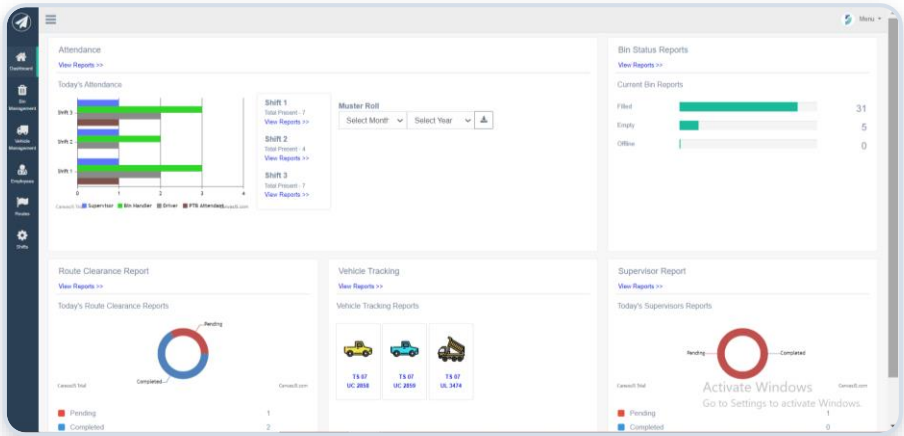
09
C&D recycling – annexure & declaration in contracts

10
Audits, inspections & stakeholder awareness









Major Learnings

1



Waste as a Resource

2



Source Segregation First

3



Circular Economy Value

4



Integrated Systems

5



Stakeholder Participation

6



Timely Processing

7



Sustainable Infrastructure

8



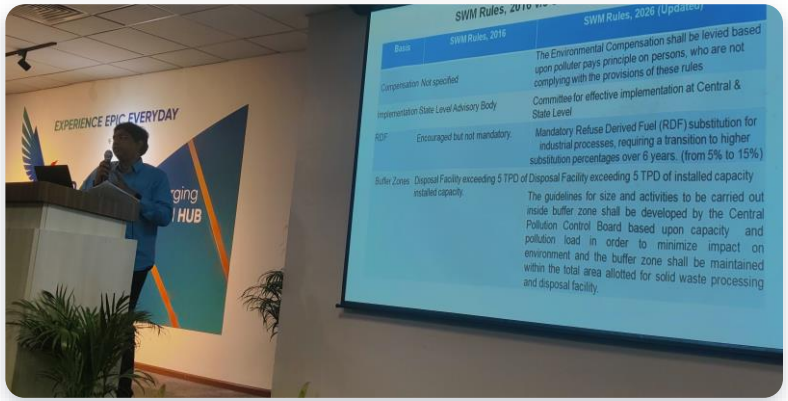
Strong Governance

CONCLUSION

RGIA's Integrated Waste Management & Circular Resource Recovery System demonstrates a replicable model delivering environmental, operational, aviation safety and economic benefits

Employee Involvement, Training & Capacity Building









Employee training, stakeholder engagement and field-level awareness activities

Thank You!

Backup Slides

Supporting data, calculations & evidence

01 Tangible benefits backup (Annual Savings)

02 Waste Quantification for Projected Passenger Growth

03 ECOBOT Laboratory certificates for Compost

04 C&D waste recycled material – lab certificate

05 Peer benchmarking in Solid Waste Management

Tangible Benefits Backup (Annual Savings)

Basis: 1,370 tons/year of wet waste processed and 343 tons/year compost generated

Benefit Component	Basis of Calculation	Amount (₹ lakh/year)
Avoided transportation & external handling	2095 tons - ₹5000/trip*349 trips (i.e., 6tons/Trip)	17.45
Avoided disposal/treatment charges	2095 tons × ₹1,150/ton	24.09
Reduced manure procurement	343 tons compost × ₹5,000/ton	17.15
Reduced housekeeping & wildlife control	Estimated reduction in pest/bird control interventions	5.00
Total Annual Savings		**63.69**

Payback Calculation

Capital investment	**₹12.38 crore**
Annual savings	**₹0.64 crore/year**
Payback period	**12.38 ÷ 0.64 = 19.34 years (~19 years)**

Key Assumptions

- Transportation & handling cost: ₹5,000/trip
- External processing cost: ₹1,150/ton
- Compost replacement value: ₹5,000/ton
- Wildlife control savings based on reduced waste exposure

Waste Quantification for Projected Passenger Growth

		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Population in 'Millions'	18.30	21.36	21.70	21.60	8.00	12.70	21.10	26.00	28.50	31.10	33.60	36.30	39.22
Waste Generation in 'Tonnes' per year	2,534	3,161	3,646	1,368	3,450	2,873	4,133	5,200	5,700	6,220	6,720	7,260	7,844
kgs/Capaita/Day	0.14	0.15	0.17	0.06	0.43	0.23	0.20	0.20	0.20	0.20	0.20	0.20	0.20
TPD (As per Pax)	**6.94**	**8.66**	**9.99**	**3.75**	**9.45**	**7.87**	**11.32**	**14.25**	**15.62**	**17.04**	**18.41**	**19.89**	**21.49**
Incl. 10% for ALD developments	Actuals						**12.45**	**15.68**	**17.18**	**18.74**	**20.25**	**21.88**	**23.64**

	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Population in 'Millions'	42.37	45.78	49.46	53.44	57.74	62.38	67.40	72.83	78.69	85.02	91.86	99.25	107.24
Waste Generation in 'Tonnes' per year	8,475	9,156	9,892	10,688	11,548	12,477	13,481	14,565	15,737	17,003	18,372	19,851	21,448
kgs/Capaita/Day	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
TPD (As per Pax)	**23.22**	**25.09**	**27.10**	**29.28**	**31.64**	**34.18**	**36.93**	**39.90**	**43.12**	**46.58**	**50.33**	**54.39**	**58.76**
Incl. 10% for ALD developments	**25.54**	**27.60**	**29.81**	**32.21**	**34.80**	**37.60**	**40.62**	**43.89**	**47.43**	**51.24**	**55.36**	**59.83**	**64.64**

As per projections, waste generation will reach **20 TPD** by the year **2027** and **40 TPD** by the year **2036**

ECOBOT Laboratory Certificates for Compost



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Driven by Quality, Inspired by Science.

NABL Scope

Test Report

Issued To:
Prabhat kishore lanka
Manager - Project management team
project site office
GMR Airport Developer Ltd
Rajiv Gandhi International Aiport
Shamshabad, Hyderabad - 500 409
Telangana
Hyderabad-500 409
Telangana,IND
Ph: Mob:99080886222

Kind Attn:Mr. prabhat kishore lanka

Registration/Report Number: VLL/VLS/23/18772/001
Issue Date: 2024-02-06
Your Ref:
and Date: 2024-01-19
Lab Ref No.: 1603828
LIMS Report No.: 508119-A

Page 1 of 3

Customer Provided Details :			
Sample Name:	GMR Solid Waste-I		
Manufacturer:	NA		
Batch Number:	NA	A.R. Number:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Analysis as per Attached List		
Other Details if Any:	NA		
Lab Provided Details :			
Sample Received Date:	2024-01-19	Sample Registration Date:	2024-01-23
Analysis Starting Date:	2024-01-23	Analysis Completion Date:	2024-02-05
Quantity Received:	1 Kg Packet X 1No		
Sampling Details:	NA		
Method of Testing:	USEPA9045D, USEPA3050B, ICARDA Pg. No. 45 to 49, IS2720PART2, USEPA415.11999, USEPA3050BUSEPA6020A & USEPAMETHOD91001986		
Other Details if Any:	NA		

ULR-TC541824000004250F
Chemical
Pollution & Environment

TEST RESULTS

S. No.	Test Parameters	Unit of Measurement	Results
1	pH at 25°C (1:2.5 ratio)	—	5.56

Scan the QR code to check the report authenticity

Name and Designation of Authorized Signatory
Dr.SUBBAREDDY MALLAMPATI
Manager - Environment

Note : This report is subject to the terms and conditions mentioned at the end of the report.
Vimta Labs Ltd., Life Sciences Campus, Plot No. 5, MN Park (Formerly Alexandria Knowledge Park),
Genome Valley, Shamirpet, Medchal - Malkajgiri - 500 101, Hyderabad, Telangana, India. Phone : +91-40-6740 4040



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Manager - Project management team
project site office
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Registration/Report Number: VLL/VLS/23/18772/001
Issue Date: 2024-02-06
Your Ref:
and Date: 2024-01-19
Lab Ref No.: 1603829
LIMS Report No.: 508120

Page 1 of 2

Customer Provided Details :			
Sample Name:	GMR Solid Waste-I		
Batch Number:	NA	A.R. Number:	NA
Mfg. Date:	NA	Exp. Date:	NA
Test Required:	Analysis of C/N Ratio,Particle Size		
Other Details if Any:	NA		
Lab Provided Details :			
Sample Received Date:	2024-01-19	Sample Registration Date:	2024-01-23
Analysis Starting Date:	2024-01-31	Analysis Completion Date:	2024-02-05
Received Quantity:	1 Kg Packet X 1No		
Sampling Details:	NA		
Method of Testing:	As per SOP NO 26/21 and Instrument used CHNS analyser and ASTMD 293.		
Other Details if Any:	NA		

TEST RESULTS

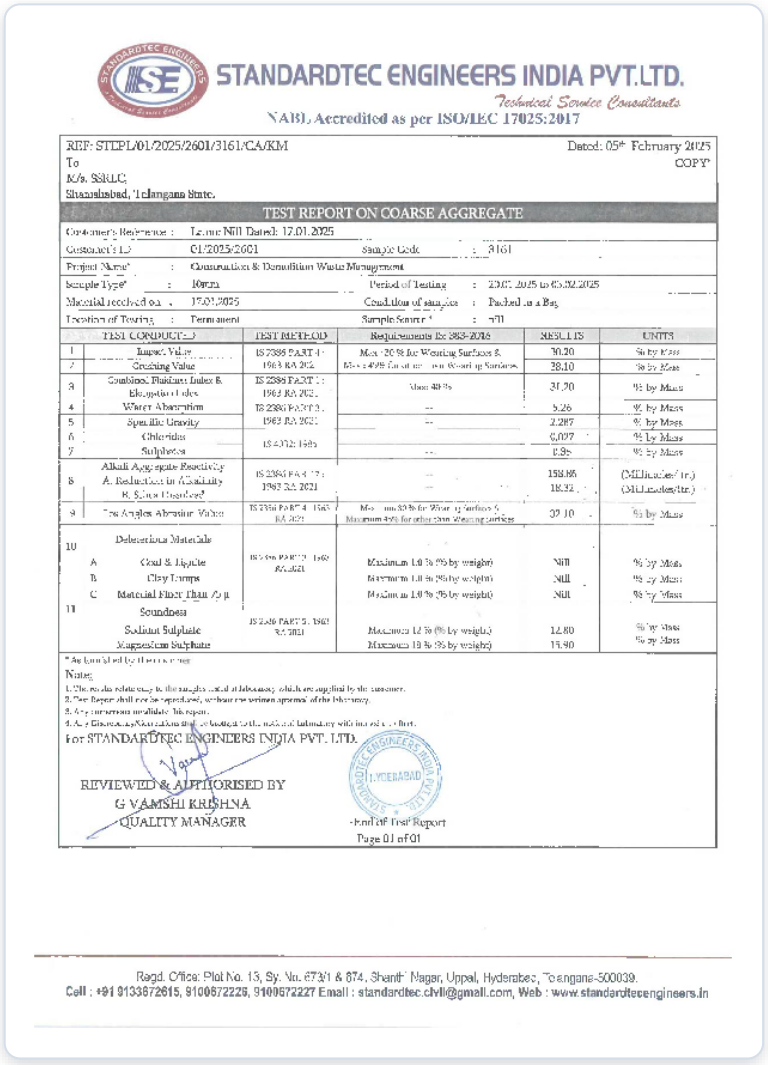
S. No.	Test Parameters	Unit of Measurement	Results
1	Nitrogen	%	3.98
2	C/N Ratio	%	12.95
3	Retained on 16 MM	%	15.95
4	Retained on 12.5 MM	%	10.30
5	Retained on 10 MM	%	9.00

Scan the QR code to check the report authenticity

Name and Designation of Authorized Signatory
Jyothi Ch
Manager

Note : This report is subject to the terms and conditions mentioned at the end of the report.
Vimta Labs Ltd., Life Sciences Campus, Plot No. 5, MN Park (Formerly Alexandria Knowledge Park),
Genome Valley, Shamirpet, Medchal - Malkajgiri - 500 101, Hyderabad, Telangana, India. Phone : +91-40-6740 4040

C&D Waste Recycled Material – Lab Certificates



STANDARDTEC ENGINEERS INDIA PVT.LTD.
Technical Service Consultants
NABL Accredited as per ISO/IEC 17025:2017

REF: STEPL/01/2025/2601/3161/CA/KM — Dated: 05th February 2025 — COPY
To
M/s. SSRIC,
Shamshabad, Telangana State.

TEST REPORT ON COARSE AGGREGATE

Customer's Reference : Lr.no: Nil Dated: 17.01.2025
Customer's ID : 01/2025/2601 — Sample Code : 3161
Project Name* : Construction & Demolition Waste Management
Sample Type* : 10mm — Period of Testing : 20.01.2025 to 03.02.2025
Material received on : 17.01.2025 — Condition of sample : Packed in a Bag
Location of Testing : Permanent — Sample Source* : Nil

	TEST CONDUCTED	TEST METHOD	Requirements IS: 383-2016	RESULTS	UNITS
1	Impact Value	IS 2386 PART 4 : 1963 RA 2021	Max. 30 % for Wearing Surfaces & Max. 45% for other than Wearing Surfaces	30.20	% by Mass
2	Crushing Value			38.10	% by Mass
3	Combined Flakiness Index & Elongation Index	IS 2386 PART 1 : 1963 RA 2021	Max 40 %	31.20	% by Mass
4	Water Absorption	IS 2386 PART 3 : 1963 RA 2021	--	5.26	% by Mass
5	Specific Gravity		--	2.287	% by Mass
6	Chlorides	IS 4032: 1985	--	0.037	% by Mass
7	Sulphates		--	0.85	% by Mass
8	Alkali Aggregate Reactivity A. Reduction in Alkalinity B. Silica Dissolved	IS 2386 PART 7 : 1963 RA 2021	--	158.86 18.32	(Milliequiv/ltr.) (Milligrams/ltr.)
9	Los Angeles Abrasion Value	IS 2386 PART 4 : 1963 RA 2021	Max. 30 % for Wearing Surfaces & Maximum 50% for other than Wearing Surfaces	29.10	% by Mass
10	Deleterious Materials				
A	Coal & Lignite	IS 2386 PART 2 : 1963 RA 2021	Maximum 1.0 % (% by weight)	Nil	% by Mass
B	Clay Lumps		Maximum 1.0 % (% by weight)	Nil	% by Mass
C	Material Finer Than 75 µ		Maximum 1.0 % (% by weight)	Nil	% by Mass
11	Soundness				
	Sodium Sulphate	IS 2386 PART 5 : 1963 RA 2021	Maximum 12 % (% by weight)	12.80	% by Mass
	Magnesium Sulphate		Maximum 18 % (% by weight)	15.40	% by Mass

* As furnished by the customer

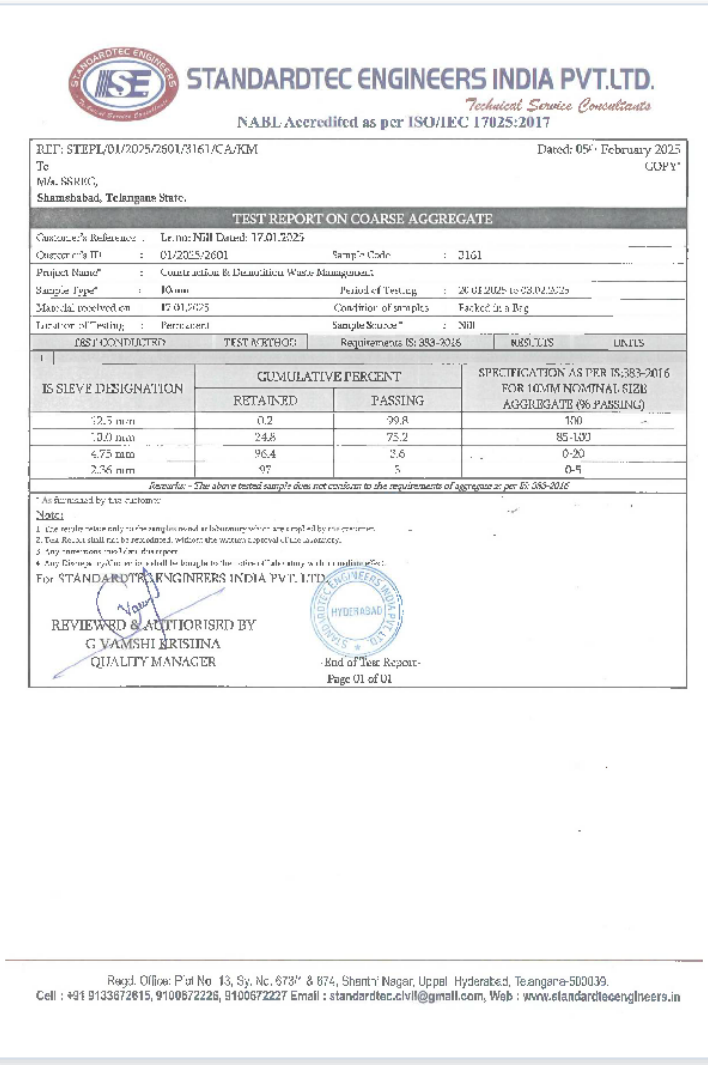
Note:
1. The results relate only to the samples tested at laboratory which are supplied by the customer.
2. Test Report shall not be reproduced, without the written approval of the laboratory.
3. Any corrections invalidate this report.
4. Any discrepancies/objections shall be brought to the notice of laboratory within 15 days of receipt.

For STANDARDTEC ENGINEERS INDIA PVT. LTD.

REVIEWED & AUTHORISED BY
G VAMSHI KRISHNA
QUALITY MANAGER

-End Of Test Report-
Page 01 of 01

Regd. Office: Plot No. 13, Sy. No. 673/1 & 674, Shanthi Nagar, Uppal, Hyderabad, Telangana-500039.
Cell : +91 9133672615, 9100672225, 9100672227 Email : standardtec.civil@gmail.com, Web : www.standardtecengineers.in



STANDARDTEC ENGINEERS INDIA PVT.LTD.
Technical Service Consultants
NABL Accredited as per ISO/IEC 17025:2017

REF: STEPL/01/2025/2601/3161/CA/KM — Dated: 05th February 2025 — COPY
To
M/s. SSRIC,
Shamshabad, Telangana State.

TEST REPORT ON COARSE AGGREGATE

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Customer's ID : 01/2025/2601 — Sample Code : 3161
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Material received on : 17.01.2025 — Condition of sample : Packed in a Bag
Location of Testing : Permanent — Sample Source* : Nil

TEST CONDUCTED	TEST METHOD	Requirements IS: 383-2016	RESULTS	UNITS
1				

IS SIEVE DESIGNATION	CUMULATIVE PERCENT RETAINED	CUMULATIVE PERCENT PASSING	SPECIFICATION AS PER IS:383-2016 FOR 10MM NOMINAL SIZE AGGREGATE (% PASSING)
12.5 mm	0.2	99.8	100
10.0 mm	24.8	75.2	85-100
4.75 mm	96.4	3.6	0-20
2.36 mm	97	3	0-5

Remarks - The above tested sample does not conform to the requirements of aggregate as per IS 383-2016

* As furnished by the customer

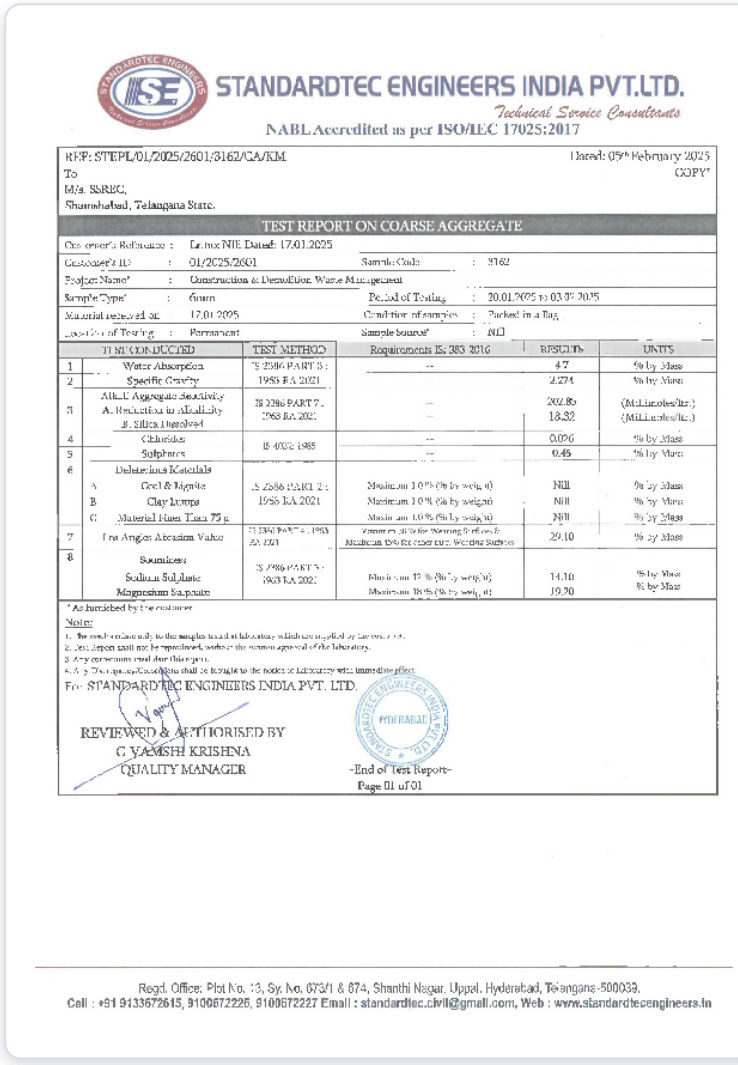
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G VAMSHI KRISHNA
QUALITY MANAGER

-End of Test Report-
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Regd. Office: Plot No. 13, Sy. No. 673/1 & 674, Shanthi Nagar, Uppal, Hyderabad, Telangana-500039.
Cell : +91 9133672615, 9100672225, 9100672227 Email : standardtec.civil@gmail.com, Web : www.standardtecengineers.in



STANDARDTEC ENGINEERS INDIA PVT.LTD.
Technical Service Consultants
NABL Accredited as per ISO/IEC 17025:2017

REF: STEPL/01/2025/2601/3162/CA/KM — Dated: 05th February 2025 — COPY
To
M/s. SSRIC,
Shamshabad, Telangana State.

TEST REPORT ON COARSE AGGREGATE

Customer's Reference : Lr.no: NIL Dated: 17.01.2025
Customer's ID : 01/2025/2601 — Sample Code : 3162
Project Name* : Construction & Demolition Waste Management
Sample Type* : 6mm — Period of Testing : 20.01.2025 to 03.02.2025
Material received on : 17.01.2025 — Condition of samples : Packed in a Bag
Location of Testing : Permanent — Sample Source* : Nil

	TEST CONDUCTED	TEST METHOD	Requirements IS: 383-2016	RESULTS	UNITS
1	Water Absorption	IS 2386 PART 3 : 1963 RA 2021	--	4.7	% by Mass
2	Specific Gravity			2.274	% by Mass
3	Alkali Aggregate Reactivity A. Reduction in Alkalinity B. Silica Dissolved	IS 2386 PART 7 : 1963 RA 2021	--	202.80 18.32	(Milliequiv/ltr.) (Milligrams/ltr.)
4	Chlorides	IS 4032: 1985	--	0.096	% by Mass
5	Sulphates		--	0.45	% by Mass
6	Deleterious Materials				
A	Coal & Lignite	IS 2386 PART 2 : 1963 RA 2021	Maximum 1.0 % (% by weight)	Nil	% by Mass
B	Clay Lumps		Maximum 1.0 % (% by weight)	Nil	% by Mass
C	Material Finer Than 75 µ		Maximum 1.0 % (% by weight)	Nil	% by Mass
7	Los Angeles Abrasion Value	IS 2386 PART 4 : 1963 RA 2021	Max. 30 % for Wearing Surfaces & Maximum 50% for other than Wearing Surfaces	29.10	% by Mass
8	Soundness				
	Sodium Sulphate	IS 2386 PART 5 : 1963 RA 2021	Maximum 12 % (% by weight)	14.10	% by Mass
	Magnesium Sulphate		Maximum 18 % (% by weight)	19.90	% by Mass

* As furnished by the customer

Note:
1. The results relate only to the samples tested at laboratory which are supplied by the customer.
2. Test Report shall not be reproduced, without the written approval of the laboratory.
3. Any corrections invalidate this report.
4. Any discrepancies/objections shall be brought to the notice of laboratory within 15 days of receipt.

For STANDARDTEC ENGINEERS INDIA PVT. LTD.

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Peer Benchmarking in Solid Waste Management

Airport / operator	Year	Waste generation rate	Diversion / recovery	Key management practice
Haneda / Japan Airport Terminal	2023	0.11 kg/pax	~40–50%	Terminal-level operational data; reuse + recycling
Schiphol Airport	2024	0.17 kg/pax	~97.7%	Recovery-led system; low residual waste
Copenhagen Airport	2023	0.18 kg/pax	99.2%	33% recycling; remaining recovery includes energy recovery
Malaysia Airports (network)	2023	0.24 kg/pax	~21.7% recovered	Network-level recovery reporting
SFO	2024	0.25 kg/pax	62%	MSW boundary; recycling + composting
Heathrow	2024	0.28 kg/pax	~100% diversion	49.8% recycling; remaining primarily energy recovery; zero landfill
HKIA	2024/25	0.336 kg/pax	—	Non-hazardous waste intensity disclosed; GRI/ESG reporting
Istanbul Airport	2024	0.58 kg/pax MSW* / 0.64 operational*	34%	Segregation; recycling/composting/recovery; landfill still material
GHIAL	**FY2025–26**	**0.2 kg/pax**	**82% diversion**	**BRSR categories; hazardous/non-hazardous segregation and recovery/disposal reporting**

Benchmarking implication: 0.1–0.3 kg/pax is a useful international reference band for operational/MSW-type airport boundaries; higher values can reflect broader boundaries. Diversion >95% is demonstrated by several leading airports.

Sources: International Journal of Environmental Science & Technology (2026), Table 3; HKIA Sustainability Report 2024/25; Public-domain sustainability disclosures / studies | Latest comparable data located (mostly 2023–2025).