

RNI Reg. No. MAHENG/2010/39292
 Postal Reg. No. MCN/231/2024-26
 Posted from: Patrika Channel Sorting Office, Mumbai - 400 001
 Date of Publication: 7th of every month Posting Date: 15th of every month
 WPP License No. MR/Tech/WPP-223/North/2024-26
 "License to post without prepayment"
 Date of Publication: 7th of every month Posting Date: 15th of every month

**STEEL
STRUCTURES
& METAL
BUILDINGS**

SSMB.IN
 nerve of steel construction...

INDIA'S LARGEST INFRASTRUCTURE CONSTRUCTION EXHIBITION ON STEEL BUILDINGS & STRUCTURES

Concurrent Expos:



SCAN TO REGISTER



www.scexpo.in



**STEEL
CONSTRUCTION
EXPO**

**13 - 15
MAR. 2025**

Chennai Convention Centre,
CHENNAI

PLAN YOUR PARTICIPATION

Brands
200+

B2B Meetings
1000+

Visitors
10000+

C O N T E N T

18 Cover Story



Crowning Glories

India's booming aviation sector faces a challenge: building modern, efficient airports quickly and cost-effectively.

14

Interaction

The Human Element

In Conversation: **Dhananjay Dake**, Founder of Construction Catalysers

10

Future Watch

Epicon, Saudi Arabia

An awe-inspiring addition to Saudi Arabia's ambitious Neom project

12

Tech Ticker

DJI Flagship Store, China

Spans nearly 4,000 sq m across four floors

28

Design With Steel

Design Discourse

In Conversation: **Manish Banker**, Principal Architect at Tao Architecture

Waste to Wonder

Featuring Abellon Waste-to-Energy Campus, Gujarat

24

Green Power Hub

The XO Factor

Featuring House XO, Kerala



48

Go Green

Crafting the Casa

Featuring Casa Riviera, Maharashtra

44

Mind Bogglers

13

Whats New

Grota's House, Brazil

Prioritises the integration of the native forest



32

Marvelous Makeover

A Factory Reset

Featuring Manufacturing Facility for Furniture, Maharashtra

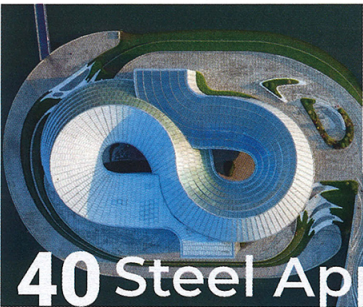
42

Womantecture

A Dialogue Between Eras

In Conversation: **Harpreet Kaur**, of Architecture Dialogue

40 Steel Application



Yohoo Museum, China

Serves as a pioneering art destination that blends tradition with modernity

46

TALES

In Conversation: **Abhijit Kane**, AGM (Project Planning & Designing) at Navi Mumbai International Airport Pvt Ltd

42

Technical article

Seismic Behaviour of Demountable Self-Lock Joint

This paper examines the development and testing of self-lock joints for modular steel construction.

36

Postshow Report

SCS Bengaluru 2024

The Steel Construction Summit, Bengaluru, held in association with the ISCA, brought together industry leaders, experts, and innovators to discuss the future of steel.

The **Abellon Waste-to-Energy Campus** in Jamnagar, Gujarat is a pioneering model of sustainable infrastructure, converting municipal waste into clean energy while promoting a circular economy. Integrating advanced waste management, renewable energy, and eco-conscious design optimises waste treatment and creates a multi-functional space that benefits both the city and its people.

Waste to Wonder



The Abellon Waste-to-Energy campus exemplifies a holistic design approach that addresses technological and environmental needs. Evolving from a simple client brief, the campus processes Municipal Solid Waste (MSW), generates clean energy and spreads awareness about waste management while showcasing responsible industrial practices for net-zero development. Sustainability is central to this design, featuring renewable energy use, energy-efficient systems, and natural resource optimisation, with strategies like natural ventilation, daylighting, solar panels, and decentralised waste treatment systems.

The main plant generates power from municipal waste, biogas, solar energy, and biomass, with

features like an electric car charging station and an eco-stove. Renewable energy systems serve as educational touchpoints for visitors, while the Neem 'van' hosts exhibitions and fairs. The campus includes sports grounds, a jogging track, and venues for cultural events. Kalpavruksh Vatika supports yoga, meditation, and plantation drives, and misting fountains enhance BOD levels and host light shows. Aeroponics vertical farming and an art wall made from MSW promote sustainable agriculture and waste management awareness.

Jayesh Hariyani, Chairman and Managing Director of INI Design Studio, highlights how the plant's Vastu-guided layout fosters positive energy, enhances productivity, ensures efficient waste flow, and meets strict regulations.



"The Aquatic Gallery, situated within the sprawling Ahmedabad Science City in Gujarat, is a 5th generation facility, India's first inland aquarium. Conceived and developed by the Gujarat Council of Science City, the Gallery is distinguished by its comprehensive approach to educational outreach, community engagement, and sustainability initiatives. Beyond serving as a premier destination for edutainment, it actively fosters scientific curiosity and environmental awareness through outreach programs, workshops, and interactive exhibits. The gallery's commitment to sustainability through the use of environmentally friendly materials, energy-efficient systems, and water conservation measures, sets a precedent for environmentally conscious architectural design."

JAYESH HARIYANI
CMD, INI Design Studio

FACT FILE

- Project: **Abellon Waste To Energy (WTE) Campus, Jamnagar**
- Client: **Goodswatts WTE Jamnagar Private Limited (SPV Abellon Clean Energy Group)**
- Architect & Project Management: **INI Design Studio**
- Structural Consultant: **DELF Consulting Engineers (India) Pvt Ltd**
- Fabricator: **Sai Nath Fabricator**
- Supplier: **TATA Steel**
- Tonnage: **150 tonne**
- Status: **Completed**





CIRCULAR SOLUTIONS

The campus integrates urban waste treatment with functional, sustainable, and socially responsible infrastructure. Its modular layout efficiently handles diverse waste streams, including organic, non-organic, and hazardous materials, while allowing for future technological upgrades or scaling. Advanced systems like automated segregation, moisture control, and high-efficiency incinerators optimise waste flow through sorting, decomposition, and energy recovery processes.

Closed-loop operations extract valuable resources such as biogas, plastics, and ash for reuse, promoting a circular economy. Passive design features like natural ventilation, daylighting, and thermal insulation complement active systems like solar panels and advanced heat recovery mechanisms, significantly reducing the environmental footprint. Landscaping with native, drought-resistant plants and rainwater harvesting further enhances sustainability by minimising water consumption and recharging groundwater.

Steel was chosen for the campus due to its strength, versatility, and efficiency in construction. Its durability ensures resilience to harsh environmental conditions typical of waste processing sites, while its design flexibility enables the creation of large, open spaces required for waste processing equipment. Prefabricated recycled steel structures follow the principle of 'form follows function,' optimising

process flow through vertical stacking and equipment sizing.

These lightweight structures minimise resource consumption and reduce construction time. Additionally, translucent, multilayered polycarbonate facades enhance thermal performance and reduce operational costs. Polycarbonate panels allow ample natural light to permeate interiors, cutting down on artificial lighting needs during the day, while their lightweight, impact-resistant design facilitates easy installation and reconfiguration.

The campus design incorporates Vastu principles, with administrative and community spaces positioned in the northern and eastern zones to harness positive energy and create a welcoming atmosphere. Treatment units are strategically placed in the southern and western zones to mitigate noise and odours, ensuring operational efficiency and user comfort. Open spaces, water bodies, and green zones act as natural buffers, reducing noise and air pollution while fostering a healthier work environment. The site's orientation optimises sunlight and ventilation, minimising heat gain and reliance on artificial systems.

COMMUNITY DRIVEN

The project, a PPP model between Goodwatts WtE Jamnagar Pvt Ltd (GWJPL) and Jamnagar Municipal Corporation (JMC), transformed a barren wasteland into a sustainable ecological hub. Previously used for

unmanaged waste dumping, and contaminated by heavy metal leachate, the site was remediated through soil treatment, landscape planning, and irrigation management. Addressing the unpredictable nature of Indian urban waste, the project implemented modular waste treatment systems, moisture control mechanisms, and scalable designs to ensure efficient processing and continuous energy generation.

The campus design emphasises sustainability, functionality, and adaptability, with a lightweight, open-span prefab steel structure that optimises operational efficiency through vertical stacking and compact equipment sizing. A modular facade system of translucent layered polycarbonate panels blocks UV radiation while allowing filtered daylight to permeate, reducing lighting energy consumption by 60 per cent. Detailed energy modelling demonstrated a 92 per cent reduction in lighting power through LED improvements. With only 20 per cent of the site dedicated to plant operations, the design reserves space for community areas, green zones, and future expansion, fostering long-term sustainability.

Community engagement was central to the project's success, beginning with a three-day workshop at Abellon's Ahmedabad headquarters, where inputs from government officials, social leaders, and architects were integrated into the design process. A comprehensive Environmental

Impact Assessment (EIA) guided the adoption of mitigation measures such as air and water quality monitoring systems, dust suppression techniques, and emission controls.

Transparent communication with local communities addressed concerns about noise, emissions, and health impacts, fostering trust. Thoughtful landscaping and material selection allowed the campus to blend seamlessly into its surroundings, transforming the site into a vibrant community hub that hosts events, sports, and educational programs while showcasing cutting-edge waste management technologies.

GREEN & GROWING

The Abellon WTE campus exemplifies sustainable land use and advanced waste-to-energy practices by dedicating only 20 per cent of its site to plant operations, reserving the rest for green zones, community spaces, and future expansion. Segregated entry points enhance efficiency and safety, while native plantations, orchards, and misting ponds mitigate the urban heat island effect and support biodiversity.

The facility thermally processes 220,000 tonne of municipal solid waste (MSW) annually, generating

43.75 million units of green power and preventing 37,317 MT of CO₂ emissions. A multi-stage flue gas cleaning system ensures compliance with global and local emission standards, while an onsite 7.5 kW solar PV system and biogas plant meet 100 per cent of its electricity needs. Treated municipal wastewater is used for cooling, reducing freshwater demand and power consumption through an AI-supported system that optimises temperature control.

Fostering a circular economy, the plant processes non-recyclable plastics and 1 MLD of treated sewage water, preventing 22,000 tonne of ocean-bound plastic pollution. Its integrated value chains include bioCNG production, plastic recovery, and green chemical manufacturing. Patented technology tailored for Indian urban waste conserves 50 acre over 20 years, while fly ash is repurposed into construction blocks and pavers, and recovered plastics are used in building materials. By reducing landfill dependency and reintegrating valuable resources into the economy, the Abellon WTE campus sets a benchmark for sustainable infrastructure, contributing to environmental stewardship and economic resilience. ■

- Vanshika Raigaga

POWERING SUSTAINABILITY

Community Engagement & Social Impact

- Net Zero campus raising awareness of waste management.
- Public spaces for gatherings, sports, and workshops.
- Stakeholder workshops shaped an inclusive design.

Environmental Benefits & Climate Resilience

- 220,000 tonne of MSW processed, 43.75 M units of green power.
- 37,317 MT CO₂ reduced annually.
- Water reuse for cooling and green landscape mitigate heat.

Overcoming Challenges in Waste Processing

- Former dumping ground transformed into a green campus.
- Advanced sorting & moisture control for efficiency.
- Strict emission controls ensure air quality compliance.
- Decentralised treatment reduces costs & footprint.

