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STEEL STRUCTURES & METAL BUILDINGS

BUILD WITH STEEL

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METAL ROOFING

PROGRESSING WITH PACE

VADODARA INTEGRATED TERMINAL GUJARAT

epitome of aesthetics with an arresting sight

"Architecture is for eternity..." and this phrase holds true for New Vadodara Integrated Terminal. The Vadodara Integrated Terminal is an epitome of aesthetics with an arresting sight. An engineering marvel, the terminal is an icon in itself, a first-of-its-kind and holds a strong identity.

Apart from being an iconic and sleek contemporary structure, Vadodara Airport is the Greenest Airport ever proposed in India, designed by M/s Creative Group which is led by Prof. Charanjit Shah. The terminal was an International Architectural Design Competition organized by AAI among many other hopefuls.

Planned To Perfection

Great airports have the ability to create a sense of excitement, anticipation and spirit of flight, even from a distance. Approaching the new terminal from Vadodara, passengers could see the terminal's iconic aerodynamic volume levitating above the landscape. Incoming vehicles follow the internal roadway loop surrounded by green trees. Passengers arrive at the curb protected by a large overhang that is punctuated with clear circular openings to provide natural light and induce natural ventilation.

The organization of the terminal is straightforward and efficient. The basis of planning is sequential with all terminal functions supported by clear way finding. Although there is a provision of definite division between airside and landside spaces, the terminal is connected visually around a central zone. Passenger and baggage circulation is organized so that departing and arriving passengers as well as domestic and international passengers do not mingle at any point on the airside of the building.

Structural Glorification

The New Integrated Terminal features an arching, sweeping roof that spans the entire length of the terminal; Inspired by the body and wings of airplanes, the building's bold sweeping form and identity is achieved by wrapping the East and West sides and the roof with one continuous aerodynamic metal skin. Careful analysis of the building's orientation informs its design and unique form. A large overhang on the North (landside) shelters the transparent facade while shading and protecting passengers along the curbside.

This profile creates an overhang on the South (airside) so that the panoramic glass curtain wall is completely shaded from the strong sun. The volumetric proportion of the interior spaces combined with filtered natural light from skylights above and the sound of flowing water will activate and enliven the experience inside the terminal. The structure is an amalgamation and intelligent use of materials and technology. Within the space defined by the arching roof, support columns are arranged so that public spaces remain column-free at all terminal levels. The curtain wall forms the facade on two sides and is supported on the vertical and horizontal members. The west & East façade has hollow blocks to protect hot sun. Elements of green architecture are being adopted and most of the ECBC code application is carried out. Green pavers, solar street lights, traffic markers are being used.

Greening With Prowess

The Architects have worked in a global association with Gensler and Frederic Schwartz Architects and have projected the New Terminal at Vadodara as the Greenest Airport in India. Carefully assessing the material palette and adherence of ECBC codes ensures energy conservation. STP and rainwater harvesting programme being adopted for water conservation. Bricks have been replaced by AAC blocks (Aerated Autoclaved Concrete Blocks), which ensures thermal insulation. Besides insulating capability, one of AAC's advantages in construction is its quick and easy installation.

AAC's high resource efficiency gives it low environmental impact in all phases of its life cycle, from processing of raw materials to the disposal of AAC waste. AAC's excellent thermal efficiency makes a major contribution to environmental protection by sharply reducing the need for space heating and cooling in buildings. The parking zone is devoid of any hard surface which has 95 per cent of water run-off and no percolation. Use of Green pavers with over 90 per cent porosity ensures ground water recharge. With water table dropping every year and is cause of immense concern.

The ECBC code application involves adaptation of active and passive strategies like use of occupancy sensors & timers, CFL & T5 fixtures, automatic shutoff system, electronic ballasts and variable drives. Superior daylight achieved throughout the building by optimizing design reduces dependence upon artificial lighting. The designing has been evolved on simple fact 'minimize the heat gain and maximizing day lighting'. The stepped pool acts as a natural and physical separation between the visitor area and the check-in zone while creating a memorable experience for passengers, its reflectivity offering a psychological respite and calming of the soul for travelers.

Roofing Extolment

With its sleek curved roof, the building's steel structure rises to form a light and open, column-free terminal with expansive glass curtain walls that create a feeling of spaciousness. Skylights follow the geometry of the roof allowing natural light to permeate the terminal. The roof structure creates column-free public spaces for both, the public concourses and the hold room areas. The structural design and repetition of the basic module result in maximum efficiency for engineering, fabrication and construction considerations.

To the East and West, the roof-supporting trusses rest on shear walls. The large forces generated at the base of these elements are transferred directly to the foundations. Departures level floors are constructed using both, post-tensioned and conventionally reinforced concrete. To insure maximum structural efficiency and to limit the overall depth of the structural envelope, girders are post-tensioned. The beams and slabs framing into these girders are designed using conventional reinforced concrete construction methods.

Prof. Shah has integrated services in underground trenches, catering to various services like fire fighting, HVAC, plumbing, BMS etc. which would not only be functional, but, effective at the same time. Along with Architect Gurpreet Shah, design team developed and conceptualized terminal's aerodynamic form and its integration with natural and artificial lighting. Architecture is a visual art, and buildings speak for themselves. This green iconic building adds to the heritage of Vadodara and brings pride to the cultural city and is a piece of art which will stay for eternity. ■

Client	Architect	Project Feasibility
Airports Authority of India	**Creative Group**	**Creative Group**

City Side Area	Terminal Building	Cost of project	Year of completion
22 acres	**19,500 sq. mtrs.**	**180 crore**	2014