EMBARK

GRIHA Trophy

Introduction

According to the United Nations Environment Programme, buildings account for nearly 50% of the entire world's energy expenditure, 40% of global greenhouse gas emissions, 25% of the earth's potable water and about 20% of all solid waste generated. Sustainable architecture seeks to construct or renovate buildings using innovative design, renewable materials and energy-efficient technology and in doing so minimize both the initial and long-term environmental impacts of buildings. The most effective buildings are those that are designed to be sustainable from the conceptual stage. Innovations can be incorporated into every aspect of the construction process allowing the creation of a minimal-energy building that promotes the health of occupants, sources its own water and energy and operates without polluting the environment. Sustainable design is not limited to new construction however and can also be incorporated into existing buildings to increase energy efficiency by adding insulation, solar panels, and replacing traditional lighting and HVAC systems with low-energy models.

India was the fastest growing domestic air travel market globally in 2018 with the country seeing 18.6% more people flying within the country than the previous year. As stated by The International Air Transport Association (IATA)- "India domestic market recorded the fastest full year domestic growth rate for the fourth year in a row followed by China." This significant expansion is expected to be underpinned by a trebling in the proportion of middle-class households and further increases in time-saving options for air passengers. This highlights the important role aviation can play in connecting the country – both internally and with the rest of the world.

With an increasing demand for air travel, it is essential to make a paradigm shift towards creating sustainable and self-sufficient aviation infrastructure. It is important to note that air travel accounts for upto 6% of the CO2 emissions from various modes of transport, projected to increase drastically in the coming years.
Airports in particular with continuous thoroughfare and occupancy have the onus of optimizing their resource demand while providing a comfortable transit to passengers. Apart from providing ease of access and movement, adequate signage and requisite security; it is essential to maintain visual, thermal and acoustic comfort standards as well as good indoor air quality in lieu of the increased noise and air pollution and excessive glare at airports. Occupant comfort along with reduced environmental impact and resource efficiency must therefore be integral to a 'Green Airport' design.

Airports have the potential for developing zero impact infrastructures, this need being further necessitated in eco-sensitive hilly regions of the country. With air transport often being the only plausible mode of connectivity in many such parts, there is a need for nuanced design imbibing aspects of sustainability from the design conception.
Sustainability must be well integrated into the design in a way that the functional requirements of the project are uncompromised. When designing Net-zero buildings, it is important that the building massing, envelope, landscape, waste and water management systems are aligned towards reducing building demand at the very outset and self-sustaining systems are provided on-site to meet these reduced demands. The key is to adopt innovative strategies for meeting demands as well as generating resource from waste on- site to truly achieve a net-zero building.

Further, assessing the performance of building systems over its entire life cycle fortified by monitoring and verification strengthens continued self-sufficiency and reduces dependence on centralized systems.

It is imperative that the design is responsive and contextual to its surrounding built-environment, cognizant of it's impact on the same. Carefully analyzing wind flow patterns, solar shading etc. and adopting strategies for an improved micro-climate, reduction in Urban Heat island effect will ensure that building design is not viewed in isolation of its vicinity.

About GRIHA Council – Green Rating for Integrated Habitat Assessment

GRIHA is India's National Rating System for Green buildings. It has been developed by TERI (The Energy and Resources Institute) and is endorsed by the MNRE (Ministry of New and Renewable Energy).

It is based on nationally accepted energy and environmental principles and seeks to strike a balance between established practices and emerging concepts, both national and international. GRIHA attempts to minimize a building's resource consumption, waste generation, and overall ecological/environmental impact by comparing them to certain nationally acceptable limits / benchmarks.
GRIHA currently offers distinct and specialized rating variants for new construction, existing buildings, affordable housing, day schools, large developments and cities.

About Airports Authority of India (AAI)

The Airports Authority of India or AAI is a statutory body (created through the Airports Authority of India Act, 1994) working under the Ministry of Civil Aviation; Government of India is responsible for creating, upgrading, maintaining and managing civil aviation infrastructure in India. It provides Communication Navigation Surveillance / Air Traffic Management (CNS/ATM) services over Indian airspace and adjoining oceanic areas. It also manages a total of 126[1] Airports, including 11International Airports, 11 Customs Airports, 89 Domestic Airports and 26 Civil enclaves at Military Airfields. AAI also has ground installations at all airports and 25 other locations to ensure safety of aircraft operations.

Airports Authority of India (AAI) is on this very mission to make sure there is sustainable development in the aviation infrastructure. Through Sustainable Development projects/activities, AAI is contributing towards control of environmental pollution both directly as well as indirectly. In operation of airports /buildings lot of power is being used which attributes to environmental pollution. In the recent gone years AAI has taken up many initiatives towards Sustainable Development.

AAI has taken steps for sustainable development in the areas of solar power plants, energy conservation, water conservation and pollution control measures. They have also actively taken up welfare measures for people affected by these projects under Corporate Social Responsibility (CSR). Solar PV Policy AAI has been setting up solar power plants for energy generation in a number of airports.

AAI has signed MoU with Solar Energy Corporation of India (SECI) to set up the rooftop and ground mounted solar power plants at these airports. AAI has commissioned 12.65 MW (megawatts) solar power plants at 25 airports and 17.04 MW at another five airports are in progress. AAI has already generated approximately 13.34 million units from the commissioned plants, which help in reduction of carbon footprint thereby contributing to the global mission of addressing climate change. AAI has so far reduced 12,000 metric tonnes of carbon emission solely from the already installed solar plants. Further AAI is in the process of formulating new methods to utilize the available vacant land in the premises of the airports for solar projects under the guidance of Ministry of New and Renewable Energy (MNRE)/SECI with an aim of energy neutrality.

AAI has already conducted energy audit at 42 airports/premises in the first phase, while 14 airports/premises that have been identified for its second phase are under process. Apart from installing solar panels, AAI is taking a number of other measures to be energy efficient. They are replacing old and hazardous mercury based CFL lights with LED based lights to protect the environment and drastically reduce the energy consumption. They are also using energy efficient chillers, energy efficient pumps, energy efficient star rated air conditioners, Variable Frequency Drive (VFD) for various applications, Automatic Power Factor Control (APFC) panels for improved power factor, Building Management System (BMS) and sensors for operation of heating, ventilation and air conditioning (HVAC) system, and also LED light for the taxiway. As regards water conservation, one of the main task-at-hand is Rain Water Harvesting (RWH), which harvests storm water instead of letting it go to waste. Most of the airports and AAI establishment implement this. At most of the airports RWH pits are created for recharging the ground water aquifer. At some airports rain water is collected in tanks for reuse in gardening purposes. AAI has also taken steps to reduce pollution by setting up Sewage Treatment Plant (STP) at airports for management of waste disposal and to use the treated recycled water for gardening purposes, for flushing in toilets and also for the HVAC system to minimize the use of fresh water. Sludge as a final product with water is used in the gardening as compost. STPs are working in 43 airports across India Through these measures AAI is trying to minimize the pollution of natural water bodies and also conserve on consumption of water.

To combat noise pollution, AAI is using diesel generator (DG) sets that are compact and have an acoustic enclosure. Water sprinklers are used to prevent dust pollution from construction work. And lastly, they are conducting extensive landscaping with horticulture and tree plantation to keep it green.

Design Brief

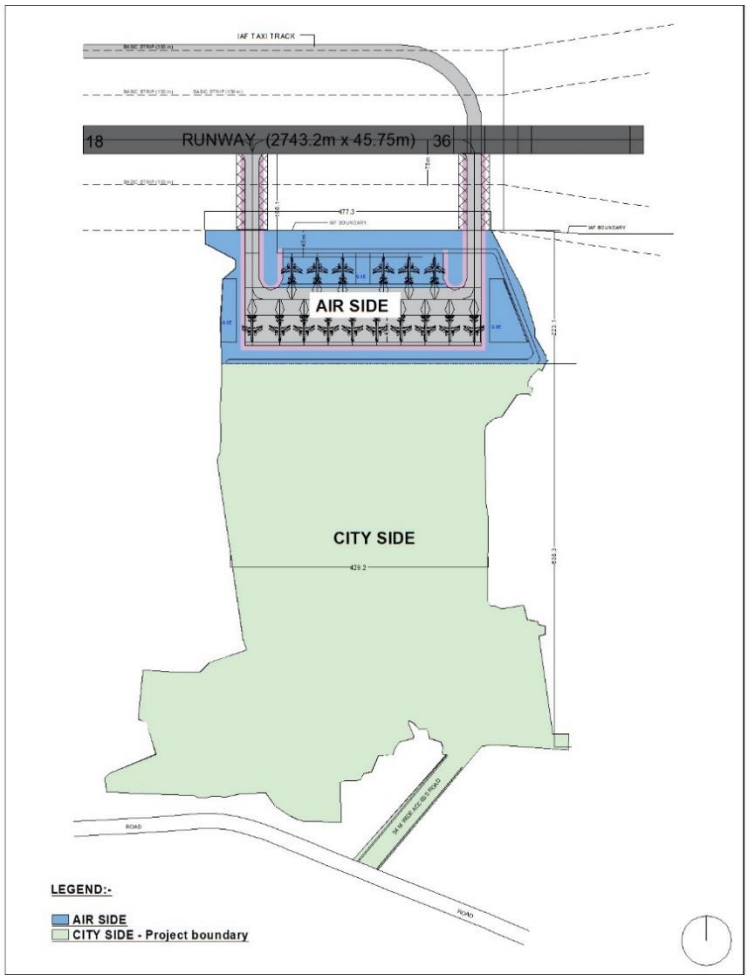
Bagdogra Airport is an international airport and gateway to the hill stations of Darjeeling, Gangtok and other parts of the North Bengal region. Located at the western part of the city Siliguri in northern West Bengal. Bagdogra It is operated as a civil enclave at Airforce station Bagdogra spread over an area of 13.77 acres.

The airport is currently being operated from an integrated terminal building having an area of 7180 sqm with peak hour handling capacity of 400 pax. Due to the increasing passenger foot fall, it has been proposed to develop new civil enclave for which AAI is initiating process to acquire 104.65 acres of land from West Bengal Govt.

To cater to the increasing growth and future demand it has been decided to construct a new Civil Enclave having Integrated Passenger Terminal building with 12.5 MPPA (Million passengers per annum) capacity and 3800 (PHP Peak Hour Projections) (3400 Domestic & 400 International)

Following are the design guidelines for the same.

Please note: Only "City Side" as marked in the site plan is under the scope of the project. The site plan in CAD format will also be shared with the participating colleges.



Designing Parameters

1. Designing of two and half level New Integrated Terminal Building with all modern facilities and amenities. The New Terminal Building having an area of 95,000 sqm (excluding Basement area) shall be designed for 3800 passengers at a time (3400 Domestic & 400 International). The building should be provided with aesthetically appealing &

soothing interior decoration matching the modern structure. Space planning should ensure that no dead Space/ Area is created in the building. New Civil enclave should be able to cater to all passengers including Divyang citizens.

2. The design of Terminal building should include Media planning, Retail area planning, F & B plan, etc. In airports with annual passenger traffic exceeding 10 million, commercial area could be upto 20% of the overall area. Overall planning of Building should capture local architectural features and it should be part of design features of terminal. The design should include the required arrangement for its regular maintenance so as to make it in-built part of execution. Solar power generation viz solar lighting, solar roofing system, etc shall be provided.
3. Departure Area - The terminal building with provision for Departure concourse, check-in area with adequate number of check-in counters, baggage conveyor belts, queuing space, segregation railing, back-up offices for Airlines, facilitation counters, weighing machines, counters etc.
4. Security Hold area with adequate seating arrangements and associated facilities.
5. The passenger frisking area in security hold with adequate space for locating required number of body scanners, X-ray machines (ATRS), Inspection Tables for manual checking of hand baggage and adequate space / room for security staff, isolated smoking area etc.
6. Arrival Area / Baggage Claim Area - In the ground floor baggage claim area, adequate number of baggage conveyor belts of adequate size should be provided.
7. Adequate space should be provided in the ground floor for required number of back up offices, money exchanger counters, Bank, space for storing of baggage trolleys, space for storage of mishandled baggage for airlines, segregation railing and associated passenger amenities.
8. Spaces for VIP/CIP lounges.
9. Horticulture – landscaping including both hard and soft landscaping, rain harvesting etc.
10. Provision of Ten Passenger Boarding Bridges (PBB) attached to fixed finger rotunda.
11. Provision of Signage's inside and outside the terminal building, car park area & City side approach road for guidance of passengers and visitors.
12. Approach road and internal circulation planning.
13. Space identification for services.
14. Identification of Spaces for Commercial planning which may include hotels, convention center, shopping complex etc. for Non Aeronautical Revenue generation for AAI.

Net- Zero Design

The terminal building design should tend towards a net-zero approach with a focus on optimizing energy and water consumption as well as waste management on site.

The project must demonstrate the following to illustrate the net-zero approach:

1. Passive strategies for reducing Solar heat gain into the building and enhancing thermal comfort.
2. Active design strategies for reducing building energy consumption.
3. Strategies for reducing water demand in the building, site and systems.
4. Strategies for offsetting building energy demand through renewable energy systems on site.
5. Strategies for offsetting building water demand to reduce dependence on Municipal water supply.
6. Strategies for waste management on site in order to reduce load on landfill.
7. Strategies for improving occupant comfort and well-being, universal accessibility, safety and security and environmental awareness.
8. Concepts regarding design, integration of materials and methods, structure, enclosure for reducing the project carbon footprint.
9. Innovation in design for enhanced building performance.
10. Improvement of existing contextual conditions responding to the natural and built environment.
11. Architectural quality and aesthetic impact, specifically concerning space, spatial sequences and movement.
12. Students are encouraged to explore and submit detailed energy simulations, water and waste calculations to get a realistic sense of the building design, however it is not compulsory.

Objectives

1. Design development highlighting an iterative approach and integration of strategies.
2. Design concept highlighting the climate responsive and passive/ active features of the proposal.
3. Design concept highlighting water and waste management strategies.

4. Design concept highlighting strategies for improving occupant comfort and well-being, universal accessibility, safety and security, environmental awareness and social impact.
5. Area statement and zoning plan highlighting passenger movement and any sustainable strategies if incorporated.
6. Building layout plans and Site layout plans with details.
7. Simulation results if any with concept note of strategies adopted.
8. The submission should include
    - Site plan and layout plan
    - Concept plan, Plans, Elevations and Sections
    - Views, perspective and any other means may be used to explain the design proposal.

Note: Scale of the drawings is at the discretion of the participating colleges. All entries must be prepared using metric units of measurement.

Evaluation Criteria

The following are mentioned in order of priority

- Resource management and sustainability
    - Impact of passive design methods and design response to climatic conditions
    - Impact of design strategies for reduced energy and water consumption and waste management
    - Impact of strategies adopted for reducing carbon footprint.
    - Effectiveness of other strategies proposed by the team.
- Innovation in architectural design
    - Effectiveness of the design for improved spatial experience.
    - Contextual response to the site and spatial functionality of the scheme
    - Use of local, innovative and sustainable building materials
- Presentation of the scheme
    - Design representation through drawings/ visual aids
    - AV presentation
    - Report submission with details of analysis
- Delivery of the scheme
    - Quality of presentation/presentation skills

- Contextual and aesthetic impact
    - Aesthetic innovation and relevance to the region.

Evaluation Format

STAGE 1: Online Submission and E-Jury

- The trophy will undergo the process of E-Jury where all the entries will be submitted on the website and will be taken to the panel of jurors.
- A PDF file of maximum file size of 25MB should be uploaded (sheets should not be pixelated)
- The project should be presented on a maximum of SIX A1 (594 X 841 mm) sheets.

STAGE 2: AV Presentation

Jury members shall shortlist the entries for AV presentation. Only two students per entry will be allowed to give the AV presentation. Time given for the short-listed entries shall not exceed 15 minutes. No college shall reveal its identity during the presentation.

General Guidelines

- Registrations and submissions should be done by the Unit Secretary in NASA India website before the deadline.
- All text should be in English.
- All sheets shall have the words "GRIHA TROPHY 2019-2020" clearly mentioned on them.
- The sheets should bear the NASA logo, in proper specification on the right -hand bottom corner.
- Any misconduct such as exposing identity through college name/stamp, participant(s) name or college code on the sheets/ post cards will be DISQUALIFIED.

NASA Logo Guidelines

- NASA Logo shall always be placed on the right-hand bottom corner of the sheet with a margin of 10mm from right and bottom of the page.
- NASA logo should not be merged, overlapped etc. with any sort of text, graphic, image, etc.
- NASA logo should be true black with a perfectly white background.
- For A1 sheet NASA India logo size should be 30mm x 52.50mm with 10mm clear border on all 4 sides.

Submission Requirements

- Authenticating letter from college HoD for each entry the work submitted is genuine and they have endorsed copyrights for the same and with the name of Participant(s) and stating the unit shall abide by whatever may be the final results and also agree that this entry is property of both the institute and NASA India.
- Declaration by the participant(s) stating the work submitted is genuine and they have endorsed copyrights for the same and to adhere by all the rules and regulations, Jury process and the results.
- Authenticating letter from college HoD/Principal/Director (on College Letterhead with Sign and Stamp of HoD/Principal/Director of the college), specifying the Account Details (Account Name, Account Number, Bank Name, ISFC Code) in which the Prize Money is to be awarded.
- The soft copy (non - editable format) of the sheets and video link/presentation should be uploaded on the website failing which the submission will be considered incomplete and the entry shall be disqualified. If the soft copy file of the sheets is damaged or in low resolution, the entry shall be disqualified.
- Editable format of the sheets has to be submitted during the Annual NASA Convention (Applicable only for shortlisted entries)

Prize Money

Prize money of 1.5 lakh Rupees is allotted to the trophy and it will be divided according to the number of the Citations and Special Mentions

Important Dates

- The release of brief – 6th November 2019
- Registrations open – 23rd November 2019
- Registrations close on – 29th November 2019
- Queries till – 25th November 2019
- Submission deadline – 27th December 2019

Any Kind of Queries need to be submitted through

https://nasaindia.co/trophy/griha

to

Simarjeet Singh
National Vice President | 2019 - 2020
NASA India