FORM – 1 (Updated)

(I) Basic Information

S. No.	Item		
1.	Name of the Project/s	:	Construction of New Integrated Terminal Building at LGBI Airport, Guwahati
2.	S. No. in the schedule	:	7 (a)
3.	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled.	:	Construction of New Integrated Terminal Building conforming to GRIHA 4 Star Rating with all modern facilities in an area of 90,000 sq m excluding Service area of 7,500 Sq m in Basement (Earlier planned with 77,500 Sq.m. excluding basement). No change in the designed capacity which is for 2900 Domestic and 200 International passengers at a time. The building includes Departure area, arrival area, security hold area and concourse area. Construction of multilevel car park with all amenities for at least 1500 cars and surface parking for VIP cars & 10 buses. Terminal Building / Car parking with canopy covering two lanes in front of the Terminal Building on the city side and connecting the main approach road to the city. Construction of Sub- station, A/C plant room and related service facilities. Provision to be made for the AC Plant Room vertical through AHU rooms, backup Generators for essential services, etc. in the lower ground floor.
4.	New/ Expansion/ Modernization	:	Expansion
5.	Existing capacity/ Area etc	:	a. Terminal Building to handle 850 pax. (425 arriving + 425 departing) at a time. b. Runway of dimension 3103 m x 45 m c. Apron to park 12 nos. A‑321, 7 nos. ATR‑72 and 1 no. 'B' type aircraft at a time. d. NAV/Comm. Aids like ILS, DVOR, DME, NDB, VHF. e. ATC Control Tower cum Technical Block and Fire Station of CAT‑VII. f. Night Landing Facilities.
6.	Category of Project i.e. ‘A’ or ‘B’.	:	A

7.	Does it attract the general condition? If yes, please specify.	:	Yes, Deepor Beel Bird Sanctuary is located at distance of 3 km approx in north-east direction. It covers 414 ha area. Deepor Beel (Lake) is listed in Ramsar Site of Assam State.
8.	Does it attract the specific condition? If yes, please specify.	:	No
9.	Location	:	Airport Reference Point 26^{o} 6' 22" N 91^{o} 35' 09" E
	Plot/ Survey/ Khasra No.	:	For proposed development no land acquisition is required as land is already available within the existing airport.
	Village	:	Borjhar,
	Tehsil	:	Guwahati
	District	:	Guwahati District
	State	:	Assam
10	Nearest railway station/ airport along with distance in kms.	:	Azara RS - 3.19 Km Guwahati RS - 18.5 km
11.	Nearest town, city, district Headquarters along with distance in kms.	:	Guwahati city - 15 Km
12.	Village Panchayat, Zilla Parishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given).	:	Borjhar, Guwahati, Assam State
13.	Name of the Applicant	:	**Airports Authority of India**
14.	Registered address	:	Lokpriya Gopinath Bordoloi International Airport, Borjhar, Guwahati, Assam – 781 015
15.	Address for Correspondence:		
	Name	:	Niranjan Sharma
	Designation (Owner/ Partner/ CEO)	:	Asst General Manager – Engg (Civil)
	Address	:	Airports Authority of India, Lokpriya Gopinath Bordoloi International Airport, Borjhar, Guwahati, Assam
	Pin Code	:	781015
	E-mail	:	guwahatiairportec@gmail.com
	Telephone No.	:	0361-2841909
	Fax No.	:	0361- 2840406
16.	Details of alternate sites examined, if any. Location of these sites should be shown on a topo sheet.	:	Proposed construction / development will be within the existing airport.
17.	Interlinked Projects.	:	No
18.	Whether separate application of interlinked project has been	:	No

	submitted?		
19.	If yes, date of submission.	:	NA
20.	If no, reason	:	NA
21.	Whether the proposal involves approval/clearance under : if yes, details of the same and their status to be given. (a) The Forest Conservation Act, 1980? (b) The Wildlife (Protection) Act, 1972? (c) The C.R.Z. Notification, 1991?	:	Not Applicable
22.	Whether there is any Government order/policy relevant/relating to the site?	:	No
23.	Forest land involved (hectares)	:	No
24.	Whether there is any litigation pending against the project and/or land in which the project is propose to be set up? (a) Name of the court. (b) Case No. (c) Orders/directions of the court, if any and its relevance with the proposed project.	:	No

- *Capacity corresponding to sectoral activity (such as production capacity for manufacturing, mining lease area and production capacity for mineral production, area for mineral exploration, length for linear transport infrastructure, generation capacity for power generation etc.,)*

(II) Activity

1. Construction, operation or decommissioning of the Project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof with approximate quantities/ rates, wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	No	Proposed development at existing Guwahati Airport will be located within the available 580.25 Acres land. Therefore, no change in land use is anticipated.
1.2	Clearance of existing land, vegetation and buildings?	No	Land required for proposed development is free from trees and buildings.
1.3	Creation of new land uses?	No	Proposed terminal building will be located within the available 580.25 Acres land of existing Guwahati Airport. Therefore, no new land use will be created.
1.4	Pre-construction investigations e.g. bore houses, soil testing?	Yes	Preliminary survey have been carried out which are required for construction of proposed terminal building and facilities.
1.5	Construction works?	Yes	New Integrated Terminal Building conforming to GRIHA 4 Star Rating: Civil Works: (i) Construction of centrally air - conditioned New Integrated Terminal Building of modular design with all modern facilities. The Integrated Terminal Building with area of 90000 sqm (excluding Service area as per requirement in Basement covering 7500 sqm area) will be designed for 2900 Domestic and 200 International passengers at a time with the recommended area specifications and to match the level of service “B” as per IATA recommendations in initial years & finally to match level of service "C" in year of saturation. The building will be provided with aesthetically appealing and soothing interior decoration matching the modern structure. Space planning will ensure that no dead space/ area is created in the building.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof with approximate quantities/ rates, wherever possible) with source of information data
			(ii) Departure area, arrival area, security hold area and concourse area are to be provided with adequate nos. of toilets for gents, ladies and differently - abled persons along with drinking water facility. Suitable number of ramps to be provided for entry and exit of differently - abled persons in Departure and Arrival area. Provision of battery operated buggies for senior citizens / differently - abled persons as per requirement. (iii) The design of Terminal building to include Media planning, Retail Area planning, F & B plan, etc. Overall planning of Building to capture local architectural features and it to be part of design features of Terminal. The design will 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 will be provided. Maintenance friendly roofing & building façade system including provision of regular cleaning with maintenance hoists, hooks, etc including cat walk / rope suspended platform / gondola etc. to be provided. (iv) Departure Area The Terminal Building with provision for Departure concourse, check - in area with adequate number of check - in counters, immigration counters, baggage conveyor belts, queuing space, segregation railing, back - up offices for Airlines, facilitation counters, weighing machines, counters etc. (v) Security Hold area a) Security Hold area with adequate seating arrangements and separate security check and holding area and associated facilities. b) The passenger frisking area in security hold with adequate space

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof with approximate quantities/ rates, wherever possible) with source of information data
			for locating required number of DFMDs, X - ray machines, frisking platforms, Inspection Tables for manual checking of hand baggage and adequate space / room for security staff, isolated smoking area etc. c) Additional Security Hold will be provided in the mezzanine floor to facilitate holding near the gates provided with aerobridges. (vi) Duty Free/Retail Area Creation of Retail Islands/ Shops without affecting the passenger movement. (vii) Food & Beverage Area (viii) Arrival Area / Baggage Claim Area a) In the ground floor Baggage Claim area, adequate number of baggage conveyor belts of adequate size will be provided. b) Adequate space will be provided in the ground floor for required number of immigration & custom counters and 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. (ix) Common Concourse Area a) Provision for Snack Bar counter, Travel Requisite, Pharmaceutical shops, Airlines offices & ticket selling counters, ATM / Bank counters etc., Meet and Greet area, First Aid room, Facilitation counters, caretaker room with store, Airport Terminal Manager office, Conference Room and other facilities at suitable locations. (x) Airport Director's office with associated office space, staff canteen, Engineering office, Toilets for staff etc to be provided in the

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof with approximate quantities/ rates, wherever possible) with source of information data
			lower ground floor. (xi) Construction of multilevel car park with all amenities for at least 1500 cars and surface parking for VIP cars & 10 buses, Separate car / scooter park area for AAI and airlines staff at appropriate location. *Multilevel Car Parking will be made for retailer in car parking area & it will be developed on Built & Operate System and shall include its space planning and model for its operations.* (xii) Development of four - lane vehicular road from Terminal Building / Car parking with canopy covering two lanes in front of the Terminal Building on the city side and connecting the main approach road to the city. (xiii) Provision of VIP/CIP lounges, with adequate number of chairs, furniture, furnishings etc in the Departure Lounge, Common Concourse, Check - in area, Security Hold area and Arrival Lounge. (xiv) Provision of water supply *pumping arrangement system*, Water Filtration, *water cooler & R.O/U.V. Filters*, Sewage Treatment Plant (STP) & Effluent Treatment Plant (ETP) as per norms and as per site conditions. (xv)Horticulture - landscaping, drainage system, water supply, Rain Water Harvesting etc. (xvi) Driver's canteen and toilet facility on the city side. (xvii) Sub - station, A/C plant room and related service facilities. Provision to be made for the AC Plant Room vertical through AHU rooms, backup Generators for essential services, etc. in the lower ground floor. (xviii) Provision of acoustics for effective functioning of PA system.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof with approximate quantities/ rates, wherever possible) with source of information data		
			(xix) Providing city side compound wall depicting local architecture and with proper gates.		
1.6	Demolition works?	No	No demolition work will be required.		
1.7	Temporary sites used for construction works or housing of construction workers?	No	No construction worker camp will located at the site and construction labour will come from local area.		
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	The Integrated Terminal Building with area of 90,000 sq m will be designed for 2900 Domestic and 200 International passengers at a time with the recommended area specifications and to match the level of service “B” as per IATA recommendations in initial years & finally to match level of service "C" in year of saturation.		
1.9	Underground works including mining or tunneling?	No	No mining or tunneling is proposed in the project.		
1.10	Reclamation works?	No	No reclamation works is required at the site		
1.11	Dredging?	No	Not Applicable		
1.12	Offshore structures?	No	Not Applicable		
1.13	Production and manufacturing processes?	No	Not Applicable		
1.14	Facilities for store of goods or materials?	Yes	**<u>During Construction Phase</u>** ❑ Temporary storage for construction materials; ❑ Storage of HSD for DG Sets and other equipment/machinery; **<u>During Operation Phase</u>** ❑ Storage of HSD for DG sets operation for integrated terminal building.		
1.15	Facilities for treatment or disposal of solid waste or liquid effluents ?	Yes	**<u>Solid Waste (During operations)</u>**		
			Domestic Waste	3100 Kg/day	Will be handed over to authorized agency for disposal as per standard practice.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof with approximate quantities/ rates, wherever possible) with source of information data
			Sludge from Wastewater Treatment | 50-60 Kg/day | Used as manure for horticulture.
			Liquid Effluent (During Operations)
			Wastewater | 710 kl/day | Will be treated in STP and treated water will be used in flushing of toilets and HVAC make-up within the airport premises.
1.16	Facilities for long term housing of operational workers?	No	No housing is proposed at the proposed airport for operational staff.
1.17	New road, rail or sea traffic during construction or operation?	Yes	Only existing transport facilities will be used.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	Yes	Only existing transport facilities will be used.
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	Not envisaged
1.20	New or diverted transmission lines or pipelines?	No	There is no transmission line and pipeline at the site of proposed terminal building within the existing airport.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	No impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers is required.
1.22	Stream crossings?	No	There is no stream at the site.
1.23	Abstraction or transfers of water from ground or surface waters? (m^3/day)	Yes	Total water requirement including recycled water is about 1010 KLD. Fresh water requirement is about 710 KLD for domestic, food courts, retail, offices, HVAC, etc. which will be extracted through existing bore wells at the airport.
1.24	Changes in water bodies or the land surface affecting drainage	No	No changes in water bodies or land surface affecting the drainage or runoff

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof with approximate quantities/ rates, wherever possible) with source of information data
	or run-off?		is envisaged as proper drainage will be provided at the site.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	**Construction Phase** ❑ During construction phase men and materials will be transported through National Highway-37. **Operation Phase** ❑ Proper access is available from National Highway-37 to Guwahati Airport.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not Applicable
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not Applicable
1.28	Influx of people to an area in either temporarily or permanently?	Yes	During construction phase, mostly local people will be given opportunity to work on the construction phase. Only skilled and semiskilled work force will come from outside.
1.29	Introduction of alien species?	No	Only local plant species will be used for landscaping.
1.30	Loss of native species or genetic diversity?	No	Not Applicable
1.31	Any other actions?	No	Not Applicable

2. Use of Natural resources for construction or operation of the project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply):

S. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	No	No additional land will be required for proposed integrated Terminal building and other associated works.
2.2	Water (expected source & competing users) unit: KLD	Yes	Total water requirement including recycled water is about 1010 KLD. Fresh water requirement is about 710 KLD for domestic, food courts, retail, offices, HVAC, etc. which will be extracted through existing bore wells at the airport.
2.3	Mineral (MT)	No	Not Applicable
2.4	Construction material – stone, aggregates, and/soil (expected source – MT)	Yes	Requirement of construction materials for proposed construction will be procured local market.
2.5	Forests and timber (source – MT)	No	No timber shall be used.
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	❑ **Power Requirement** • During Operation Phase = 7.5 MW • Source: Grid Power Supply from State Electricity Board. • Standby source: 6x2000 kVA DG sets for 10% power back-up. • Total estimated air-conditioned load is 3300 TR after diversity **Fuel Storage** • Diesel (HSD) = 30 Kl
2.7	Any other natural resources (use appropriate standard units)	No	Not Applicable

3. Use, storage, transport, handling or production of substances or materials, which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health.

S. No.	Information / Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	Diesel (HSD) = 30 KL
3.2	Changes in occurrence of disease or affect disease vectors (*e.g.* insect or water borne diseases)	No	Not expected
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	❑ Increase in tourism; ❑ More business opportunities ❑ Increase in direct and indirect employment opportunity; and ❑ Generation of more revenue to the state hence more development of the region.
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	Proposed construction of integrated terminal building and associated works will be located within the existing airport, there for no vulnerable groups of people will be affected from the airport.
3.5	Any other causes	No	Not Applicable

4. Production of solid wastes during construction or operation or decommissioning (MT/ month)

Sl. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	No	No such waste will be generated.
4.2	Municipal waste (domestic and or commercial wastes)	Yes	**During Construction Phase: 50 kg/day** ❑ Kitchen Waste; ❑ Metal Scrap and empty metal drums of Non Hazardous materials; and ❑ Paper and Wood Scrap.

Sl. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
			During Operation Phase: 3100 kg/day ❑ Kitchen Waste; ❑ Paper and stationary scrap; and ❑ Empty plastic containers of non-hazardous materials.
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	• Containers containing paint residue mainly during construction phase; and • Waste oil to be generated from DG sets, once in year, which will be collected in drum and handed over to CPCB/APCB, approved waste oil recycler.
4.4	Other industrial process wastes	No	--
4.5	Surplus product	No	None
4.6	Sewage sludge or other sludge from effluent treatment	Yes	About 50-60 kg per day which will be used as manure in landscaping
4.7	Construction or demolition wastes	Yes	Small quantity of non hazardous construction waste generated and will used for filling at site.
4.8	Redundant machinery or equipment	No	None
4.9	Contaminated soils or other materials	No	--
4.10	Agricultural wastes	No	--
4.11	Other solid wastes	No	--

5. Release of pollutants or any hazardous, toxic or noxious substances to air (kg/hr)

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
5.1	Emissions form combustion of fossil fuels from stationary or mobile sources	Yes	Landing, take-off and taxing of aircrafts are source of exhaust emissions from existing airport. Stack emissions from DG sets will be

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
			intermittent as these will be operated only during grid power failure. Stack height will be provided to DG sets as per CPCB guidelines to achieve proper dispersion of pollutants. Vehicular emissions will also be source of exhaust emissions.
5.	Emissions from production processes	No	Not Applicable
5.3	Emissions from materials handling including storage or transport	Yes	Confined to construction phase only.
5.4	Emissions from construction activities including plant and equipment	Yes	During construction phase, emissions from DG set and construction equipment/machinery will be intermittent as these will not be operated continuously.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste	Yes	During construction phase, emissions from construction equipment/machinery will be intermittent as these will not be operated continuously. No odour problem is anticipated from construction materials, sewage and waste as same will be handled as per standard practice.
5.6	Emissions from incineration of waste	No	Not Applicable
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	Burning of waste will not take place at the site.
5.8	Emissions from any other sources	Yes	Emissions from vehicular movement during operation phase.

6. Generation of Noise and Vibration, and Emissions of Light and Heat:

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
6.1	From operation of equipment *e.g.* engines, ventilation plant, crushers		❑ Aircraft Noise Level (EPNdB) (As per ICAO)

<table>
<tr><th>S. No.</th><th>Information/Checklist confirmation</th><th>Yes/ No</th><th colspan="4">Details thereof (with approximate quantities/rates, wherever possible) with source of information data</th></tr>
<tr><td></td><td></td><td>Yes</td><td>Air Craft Type</td><td>Lateral/ Full Power</td><td>Approach</td><td>Flyover</td></tr>
<tr><td></td><td></td><td></td><td>Airbus 321</td><td>96.0</td><td>100.7</td><td>91.7</td></tr>
<tr><td></td><td></td><td></td><td>ATR -72</td><td>94</td><td>98</td><td>89</td></tr>
<tr><td></td><td></td><td></td><td colspan="3">❑ DG Sets – 75 dB (A)</td></tr>
<tr><td>6.2</td><td>From industrial or similar processes</td><td>No</td><td colspan="4">Not Applicable</td></tr>
<tr><td>6.3</td><td>From construction or demolition</td><td>Yes</td><td colspan="4">Maximum cumulative noise shall vary from 80 - 85 dB (A).</td></tr>
<tr><td>6.4</td><td>From blasting or piling</td><td>No</td><td colspan="4">Not Applicable</td></tr>
<tr><td>6.5</td><td>From construction or operational traffic</td><td>Yes</td><td colspan="4">Leq : 60-70 dB(A)</td></tr>
<tr><td>6.6</td><td>From lighting or cooling systems</td><td>Yes</td><td colspan="4">Leq: 65-70 dB(A)</td></tr>
<tr><td>6.7</td><td>From any other sources</td><td>Yes</td><td colspan="4">Vehicular Movement Leq: 65 -70 dB(A)</td></tr>
</table>

7. Risks of contamination of land or water from releases of pollutants into the ground or into sewers, surface waters, groundwater, coastal waters or the sea:

S. No.	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
7.1	From handling, storage, use or spillage or hazardous materials	Yes	30 KL HSD will be stored. It will be confined to the project site only.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	Yes	Sewage generated will be treated in the STP and treated waste water will be used for Toilet flushing and HVAC make-up. No treated wastewater will be discharged outside the premises.
7.3	By deposition of pollutants emitted to air into the land or into water	Yes	Air emissions and treated waste water will be well within the standards stipulated by APCB/ CPCB.
7.4	From any other sources	No	Not Anticipated
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	--

8. Risk of accidents during construction or operation of the Project, which could affect human health or the environment

S. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/rates, wherever possible) with source of information data
8.1	From explosions, spillages, fires etc. from storage, handling, use or production of hazardous substances	Yes	• Storage of HSD during construction and operation.
8.2	From any other causes	Yes	• Crash of Aircraft during landing and takeoff; and • Traffic movement inside Airport. • Short circuit at Terminal Building
8.3	Could be project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloudburst etc.)?	Yes	The airport is located in Seismic Zone V. Suitable safeguards will be taken during design and construction of integrated terminal building.

9. Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
9.1	Lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:		
	◆ Supporting infrastructure (roads, power supply, waste or waste water treatment, etc.)	No	The integrated terminal building and other related development at existing Airport is aimed to provide better facilities for passengers, tourist and visitors. Any development activity around the airport will be discouraged or it will be as per applicable siting criterion.

S. No.	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
	◆ Housing development	No	Proposed construction of terminal building and associated works will provide direct and indirect employment and business opportunities to local peoples.
	◆ Extractive industries	No	Not Applicable
	◆ Supply industries	Yes	Proposed development will have positive impact on the hotel industry, local handicraft and other tourism related activities.
	◆ Other	No	--
9.2	Lead to after-use of the site, which could have an impact on the environment	Yes	It is longer lasting project.
9.3	Set a precedent for later developments	Yes	Will provide a interface for development at later stage
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	No cumulative effect is anticipated due to proposed integrated terminal building and development at Guwahati Airport.

(III) Environmental Sensitivity

S. No.	Areas	Name/ Identity	Aerial distance (within 15km.) Proposed project location boundary
1.	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	Deepor Beel Bird Sanctuary. Deepor Beel (Lake) is listed in Ramsar Site Assam.	3 km, north-east direction.
2.	Areas which are important or sensitive for ecological reasons – Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests.	Deepor Beel (Lake) Brahmaputra River	3 km, north-east direction. 2.2 km, north direction.
3.	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	Deepor Beel Bird Sanctuary	3 km, north-east direction.
4.	Inland, coastal, marine or underground waters	No	No such issue is involved
5.	State, National boundaries	No	No State or National boundaries with 15 km radius distance from existing airport.
6.	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	National Highway – 37	1.2 km from existing airport.
7.	Defense installations	No	Nil in 15 km distance.
8.	Densely populated or built-up area	Guwahati city	15 km from the existing airport boundary.
9.	Areas occupied by sensitive man-made land uses (hospitals, schools, places of worship, community facilities)	Guwahati city	15 km from the existing airport boundary
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	No such issue is involved

S. No.	Areas	Name/ Identity	Aerial distance (within 15km.) Proposed project location boundary
11	Areas already subjected to pollution or environmental damage (those where existing legal environmental standards are exceeded)	No	There is no major source of pollution and areas subject to environmental damage**.**
12	Areas susceptible to natural hazard which could cause the project to present environ-mental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)	No	The airport is located in Seismic Zone V.

(IV) Proposed Terms of Reference for EIA studies :

Not applicable as the project has already obtained TOR from MoEFCC.

I hereby given undertaking that the data and information given in the application and enclosures are true to the best of my knowledge ad belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project will be rejected and clearance give, if any to the project will be revoked at our risk and cost.

Date : 27-10-2017
Place : Guwahati

Niranjan Sharma
AGM – Engg (Civil)

Airports Authority of India,
LGBI Airport, Guwahati Airport,
Guwahati, Assam – 781 015.

(Signature of the applicant

With Name and Full Address)

PRE FEASIBILITY REPORT

(Updated)

For the proposed Construction of Integrated Terminal Building at LGBI Airport, Guwahati, Assam State

Submitted by

भारतीय विमानपत्तन प्राधिकरण

AIRPORTS AUTHORITY OF INDIA

LGBI Airport,

Guwahati, Assam State

Chapter 1

Proposed Development at Guwahati Airport

1.1 Background

Guwahati Airport, one of the major airport in India and in North East Region and is situated in the state of Assam, belongs to AAI. Operators like Air India, Jet Airways, Spice Jet, Indigo, Go Air, Vistara, Air Asia India and Pawan Hans Helicopters are presently operating with 75 flights movements per day and 528 flights in a week. The Airport is an International Airport being developed as inter-region hub and suitable for operation of B-767/A-310 type of aircraft.

1.2 Present Status & Facilities at Guwahati Airport

Guwahati Airport is an international airport and suitable for operation of B-767/A-310 type of aircraft in all weather conditions. The existing terminal building is capable to handle 850 pax (425 arriving + 425 departing) at a time. The major facilities available at the Guwahati Airport are:

Major Facilities Available

a) Runway of dimension 3103m x 45m
b) Apron to park 12 nos. A-321, 7 nos. ATR-72 and 1 no. 'B' type aircraft at a time.
c) Terminal Building to handle 850 pax. (425 arriving + 425 departing) at a time.
d) NAV/Comm. Aids like ILS, DVOR, DME, NDB, VHF.
e) ATC Control Tower cum Technical Block and Fire Station of CAT-VII.
f) Night Landing Facilities.

1.4 Proposed Proposal

The existing terminal building has saturated. In view of the future traffic growth at Guwahati Airport, there is a requirement of construction of New Integrated Terminal Building on Turn Key Basis. As per action plan 2015-16, necessary actions need to be taken to start the work by freezing engagement of PMC Consultant to facilitate development of Guwahati Airport as inter-regional hub.

1.5 Scope of Work for Development of Airport

A. New Integrated Terminal Building conforming to GRIHA 4 Star Rating:

Civil Works:

(i) Construction of centrally air- conditioned New Integrated Terminal Building of modular design with all modern facilities and amenities as per the layout plan provided. The Integrated Terminal Building with area of 90000 sqm (excluding Service area as per requirement in Basement covering 7500 sqm area) shall be designed for 2900 Domestic and 200 International passengers at a time with the

recommended area specifications and to match the level of service “B” as per IATA recommendations in initial years & finally to match level of service "C" in year of saturation. The building should be provided with aesthetically appealing and soothing interior decoration matching the modern structure. Space planning should ensure that no dead Space/ Area is created in the building. The building area break up is provided as annexure.

(ii) Departure area, Arrival area, Security Hold area and Concourse area are to be provided with adequate nos. of toilets for gents, ladies and differently- abled persons along with drinking water facility. Suitable number of ramps to be provided for entry and exit of differently- abled persons in Departure and Arrival area. Provision of battery operated buggies for senior citizens / differently- abled persons as per requirement.

(iii) The design of Terminal building to include Media planning, Retail Area planning, F & B plan, etc. Overall planning of Building to capture local architectural features and it to 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. Maintenance friendly roofing & building façade system including provision of regular cleaning with maintenance hoists, hooks, etc including cat walk / rope suspended platform / gondola etc. to be provided.

(iv) Departure Area

The terminal building with provision for departure concourse, check-in area with adequate number of check-in counters, immigration counters, baggage conveyor belts, queuing space, segregation railing, back-up offices for Airlines, facilitation counters, weighing machines, counters etc.

(v) Security Hold area

a) Security Hold area with adequate seating arrangements and separate security check and holding area and associated facilities.
b) The passenger frisking area in security hold with adequate space for locating required number of DFMDs, X-ray machines, frisking platforms, Inspection Tables for manual checking of hand baggage and adequate space / room for security staff, isolated smoking area etc.
c) Additional Security Hold should be provided in the mezzanine floor to facilitate holding near the gates provided with aerobridges.

(vi) Duty Free/Retail Area Creation of Retail Islands/ Shops without affecting the passenger movement.

(vii) Food & Beverage Area

(viii) Arrival Area / Baggage Claim Area

In the ground floor Baggage Claim area, adequate number of baggage conveyor belts of adequate size should be provided. Adequate space should be provided in the ground floor for required number of immigration & custom counters and 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.

(ix) Common Concourse Area

Provision for Snack Bar counter, Travel Requisite, Pharmaceutical shops, Airlines offices & ticket selling counters, ATM / Bank counters etc., Meet and Greet area, First Aid room, Facilitation counters, caretaker room with store, Airport Terminal Manager office, Conference Room and other facilities at suitable locations.

(x) Airport Director's office with associated office space, staff canteen, Engineering office, Toilets for staff etc to be provided in the lower ground floor.

(xi) Construction of multilevel car park with all amenities for at least 1500 cars and surface parking for VIP cars & 10 buses, Separate car / scooter park area for AAI and airlines staff at appropriate location. *Multilevel Car Parking should be made for retailer in car parking area & it should be developed on Built & Operate System and shall include its space planning and model for its operations.*

(xii) Development of four-lane vehicular road from Terminal Building / Car parking with canopy covering two lanes in front of the Terminal Building on the city side and connecting the main approach road to the city.
(xiii) Provision of VIP/CIP lounges, with adequate number of chairs, furniture, furnishings etc in the Departure Lounge, Common Concourse, Check-in area, Security Hold area and Arrival Lounge.

(xiv) Provision of water supply ***pumping arrangement system***, Water Filtration, ***water cooler & R.O/U.V. Filters***, Sewage Treatment Plant (STP) & Effluent Treatment Plant (ETP) as per norms and as per site conditions.

(xv) Horticulture-landscaping, drainage system, water supply, Rain Water Harvesting etc.

(xvi) Driver's canteen and toilet facility on the city side.

(xvii) Sub-station, A/C plant room and related service facilities. Provision to be made for the AC Plant Room vertical through AHU rooms, backup Generators for essential services, etc. in the lower ground floor.

(xviii) Provision of acoustics for effective functioning of PA system.

(xix) Providing city side compound wall **depicting local architecture and with proper gates.**

Electrical Works

a) Internal and external electrification for Terminal Building Complex, associated buildings, Car Park and roads.
b) Augmentation of main power supply, Substation Equipments, DG Sets for Secondary Power supply and associated ancillary buildings.
c) Central air-conditioning with provision of vertical air-conditioning concept & BMS.
d) Provision of conveyor belts with In-line X-ray inspection System and other equipment at departure area and at least three inclined Carousels at Arrival hall.
e) Fire detection, alarm and protection system with Fire Control Room.
f) Provision of automatic sliding doors at exit & entry points of Terminal Building.
g) Escalators & Elevators with matching staircase.
h) Provision of five Passenger Boarding Bridges (PBB) or as required as per design attached to fixed finger rotunda for the specified parking stands.
i) Provision of adequate number of Signages of world class standard, inside and outside the terminal building, car park area & City side approach road and air side area for guidance of passengers and visitors.

Airports Systems

i) Public address system and car calling system.
ii) Surveillance Close circuit TV system (SCCTV) and provision of adequate number of close circuit TV monitors, in the Security Control Room, Terminal Manager Room, APD Office etc.
iii) Provision of Flight Information Display System (FIDS) with adequate number of Display Devices in departure, arrival and security hold area for passenger facilitation.
iv) Provision of adequate number of X-ray machines for scanning Registered Baggage (RB)/ Hand Baggage (HB), including provision of required number of ETDs, DFMDs and HHMDs, as per BCAS norms.
v) Provision of adequate no. of VHF FM Sets (Walkie-Talkie, Base Stations and Mobile Stations).
vi) Provision of Telephone Exchange / digital EPABX/ IP EPABX system for Terminal Building including telephone/ intercom instruments, wiring etc.

IT Systems

i) Passive and Active networking components such as OFC, UTP cabling, Routers, Core & Access switches and accessories. Provision of raceways, Cable trays and Conduiting and Cabling.
ii) Server room and adequate space for keeping network switches along with electrical power points and UPS.
iii) Access Control System as per BCAS requirement.
iv) Provision of Internet, VPN bandwidth, Wi-Fi system.

Commercial Works

i) Provision of CUTE and CUSS Systems.

1.4 Locational Details of Guwahati Airport

The Guwahati airport is located at Borjhar Guwahati at distance of 1.2 km from NH-37 in Guwahati at distance of 15 km from Guwahati City. The geographical coordinates of the airport are 26^{o} 6' 22" N and 91^{o} 35' 09" E. The Aerodrome Reference Point (ARP) elevation is 51 m above mean sea level.

1.5 Integrated Terminal Building

The Integrated Terminal Building with area of 90000 sqm (excluding Service area as per requirement in Basement) shall be designed for 2900 Domestic and 200 International passengers at a time with the recommended area specifications and to match the level of service “B” as per IATA recommendations in initial years & finally to match level of service "C" in year of saturation.

1.5.1 Land Required for Proposed Development Including Integrated Terminal Building

The proposed developed including integrated terminal building and associated works will be constructed on the land available within the existing airport. Therefore, no fresh land acquisition is required for the works listed in scope of work.

1.5.2 Details of Proposed Development

The proposed developmental activities are shown in the layout plan shown in **Figure 1.1 – 1.4.**

1.6 Power Requirement

For the power back-up, DG sets will be provided to meet the power requirement in the event of grid power failure.

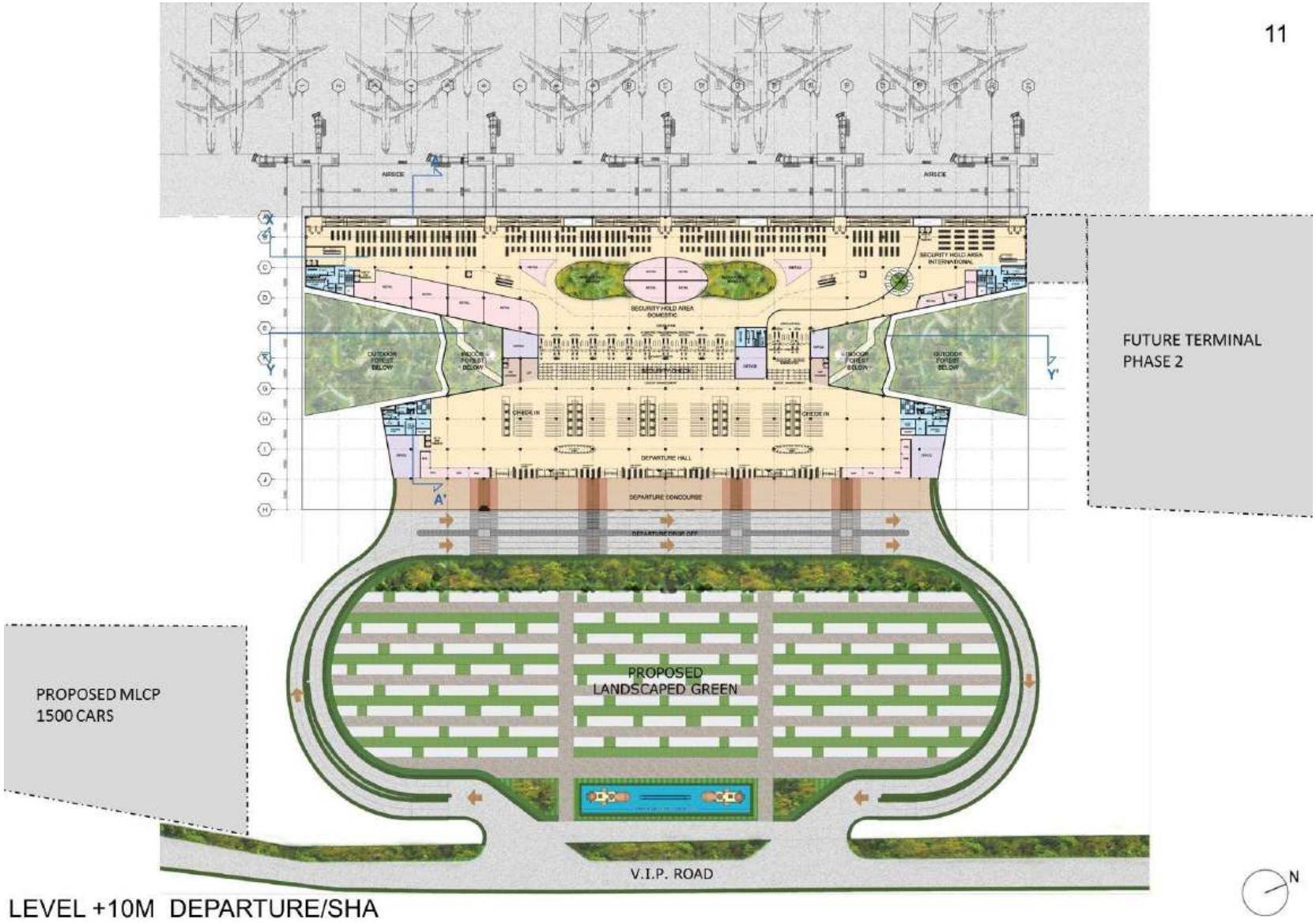


Figure 1.1 : Site Plan for Departure Side for New Integrated Terminal Building

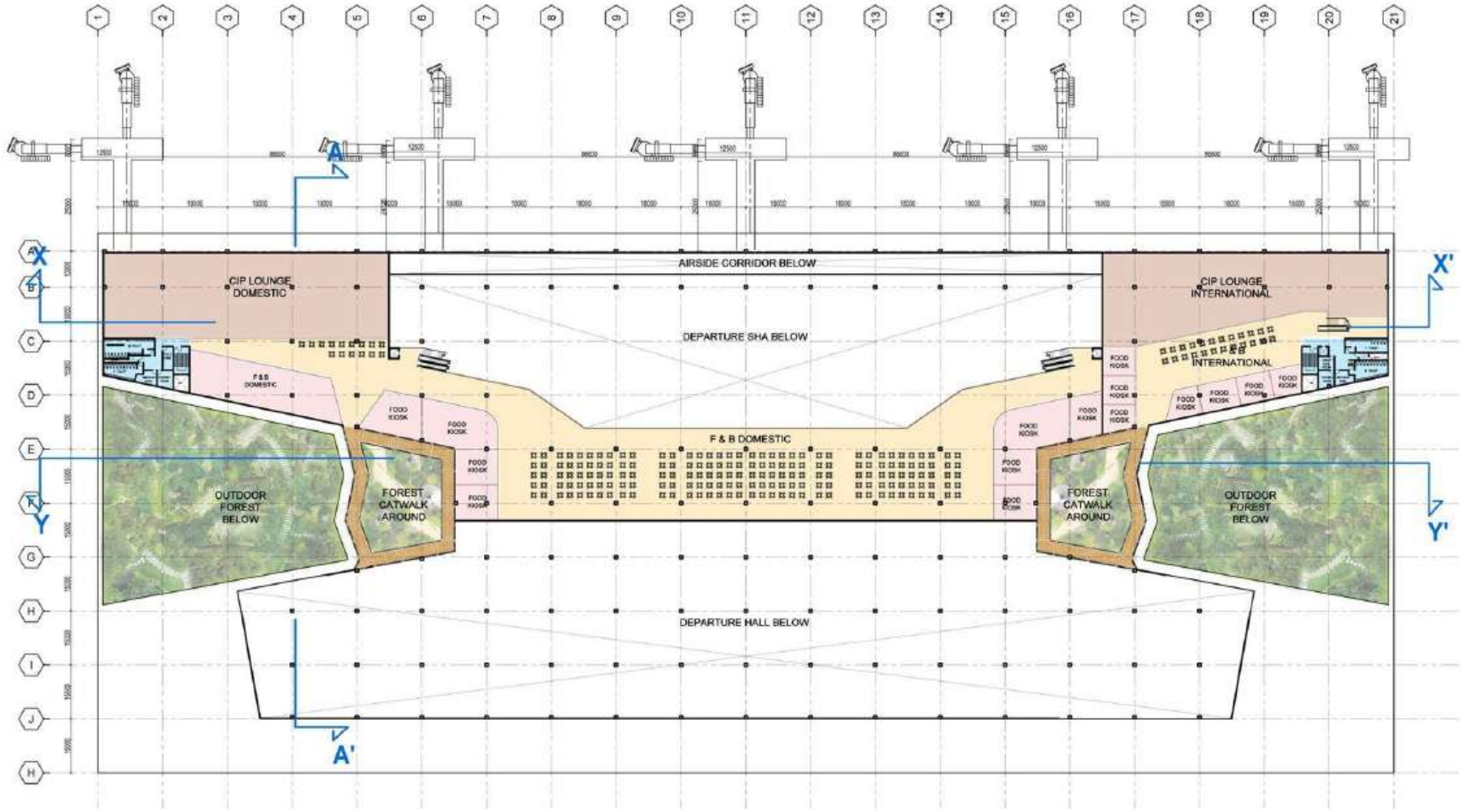


Figure 1.2 : Site Plan for Retail/F&B Departure Side for New Integrated Terminal Building

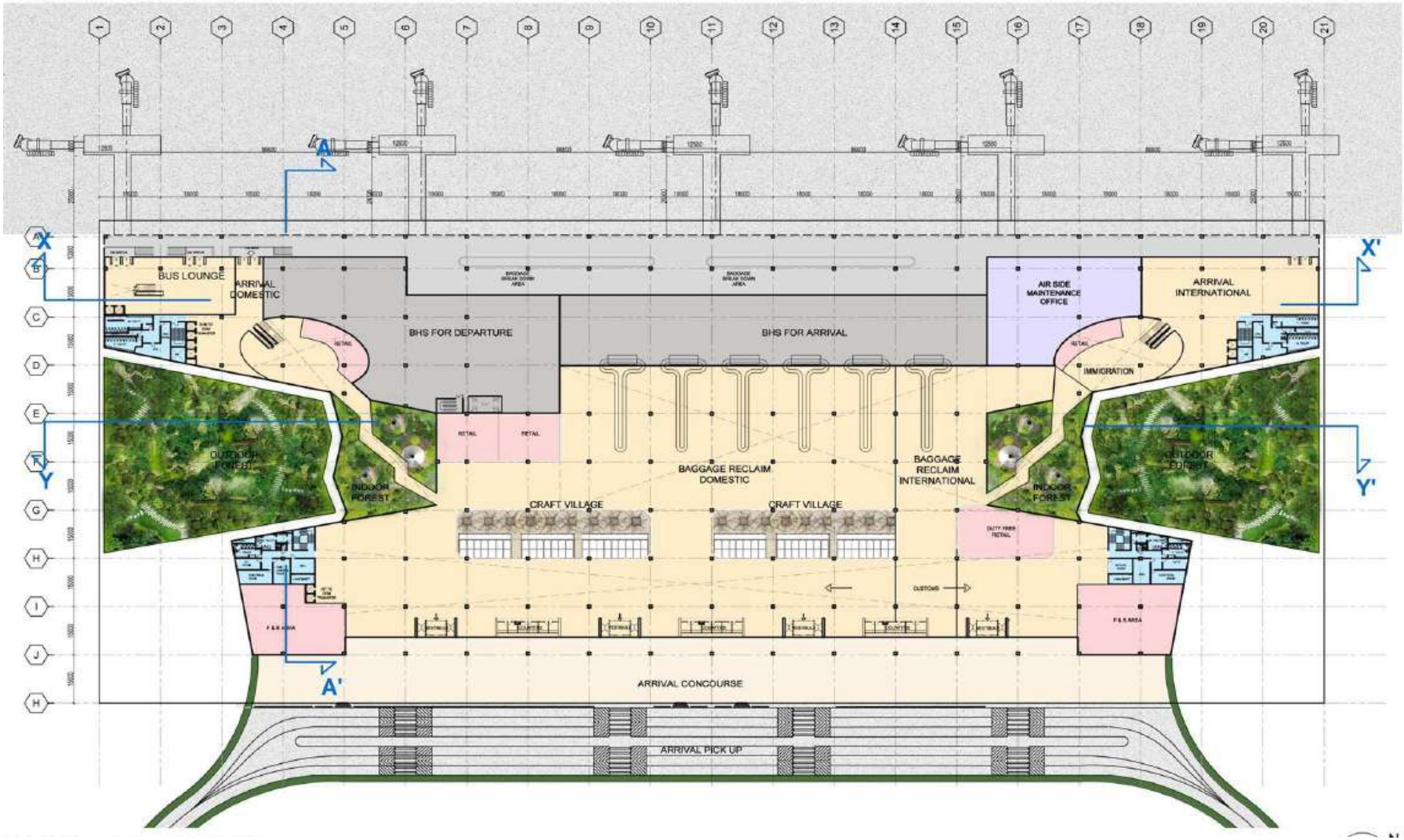


Figure 1.3 : Site Plan for Arrival Side for New Integrated Terminal Building

Figure 1.4 : Isometric View of New Integrated Terminal Building

Chapter 2

BMS System for the Proposed Terminal Building

2.1. General

This chapter outlines the design features, basis of design, estimated requirements etc. of the HVAC System at the proposed terminal building.

The proposal for installing microprocessor based control system (BMS) is also outlined in this Chapter.

2.2 Design Considerations

The system proposal is designed to fulfill the following objectives:

- Low capital cost.
- Energy efficient throughout the varying load patterns
- Minimum power demand.
- Providing required Indoor air quality (IAQ) with reduced operating cost.
- Maximum flexibility of operation.
- Use of highly responsive control system (BMS) to optimize system functioning.

2.3 Capital Cost

The selection of equipment is designed to achieve the lowest capital cost consistent with energy efficient modern technology. The choice of equipment and specifications will provide the best possible system at a reasonable price.

2.4 Energy Efficient

The air conditioning systems operate between a minimal demand of 40% and up to a maximum demand of 95% for a major part of the year. Hence, the selection proposed is such that the overall power requirement remains consistent with the demand, avoiding all possible waste.

2.5 Flexibility

The use of air cooled chilling units has been proposed instead of water cooled chillers. This will avoid use of cooling towers and condenser water pumps, thereby reducing by nearly 40% the number of equipments which have to be operated and maintained.

The chiller will be fitted with air cooling pads to reduce power consumption and save 80% water as compared to water cooled system, the cooling pads will be used whenever Ambient temperature crosses 35°C.

The use of air cooled chillers will thus simplify operation and also avoid worrying about availability of water in cooling towers at all times. There will be separate pumps for secondary circuit. In addition each floor will have independent Air handling Units (AHUs). This will ensure that the equipment in operations is as per demand without any wastage of power.

2.6 Control System

It is proposed to use microprocessor based control system (BMS) to optimize plant operation and minimize running costs.

The various systems are selected carefully to provide maximum benefits at a reasonable cost.

The BMS will also be used to integrate other services and control external lighting and monitor other services.

2.7 System design (Ventilation & Miscellaneous)

The ventilation of D.G. room and pump will be through the use of axial flow fans on the opposite side. The HVAC plant room will be ventilated using propeller type fans.

2.8 Building Management System (BMS)

It is proposed to provide a Microprocessor Based Building Management and control system (BMS) for HVAC system and other services to create an intelligent building.

Chapter 3

Electrical Service for the proposed Terminal Building & Allied Units

3.1 General

AAI is proposing construction of proposed Integrated Terminal Building at the existing Guwahati Airport. The proposed terminal building shall have plinth area of approx 90000 sq.m.

The proposed terminal building project at Guwahati Airport shall generally consist of the following facilities:

- Integrated Terminal Building.
- Substation and AC plant room.
- Sewage disposal arrangements.
- Lift pits, escalators pits and related civil works for lifts, escalators.
- Underground sump and pump house and underground storage tank for fire fighting system.
- Other infrastructure facilities like roads. Overhead tank for water supply and plumbing
- Sewage treatment plant, road/street lights, drainage system, insulation of roof, cable trenches, car parking areas, interior furnishing */* decoration and allied facilities.

3.2 Electrical Services for Proposed Terminal Building

The proposed electrical services at the proposed integrated terminal building at existing Guwahati Airport will cover following:

a) Internal and external electrification for Terminal Building Complex, associated buildings, Car Park and roads.
b) Augmentation of main power supply, Substation Equipments, DG Sets for Secondary Power supply and associated ancillary buildings.
c) Central air-conditioning with provision of vertical air-conditioning concept & BMS.
d) Provision of conveyor belts with In-line X-ray inspection System and other equipment at departure area and at least three inclined Carousels at Arrival hall.
e) Fire detection, alarm and protection system with Fire Control Room.
f) Provision of automatic sliding doors at exit & entry points of Terminal Building.
g) Escalators & Elevators with matching staircase.
h) Provision of five Passenger Boarding Bridges (PBB) or as required as per design attached to fixed finger rotunda for the specified parking stands.
i) Provision of adequate number of Signages of world class standard, inside and outside the terminal building, car park area & City side approach road and air side area for guidance of passengers and visitors.

Chapter 4

Water Supply, Sewerage, Drainage And Fire Fighting

4.1 Introduction

The Integrated Terminal Building with area of 90000 sqm (excluding Service area as per requirement in Basement covering 7500 sqm area) shall be designed for 2900 Domestic and 200 International passengers at a time. According to National Building Code 2016 the complex falls under assembly building as per occupancy.

4.2 Total Water Requirement Calculations

Daily water demand calculations for proposed integrated terminal building at Guwahati Airport are given below :

S. No.	Description	Total Occupancy	Domestic Water		Flushing Water		Total Water	% Flow to Sewer	Flow to Sewer
		No.	LPCD	LPD	LPCD	LPD	LPD		LPD
a.	Water requirement @ 70 Lit / person for approximately 17800 passengers.	17800	40	712000	30	534000	1246000	80	996800
b.	Water requirement @ 15 Lit / Person for visitors & staff (20% of Total Passengers)	3560	5	17800	10	35600	53400	80	42720
c.	Water requirement @ 35 Lit / Seat for Food Court.	321	25	8025	10	3210	11235	80	8988
d.	Water requirement for departure- office @ 10 sq.m/p, Office Area-1400 sq.m	140	25	3500	20	2800	6300	80	5040
e.	Water requirement for departure- Retail @ 6 sq.m/p, Office Area-3900 sq.m	650	25	16250	20	13000	29250	80	23400
f.	Water requirement for Mezzanine-office @ 10 sq.m/p, Office Area-300 sq.m	30	25	750	20	600	1350	80	1080
g.	Water requirement Mezannine- Retail @ 6 sq.m/p, Retai Area-8447 sq.m	1408	25	35200	20	28160	63360	80	50688

S. No.	Description	Total Occupancy	Domestic Water		Flushing Water		Total Water	% Flow to Sewer	Flow to Sewer
		No.	LPCD	LPD	LPCD	LPD	LPD		LPD
h.	Water requirement for Arrival- office @ 10 sq.m/p, Office Area-1072 sq.m	107	25	2675	20	2140	4815	80	3852
i.	Water requirement Arrival- Retail @ 6 sq.m/p, Retai Area-4533 sq.m	755	25	18875	20	15100	33975	80	27180
	Total			**815075**		**634610**	**1449685**		**1159748**

S. No.	Description	Total Occupancy	Domestic Water		Flushing Water		Total Water	% Flow to Sewer	Flow to Sewer
		No.	LPCD	LPD	LPCD	LPD	LPD		LPD
	Since we are using efficient plumbing fixtures which use 30% less water hence, the daily water demand will be reduce by 30%.			**570553**		**444227**	**1014780**		**811824**
	Total for Terminal Building (Say)			**571000**		**444000**	**1015000**		**812000**

4.3 Water Balance Diagram

Fresh water requirement will be 710 KLD for domestic, food courts, retail, offices, HVAC, etc. (Total water requirement including recycled water- 1010 KLD). Water requirement will be extracted through bore wells at the airport.

Water consumption summary & treated waste water re-use/recycle details are as given below:

S. No.	Description	Round-Off
1.	Domestic Water Requirement	Say 570 KL/Day
2.	Flushing Water Requirement	Say 440 KL/Day
	Total (1+2)	**Say 1010 KL/Day**
3.	Flow to STP	**Say 810 KL/Day**
	Considered 20% additional for STP Capacity	**Say 1000 KL/Day**
	Treated water available from the STP @ 95% of total sewer generation.	**Say 770 KL/Day**
4.	Cooling Tower Make -Up - Air Conditioning Plant Total diversify HVAC load 3300 TR. Water requirement = 3300*24 hr*10 ltrs/hr*0.6 = 470 KLD	Say 470 KL/Day
5.	Flushing Water Requirement	Say 440 KL/Day
	Total	**Say 910 KL/Day**
	Conclusion: Total Water Requirement of Project - 1010 KL/Day Fresh Water Requirement - 710 KL/Day (570+140) Treated Waste Water Use - 770 KL/Day	

The water balance diagram is shown in **Figure 4.1**. The water requirement for flushing and HVAC/cooling will be met through reuse of treated waste water from STP.

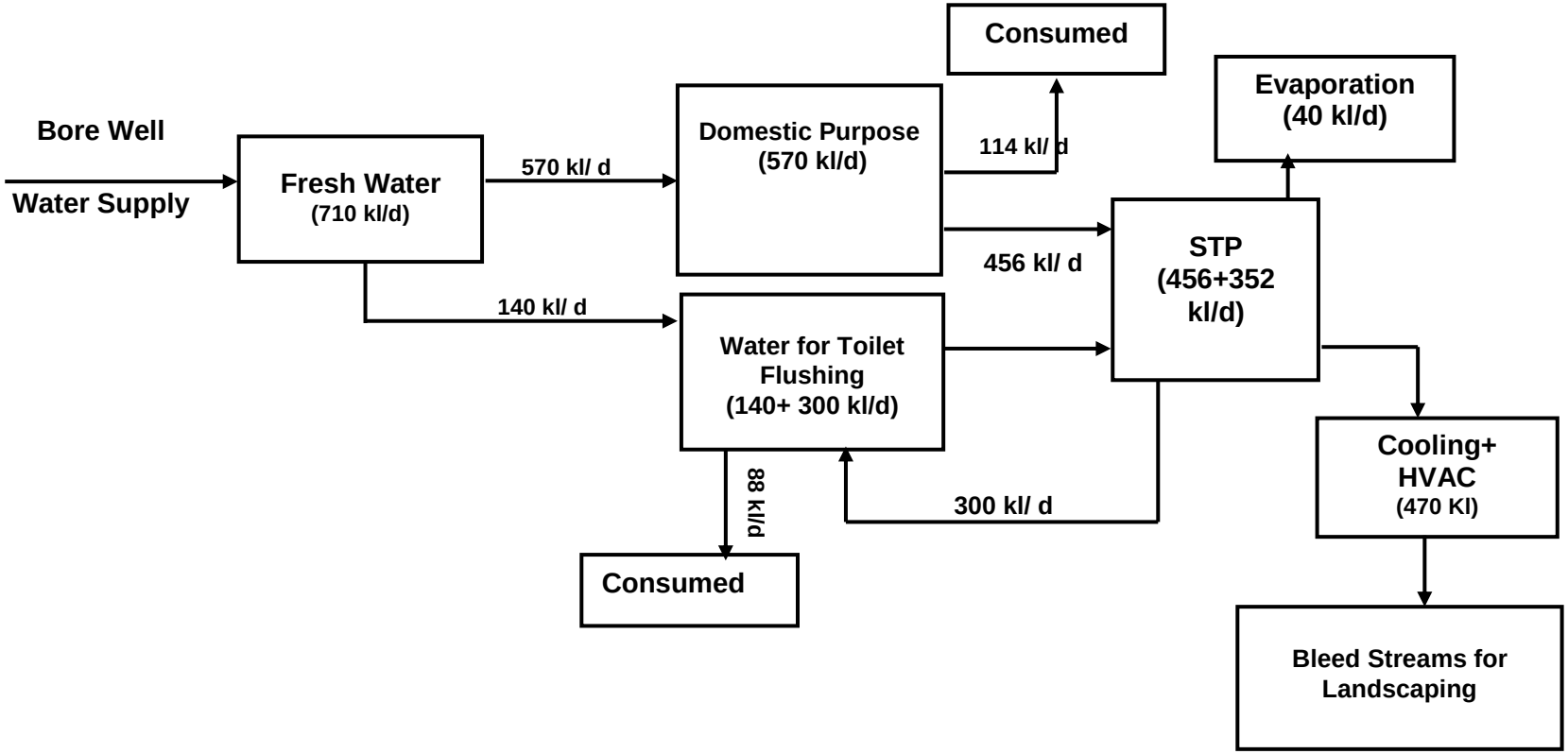


Figure 4.1: Water Balance Diagram for Guwahati Airport

4.4 Sources of Water

Water requirement will be met through tubewells already available at the Guwahati airport.

4.5 Sanitary Fixtures & Toilet Accessories

Water Closet: All water closets will be wall hung with concealed Dual flushing cistern and in lodders and staff toilets WC will be provided with Dual flushing cistern. Under counter/ circular above counter wash basins with battery operated auto sensor pillar taps will be provided.

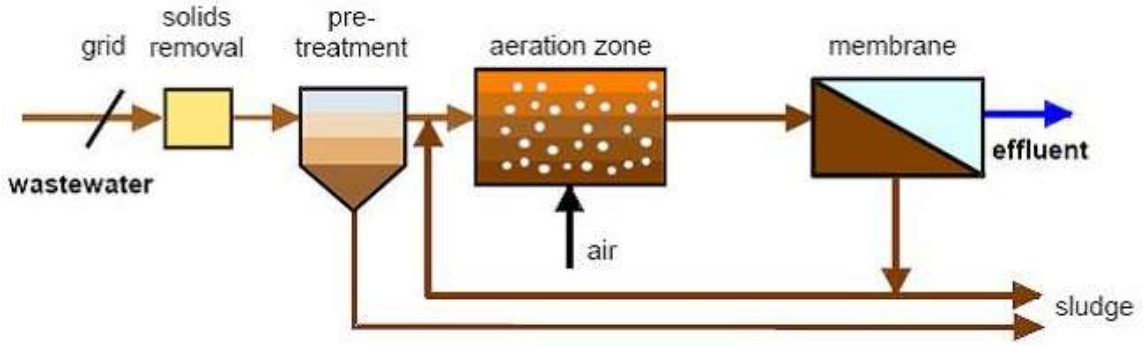
- Provision of green toilets
- Flat back wash basins with CP brass self closing pillar tap will be provided in lodders and staff toilets.
- Semi stall urinal with battery operating auto sensor flush valves.
- Frosted Glass urinal portion with metal clips.
- CP adjustable shower with Diverter and spout in rest room's and VIP toilet.
- Vitreous china recess toilet paper holder.
- Automatic soap dispenser on wash basins. (Stainless steel)
- Automatic air purifier. (Stainless steel)
- Toilet tissue paper holder. (Stainless steel)
- Automatic electrically operated hand drier. (Stainless steel)

4.6 Water Distributions Pipe and Fittings

G.I. / composite Pipe and fitting for hot and cold water. Heavy class G.I. pipe and fitting in shaft and under floor. All external under ground water pipe will be cast iron class LA conforming to IS 1536 with specials and lead joints.

4.7 Sewerage Treatment and Disposal

As per water balance diagram, 810 kl/d sewage will be generated after the operation of integrated terminal building which will be treated in STP of capacity 1000 kl. Membrane bioreactor (MBR) Technology will be used for treatment of waste water at the airport. Membrane bioreactor (MBR) is the combination of a membrane process like microfiltration or ultrafiltration with a biological wastewater treatment process, the activated sludge process.



Schematic Diagram for Membrane Bioreactor (MBR) Technology

Chapter 5

Solid Waste Management

5.1 Solid Waste Generation

Approx. 3100 kg/d solid waste is generated from the airport. From the integrated terminal building, waste will be generated in the form of paper, plastics, polyethylene bags, and food waste, etc.

5.2 Solid Waste Management

The following measures will be taken for management of solid waste during operation phase of integrated terminal building.

- Solid Waste Management is carried out as per Solid Wastes Management Rules, 2000.
- Waste is collected in designated waste bins based on their types, placed at the strategic locations.

The solid waste handling and disposal services has been outsourced to authorized agency to ensure disposal of solid waste generated from the airport. Solid waste generated in the aircrafts is also disposed off at the designated waste collection points from where the agency is picked up the garbage bags. The agency collects the garbage from designated bins in integrated terminal building. The wet garbage of the aircrafts comprising of left over food in the tray from the security gates of flight kitchens is also disposed off at the specified places.

The collected garbage will be transported in covered container and will be arranged to dispose off after segregation of recyclable wastes as per provisions of Municipal Wastes (Handling & Management) Rule 2000. After collection of garbage, garbage bins will be disinfected every day by sprinkling disinfectant powder by the agency. Weekly washing of garbage bins will also be carried out by this agency. After collection of waste, solid waste management plan to be followed by authorized agency is as given below:

- Segregation of recyclable and non recyclable wastes.
- Disposal of recyclable wastes for recycling.
- Composting of biodegradable organic of wastes for captive use
- Disposal of segregated wastes to common municipal waste landfill Site

Chapter 6

Energy Conservation

6.1 Energy Conservation Measures

During design and construction of integrated terminal building at the Guwahati airport necessary measures will be taken for conservation of energy in line with "Energy Conservation Building Code –2006" and "National Building Code 2005". The important energy conservation measures proposed for new terminal building are described below:

- Airport Terminal building will be designed and constructed for GRIHA Rating 4 star,
- Use of Energy Efficient building material & glass,
- Use of LED lamps instead of GLS lamps,
- Use of Solar Backed up Light Emitting Diode Lamps instead of par lamps,
- Energy efficient HVAC system,
- Solar passive techniques for terminal building,
- Use of 5 star BEE energy efficiency rating electrical equipments,
- Microprocessor-based Building Management System (BMS) will be installed for minimization of energy consumption,
- Automatic lighting on/ off control system will be provided in the airport area for optimum utilization of energy.

It is proposed that 540 KW solar power generation plant will be established at the airport to produce clean energy. By adopting above measures about 30% energy will be saved.

6.2 GRIHA Rating System

It is proposed that all works necessary will achieve 4 stars GRIHA Rating. GRIHA is an acronym for Green Rating for Integrated Habitat Assessment. GRIHA is a rating tool that helps to assesses the performance of their building against certain nationally acceptable benchmarks. It evaluates the environmental performance of a building holistically over its entire life cycle, thereby providing a definitive standard for what constitutes a 'green building'. The rating system, based on accepted energy and environmental principles, will seek to strike a balance between the established practices and emerging concepts, both national and international.
GRIHA rating system consists of 34 criteria categorized under various sections such as site selection and site planning, conservation and efficient utilization of resources, building operation and maintenance, and innovation points.

Eight of these 34 criteria are mandatory, four are partly mandatory, while the rest are optional. Each criterion has a number of points assigned to it. It means that a project intending to meet the criterion would qualify for the points. Different levels of certification (one star to five stars) are awarded based on the number of points earned. The minimum points required for certification is 50.

Eligibility

All buildings more than 2,500 sq m, (except for industrial complexes), which are in the design stage, are eligible for certification under GRIHA. Buildings include: offices, retail spaces, institutional buildings, hotels, hospital buildings, healthcare facilities, residences, and multi-family high-rise buildings.

For more details on the rating system:

- Criteria of the rating system
- Scoring points for GRIHA
- Evaluation procedure of criterion of GRIHA

GRIHA is a 100 point system consisting of some core points, which are mandatory, while the rest are optional.

Different levels of certification (one star to five stars) are awarded based on the number of points earned. The minimum points required for certification is 50.

Points achieved	GRIHA Rating
50-60	★
61-70	★★
71-80	★★★
81-90	★★★★
91-100	★★★★★

Criterion 1	Site Selection
Criterion 2	Preserve and protect landscape during construction/compensatory depository forestation.
Criterion 3	Soil conservation (post construction)
Criterion 4	Design to include existing site features
Criterion 5	Reduce hard paving on site
Criterion 6	Enhance outdoor lighting system efficiency
Criterion 7	Plan utilities efficiently and optimize on-site circulation efficiency
Criterion 8	Provide minimum level of sanitation/safety facilities for construction workers
Criterion 9	Reduce air pollution during construction
Criterion 10	Reduce landscape water demand
Criterion 11	Reduce building water use
Criterion 12	Efficient water use during construction
Criterion 13	Optimize building design to reduce conventional energy demand
Criterion 14	Optimize energy performance of building within specified comfort limits

Criterion 15	Utilization of fly-ash or equivalent industrial/agricultural waste as recommended by BIS in building structures
Criterion 16	Reduce embodied energy of construction is reduced by adopting material efficient technologies and/or low-energy materials
Criterion 17	Use low-energy materials in Interiors
Criterion 18	Renewable energy utilization
Criterion 19	Renewable energy based hot water system
Criterion 20	Waste water treatment
Criterion 21	Water recycle and reuse (including rainwater)
Criterion 22	Reduction in waste during construction
Criterion 23	Efficient Waste segregation
Criterion 24	Storage and disposal of wastes
Criterion 25	Resource recovery from waste
Criterion 26	Use of low-VOC paints/adhesives/sealants
Criterion 27	Minimize ozone depleting substances
Criterion 28	Ensure water quality
Criterion 29	Acceptable outdoor and indoor noise levels
Criterion 30	Tobacco and smoke control
Criterion 31	Provide at least the minimum level of accessibility for persons with disabilities
Criterion 32	Energy audit and validation
Criterion 33	Operation and Maintenance
Criterion 34	Innovation Points

Annexure - 1

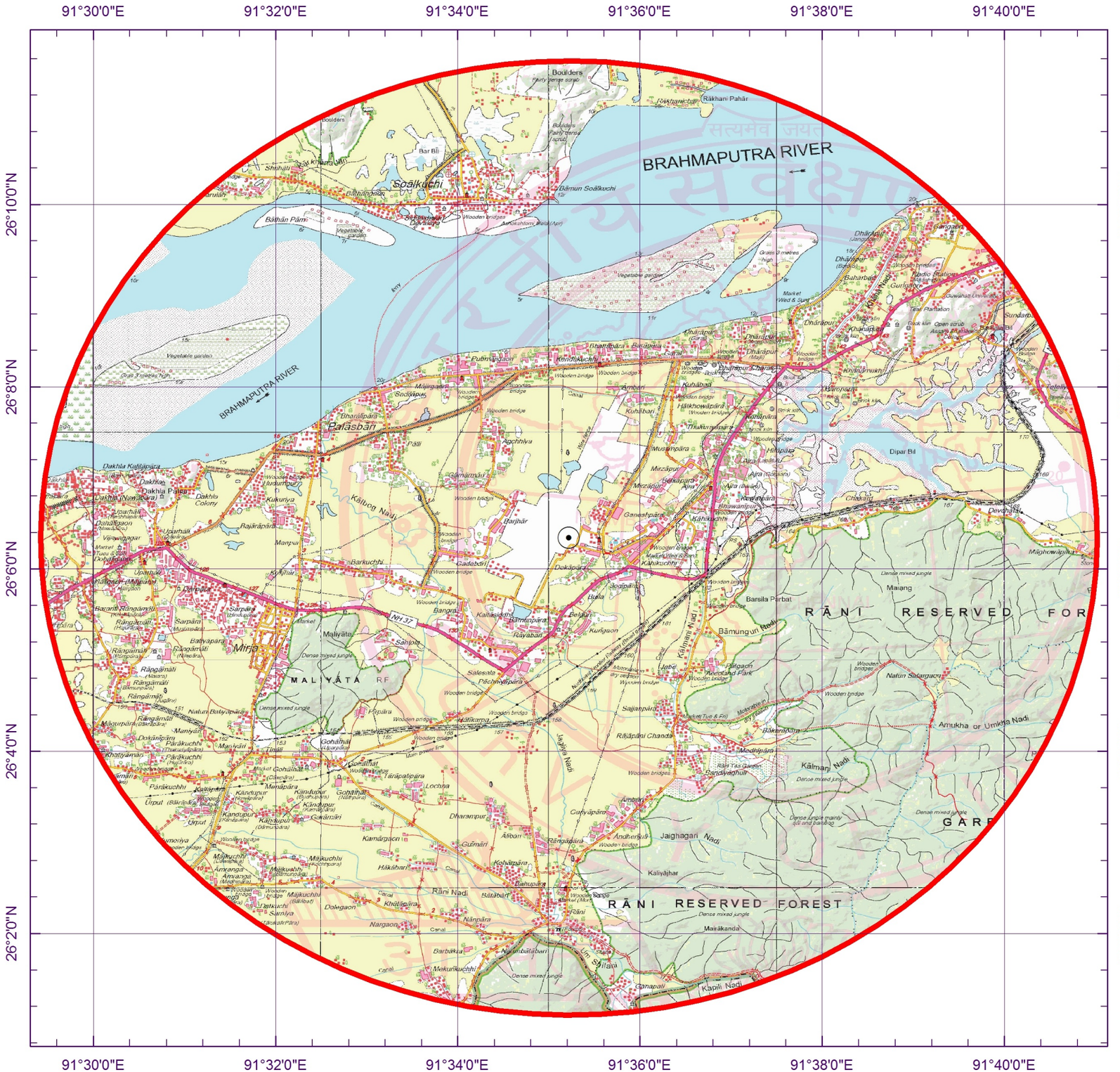
Construction of Terminal Building at Guwahati Airport, Assam State

Area Statement

Area Concern	Area (Sq. m.)
Departure (+10m Lvl)	
Departure Hall	10407
Emigration	218
Security	2829
Cores	594
Toilets	664
MEP	695
Office	1703
Circulation	6166
VIP/CIP Lounge	305
Gate Lounge	7993
Retail	2786
Sub Total	**34,360**
Mezzanine (+15m Lvl)	
Retail	7810
CIP	3580
Cores	317
Toilets	278
MEP	164
Circulation	1210
Sub Total	**13,359**
Mezzanine (+5.8m Lvl)	
Arrival Hall	1518
Baggage Handling Area	3036
Arrival Circulation	4507
Toilets	278
MEP	164
Cores	597
Transit Lounge	835
Sub Total	**10,935**
Arrival (+0m Lvl)	
Baggage Claim Hall	5615
Baggage Handling Area	5640
Arrival Hall	7651
Departure Gate Lounge	992
Retail/F &B)	4464
Office	1825
Immigration	530

Area Concern	Area (Sq. m.)
Customs	355
Circulation	2056
Cores	594
Toilets	560
MEP	793
Subtotal	**31,075**
Grand Total	**89,729**
Total Retail / F&B	**15060**
Total CIP Lounges	**3885**
Note: Total 89729 Sq. m build up does not include basement of 7500 sqm area	

SITE LOCATION WITHIN 10KM RADIUS ON TOPOMAP - M/s. Airports Authority of India, Guwahati



Source: Extraction from
Topo Map 78N8
78N12
(1:50,000 Scale)
AOI:10km radius from the
project site

N
W E
S

0 0.5 1 2 3 4
Kilometers

CONVENTIONAL SYMBOLS

Project Name	Construction of New Integrated Terminal Building at LGBI Airport, Guwahati
Project Site Address	Construction of New Integrated Terminal Building at LGBI Airport, Guwahati
Client Name	M/s. Airports Authority of India, Guwahati
Prepared By	ABC Techno Labs™ India Private Limited

MSL 51m

S.No	Lattitude	Longitude
1	26° 6'18.80"N	91°35'13.30"E