PRE-FEASIBILITY REPORT

FOR

PROPOSED EXTENSION OF RUNWAY AND ALLIED WORKS

AT

SHILLONG AIRPORT, BARAPANI, MEGHALAYA

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

AIRPORTS AUTHORITY OF INDIA

INDEX

EXECUTIVE SUMMARY

1.1. Identification of Project:

Airports Authority of India (AAI) proposes to upgrade the existing facilities of Shillong Airport at Barapani, Meghalya. AAI is planning to take up the works of up gradation of airport involves the extension & strengthening of runway & allied works. The project will be developed in an area of 416.16 acres (Exiting: 192 acres & Proposed: 224.16 acres). The land required for expansion of Airport measuring 224.16 acres has been handover by Collector, Ri-Bhoi District, Nongpoh, Meghalaya govt. to Airports Authority of India.
Currently, the Shillong Airport handles the operations of ATR-42 type of Aircraft. The airport will be upgraded to cater for operation of AB-321 type of aircrafts.

The proposed expansion of existing Airport is categorized as category A under item 7 (a) of Schedule - Gazette *Notification dated Sept. 14th, 2006* and its subsequent amendment thereafter.

1.2. Project Brief:

Proposed expansion project includes Extension & Strengthening of Runway & Construction of link Taxiway, Shoulders, Isolation Bay, Apron Extension, Approach Lights, runway lights etc. The details are as under:

S. No	Particulars	Existing	Proposed Expansion	Total
1.	**Land Area**			
i.	Total Land Area	192 acres	224.16 acres	416.16 acres
2.	**Runway Details**			
i.	Runway Length/dimension	Length: 6000 ft. (1829 m) Dimension: 1829 m x 45 m	Length : 1500 ft.	Length : 7500 ft (2286.58 m) Dimension: 2286.58 m x 45 m
ii.	Runway shoulders	Nil	Width of Shoulder : 7.5 m	Width of Shoulder : 7.5 m
iii.	Runway strip Dimension	1949 m x 150 m	2406.58 m x 300 m	2406.58 m x 300 m
iv.	Runway end safety	90 m x 90 m	150 m x 90 m	150 m x 90 m

	area (RESA) Dimension			
v.	Runway lights	Single circuit available	CAT-1,2 Circuit	CAT-1,2 Circuit
3.	**Type of Aircraft handles**			
i.	Type of Aircraft	ATR-42	AB-321	ATR-42, AB-321
4.	**Other Facility**			
i.	Isolation Bay	Nil	75 m x 90 m	75 m x 90 m
ii.	ILS (Instrument Landing System)	Nil	Yes	Yes
iii.	Approach lights	Nil	Yes	Yes
5.	**Navigation Aids**			
i.	DVOR	Available	Relocation	Relocation
ii.	PAPI	Available	Nil	Available
6.	**Apron Details**			
i.	Dimension	91 m x 61 m	191m x 120 m	191m x 120 m
7.	**Terminal Building**			
i.	Area	5000 sq.m	Nil	5000 sq.m
ii.	Capacity	100 Arrival & 100 Departure	Nil	100 Arrival & 100 Departure
iii.	Car Parking	140 nos. including 40 nos. for VIP	Nil	140 nos. including 40 nos. for VIP
8.	**Taxiway Details**			
i.	Dimension	Width -23 m	191m x 23 m	191m x 23 m
9.	**AAI staff Accommodation**			
i.	Residential Quarter	30 nos.	Nil	30 nos.
ii.	CISF Barrack	27 nos. of beds	Nil	27 nos. of beds

1.3. Water & Power Requirement:

- The project will utilize the ground water. The daily consumption of water during operation phase will be about 48 KLD of which 27 KLD will be fresh water and 18 KLD will be recycled water.
- The total connected load is 180 KW (existing-150 KW; proposed -30 KW). The maximum demand is 150 kVA. The power supply shall be drawn from the grid of Meghalaya Power Distribution Corporation Limited (MPDCL). There will be power

backup through DG sets of capacity of 380 kVA (2 nos.) used in case of power cut or failure. DG set will be provided with an effective safe stack height for proper dispersion of pollutants that will keep the emissions within the permissible limit. The fuel requirement will be about 121 lit/hr of HSD (as and when used).

- The estimated cost of the project is approx. Rs. 186.00 Crores.

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INTRODUCTION OF THE PROJECT

2.1 Project Background:

Shillong city lies on the eastern part of the Meghalaya state. It is situated at a distance of 104 kms from Guwahati, 295 km from Kaziranga, 578 km from Siliguri and 658 km from Darjeeling. Shillong airport is located in the state of Meghalaya which caters for state capital Shillong. The proposal is to upgrade existing airport facilities at Shillong airport to make it suitable for AB-321 class of aircraft operation. The task force on Civil Aviation for North-East Region had recommended up gradation of Shillong airport.

Airports Authority of India (AAI) proposes to upgrade the existing facilities of Shillong Airport at Barapani, Meghalya. AAI is planning to take up the works of extension & strengthening of runway and other allied works.

The proposed expansion of Existing Airport is categorized *under item 7 (a) of Schedule - Gazette Notification dated Sept. 14th, 2006* and its subsequent amendment thereafter.

The existing facility & other details are as follows:

S. no	Particulars Details	Particulars Details
A.	**General Information**	
1.	Airport Owner/Operator	Airports Authority of India
2.	State	Meghalaya
3.	Location	Village- Umroi, Tehsil & District- Ri-Bhoi. Meghalaya
4.	Latitude & Longitude of Aerodrome Reference Point (ARP–WGS 84)	25°42'12" N, 91°58' 41" E
5.	Suitability	Suitable For ATR-42 type of aircraft
6.	Aircraft operations (Scheduled/Non-scheduled)	Destination : Kolkata
		Operator : Air India
		Frequency :1 +1 per day
7.	Other Airports in the vicinity (within 150 Km radius)	Guwahati Airport : 59.50 km towards NW Silchar Airport : 133.50 kms towards SE
B.	**Airport land area & utilization**	
1.	Total land area (Acres)	192 Acres
C.	**Aerodrome Data (Air side)**	

1.	Aerodrome elevation / Reference Temperature	2909 Ft. (891.24m)/ 24°C
2.	Aerodrome Reference Code (ARC)	3C
3.	Aerodrome traffic density	Light (2 Operations / Day)
4.	Type of traffic permitted	VFR
5.	Aerodrome rescue & fire fighting category (ARFF)	Cat-IV
D.	**Runway**	
1.	Runway operations	04/22
2.	Runway Dimension	1829 m x 45 m
3.	Runway strip dimension	1949 m x 150 m
4.	Runway Strength (PCN)	23 R/C/W/T
5.	Runway surface	Concrete
6.	Runway shoulder	Not Available
7.	Runway End Safety area (RESA)	90 m x 90 m
E	**Terminal Building**	
1.	Area	5000 sq.m
2.	Capacity	100 Arrival & 100 Departure
3.	Car Parking	140 nos. including 40 nos. for VIP
F.	**Apron Details**	
1.	Dimension	91 m x 61 m
2.	Capacity	2 nos. (ATR-72)
3.	PCN	28/ R/C/W/T
G	**Taxiway Details**	
1.	Width	23 m
2.	PCN	28/ R/C/W/T
3.	Shoulder	Not Available
H.	**Navigation Aids**	
1.	DVOR	Available
2.	PAPI	Available
I	**AAI Staff Accommodation**	
	Residential Colony	30 nos. quarters
	CISF Barrack Accommodation	27 nos. of beds
J.	**Other Facilities**	

1.	Instrumental Landing system	Not Available
2.	Residential Colony	Available
3.	Runway Light Facilities	Not Available
4.	Approach Lights	Not Available

Annual traffic handled by Shillong Airport:

Particulars	Financial Year							
	2012-13		2013-14		2014-15		2015-16	
	Domestic	Int.	Domestic	Int.	Domestic	Int.	Domestic	Int.
Aircraft Movement	444	0	398	0	499	0	540	0
Passenger	7750	0	8498	0	10367	0	11624	0
Cargo (in tonnes)	0	0	0	0	0	0	0	0

2.2 Project Proponent

Airports Authority of India (AAI) was constituted by an Act of Parliament and came into being on 1st April 1995. AAI under the Ministry of Civil Aviation is responsible for creating, upgrading, maintaining and managing civil aviation infrastructure in India. Airports Authority of India (AAI) has decided to upgrade the existing facilities of Shillong Airport at Barapani, Meghalya. The airport will be developed to cater for operation of AB-321 type of aircrafts. AAI has full-fledged sections for civil engineering, electrical engineering, which looks after planning, and designing of new or expansion airport projects and maintenance of existing ones.

Type of project:

The proposed expansion of Airport is categorized as category A under *item 7 (a) of Schedule - Gazette Notification dated Sept. 14th, 2006* and its subsequent amendment for preparation of Environment Impact Assessment study and Environment Management Plan. However general condition is not applicable to this project. This project is independent and is not linked with other project which may attract directly or indirectly any provisions of schedule of EIA notification 2006 amended to date.

Airport Profile in North-East Region:

India has 464 airports & airstrips, out of which 125 airports are owned by AAI. The North East region comprising of 8 states lie deep in the lap of easternmost Himalayan hills in north-eastern part of India. Accordingly, Ministry of Development of North Eastern Region (DONER) was set up in September 2001 to act as the nodal Department of the Central Government to deal with matters pertaining to socio-economic development of the eight States of North East i.e. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim.

At present there are 12 Operational and 12 non operational Airports in the entire North East Region as below:

Operational		Non-operational	
S. no	**Name**	**S. no**	**Name**
1.	Agartala	**1.**	Along (Arunachal)
2.	Dibrugarh	**2.**	Daparizo (Arunachal)
3.	Dimapur	**3.**	Kailashahar
4.	Guwahati (International Airport)	**4.**	Kamalpur
5.	Imphal (International Airport)	**5.**	Khowai
6.	Jorhat (CE)	**6.**	Pasighat
7.	Lilabari	**7.**	Rupsi
8.	Shillong	**8.**	Tezu (Arunachal)
9.	Silchar (CE)	**9.**	Tura (Meghalaya)
10.	Lengpui (SG-Mizoram)	**10.**	Turial (Aizwal)
11.	Tezpur (CE)	**11.**	Ziro (SG-Arunachal)
12.	Bagdogra (CE)	**12.**	Shella

State wise break up:

S. No	State	No of Operational Airports	No of Non-Operational
1.	Assam	6 3 IAF, 3 AAI	2
2.	Arunachal Pradesh	-	5
3.	Manipur	1	-
4.	Meghalaya	1	1
5.	Mizoram	1	1

6.	Nagaland	1	-
7.	Tripura	1	3
8.	Sikkim	-	-
9.	West Bengal	1	-
	Total	**12 nos.**	**12 nos.**

Fig: Map showing Airports in North East Region

2.3 Need for the project & its Importance

To meet the growing demands of the traffic and to facilitate bigger aircrafts of AB-321 type of Aircrafts at Shillong Airport, the extension of Runway to 7500 feet & allied works is proposed.

The civil air transport network has been called the Real World Wide Web. It has been observed that the improvement in air connectivity has brought tremendous benefits to users of air transport services by:

- ✓ Reducing time spent in transit.
- ✓ Increasing the frequency of service.

- ✓ Allowing for shorter waiting times and better targeting of departure and arrival times.
- ✓ Improving the quality of service, such as reliability, punctuality and quality of the travel experience.

Improvements in connectivity will effectively contribute to the economic performance of the wider economy through enhancing its overall level of productivity. **Table 1.1** shows the quantum of passengers handled at major airports in India in last few years:

Table 1-1: Passenger Handled at Major Airports in India (in millions)

S. No	Airports	City	FY-2016	FY-2017
1.	Indira Gandhi International Airport	Delhi	16.48 million	17.57 million
2.	Chhatrapati Shivaji International Airport	Mumbai	41.7 million	45.20 million
3.	Chennai International Airport	Chennai	15.20 million	16.70 million
4.	Kempegowda International Airport	Bangalore	16.19 million	17.22 million
5.	Netaji Subhash Chandra Bose International Airport	Kolkata	12.40 million	14.35 million
6.	GMR Hyderabad International Airport Limited	Hyderabad	12.40 million	15.24 million

Source: *Airports Authority of India, APAO, New Delhi*

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PROJECT DESCRIPTION

3.1 Type of Project:

AAI is planning to take up the works of extension & strengthening of runway & other allied works. The airport will be developed to cater for operation of AB-321 type of aircrafts.

Project falls under Category "A", under schedule '7(a)' of EIA Notification dated 14th September, 2006 & amendment made thereafter.

3.2 Location:

The project is situated at Umroi, Barapani, Ri-Bhoi District, Shillong, Meghalaya. The airports reference point is located at latitude 25° 42' 10" N and longitude 91° 58' 52" E. The Google map is given in Figure.

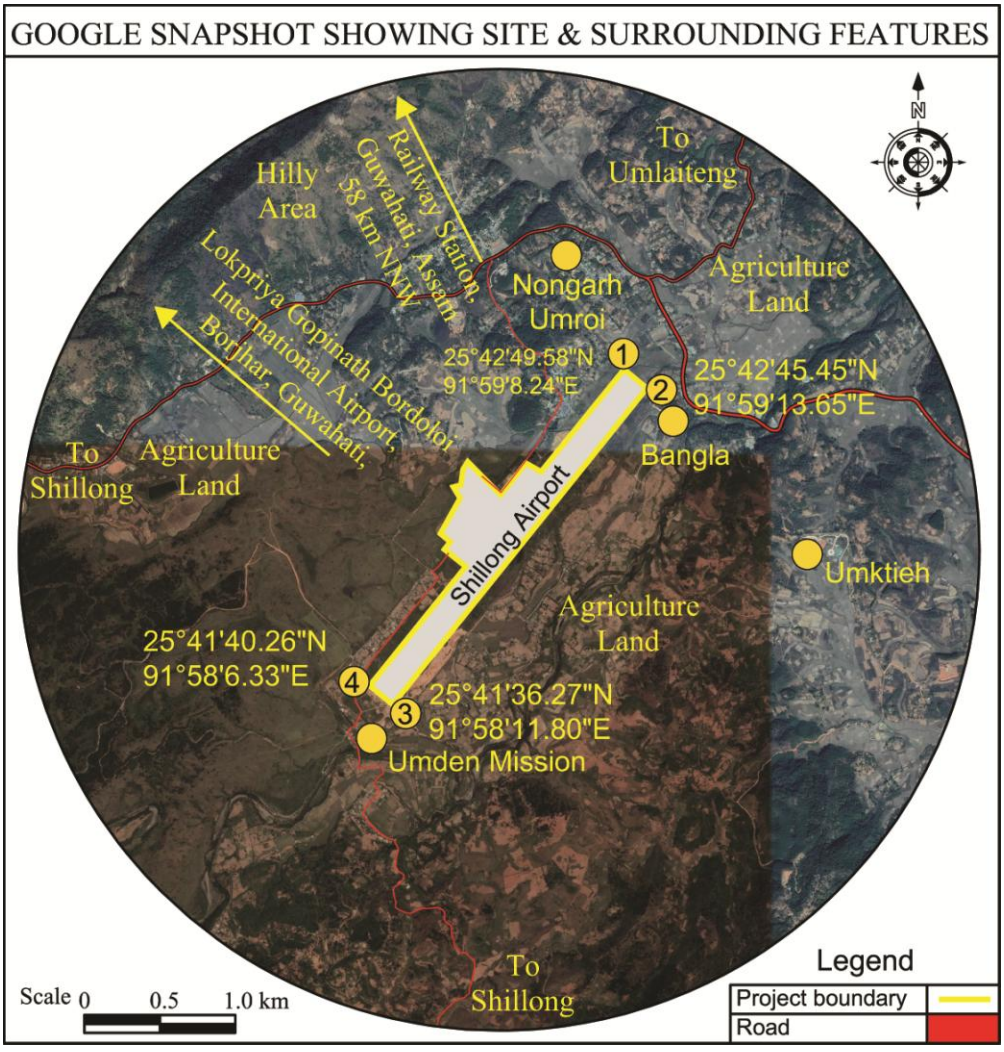

Figure: Google Map

Shillong Airport Environmental Setting:

S. no	Particulars	Details
1.	Latitude	25° 42' 10" N
2.	Longitude	91° 58' 52" E
3.	Climate Condition	a. Max. Temp : 30 °C b. Mini. Temp : 18 °C c. Average Temp : 25 °C d. Average Rainfall : 2193 mm
4.	Present Land use at Airport	Industrial
5.	Nearest Highway/Major Road	• Shillong Bypass Road-1.67 km towards NNE • SH-8: 5.68 km towards NW • NH-40 : 8.08 km towards SW • AH-2: 7.22 km towards WSW
6.	Nearest Railway Station	Kamrup Khetri RS : 48 km towards NNE Guwahati RS : 58 km towards NNE
7.	Nearest Town/village	• Umroi : 2.2 km towards NW • Umden : 1.20 km towards WSW • Umsning : 10.00 km towards NW • Shillong : 16.00 km towards SW
8.	Major Water Bodies	• Umaim Lake : 8.16 km towards WSW • Wah Umiam River : 0.70 km towards SE
9.	Seismic Zone	Zone V (Very High Seismic Hazard)

3.3 Details of alternative site:

The proposed project involves extension of existing runway to cater to the operations of AB-321 type of aircrafts. The extension will be done in the land abutting the existing airport. Hence, no alternative sites were examined.

3.4 Existing project features:

Existing facilities includes:

S. no	Particulars Details	Particulars Details
A.	**General Information**	
1.	Airport Owner/Operator	Airports Authority of India

2.	State	Meghalaya
3.	Location	Village- Umroi, Tehsil & District- Ri-Bhoi. Meghalaya
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1.	Total land area (Acres)	192 Acres
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5.	Runway surface	Concrete
6.	Runway shoulder	Not Available
7.	Runway End Safety area (RESA)	90 m x 90 m
E	**Terminal Building**	
1.	Area	5000 sq.m
2.	Capacity	100 Arrival & 100 Departure
3.	Car Parking	140 nos. including 40 nos. for VIP
F.	**Apron Details**	
1.	Dimension	91 m x 61 m

2.	Capacity	2 nos. (ATR-72)
3.	PCN	28/ R/C/W/T
G	**Taxiway Details**	
1.	Width	23 m
2.	PCN	28/ R/C/W/T
3.	Shoulder	Not Available
H.	**Navigation Aids**	
1.	DVOR	Available
2.	PAPI	Available
I	**AAI Staff Accommodation**	
	Residential Colony	30 nos. quarters
	CISF Barrack Accommodation	27 nos. of beds
J.	**Other Facilities**	
1.	Instrumental Landing system	Not Available
2.	Residential Colony	Available
3.	Runway Light Facilities	Not Available
4.	Approach Lights	Not Available

3.5 Size or magnitude of operation:

Shillong Airport is spread over an area of 192 acres. The present airport infrastructure has the capacity to handle the operations of ATR-42 types of Aircraft. The terminal building having the area of 5000 sq.m & sufficient to cater the passenger capacity of (100 +100) passengers at a time. Airports Authority of India (AAI) proposes to upgrade the existing facilities of Shillong Airport including extension & strengthening of runway and allied works. The proposed expansion will include an area of 224.16 acres.

Proposed expansion project involves the development of infrastructure inside operational area which mainly includes extension & strengthening of runway & other allied works. The details of proposed facility area as follows:

1. Extension of runway from 6000 ft to 7500 ft and strengthening the existing runway for AB-321 type aircraft.
2. Provision of standard basic strip of 300 meters width extending laterally by 150 meters on either side of runway central line and extending longitudinally by 60 m

beyond runway ends for the entire runway after extension including provision of RESA.

3. Providing shoulders to the existing runway, apron & taxiway.
4. Provision of isolation bay of dimensions 75 m x 65 m on the southern side of runway 04 to park one AB-321 type of aircraft in case of hijacking & other unlawful interference with the aircraft.
5. Expansion of apron to make total dimension 191 x120 m.
6. Taxi track of dimension 191 x 23 m will be constructed.
7. Provisions of apron flood light.
8. Provisions of approach lighting and up gradation of runway edge light.
9. Provisions of (ILS) Instrument Landing System.
10. Construction of drainage system in the airport premises.
11. Shifting of existing DVOR.
12. Diversion of Nallah.

Details of existing & proposed Facility are as under:

S. No	Particulars	Existing	Proposed Expansion	Total
1.	**Land Area**			
i.	Total Land Area	192 acres	224.16 acres	416.16 acres
2.	**Runway Details**			
i.	Runway Length/dimension	Length: 6000 ft. (1829 m) Dimension:1829 m x 45 m	Length : 1500 ft.	Length : 7500 ft (2286.58 m) Dimension: 2286.58 m x 45 m
ii.	Runway shoulders	Nil	Width of Shoulder : 7.5 m	Width of Shoulder : 7.5 m
iii.	Runway strip Dimension	1949 m x 150 m	2406.58 m x 300 m	2406.58 m x 300 m
iv.	Runway end safety area (RESA) Dimension	90 m x 90 m	150 m x 90 m	150 m x 90 m
v.	Runway lights	Single circuit available	CAT-1,2 Circuit	CAT-1,2 Circuit
3.	**Type of Aircraft handles**			

i.	Type of Aircraft	ATR-42	AB-321	ATR-42, AB-321
4.	**Other Facility**			
i.	Isolation Bay	Nil	75 m x 90 m	75 m x 90 m
ii.	ILS (Instrument Landing System)	Nil	Yes	Yes
iii.	Approach lights	Nil	Yes	Yes
5.	**Navigation Aids**			
i.	DVOR	Available	Relocation	Relocation
ii.	PAPI	Available	Nil	Available
6.	**Apron Details**			
i.	Dimension	91 m x 61 m	191m x 120 m	191m x 120 m
7.	**Terminal Building**			
i.	Area	5000 sq.m	Nil	5000 sq.m
ii.	Capacity	100 Arrival & 100 Departure	Nil	100 Arrival & 100 Departure
iii.	Car Parking	140 nos. including 40 nos. for VIP	Nil	140 nos. including 40 nos. for VIP
8.	**Taxiway Details**			
i.	Dimension	Width -23 m	191m x 23 m	191m x 23 m
9.	**AAI staff Accommodation**			
i.	Residential Quarter	30 nos.	Nil	30 nos.
ii.	CISF Barrack	27 nos. of beds	Nil	27 nos. of beds
10.	**Water Requirement**			
i.	Total	45 KLD	Nil	45 KLD
ii.	Fresh	27 KLD	Nil	27 KLD
iii.	Recycle	18 KLD	Nil	18 KLD
11.	**Power Demand [Source: *Meghalaya Power Distribution Corporation Limited* (MPDCL)]**			
i.	Connected Load	150 KW	30 KW	180 KW
ii.	Transformer	750 kVA-2 nos.	Nil	750 kVA-2 nos.
iii.	Power backup DG set	380 kVA- 2 nos.	Nil	380 kVA-2 nos.

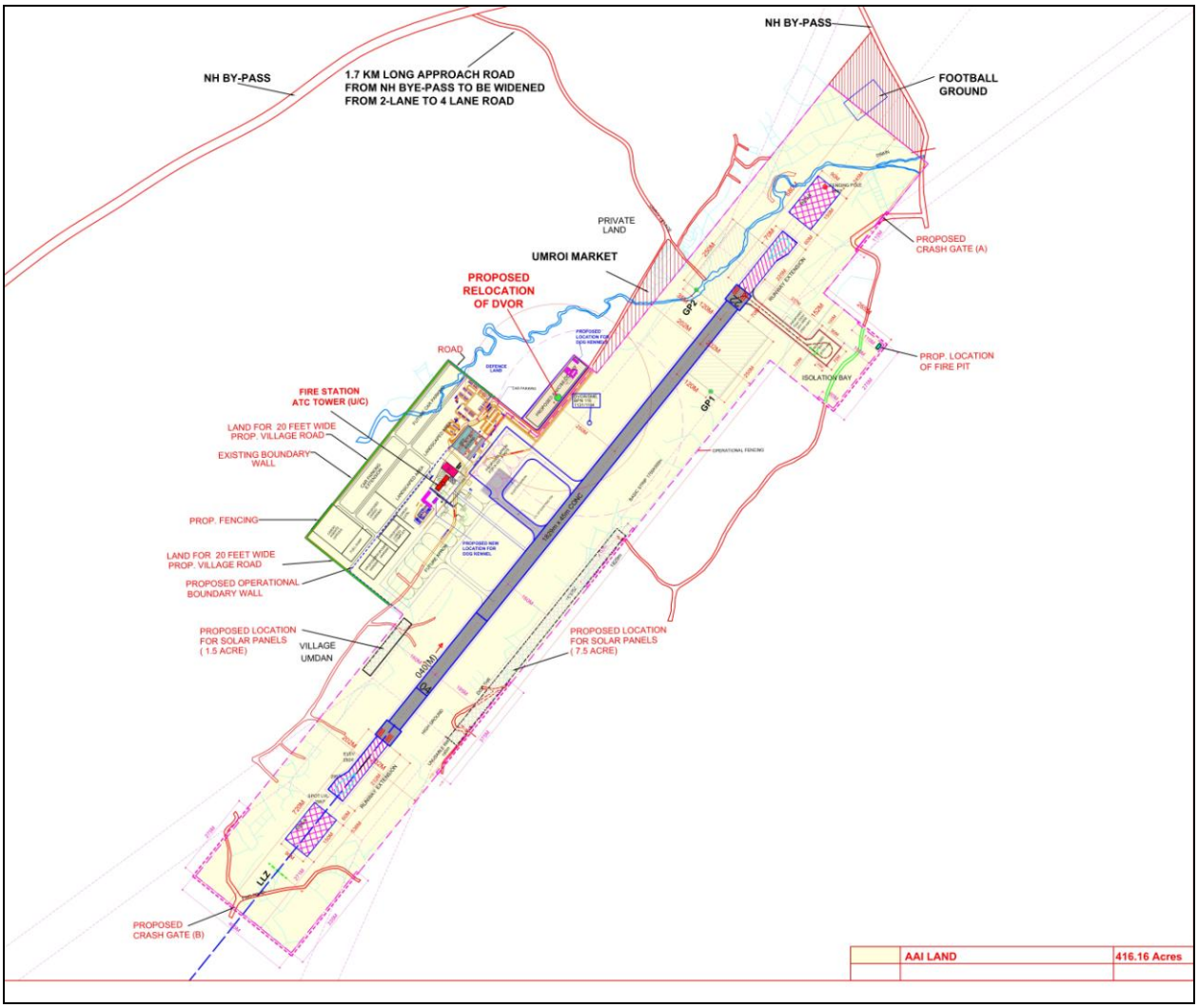


Fig: Master Plan

3.6 Raw Material (Quantity & Source), Product & Mode of Transport:

Airport being a service industry doesn't process any raw material or deal in production of products. The infrastructure build will be used to provide service to passenger and airlines. Resources such as drinking Water, Energy & Fuels will be used to provide best in service passenger and airlines.

3.7 Source optimization/recycling & Reuse envisaged in the Project:

1. Use of fly ash use will be considered as a part of resource optimization, recycling & reuse as per engineering and operational requirements.
2. During construction phase, material will be used as per requirements with the focus of resources conservation.

3. During operational phase, the input resources such as Drinking Water, Energy & Fuels will be used as per requirements with the focus of resources conservation & resource optimizations.
4. During operation Municipal wastes will be managed as per MSW Rules, 2016; two bin systems will be followed. All the recyclable wastes collected will be recycled by the service provider and biological wastes will be composted away from the airport by municipal authorized facilities.
5. ISO 50001- Energy Management System is in place, energy conservation, energy efficiency will be considered as a part of resources conservation & resource optimizations.
6. Currently Airport has Solar PV systems for renewable energy generation. Use of renewable energy and capacity enhancement will be considered for energy resource optimization.

3.8 Availability of Water, Energy / Power Requirement & Source:

3.8.1 Water requirement:

The project will utilize the ground water. The daily consumption of water during operation phase will be about 45 KLD of which 27 KLD will be fresh water and 18 KLD will be recycled water. The details of water requirement and wastewater generation for construction and operation phase area as follows:

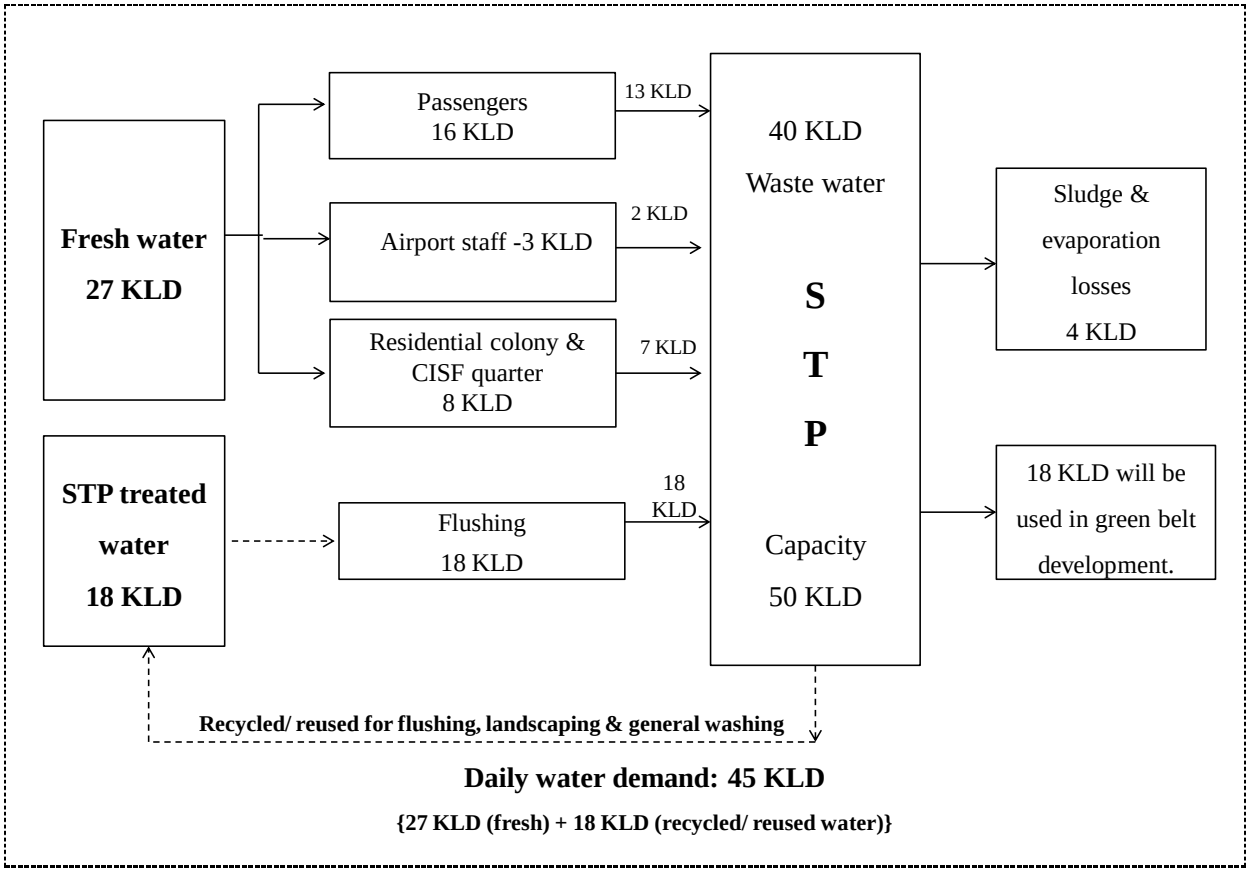
A. Construction phase:

During construction phase approx 100 nos. of workers will be engaged. Total Water consumption during construction phase is 5 KLD, which will be met through the ground water.

B. Operational Phase:

S. No.	Particulars	Population	Fresh water demand	Treated water Demand	Total water Demand
1.	Passengers	400	@40 LPCD: 16 KLD	@30 LPCD:12 KLD	28 KLD
2.	Airport staff	100 (LS)	@25 LPCD: 3 KLD	@20 LPCD: 2 KLD	5 KLD
3.	Residential colony & CISF Quarter	80	@90 LPCD: 8 KLD	@45 LPCD: 4 KLD	12 KLD
	Total		**27 KLD**	**18 KLD**	**45 KLD**

Water Balance



3.8.2 Power Demand

The total connected load is 180 KW (existing-150 KW; proposed -30 KW). The maximum demand is 150 kVA. The power supply shall be drawn from the grid of Meghalaya Power Distribution Corporation Limited (MPDCL). There will be power backup through DG sets of capacity of 380 kVA (2 nos.) used in case of power cut or failure. DG set will be provided with an effective safe stack height for proper dispersion of pollutants that will keep the emissions within the permissible limit. The fuel requirement will be about 121 lit/hr of HSD (as and when used).

3.9 Waste Generation & Management

Solid Waste management:

Solid waste generated from the airport mainly comprises of food waste and garbage waste. Further, small quantities of sludge from STP and other waste are being generated. Collection and handling of domestic solid waste is being done in line with the provisions of the Solid Waste Management Rules 2016.

Waste water treatment & management:

During operation phase, wastewater generation mainly consists of sanitary waste, sewage from airport terminal, flight kitchen, effluent from the workshop etc. The sewage and sanitary waste from the buildings and airport terminal will treated in Sewage Treatment Plant (STP) comprising primary, secondary and tertiary treatment facilities. The treated wastewater from the STP is will be used for green belt development.

3.10 Schematic representations of the Feasibility drawing which give information of EIA purpose:

As per the EIA notification dated 14th September, 2006, it is mandatory for the proposed activity to get Environmental Clearance (EC) before setting up any project or expansion/modernization of any project. The detailed chart delineating the process is given below:

Environmental Impact Assessment (EIA) is a well planned process to predict the environmental consequences of any kind of development, which is a result of human activities and to suggest appropriate measures in order to reduce adverse effects and also to augment positive effects. The EIA procures a rational and ethical approach for sustainable development. However, it is more scientific process because it not only tells the past, present and the future consequences of on-going developments, but also predicts the future events which are likely to change due to various reasons.

In terms of the EIA notification of the MoE&F dated 14th September 2006, the generic structure of EIA documents shall be as under:-

- Introduction
- Project Description
- Analysis of Alternatives (Technology & Site)
- Description of the Environment
- Anticipated Environmental Impact & mitigation Measures
- Environmental Monitoring Programme
- Additional studies
- Project benefits
- Environmental Cost benefits Analysis

- EMP
- Summary & Conclusion
- Disclosure of Consultant Engaged

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SITE ANALYSIS

4.1 Connectivity:

Shillong Airport is situated nearly 59.50 kms from LGB International airport Guwahati, 58 kms from Guwahati Railway station.

Particular	Details
Nearest Highway/Major Road,	• Shillong Bypass Road-1.67 km towards NNE • SH-8: 5.68 km towards NW • NH-40 : 8.08 km towards SW • AH-2: 7.22 km towards WSW
Railway Station	Kamrup Khetri RS : 48 km towards NNE Guwahati RS : 58 km towards NNE
Public Transport	Plenty of tourist buses, taxis and luxury coaches are available from Guwahati to Shillong.

4.2 Land Form, Land Use & Land Ownership

Presently, the airport is situated on 192 acres of land and is in operation since mid 1970 and currently operates about 30 flights per month.

Additionally, 224.16 acres of land is required for the expansion, which is transferred by Collector, Ri-Bhoi District, Nongpoh, Meghalaya Govt. to Airport Authority of India.

The total land after runway extension will be 416.16 acres.

4.3 Topography

The airport facilities already exist. Additional land of 224.16 acres is acquired area for the extension of runway.

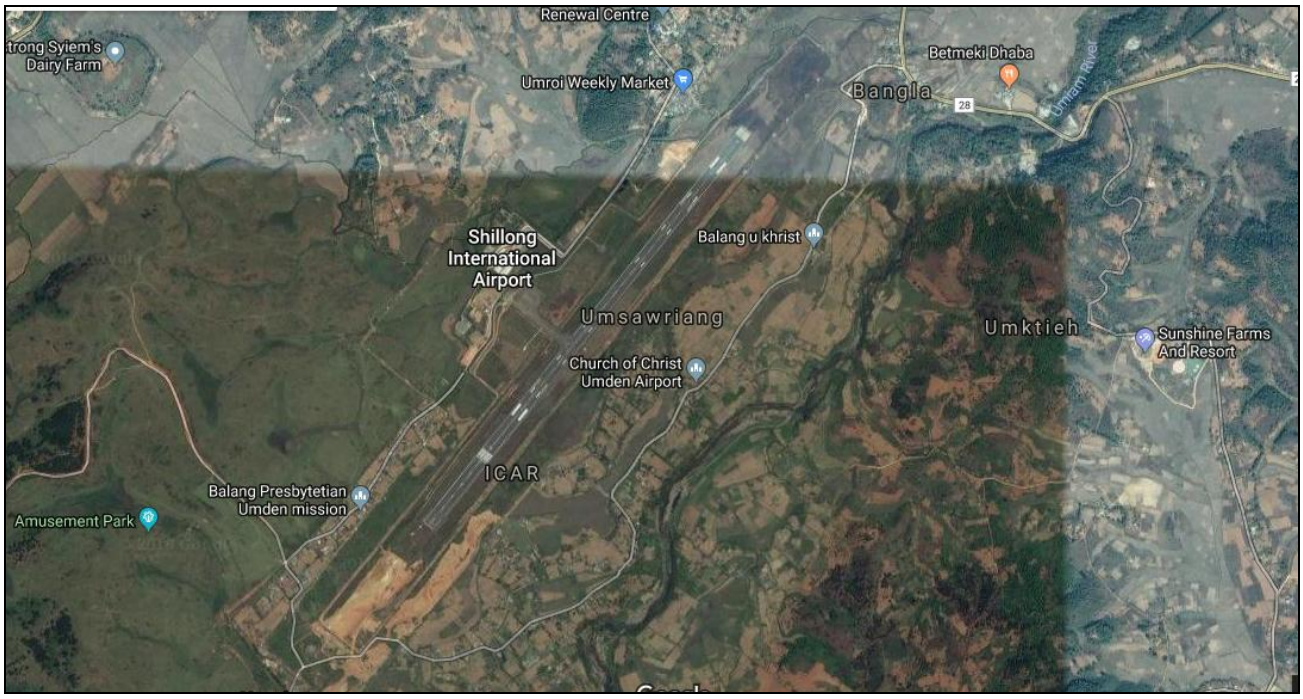

Fig: Shillong Airport

4.4 Proposed Land use Pattern

The land use pattern of the existing airport remains same. The additional acquired land will be converted into industrial commercial category.

4.5 Existing Infrastructure of Site

Existing infrastructure details are given in Section-3.4.

4.6 Soil Classification

The soils of the hills are derived from gneissic complex parent materials; they are dark brown to dark reddish-brown in colour, varying in depth from 50-200 cm. The texture of soils varies from loamy to fine loamy. The soils of the alluvial plains adjacent to the northwest and southern plateau are very deep, dark brown to reddish-brown in colour and sandy-loam to silty-clay in texture.

4.7 Climate Data from Secondary Sources

Shillong city has abracing climate, throughout the year, which is influenced by the North-East winter winds. There are four main seasons in city, viz. (i) Spring -March and April (ii) summer (Monsoon) - May to September (iii) Autumn October and November and (iv) Winter

December to February. The maximum and minimum temperatures attained during summer are 20°C and 15°C while during winter these are 16°C and 4°C respectively. In October and November months the climate is cool. After November, the winter sets in and continues upto the end of February. Rainfall starts by the third week of May and continues up to September end and sometimes up till middle of October.

4.8 Social Infrastructure Available

The existing social infrastructure in the Shillong which is located at about 10 km from the airport are:

- Hospital with ambulance;
- Banks;
- Post office;
- Bus station;
- Fire station;
- Secondary school;
- Police station;
- Shopping complex;
- Sports infrastructure (Stadium & Camps etc);
- Community halls;
- Cinema halls; and
- Primary health care centers

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PLANNING BRIEF

5.1 Planning Concept

This is a planned airport development project to cater aviation demand as per Master Plan. The proposed expansion project is planned to be carried facilities such as runway extension, taxiways & other airport supporting facilities are proposed. Other facilities such as power, transportation and communication, social infrastructure facilities are locally available near project site.

5.2 Population Projection

Considering the huge tourism potential of Shillong and the initiative of State Government to attract tourists, it is expected that by 2020 itself the passenger traffic may reach up to 5 lakhs.

5.3 Land use planning

Land use has been categorized based on the following functional groups:

Airfield Dependent: Land uses with the highest location and area priority include those that are fully within the airfield, or overlapping the airside-landside boundary.

Airport Supporting: Land uses with functional priority include those that are required for the airport to function. Their location may be on the airside or landside but preferably within the airport boundary.

Commercial: Land uses that are fully provide non-aviation revenues. These uses have flexibility of location but should not interfere with the functional operation of Airfield Dependent or Airport Supporting Land Uses.

Infrastructure & Open Space: These land use areas are determined by the needs of all the land uses above. Since supporting infrastructure must be within the development areas the first three groups determine the area required for this group. Open space includes those areas remaining which cannot be developed.

5.4 Assessment of Infrastructure Demand (Physical & Social)

Social Demand

On the basis of the preliminary site visit, the infrastructure demand in the villages assessed on the basis of need and priority:

The health infrastructure of the study area requires improvement. The lack of modern and specialist facilities in hospitals needs improvement.

The assessment will be identified in the socio economic survey, after the grant of TOR and will be submitted at the time of final presentation regarding Environmental Clearance.

Physical infrastructure

Physical infrastructure is an important aspect of a site. It determines the quality of life to a large extent. Physical infrastructure deals with:

- Water supply
- Electricity
- Waste management & treatment

Water supply

The project will utilize the ground water. The daily consumption of water during operation phase will be about 45 KLD of which 27 KLD will be fresh water and 18 KLD will be recycled water.

Electricity

The total connected load is 180 KW (existing-150 KW; proposed -30 KW). The maximum demand is 150 kVA. There will be power backup through DG sets of capacity of 380 kVA (2 nos.) used in case of power cut or failure. DG set will be provided with an effective safe stack height for proper dispersion of pollutants that will keep the emissions within the permissible limit. The fuel requirement will be about 121 lit/hr of HSD (as and when used).

Solid Waste management:

Solid waste generated from the airport mainly comprises of food waste and garbage waste. Further, small quantities of sludge from STP and other waste are being generated. Collection and handling of domestic solid waste is being done in line with the provisions of the Solid Waste Management Rules 2016.

Waste water treatment & management:

During operation phase, wastewater generation mainly consists of sanitary waste, sewage from airport terminal, flight kitchen, effluent from the workshop etc. The sewage and sanitary waste from the buildings and airport terminal is being treated in Sewage Treatment Plant (STP) comprising primary, secondary and tertiary treatment facilities. The treated wastewater from the STP is will be used for green belt development.

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PROPOSED INFRASTRUCTURE

6.1 Industrial Area (processing area)

Proposed expansion project involves the development of infrastructure inside operational area which mainly includes extension & strengthening of runway & other allied works. The details of proposed facility area as follows:

1. Extension of runway from 6000 ft to 7500 ft and strengthening the existing runway for AB-321 type aircraft.
2. Provision of standard basic strip of 300 meters width extending laterally by 150 meters on either side of runway central line and extending longitudinally by 60m beyond runway ends for the entire runway after extension including provision of RESA.
3. Providing shoulders to the existing runway, apron & taxiway.
4. Provision of isolation bay of dimensions 75 m x 65 m on the southern side of runway 04 to park one AB-321 type of aircraft in case of hijacking & other unlawful interference with the aircraft.
5. Expansion of apron to make total dimension 191 x120 m.
6. Taxi track of dimension 191 x 23 m will be constructed.
7. Provisions of apron flood light.
8. Provisions of approach lighting and up gradation of runway edge light.
9. Provisions of (ILS) Instrument Landing System.
10. Construction of drainage system in the airport premises.
11. Shifting of existing DVOR
12. Diversion of Nallah.

The Brief details are as under:

S. No	Particulars	Existing	Proposed Expansion	Total
1.	**Land Area**			
i.	Total Land Area	192 acres	224.16 acres	416.16 acres
2.	**Runway Details**			
i.	Runway Length/dimension	Length: 6000 ft. (1829 m) Dimension:1829 m x 45	Length : 1500 ft.	Length : 7500 ft (2286.58 m) Dimension:

		m		2286.58 m x 45 m
ii.	Runway shoulders	Nil	Width of Shoulder : 7.5 m	Width of Shoulder : 7.5 m
iii.	Runway strip Dimension	1949 m x 150 m	2406.58 m x 300 m	2406.58 m x 300 m
iv.	Runway end safety area (RESA) Dimension	90 m x 90 m	150 m x 90 m	150 m x 90 m
v.	Runway lights	Single circuit available	CAT-1,2 Circuit	CAT-1,2 Circuit
3.	**Type of Aircraft handles**			
i.	Type of Aircraft	ATR-42	AB-321	ATR-42, AB-321
4.	**Other Facility**			
i.	Isolation Bay	Nil	75 m x 90 m	75 m x 90 m
ii.	ILS (Instrument Landing System)	Nil	Yes	Yes
iii.	Approach lights	Nil	Yes	Yes
5.	**Navigation Aids**			
i.	DVOR	Available	Relocation	Relocation
ii.	PAPI	Available	Nil	Available
6.	**Apron Details**			
i.	Dimension	91 m x 61 m	191m x 120 m	191m x 120 m
7.	**Terminal Building**			
i.	Area	5000 sq.m	Nil	5000 sq.m
ii.	Capacity	100 Arrival & 100 Departure	Nil	100 Arrival & 100 Departure
iii.	Car Parking	140 nos. including 40 nos. for VIP	Nil	140 nos. including 40 nos. for VIP
8.	**Taxiway Details**			
i.	Dimension	Width -23 m	191m x 23 m	191m x 23 m
9.	**AAI staff Accommodation**			
i.	Residential Quarter	30 nos.	Nil	30 nos.
ii.	CISF Barrack	27 nos. of beds	Nil	27 nos. of beds
10.	**Water Requirement**			
i.	Total	45 KLD	Nil	45 KLD

ii.	Fresh	27 KLD	Nil	27 KLD
iii.	Recycle	18 KLD	Nil	18 KLD
11.	**Power Demand [Source: *Meghalaya Power Distribution Corporation Limited* (MPDCL)]**			
i.	Connected Load	150 KW	30 KW	180 KW
ii.	Transformer	750 kVA-2 nos.	Nil	750 kVA-2 nos.
iii.	Power backup DG set	380 kVA- 2 nos.	Nil	380 kVA-2 nos.

6.2 Residential Area (non-processing area)

The unit has housing facility for airport staff.

6.3 Green Belt

Approximately 33% of the total project area will be under green belt and plantation. Entire landscaping is irrigated with treated waste water having drip irrigation and automatic water efficient water dispensing system.

6.4 Social Infrastructure

The proposed infrastructure will be identified in the socio-economic survey, after the grant of ToR and will be submitted at the time of final presentation regarding Environmental Clearance.

6.5 Connectivity

Shillong Airport is situated nearly 59.50 kms from LGB International airport Guwahati, 58 kms from Guwahati Railway station. It is an expansion project. The connectivity details are as below:

Particular	Details
Nearest Highway/Major Road,	• Shillong Bypass Road-1.67 km towards NNE • SH-8: 5.68 km towards NW • NH-40 : 8.08 km towards SW • AH-2: 7.22 km towards WSW
Railway Station	Kamrup Khetri RS : 48 km towards NNE Guwahati RS : 58 km towards NNE

Public Transport	Plenty of tourist buses, taxis and luxury coaches are available from Guwahati to Shillong.

6.6 Water Management (source & supply of water)

The project will utilize the ground water. The daily consumption of water during operation phase will be about 45 KLD of which 27 KLD will be fresh water and 18 KLD will be recycled water.

6.7 Sewerage System

For the treatment of domestic sewerage, STP will be installed in the project site.

6.8 Industrial Waste Management

No Industrial waste will be generated from the project.

6.9 Solid waste Management

Solid waste generated from the airport mainly comprises of food waste and garbage waste. Further, small quantities of sludge from STP and other waste are being generated. Collection and handling of domestic solid waste is being done in line with the provisions of the Solid Waste Management Rules 2016.

6.10 Waste water treatment & management

During operation phase, wastewater generation mainly consists of sanitary waste, sewage from airport terminal, flight kitchen, effluent from the workshop etc. The sewage and sanitary waste from the buildings and airport terminal is being treated in Sewage Treatment Plant (STP) comprising primary, secondary and tertiary treatment facilities. The treated wastewater from the STP is will be used for green belt development.

6.11 Power Requirement & Supply/ Source

The total connected load is 180 KW (existing-150 KW; proposed -30 KW). The maximum demand is 150 kVA. The power supply shall be drawn from the grid of Meghalaya Power Distribution Corporation Limited (MPDCL). There will be power backup through DG sets of capacity of 380 kVA (2 nos.) used in case of power cut or failure. DG set will be provided with an effective safe stack height for proper dispersion of pollutants that will keep the

emissions within the permissible limit. The fuel requirement will be about 121 lit/hr of HSD (as and when used).

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REHABILITATION & RESETTLEMENT (R&R) PLAN

7.1. Rehabilitation & Resettlement (R&R) Plan

Introduction:

Airport Authority of India (AAI) proposes to upgrade the existing facilities of Shillong Airport including extension & strengthening of runway and allied works. The proposed expansion will include an area of 224.16 acres. A land area of 224.16 acres is transferred by Collector, Ri-Bhoi District, Nongpoh, Meghalaya Govt. to Airport Authority of India.

State Govt. given the compensation to villagers for diversion of village roads. The Details of the same is enclosed as *Annexure.*

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PROJECT SCHEDULE & COST ESTIMATES

8.1. Project Schedule & Cost Estimates

Estimated cost of work for the extension of Runway & allied works is worked out to be Rs. 186.00 Crores.

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ANALYSIS OF PROPOSAL

9.1. Analysis of the Proposal

The present proposal of extension of runway will help meet the growing demands of the traffic and to facilitate bigger aircrafts operation in the airport. The project will boast economic growth benefitting the whole region through the generation of both direct and indirect economic value. Airport operations will have a considerable economic and social impact in surrounding regions.

These benefits extend far beyond the direct effect of an airport's operation on its community development to the wider benefits that air service accessibility brings to business interests and to consumers. The construction and operation of airport will generate direct employment opportunity, indirectly contributed jobs through supply chain, enhance induced impact through tourism. Thus the project will prove beneficial to the area.

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