

FORM-1

FOR
AMENDMENT IN ENVIRONMENTAL CLEARANCE
(F.no: 10-24/2012-IA.III dated 22nd August, 2014)
FOR
THE ADDITION OF EASTERN CONNECTIVITY TUNNEL
AT
KEMPEGOWDA INTERNATIONAL AIRPORT
DEVANAHALLI, BENGALURU, KARNATAKA

Submitted to:

**MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
NEW DELHI**

Submitted by:



BANGALORE INTERNATIONAL AIRPORT LIMITED
Kempegowda International Airport,
Devanahalli, Bengaluru-560 300

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September, 2018

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FORM-1

(I) BASIC INFORMATION

Sr. No.	Item	Details
1	Name of the project/s:	<p>Amendment to Earlier Environmental Clearance dated 22nd August 2014 granted for Kempegowda International Airport (formerly known as Bengaluru International Airport)</p> <p>Kempegowda International Airport (KIA) proposes addition of a 4-lane eastern connectivity tunnel and an approach road to cater as an alternative access to the Terminal Forecourt from the Eastern part of the Airport.</p> <p>The project location map giving study area details of 10 km radius from project boundary and location map enclosed as Annexure-I & Annexure-II. Google image is attached as Annexure-III.</p>
2	S. No. in the schedule	Sr. No. 7 (a) under 'A' Category (Airport Project)
3	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled	<p>BIAL is an operating airport with a sanctioned capacity of 55 MPPA (ultimate phase to be achieved by 2029-30) and associated facilities.</p> <p>Existing: Terminal (T1) – 20 MPPA is already in operation</p> <p>Proposed Expansion as per the earlier EC (22.08.2014) granted.</p> <p>Terminal 2 (T2) will be built in two stages of 25 MPPA (stage-1) and stage-2 (10 MPPA)</p> <p>Proposed Amendment:</p> <p>Eastern connectivity tunnel is an alternative access to the Terminal Forecourt from the Eastern part of the city to decongest the traffic on NH7 with a length of approximately 2.5 km and about 5.5 m height and approach road of approximately 1.28 km.</p> <p>Layout map is shown in Annexure-IV.</p> <p><u>Project cost for the proposed Eastern Connectivity Tunnel:</u></p> <p>Approximately Rs. 15978 crores</p>

Sr. No.	Item	Details										
4	New/Expansion/Modernization	Addition of eastern connectivity tunnel for alternative connectivity to the Airport.										
5	Existing Capacity/ Area etc.	<p>The sanctioned capacity of the airport is designed to handle 55 MPPA by 2029-30.</p> <p>Total Airport Area: 1622 ha</p> <p><i>Environment Clearance granted by MoEE&CC vide its F.No: 10-24/2012-IA.III dated: 22nd August, 2014 for second stage expansion of Bengaluru International Airport, Bengaluru, Karnataka. EC copy attached as Annexure-V. Certified EC compliance is enclosed as Annexure-VA.</i></p> <p>Consent to Establishment is given in Annexure-VI. Consent to Operate copy attached as Annexure-VII.</p>										
6	Category of Project i.e. 'A' or 'B'	Category A (Airport Project)										
7	Does it attract the general condition? If yes, please specify.	No										
8	Does it attract the specific condition? If yes, please specify.	No										
9	Location:	<p>This tunnel alignment passes under the aprons and the cross taxiway of the proposed Airside development.</p> <p>The geographical co-ordinates of airport are given below:</p> <p><u>Latitude & Longitudes of Extreme Coordinates</u></p> <p>A: 13^o 12'35" N and 77^o 40'38" E B: 13^o 12'36" N and 77^o 43'03" E C: 13^o 12'22" N and 77^o 44'16" E D: 13^o 10'58" N and 77^o 44'13" E E: 13^o 11'10" N and 77^o 40'53" E</p> <p>The project location map giving study area details of 10 km radius from project boundary and location map enclosed as Annexure-I.</p> <table border="1" data-bbox="293 1637 683 1805"> <tr> <td>Plot/ Survey/Khasra No.</td> <td>-</td> </tr> <tr> <td>Village</td> <td>Devanahalli</td> </tr> <tr> <td>Tehsil</td> <td>Devanahalli</td> </tr> <tr> <td>District</td> <td>Bengaluru Rural District</td> </tr> <tr> <td>State</td> <td>Karnataka</td> </tr> </table>	Plot/ Survey/Khasra No.	-	Village	Devanahalli	Tehsil	Devanahalli	District	Bengaluru Rural District	State	Karnataka
Plot/ Survey/Khasra No.	-											
Village	Devanahalli											
Tehsil	Devanahalli											
District	Bengaluru Rural District											
State	Karnataka											
10	Nearest railway station/ airport along with distance in km	<p>Nearest Railway Station:</p> <p>Devanahalli Railway station (4.0 km, N) Doddajala Railway station (4.4 km, WSW)</p>										

Sr. No.	Item	Details
		Airport: Airforce station: Yelahanka (10.7 km, SW) Jakkur Aerodrome (16.5 km, SW) HAL airport, Bengaluru (27.1 km, S)
11	Nearest town, city, district head quarters along with distance and direction in kms	Devanahalli (4.0 km, N) Bengaluru (25 km, SSW) Bengaluru Rural District Headquarters (28 km, SSW)
12	Village panchayats, Zilla parishad, Municipal corporation, local body (complete postal addresses with telephone nos. to be given)	Bengaluru International Airport Area Planning Authority (BIAAPA) Devanahalli-Hosakote Road, Devanahalli, Bengaluru, Karnataka 562110 080 2768 2035
13	Name of the applicant	Bengaluru International Airport Limited (BIAL)
14	Registered Address	Kempegowda International Airport Devanahalli Bengaluru – 560 300
15	Address for correspondence	Mr. John Tom Shimmin
	Name	
	Designation (Owner/Partner/CEO)	Chief Project Officer
	Address	Project Office Kempegowda International Airport Devanahalli Bengaluru – 560 300
	Pin Code	560 300
	E-mail	tomshimmin@BIALAIRPORT.COM
	Telephone No.	9538882802, + 91 80 66782802
16	Details of Alternative Sites examined, if any. Location of these sites should be shown on a toposheet.	None. This proposal is for an amendment to the existing EC and the proposed development will be within the existing airport premises.
17	Interlinked Projects	No
18	Whether separate application of interlined project has been submitted	Not Applicable
19	If yes, date of submission	
20	If no, reason	Not Applicable
21	Whether the proposal involves approval/clearance under: (a) The Forest (Conservation) Act, 1980 (b) The Wildlife (Protection) Act, 1972 (c) The C.R.Z Notification, 1991	No Forest clearance had already been granted by MoEF&CC vide GOI letter no. S-66/96-FC dated August 19, 2002 for diversion of 565 ha of forest land for the airport development – BIAL with private sector participation at Devanahalli, Bengaluru, Karnataka. Land is already in the possession of BIAL. No additional land required for the proposed eastern connectivity tunnel.

Sr. No.	Item	Details
22	Whether there is any Government Order/ Policy relevant/relating to the site	Government of India, as part of policy to encourage private participation in the development of Airport Infrastructure has granted its approval for the development of Airport. BIAL has been established for development, design, financing, construction, completion, maintenance, operation and management of the KIA.
23	Forest land involved (hectares)	As mentioned in Sr.No-21
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

(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.)

Sr. 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)	Yes	There will not be any change in land use within the project area. However, land cover may change due to construction of access tunnel through the proposed airside area of the airport. Site photographs are given in Annexure-VII .
1.2	Clearance of existing land, vegetation and building?	No	Not required
1.3	Creation of new land uses?	No	Already under BIAL possession for aviation related activities
1.4	Pre-construction investigations e.g., bore houses, soil testing?	Yes	Soil investigation has been completed.
1.5	Construction works ?	Yes	Construction of eastern connectivity tunnel
1.6	Demolition Works ?	No	None
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Existing labor colony within the premises will be used

Sr. No.	Information/Checklist Confirmation	Yes /No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	The proposed above ground construction includes cutting/filling and concrete & steel structures for egress and ventilation shafts along with at-grade approach roads including grade separator at junctions.
1.9	Underground works including mining or tunneling?	Yes	The proposed underground construction includes cut and cover concrete tunnel and ramps.
1.10	Reclamation works?	Yes	Excavated soil will be partly used for back filling and for reclamation of low laying areas in the site.
1.11	Dredging?	No	Not applicable
1.12	Offshore structures?	No	Not applicable
1.13	Production and manufacturing Process?	No	Not involved
1.14	Facilities for storage of goods or materials?	Yes	During the construction phase, temporary storages will be created at the project site and construction material such as cement, steel, brick and sand etc. will be stored at designated locations with provision of labels and cover.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	<p>Liquid Waste Generation & Management with respect to the proposed tunnel.</p> <p>Construction:</p> <ul style="list-style-type: none"> ➤ From Labour Camps: Domestic sewage from labour colony is treated in sewage treatment plant and recycled for water sprinkling to suppress the dust <p>Operation: Not envisaged</p> <p>Solid Waste Generation & Management with respect to the proposed tunnel.</p> <p>Construction:</p> <ul style="list-style-type: none"> ➤ Excavated earth is stored and is used for Reclamation purpose. ➤ Municipal solid waste from labour camp and office area are disposed-off to the KSPCB approved agency. ➤ Separate storage areas are identified for other waste materials generated and will be disposed through authorized dealers. <p>The waste oil generated due to usage of DG sets will be stored and subsequently given to the authorized hazardous waste management agencies authorized by KSPCB.</p>

Sr. No.	Information/Checklist Confirmation	Yes /No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
			Operation: Not envisaged
1.16	Facilities for long term housing of operational workers?	No	Not required.
1.17	New road, rail or sea traffic during construction of operation?	No	Not required. Existing facilities will be utilized.
1.18	New road, rail, air waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	No	Not required
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	Not required
1.20	New or diverted transmission lines or pipelines?	No	Not required
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	Not required
1.22	Stream crossings?	No	There are no streams passing across the project site.
1.23	Abstraction or transfers of water from ground or surface waters?	No	The water requirement is met by water supply from Bangalore Water Supply, Sewerage Board (BWSSB) and Rain water harvesting pond.
1.24	Changes in water bodies or the land surface affecting drainage or run-off	No	There will not be any change in the drainage pattern. Storm water drainage network in the project premises is in line with the topography of the site.
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	The existing road leading to the site will be utilized for the transportation of material and personal.
1.26	Long-term dismantling or decommissioning or restoration works?	No	Not envisaged
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not envisaged
1.28	Influx of people to an area in either temporarily or permanently?	No	Local people/existing labor deployed for airport construction will be engaged for construction of the tunnel.

Sr. No.	Information/Checklist Confirmation	Yes /No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
1.29	Introduction of alien species?	No	Not envisaged
1.30	Loss of native species or genetic diversity?	No	Not envisaged
1.31	Any other actions?	No	Not envisaged

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

Sr. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
2.1	Land specially undeveloped or agricultural land (ha)	No	The land for the proposed facility is part of the existing airport complex. No land acquisition involved.
2.2	Water (expected source & competing users) unit KLD	Yes	<p>The present water requirement is met from Bangalore Water Supply and Sewerage Board (BWSSB) and same source will be used. BWSSB has allocated 2 MLD water to BIAL which will be sufficient to meet the water requirement.</p> <p>Water requirement is envisaged for firefighting during operational phase. During construction phase water requirement will be about 2,25,000 m³ which will be supplied by BWSSB.</p>
2.3	Minerals (MT)	No	Not Applicable
2.4	Construction material – stone, aggregates, and/soil (expected source - MT)	Yes	<p>Approximate major quantities for the proposed Eastern Connectivity Tunnel-</p> <p>a) Excavation – 10,00,000 cum b) RCC – 5,63, 000 cum c) Reinforcement Steel – 113,000 MT</p>
2.5	Forests and timber (source-MT)	No	-
2.6	Energy including electricity and fuels (source, competing users) Unit: fuel (MT), energy (MW)	Yes	<p>The total power requirement for KIA by 2030 is projected to be 325 MVA. The power shall be supplied by Bangalore Electricity Supply Company (BESCOM).</p> <p>DG sets have been provided with inbuilt and buried fuel (HSD) storage tanks. The required fuel is sourced from the nearest oil depots.</p> <p>Temporary DG power is used for construction. Electrical load during operational stage is 1500KV</p>

Sr. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
2.7	Any other natural resources (use appropriate standard units)	No	Not envisaged

3.0 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

Sr. 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)	No	DG fuel. DG set is provided with in-built (HSD) storage tanks. Used oil from the DG sets is given to authorized recyclers.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	Not envisaged
3.3	Affect the welfare of people, e.g., by changing living conditions?	No	Not envisaged
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.	No	Not envisaged
3.5	Any other causes	No	Not envisaged

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

Sr. 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	Not Applicable. The earth work and other waste will be used for leveling only.
4.2	Municipal waste (domestic and or commercial wastes)	Yes	During the construction and operational phase of the project, collection and handling of domestic solid waste would be done as per the existing practice at the airport complex, in line with the provisions of the Municipal Solid Waste Rules.
4.3	Hazardous wastes (as per hazardous waste management rules)	Yes	Hazardous waste generated during construction and operation phase shall be disposed as required by the Hazardous

Sr. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
			Wastes Management and Handling Rules. Used oil generated during oil changes from emergency DG sets will be given to KSPCB approved agencies.
4.4	Other industrial process wastes	No	No process involved.
4.5	Surplus product	No	-
4.6	Sewage sludge or other sludge from effluent treatment	Yes	The sludge generated from the Sewage Treatment Plant is be used as manure for greenbelt development by the developer.
4.7	Construction or demolition wastes	Yes	Construction waste such as spoil, brick waste etc. will be used for leveling at the site. The hazardous wastes such as paints, solvents, wood preservatives, pesticides, adhesives and sealants will be stored in sealed containers, labeled, and disposed-off as required by the Hazardous Wastes Management and Handling Rules.
4.8	Redundant machinery or equipment	No	Not Applicable
4.9	Contaminated soils or other materials	No	The soil will be protected from construction equipment by providing drip pans for oil collection.
4.10	Agricultural wastes	No	-
4.11	Other solid wastes	Yes	Construction Phase: Top soil will be stacked separately and will be used for greenbelt development. Operation Phase: Hazardous waste generated from the facility will be given to authorized KSPCB recyclers.

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

Sr. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	DG sets are operated only during requirement, which generate gaseous emissions of SO ₂ and NO _x .
5.2	Emission from production processes	No	Not Applicable
5.3	Emissions from material handling including storage or transport	Yes	Fugitive emissions are envisaged from material handling and transportation areas during the construction stage. These will be controlled by good housekeeping, sprinkling water in the dust prone areas, providing paved roads, proper fencing and green belt

Sr. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
			development. Vehicular Emissions generated during the transportation of the materials will be controlled by regular maintenance of the vehicles. Only PUC certified vehicles will be used for transportation.
5.4	Emissions from construction activities including plant and equipment	Yes	Fugitive dust. The gaseous emissions like oxides of Nitrogen, Sulphur, and CO will be emitted from the equipment during construction phase only. However, these are of temporary nature and controlled as per the existing Environmental Management System of BIAL.
5.5	Dust or odors from handling of materials including construction materials, sewage and waste	Yes	Construction activities may lead to temporary increase in particulate matter levels. Dust covers will be provided on trucks that would be used for transportation of materials prone to fugitive dust emissions. Water sprinkling on ground and new construction will be done at regular intervals to reduce spreading of dust particles. There will not be any odour generation activities.
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/ incineration of any waste is not envisaged
5.8	Emissions from any other sources	Yes	Emissions from air traffic and vehicular traffic

6.0 Generation of Noise and Vibration, and emissions of Light and Heat

Sr. 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	Yes	All the super structures will be fabricated in workshops and then transported to site and erected. Only minor welding activities will be involved at site. Some emission of light due to welding activities and noise generation due to construction activities may be there during construction phase.
6.2	From industrial or similar processes	Yes	Noise will be generated from the aviation sector industries will be controlled by providing the noise control equipment. All the personnel working in the processing units, STP, pump house and other noise

Sr. No.	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
			generating activities will be provided with personal protective devices such as earplugs.
6.3	From construction or demolition	Yes	Negligible No heat or light emissions envisaged. Noise due to construction activities shall be minimal and temporary in nature. There is no requirement of demolishing any structures or buildings.
6.4	From blasting or piling	No	Not envisaged
6.5	From construction or operational traffic	Yes	The noise levels will be <75 dB (A) and these will be fleeting noise sources. Workers will be provided with protective equipment such as earmuffs etc. During the operation, the noise will be generated from the vehicular traffic.
6.6	From lighting or cooling systems	Yes	Insignificant noise generation is envisaged from cooling systems.
6.7	From any other sources	No	-

7.0 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

Sr. 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 of hazardous materials	No	Hazardous wastes generated during construction phase, such as paints, solvents, wood preservatives, pesticides, adhesives and sealants will be stored in sealed containers, labeled, and disposed-off as required by the Hazardous Wastes Management and Handling Act.
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	Liquid Waste Generation & Management: Construction: <ul style="list-style-type: none"> ➤ From Labour Camps: Domestic sewage from labour colony is treated in sewage treatment plant and recycled for water sprinkling to suppress the dust Operation: Not envisaged Solid Waste Generation & Management: Construction: <ul style="list-style-type: none"> ➤ Municipal solid waste from labour camp

Sr. No	Information/Checklist Confirmation	Yes/ No	Details thereof (with approximate quantities/ rates, wherever possible) with source of information data
			<p>and office area are disposed on daily basis</p> <p>➤ Separate storage areas are identified for other waste materials generated and will be disposed through authorized dealers.</p> <p>The waste oil generated due to usage of DG sets will be stored and subsequently given to the agency authorized by KSPCB.</p> <p>Operation: Not envisaged</p>
7.3	By deposition of pollutants emitted to air into the land or into water	No	No wastewater will be discharged outside the facility. There will not be any major air emissions.
7.4	From any other sources	No	Not envisaged
7.5	Is there a risk of long term buildup of pollutants in the environment from these sources?	No	There will not be any process emissions during operations. The emissions are envisaged from DG sets which will be operated only during requirement and air and vehicular traffic. The facility has been developed with adequate open spaces and green belt / green cover. Thus, long term build-up of pollutants is not envisaged.

8.0 Risk of accidents during construction or operation of the project, which could affect human health or the environment

Sr. 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	The fuel oil will be stored and will be handled in a safe manner as prescribed by statutory authorities. Fire safety measures will be in place to control fire hazards.
8.2	From any other causes	Yes	There is a possibility of construction/operational accidents. However, all the possible precautions will be taken during construction and operation phases.
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslides, cloud burst etc)?	No	The project area falls under seismic zone-II as per IS: 1893 (Part-1): 2002. It is not flood prone or landslide prone areas. Hence, no risk due to natural hazards is envisaged.

9.0 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

Sr. 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, utilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:	No	Not envisaged
	Supporting infrastructure (roads, power supply, waste or wastewater treatment, etc)	Yes	All the existing infrastructural facilities are adequate to meet the increased demand.
	Housing development	No	Not envisaged
	Extractive industries	No	Not envisaged
	Supply industries	No	Not envisaged
	Other	No	Not envisaged
9.2	Lead to after use of the site, which could have an impact on the environment	No	No significant impact envisaged. The emissions from vehicular traffic is expected to increase.
9.3	Set a precedent for later developments	No	Not envisaged
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	Not envisaged

(III) ENVIRONMENTAL SENSITIVITY

Sr. No	Areas	Name/ Identity	Aerial distance (within 15-km) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	None	-

Sr. No	Areas	Name/ Identity	Aerial distance (within 15-km) Proposed project location boundary
2	Areas which are important or sensitive of ecological reasons – wetlands, water courses or other water bodies, coastal zone, biospheres, mountains, forests	Water Bodies; Dodda Sanne kere (0.9 km, NNW) Bandakodiganahalli Kere (1.7 km, SW) Chikka Sanne Kere (2.6 km, NNW) Doddaja Amani kere (4.5 km, SW) Budigere Amani kere (6.0 km, SE) Forests: Beltakote RF (0.5 km, SE) Yaratiganahalli RF (0.5 km, W) Rayasandra RF (1.2 km, NE) RF Near Buvanahalli village (1.2 km, NW) Akkupel SF (3.8 km, N) Gollahalli SF (RF) (13 km, SE)	
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	None	-
4	Inland, coastal, marine or underground waters	None	-
5	State, national boundaries	None	-
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	NH-7 : 0.5 km, WNW NH-207 : 1.8 km, NE	
7	Defense installations	None	-
8	Densely populated or built-up area	Devanhalli (4.1 km, N)	
9	Areas occupied by sensitive man made land uses (<i>hospitals, schools, places of worship, community facilities</i>)	Hospitals, schools, temples and other general community facilities exist in the settlements in the study area	
10	Areas containing important, high quality or scarce resources (<i>ground water resource, surface resources, forestry, agriculture, fisheries, tourism, minerals</i>)	Forests: Beltakote RF (0.5 km, SE) Yaratiganahalli RF (0.5 km, W) Rayasandra RF (1.2 km, NE) RF Near Buvanahalli village (1.2 km, NW) Akkupel SF (3.8 km, N) Gollahalli SF (RF) (13 km, SE) Places of archaeological importance: Devanhalli fort and Tipu Sultan's birth place are located near Devanhalli	
11	Areas already subjected to pollution or environmental damage. (<i>those where existing legal environmental standards</i>)	None	-

Sr. No	Areas	Name/ Identity	Aerial distance (within 15-km) Proposed project location boundary
	<i>are exceeded)</i>		
12	Areas susceptible to natural hazard which could cause the project to present environmental problems <i>(earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions)</i>	This is generally a plain area not prone for any of the natural disasters. The location is not prone to earthquake either since the area falls in Seismic Zone-II.	

(III) PROPOSED TERMS OF REFERENCE

Environment Clearance was granted by MoEE&CC vide its F.No: 10-24/2012-IA.III dated: 22nd August, 2014 for second stage expansion of Kempegowda International Airport, Bengaluru, Karnataka. Eastern connectivity Tunnel will be added to the existing approved facilities for which amendment is being sought.

The current proposal is for seeking amendment in earlier EC (22.08.2014) due to the addition of alternative connectivity (Tunnel) through the proposed airside area of the airport. Detailed prefeasibility report along with EMP attached.

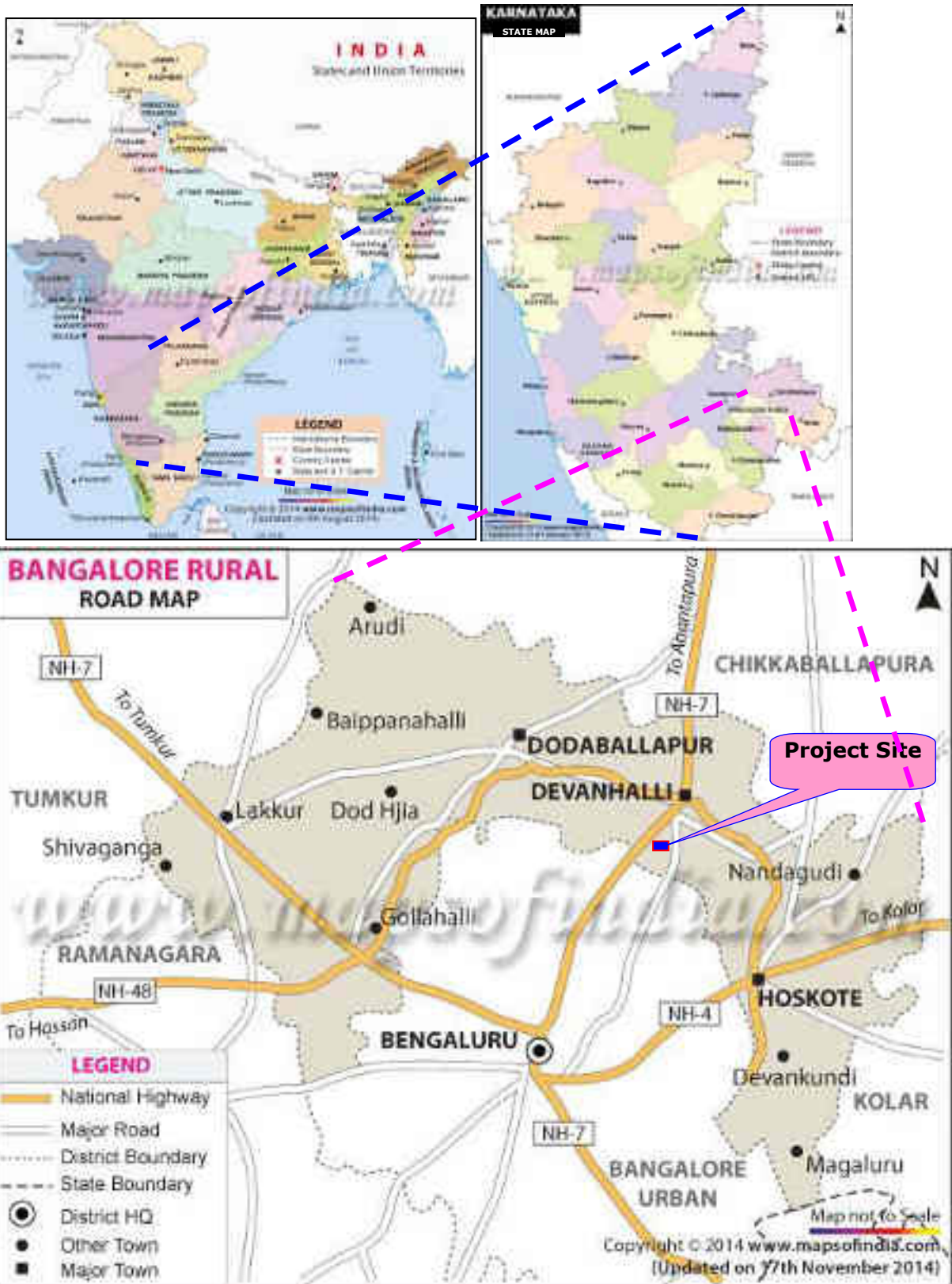
I hereby give an undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project be rejected and clearance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

Date:
Place:

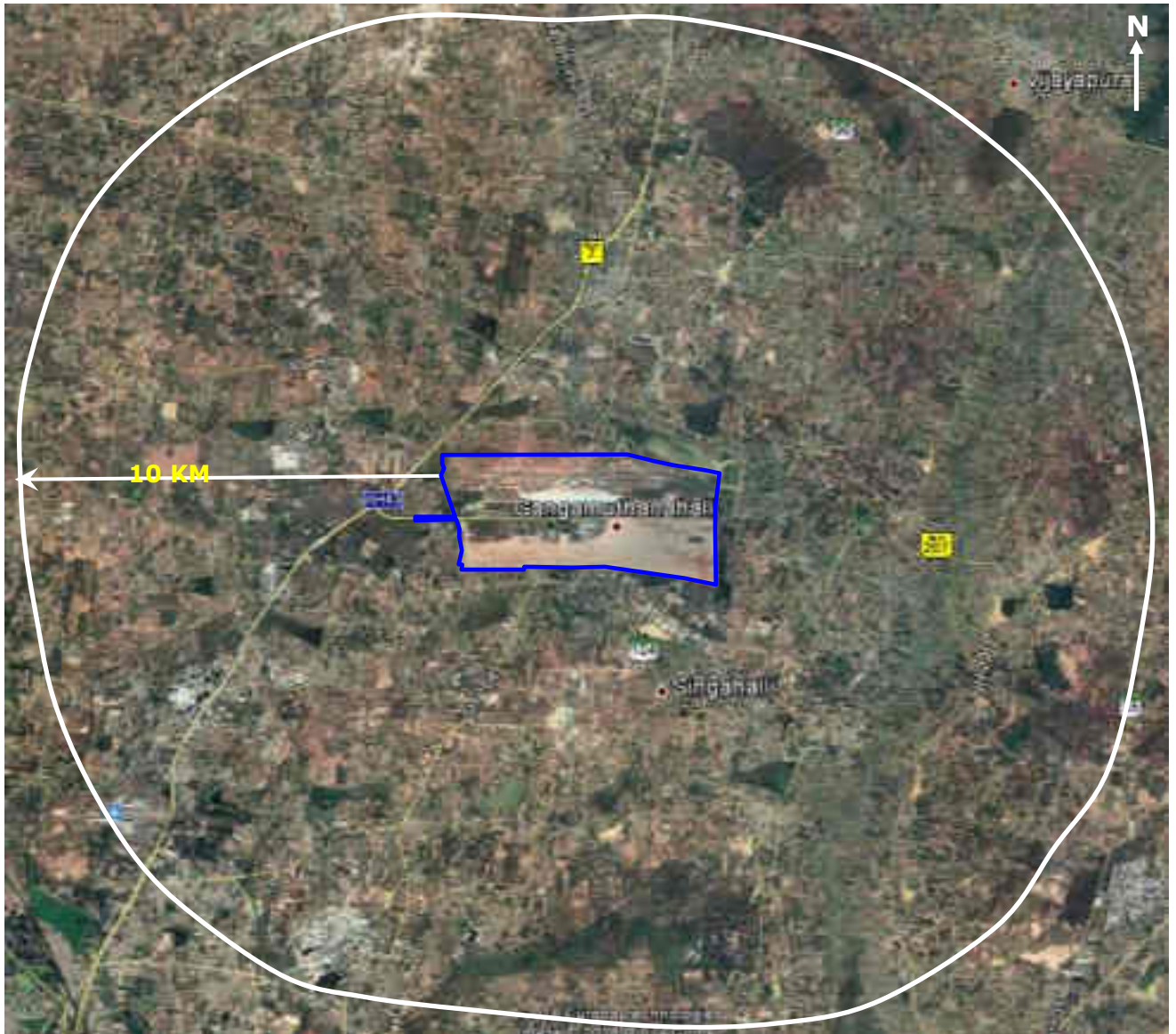


Mr. John Tom Shimmen
Chief Project Officer
Project Office
Kempegowda International Airport
Devanhalli
Benguluru – 560 300

ANNEXURE-I
INDEX MAP

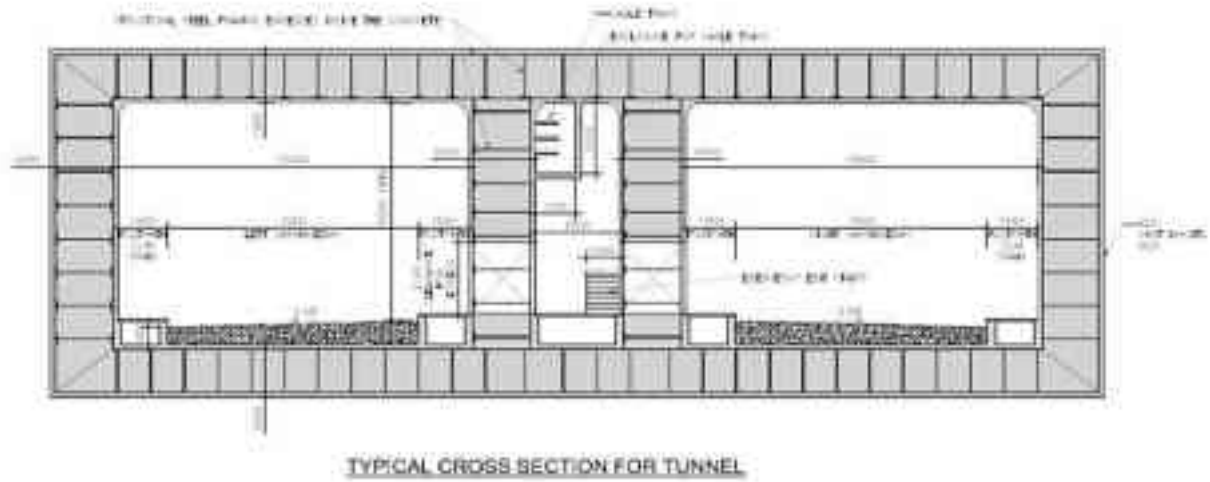


ANNEXURE-III
GOOGLE IMAGE



— Airport Boundary Area

ANNEXURE-IV (B)
LAYOUT SHOWING EASTERN TUNNEL CONNECTIVITY (CROSS SECTION)



ANNEXURE-V (A)
ENVIRONMENTAL CLEARANCE OF BIAL

F.No.10-24/2012-IA.III
Government of India
Ministry of Environment, Forests & Climate Change
(IA-III Section)

Vayu Wing, 3rd Floor,
Indira Paryavaran Bhawan,
Jor Bag Road, Aliganj,
New Delhi - 110 003

Dated: 22nd August, 2014

To
The Senior Director – Finance & Support Services,
M/s Bengaluru International Airport Ltd.,
Administration Block, Bengaluru International Airport,
Bengaluru – 560 300, Karnataka.

Contact Person Details:
Shri Bhaskar Bedapari,
Tel.: 8066782050, Fax: 8066783366

Subject: Environment Clearance for second stage expansion of Bengaluru International Airport, Bengaluru, Karnataka by M/s Bengaluru International Airport Ltd. - Reg.

This has reference to your letter No. BIAL/02/2014 dated 07.02.2014 seeking Environmental Clearance under the Environment Impact Assessment Notification, 2006. The proposal has been appraised as per prescribed procedure in the light of provisions under the Environment Impact Assessment Notification, 2006 and its subsequent amendments on the basis of the mandatory documents enclosed with the application viz., the Form-I, EIA, EMP, Public Hearing proceedings and the additional clarifications furnished in response to the observations of the Expert Appraisal Committee constituted by the competent authority in its meeting held on 21st - 22nd March, 2014.

2. The Bengaluru International Airport Limited (BIAL) proposes to expand Airport operations to cater to 55 MPPA by 2029-2030 along with the required airport infrastructural facilities and non-aeronautical developments including supporting ancillary projects required for International Airport operations. Earlier in July 2011, Ministry had approved the first stage expansion enhancing the passenger handling capacity from 11.4 MPPA to 17.3 MPPA. The Stage-I expansion has been completed in December 2013. To accommodate the future traffic growth which is forecast to reach the level of 55 MPPA by 2030, this 2nd stage expansion project has been envisaged.

3. The proposed expansion project will be developed within the existing airport site area. No additional land acquisition is involved as all the proposed aeronautical / non-aeronautical infrastructure facilities are planned within the existing airport site area of 1622 ha (4009 acres). Aeronautical Zone (airside) is spread on total site area of around 1213 ha (2998 acres) accounting for approximately 75% of total area of BIAL. Aeronautical is planned to provide all required aviation operational infrastructure to enable ultimate passenger

1



capacity of approximately 55 million and about 1 million tonnes of cargo handling per annum. The airside development will include construction of new passenger terminal along with new second runway, taxiways, aprons & aircraft parking, all aviation facilities & structures etc. Non aeronautical zone (city-side) covers approximately 409 ha (1011 acres) accounting for approximately 25% of total area of BIAL. The non aeronautical development will include aviation/ non-aviation commercial development, hospitality, entertainment, health care, business park, institutional, recreation & commercial facilities, convention centre including creation of new and expanded road network, drainage, utility provisions, parking infrastructure along with development of open/green areas, landscape etc. The proposed non-aeronautical development will support and complement the aviation operations. The total water requirement of BIAL by 2030 is 53.25 MLD based on the demand forecasts. This will be mainly met by recycling of treated water and rain water harvesting. Fresh water demand will be about 20 MLD, required in phases. Estimated power requirement is 320.57MVA by 2029-30 and will be supplied by BESCOM in phases. For back-up power approx. 10.9 MVA DG is also planned for emergency operational requirements. As presented by PP, presently well connected sewage collection & treatment system exist in BIAL. The future sewage generation is estimated to be 26.42MLD. New STP Plants based on state-of-the-art technology (MBR, MBBR, SBR) would be installed for sewage treatment in phases as required. Estimated quantity of solid waste generation from airside and city side facilities would be about 59.65 TPD and 122.62 TPD respectively by 2030. With the proposed expansion on aeronautical and non-aeronautical zones, total direct & indirect employment generation potential is about Rs. 2.24 lakhs. The overall project cost is around Rs. 14,867 crores.

4. The project was examined by the EAC in its meeting held on 18th -20th January, 2011 and finalized ToR including conduct of Public Hearing. Public Hearing conducted on 13.01.2012 at BIAL site, Bengaluru. Major issue is employment to the local public.

3. The Expert Appraisal Committee, after due consideration of the relevant documents submitted by the project proponent and additional clarifications furnished in response to its observations, have recommended for the grant of Environmental Clearance for the project. Accordingly, the Ministry hereby accords necessary Environment Clearance for the above project as per the provisions of Environment Impact Assessment Notification, 2006 and its subsequent amendments, subject to strict compliance of the terms and conditions as follows:

6. SPECIFIC CONDITIONS:

- (i) The "Consent to Establish" shall be obtained from State Pollution Control Board under Air and Water Act. A copy shall be submitted to the Ministry before start of any construction work at the site.
- (ii) Clearance shall be obtained from Central Ground Water Board for the ground water drawal as applicable.
- (iii) The material for filling and construction shall be sourced from approved quarry only.



- (iv) The treated wastewater shall be recycled for green belt, cooling system, flushing etc.
- (v) Green belt shall be developed as committed.
- (vi) Rainwater harvesting shall be provided as committed with well planned.
- (vii) CSR activities viz. Medical schemes, education, infrastructure facilities shall be carried out as committed.
- (viii) All the recommendations of the EMP/DMP shall be complied with in letter and spirit. All the mitigation measures submitted in the EIA report shall be prepared in a matrix format and the compliance for each mitigation plan shall be submitted to MoEF&CC along with half yearly compliance report to MoEF&CC-RO.
- (ix) The responses/commitments made during public hearing shall be complied with in letter and spirit.
- (x) The solid waste generated shall be properly collected, segregated and disposed as per the provision of Solid Waste (Management and Handling) Rules, 2000 and modified from time to time.
- (xi) Installation and operation of DG sets shall comply with the guidelines of CPCB.
- (xii) Construction spoils, including bituminous material and other hazardous materials, must not be allowed to contaminate watercourses and the dump sites for such material must be secured so that they should not leach into the ground water.
- (xiii) Any hazardous waste generated during construction phase, should be disposed off as per applicable rules and norms with necessary approval of the SPCB.
- (xiv) Noise should be controlled to ensure that it does not exceed the prescribed standards. During night time the noise levels measured at the boundary shall be restricted to the permissible levels to comply with the prevalent regulations.
- (xv) The new construction shall follow ECBC 2009 norms.
- (xvi) Energy conservation measures shall be taken up.
- (xvii) Parking provisions shall be provided as per National Building Code of India, 2005.
- (xviii) Water conservation fixtures shall be provided.
- (xix) The terminal building shall incorporate the features of local architecture in and around the area as well as take special



measures to highlight the Indian antiquity through a museum like corner depicting the same.

- (xx) Under the provisions of Environment (Protection) Act, 1986, legal action shall be initiated against the project proponent if it was found that construction of the project has been started without obtaining environmental clearance.
- (xxi) To reduce the generation of solid waste in the form of pet bottles, the PP shall provide drinking water at convenient places for the passengers and also at the cafeteria.
- (xxii) The project proponent will set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.

7. GENERAL CONDITIONS:-

- (i) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
- (ii) A First Aid Room will be provided in the project both during construction and operation of the project.
- (iii) All the topsoil excavated during construction activities should be stored for use in horticulture/landscape development within the project site.
- (iv) Disposal of muck during construction phase should not create any adverse effect on the neighbouring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.
- (v) The diesel generator sets to be used during construction phase should be low sulphur diesel type and should conform to Environment (Protection) Rules prescribed for air and noise emission standards. The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from Chief Controller of Explosives shall be taken.
- (vi) Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.
- (vii) Fly ash usage shall be explored as building material in the construction as per the provisions of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003.



- (viii) Ready mixed concrete must be used in building construction.
- (ix) Storm water control and its re-use as per COWB and BIS standards for various applications.
- (x) Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.
- (xi) Separation of grey and black water should be done by the use of dual plumbing line for separation of grey and black water.
- (xii) Use of glass may be reduced by upto 40% to reduce the electricity consumption and load on air-conditioning. If necessary, use high quality double glass with special reflective coating in windows.
- (xiii) Roof should meet prescriptive requirement as per Energy Conservation Building Code by using appropriate thermal insulation material to fulfill requirement.
- (xiv) Opaque wall should meet prescriptive requirement as per Energy Conservation Building Code which is proposed to be mandatory for all air-conditioned spaces while it is aspirational for non-air-conditioned spaces by use of appropriate thermal insulation material to fulfill requirement.
- (xv) The green belt of the adequate width and density preferably with local species along the periphery of the plot shall be raised so as to provide protection against particulates and noise.
- (xvi) Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.
- (xvii) The construction of the structures shall be undertaken as per the plans approved by the concerned local authorities/local administration, meticulously conforming to the existing local and central rules and regulations.
- (xviii) The construction material shall be obtained only from approved quarries. In case new quarries are to be opened, specific approvals from the competent authority shall be obtained in this regard.
- (xix) Adequate precautions shall be taken during transportation of the construction material so that it does not affect the environment adversely.
- (xx) Full support shall be extended to the officers of this Ministry/Regional Office by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.



- (xxc) A six-Monthly monitoring report shall need to be submitted by the project proponents to the Regional Office of this Ministry regarding the implementation of the stipulated conditions.
- (xxd) Ministry of Environment, Forests & Climate Change or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.
- (xxe) The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry.
- (xxf) In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment, Forests & Climate Change.
- (xxg) The project proponents shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.
- (xxh) A copy of the clearance letter shall be marked to concerned Panchayat/local NGO, if any, from whom any suggestion/representation has been made received while processing the proposal.
- (xxi) State pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industries Centre and Collector's Office/ Tehsildar's office for 30 days.

8. These stipulations would be enforced among others under the provisions of Water (Prevention and Control of Pollution) Act 1974, the Air (Prevention and Control of Pollution) Act 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification 2006, including the amendments and rules made thereafter.

9. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department, Forest Conservation Act, 1980 and Wildlife (Protection) Act, 1972 etc. shall be obtained, as applicable by project proponents from the respective competent authorities.

10. The project proponent shall advertise in at least two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental Clearance and copies of clearance letters are available with the State Pollution Control Board and may also be seen on the website of the Ministry of Environment, Forests & Climate Change at <http://www.envfor.nic.in>. The advertisement should be made within 10 days from the date of receipt of the Clearance letter and a copy of the same should be forwarded to the Regional office of this Ministry.




11. This Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.

12. Status of compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website.

13. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

14. The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.


(Lalit Kapur)
Director (IA-III)

Copy to:

- (1) The Secretary, Department of Environment, Government of Karnataka, Bangalore.
- (2) The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi - 110 032.
- (3) The Member Secretary, Karnataka State Pollution Control Board, "Parivara Bhavan, 4th & 5th Floor, # 49, Church Street, Bangalore-560 001.
- (4) The CCF, Regional Office, Ministry of Environment & Forests(S/Z), Kendriya Sadan, IVth floor, E&F wings, 17th Main Road, Koramangala II Block, Bangalore - 560 034.
- (5) IA - Division, Monitoring Cell, MOEF, New Delhi - 110003.
- (6) Guard file.

(Lalit Kapur)
Director (IA-III)

ANNEXURE-V (B)
COMPLAINT TO ENVIRONMENTAL CLEARANCE

EP/12.1/4/2014-15/Karnataka
GOVERNMENT OF INDIA
Ministry of Environment, Forests and Climate Change
(Regional Office, Southern Zone)
Bangalore-34

MONITORING REPORT
PART I

- | | | |
|----|---|---|
| 1. | Name of the projects | Second stage expansion of Bangalore International Airport by M/s. Bangalore International Airport Limited. |
| 2. | Clearance letter No. & date | No.10-24/2012 dated 22 nd August 2014. |
| 3. | Location: District & State / UT | Devanahalli Taluk, Bangalore North, Karnataka. |
| 4. | Address for correspondence: | Mr Premanand Shetti, Vice President (Projects)
M/s Bangalore International Airport Ltd.
Project Office, Kempegowda International Airport,
Bangalore-560030; Telephone: 080 – 66782818 Fax: 080 –
6678 3388 Cell: 9538882818
Email: premanand@bialairport.com |
| 5. | Date of site visit for this report | 3 rd August 2018 |
| 6. | Date of previous visit(s) if any | 11-01-2018 |
| 7. | Brief on the project along with the present status: | |

The site visit to Kempegowda International Airport was carried out along with Mr. Premanand Shetti, Vice President (Projects) and Lakshmi Narayanan, Vice President, Engineering and Maintenance (E&M) and other officers of the Project and E&M department of Bangalore International Airport Limited (BIAL).

The BIAL is a public limited company formed to build, own and operate Bangalore's Greenfield International Airport. The Airport was commissioned for the capacity of 11.4 Million Passenger Per Annum (MPPA) in May 2008.

1. Their first Environment Clearance (EC) from the Ministry of Environment, Forest and Climate Change (MoEFCC) was obtained vide Reference No. J-160011/97- 1A-III dated 27th August 2002 for setting up of this airport at Devanahalli in Bangalore. The major components in this clearance include: Runway, Terminal building, Taxi-way and other infrastructure facilities required for the airport operation. The total land area is 4,009 acres, of which 1,394.2 acres is

Forest land, for which MoEFCC has granted Forest Clearance for diversion of the Forest land under the provisions of Forest (Conservation) Act, 1980 vide Ministry's Letter No 8-66/96-FC, dated 19.08.2002.

2. Subsequently in order to enhance the passenger facilities and amenities, BIAL obtained another EC for improvisation/expansion of airport in 2007 vide MoEFCC Reference No. 10-157/2007-IA-III dated 6th May 2008. This expansion facility included Rapid exit taxi-ways, Aprons, Main access road, Taxi-ways, STP, Parking area etc.
3. Then, keeping in view of the increasing passenger growth at Bangalore International Airport (now Kempegowda International Airport), further expansion of Terminal building and associated facilities was implemented to enhance the passenger handling capacity from 11.4 MPPA to 17.2 MPPA by utilization of existing single runway, for which environmental clearance was granted by MoEFCC vide Letter No.J-16011/11/97/-IA-III dated 8th July 2011. This expansion activity mainly involves the expansion of Terminal building on East and West side & modifications; Construction of additional Apron area on the airside; Construction of new VVIP building on the west side of terminal building; Construction of new energy centre; Construction of new chiller-plant and utilities; Kerb side improvements on airside landside and roads and Terminal forecourt improvements.
4. After these three environmental clearances BIAL has obtained a fresh Environmental Clearance for their second stage expansion of the airport cleared by the MoEFCC vide Reference No.10-24/2012-IA III dated 22nd August 2014. This expansion is within the existing Airport area and the new aeronautical & non-aeronautical infrastructure facilities are planned within the existing airport area of 1622 ha (4009 acres). Aeronautical Zone (airside) is spread on total area of 1213 ha (2998 acres) accounting for approximately 75% of total area of BIA. Aeronautical is planned to provide all required aviation operational infrastructure to enable ultimate passenger capacity of 55 million and about 1 million tons of cargo handling per annum. The airside development will include construction of new passenger terminal along with new second runway, taxiways, aprons & aircraft parking, all aviation facilities & structures etc. Non aeronautical zone (city- side) covers approximately 409 ha (1011 acres) accounting for approximately 25% of total area. The non-aeronautical development include aviation/ non-aviation commercial development, hospitality, entertainment, health care, business park, institutional, recreation & commercial facilities, convention center including creation of new and expanded road network, drainage, utility provisions, parking infrastructure along with development of open green areas, landscape etc. The proposed non-aeronautical development will support and complement the aviation operations. The overall project cost is estimated to be around Rs.14, 867 crores.

During the visit to the Airport, it was observed that the construction of their second stage expansion project works were progressing in full swing and comprehensive on-site measures have been taken to protect the environment, workers' safety and occupational health. It was noted that the airport housekeeping and general maintenance is very good and efficient. The sewage water treatment facilities are noted to be state-of-art with primary, secondary and tertiary

treatment, to achieve zero- discharge. BIAL has established a full-fledged laboratory to test and measure the water quality parameters. The quality of treated water as seen from their daily recorded data is in conformity with prescribed CPCB/ SPCB standards. The treated water is fully recycled and reused for landscaping, greenery development and heating, ventilation and air conditioning purposes.

BIAL has a detailed Master plan to provide 1166 acres Green belt/ landscape of which green belt of 474 acres on Airside and Landscaping of 92 acres on Landside has been developed. Regarding their landscape development; it was informed that the airport was initially commissioned & operations started in 2008 with only 40 acres of landscape & horticulture and the area is increasing in line with their new development expansion activities, i.e. 75 acres in 2013 and presently increased to around 92 acres under landscaping activities.

BIAL authorities are also concentrating systematically on CSR activities and a separate department is working for this purpose through which they are promoting education (construction of school buildings, refurbishment of existing buildings and providing scholarships), health (Medical camps), sports, cultural heritage, rural development and water shed development activities in the surrounding airport areas. Under rural development programs, they have selected Uttara Kannada and Davangere districts and contributed towards the construction of bus shelters, supplying lab equipment's for engineering colleges, furniture for schools/ colleges and for setting up of computer training rooms.

Regarding the solid waste management, BIAL is generating around 15 tons of MSW from their operations. BIAL is systematically managing their waste and has already set benchmarks for other Indian airports. M/s MSGP Infra Pvt. Ltd a KSPCB and BBMP approved agency has been engaged for handling and disposal of MSW in a scientific way.

Now for the expansion project BIAL Management decided to establish its own state of art integrated solid waste management facility at the Airport as part of "Swachh Baharat" mission and engaged M/s Ekolog Pvt. Ltd. Poland for design, finance, built, own, operate and transfer (DFBOOT). During inspection officers of BIAL informed that the vendor is providing the world's best technology and it is expected to be commissioned by March 2019.

During the visit the BIAL also informed that the construction will be in accordance with ECBC criteria.

They have a fully functional Environment Management Cell consisting of officers from various disciplines to co-ordinate the activities concerned with the Environment management. This cell is the nodal agency to co-ordinate and provides the necessary services on Environmental issues. It interacts with MoEFCC, KSPCB and other regulatory agencies. Serious efforts and effective measures have been put in by BIAL in complying with all the clearance conditions of MoEFCC. BIAL is submitting the half-yearly compliance reports regularly to the Regional Office of the Ministry with all supporting documents.

They have obtained many awards and certifications for their best performance in the respective fields. Some of the recent ones are as follows:

1. GreenCo Platinum rating from CII Indian Green Building Council (IGBC) in the year 2016. GreenCo certification is a first of this kind rating system in the World, which attempts to certify a company as a whole on its environment friendliness and sustainability initiatives, instead of certifying a building or a part of its operation.
2. "Most Innovative" (top category) in GreenCo Best Practice Award – 2016 at 5th GreenCo Summit held at Hyderabad on 15th June 2016 and also bagged the "Most useful project presentation" award during the event as chosen by about 18+ participated companies through voting.
3. Airport Carbon Accreditation at Level 3+ i.e. Neutrality Level from Airport Council International in the year 2017.
4. "Energy Efficient Unit Award 2017" at 18th National Award for Excellence in Energy Management 2017 organized by CII from 30th Aug'17 to 1st Sept'2017 at Hyderabad.
5. BIAL has migrated to new version of the standard for ISO 9001:2015 and ISO 14001:2015 in 2016 and surveillance audit of two ISO standards i.e. OHSAS 18001:2007 & ISO 50001:2011 which were achieved earlier has been successfully renewed in 2016.

Overall for all their clearances BIAL is maintaining satisfactory compliances. The first three Environmental Clearances of 2002, 2008 and 2011 were monitored by this Regional Office (Bangalore) and found to be satisfactory in their compliance.

BIAL is planning for a new connectivity to the airport to decongest the traffic on existing NH-7 by constructing a tunnel from SH-104 for which they are seeking amendment in their EC dated 22nd August 2014 from MoEFCC. For applying for this amendment, BIAL vide its letter BIAL/MOEFCC/2018/002, dated 26th July 2018 has requested the Regional office to provide certified compliance report and thus this site visit was carried out on 3rd August 2014 to monitor the compliance status of the various conditions stipulated in the EC dated 22nd August 2014. The project authorities are complying with the conditions of the environmental clearance and their compliance status is rated as satisfactory. The detailed point wise compliance status for this project is given in this report.


(Dr U. Sridharan)
Scientist "SG"

PART-II

Status of compliance to the Environmental clearance issued by the Ministry of Environment, Forest and Climate Change for the Second stage expansion of Bangalore International Airport by M/s. Bangalore International Airport Limited issued vide Ref. Letter No.10-24/ 2012 - 1A III dated 22nd August 2014.

Compliance status in brief:

No	Specific Conditions	Compliance
1	The "Consent to Establish" shall be obtained from SPCB.	Complied
2	Clearance from C G W Board for the ground water drawl	Complied
3	Construction material be sourced from approved quarry only.	Complied
4	Wastewater be recycled for green belt, cooling, flushing etc.	Complied
5	Green belt shall be developed as committed.	Agreed to comply
6	Rainwater harvesting be provided as committed	Complied
7	CSR activities be carried out as committed.	Complied
8	Recommendations of the EMP/DMP shall be complied with	Agreed to comply
9	Commitments made during public hearing be complied with.	Agreed to comply
10	The solid waste generated shall be properly managed.	Complied
11	Installation and operation of DG sets comply with guidelines	Complied
12	Construction spoils must not contaminate watercourses.	Complied
13	Hazardous waste generated be disposed off as per rules.	Complied
14	Noise should be controlled to ensure prescribed standards.	Complied
15	The new construction shall follow ECBC 2009 norms.	Agreed to comply
16	Energy conservation measures shall be taken up.	Agreed to comply
17	Parking provisions shall be provided as per Building Code.	Agreed to comply
18	Water conservation fixtures shall be provided.	Agreed to comply
19	Incorporate the features of local architecture in and around.	Agreed to comply
20	No construction without obtaining Environmental Clearance.	Complied
21	Shall provide drinking water for passengers	Agreed to comply
22	Separate Environmental management cell for Implementation.	Complied
No	General Conditions	
1	Provision of infrastructure for workers.	Complied
2	Provision of First Aid Room in the project.	Complied
3	Topsoil be stored for use in horticulture.	Complied
4	Disposal of muck not to create any adverse effect.	Agreed to comply
5	Low Sulphur diesel type DGs should conform standards.	Complied
6	Vehicles hired are to be in good condition and pollution free.	Complied
7	Fly ash usage shall be explored as building material.	Agreed to comply
8	Ready mixed concrete must be used in building construction.	Agreed to comply
9	Storm water control and its re-use as per standards.	Agreed to comply
10	Water demand during construction should be reduced.	Agreed to comply
11	Separation of grey and black water should be done	Agreed to comply
12	Use of glass be reduced up to 40% to save electricity.	Agreed to comply

13	Roof should meet requirement of Conservation Building Code.	Agreed to comply
14	Opaque wall meet requirement of Energy Con. Building Code	Agreed to comply
15	Green belt of the adequate width and density be raised.	Agreed to comply
16	Traffic congestion near the entry and exit points be avoided.	Agreed to comply
17	Construction as per the plans approved by authorities.	Agreed to comply
18	Construction material be obtained from approved quarries.	Complied
19	Precautions during transportation of construction material.	Complied
20	Support be extended to the officers during inspection.	Complied
21	Six-Monthly reports submitted to the Ministry.	Complied

Part-III

A. Specific conditions:

1. *The "Consent to Establish" shall be obtained from State Pollution Control Board under Air and Water Act. A copy shall be submitted to the Ministry before start of any construction work at the site.*

The project authorities have obtained consent to establish from KSPCB for their second stage expansion on 19-8-2015 which is valid up to 18-08-2020 and a copy of the consent has been submitted to the regional office of the Ministry. The construction works for this expansion have started in January 2016.

2. *Clearance shall be obtained from Central Ground Water Board for the ground water drawl as applicable.*

The project authorities have agreed for this condition and informed that since currently no ground water is withdrawn; clearance from CGWB is not obtained. BIAL has constructed ground water recharge structures and rain water harvesting pond for rain water recharging in to ground and increasing the ground water table.

3. *The material for filling and construction shall be sourced from approved quarry only.*

It was informed that materials for filling and construction are procured from approved queries only. Mass balancing was carried out to ensure balance in cut and fill earthworks quantities, which ensured no additional earth needs to be brought from outside.

4. *The treated wastewater shall be recycled for green belt, cooling system, flushing etc.*

The project authorities have informed that at present they are generating about 0.75 MLD of sewerage in the airport which is treated in the existing 2 MLD Sewage Treatment Plant (STP). All the treated sewage is used for development of green belt; landscaping and heating, ventilation & air conditioning (HVAC) make up water.

In the second stage of expansion, the project authorities have proposed 9 MLD and 15.5 MLD STPs for airside and city side respectively. The treated water from these STPs will also be used for green belt development, landscaping and HVAC. It was informed that the black and grey water generated from the proposed Terminal-2 is also planned to be treated and used for external irrigation, toilet flushing and for HVAC makeup water.

5. Green belt shall be developed as committed.

BIAL has a detailed Master plan to provide 1166 acres Green belt/landscape of which green belt of 474 acres on Airside and Landscaping of 92 acres on Landside has been developed. Regarding their landscape development; it was informed that the airport was initially commissioned & operations started in 2008 with only 40 acres of landscape & horticulture and the area is increasing in line with their new development expansion activities, i.e. 75 acres in 2013 and presently increased to around 92 acres under landscaping activities. Further works of Landscaping and green belt development are in progress.

6. Rainwater harvesting shall be provided as committed with well planned.

As per the Master plan for Kempegowda International Airport the Rain Water Harvesting tanks are planned/ proposed at different locations to collect and store rain water from surrounding catchment areas. The total harvested rain water quantity from these proposed RWH tanks are estimated to be 2.87 MLD average based on bad monsoon and is planned to serve airside (i.e. RWH 1 to 5) and city side (i.e. 6 to 9) potable water requirements after adequate treatment at a water treatment plant.

7. CSR activities viz. Medical schemes, education, infrastructure facilities shall be carried out as committed.

BIAL has a separate CSR plan and dedicated team of officers to implement it as per their Corporate Policy "to be as role model for sustainable development". BIAL is concentrating on the community around the site and upgrading the physical infrastructure in government schools. Various activities carried out are broadly in the areas like providing emergency response services, housing for under privileged people, health and hygiene, education, community based programmes, empowerment and entrepreneurship development, arts music, sports and number of other social activities. Group community development approach is focused on – Physical infrastructure development, public health, education and promoting sports and number of other socio economic activities. The project authorities have provided the details of the works so far carried out and the total expenditure on CSR activities during the visit.

8. All the recommendations of the EMP/DMP shall be complied with in letter and spirit. All the mitigation measures submitted in the EIA report shall be prepared in a matrix format and the compliance for each mitigation plan shall be submitted to MoEF&CC along with half yearly compliance report to MoEF&CC RO.

The project authorities have assured that they will comply with the recommendations of the EIA & DMP. Currently design works for the Airside, Terminal and Landside are in full swing for expansion. It was informed that once the design works are finalized necessary actions will be taken to incorporate the EMP/DMP recommendations in their project.

9. *The responses/commitments made during public hearing shall be complied with in letter and spirit.*

It was informed that the BIAL has ensured that all the points mentioned in public hearing are adhered by giving employment to local villagers by organizing Udyoaga Melas. Under CSR activities BIAL has taken up Bettakote Lake development and rainwater harvesting pits in 300 homes around the airport.

10. *Solid waste generated shall be properly collected, segregated and disposed as per the provision of Solid Waste (Management and Handling) Rules, 2000 and modified from time to time.*

BIAL is generating around 15 tons /day of MSW from their operations and they are systematically managing their waste and have already set benchmarks for other Indian airports. M/s MSGP Infra Pvt. Ltd a KSPCB and BBMP approved agency has been engaged for handling and disposal of MSW in a scientific way. Now for the expansion project BIAL Management decided to establish its own integrated solid waste management facility at the airport as part of "Swachh Baharat" mission and engaged M/s Ekolog Pvt. Ltd. Poland for design, finance, built, own, operate and transfer (DFBOOT). During inspection officers of BIAL informed that the vendor is providing the world's best technology and it is expected to be commissioned by March 2019.

11. *Installation and operation of DG sets shall comply with the guidelines of KSPCB.*

The project authorities are complying with the guidelines for their existing DG sets. For their expansion also they are taking necessary precautions during the earthworks stage itself and for all the works carried out till now. Approvals from KSPCB as required have been taken. Regular monitoring of air and noise quality parameters is done and the reports submitted to the concerned regulatory authorities. Low sulphur diesel is used.

12. *Construction spoils, including bituminous material and other hazardous materials, must not be allowed to contaminate watercourses and the dump sites for such material must be secured so that they should not leach into the ground water.*

No hazardous wastes like construction spoils and bituminous materials are generated. The bitumen works are expected to start from December 2018 onwards and it was assured that necessary measures will be taken to ensure compliance to meet the above condition.

13. Any hazardous waste generated during construction phase, should be disposed off as per applicable rules and norms with necessary approval of the SPCB.

Hazardous wastes like waste oils, cotton wastes etc generated during construction are separated, segregated and disposed off as per the norms and with the approvals of KSPCB.

14. Noise should be controlled to ensure that it does not exceed the prescribed standards. During night time the noise levels measured at the boundary shall be restricted to the permissible levels to comply with the prevalent regulations.

Acoustic enclosures are provided to the DG sets, regular maintenance of heavy machines and earth movers is carried out. Regular monitoring is carried out to keep a vigil on the noise generated. Monitoring reports shows that the noise levels are within the prescribed limits.

15. The new construction shall follow ECBC 2009 norms.

It was informed that Terminal 2 design is based on ASHRAE 90.1 2010 energy standards which generally exceeds the requirements of ECBC 2009. The project is targeting at minimum of 5% energy cost savings. It was informed that from their energy model & Schematic design, it is predicted a energy savings of 7.1%.

16. Energy conservation measures shall be taken up

It was informed that energy saving strategies are already incorporated in their design which is expected to deliver a project that exceeds code when evaluated through a performance-based methodology.

17. Parking provisions shall be provided as per National Building Code of India, 2005.

The proposed building is planned to be compliant with NBC 2016 and is having provision for necessary parking facilities.

18. Water conservation fixtures shall be provided.

It was informed that in their expansion project they have made adequate provision for fixtures with low flow rates to reduce water consumption.

19. The terminal building shall incorporate the features of local architecture in and around the area as well as take special measures to highlight the Indian antiquity through a museum like corner depicting the same.

It was informed that the new Terminal 2 design is inspired by Karnataka Art and Culture and will have local Architectural design.

20. *Under the provisions of Environment (Protection) Act, 1986, legal action shall be initiated against the project proponent if it was found that construction of the project has been started without obtaining environmental clearance.*

Construction works have started in January 2016 only after obtaining environmental clearance from MoEFCC on 22nd Aug 2014 and Consent to Establish from KSPCB on 19th August 2015.

21. *To reduce the generation of solid waste in the form of pet bottles, the Project Proponent shall provide drinking water at convenient places for the passengers and also at the cafeteria.*

Drinking water provisions have been made at all the convenient places in the operational areas. In the construction site also arrangements have been made at different locations like cafeteria office premises etc.

22. *The project proponent will set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.*

BIAL has created an Environment Management Cell consisting of officers from various disciplines headed by the Vice President E&M of the airport to co-ordinate the activities concerned with the management and implementation of the environmental control measures. This cell is the nodal agency for coordinating and providing necessary services on environmental issues. The cell interacts with MoEFCC, KSPCB and other regulatory agencies.

B - General Conditions:

1. *Provision shall be made for the housing of construction labor within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.*

A separate housing colony in the form of a temporary structure has been provided in the construction site, which can accommodate 1000 number of labourers. Civic amenities such as RO plant for supply of safe drinking water, toilets, bath space, medical unit with doctor and medical attendant, ambulance, separate kitchen with dining hall, lighting arrangements, STP, shops, recreations ground etc. have been provided in the colony.

2. *A First Aid Room will be provided in the project both during construction and operation of the project.*

First aid facilities with a part time doctor and a full time male nurse have been provided at site.

3. *Topsoil excavated during construction activities should be stored for use in horticulture/landscape development within the project site.*

All the topsoil excavated is stored within the project site for use in horticulture/landscape development.

4. *Disposal of muck during construction phase should not create any adverse effect on the neighbouring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.*

Project authorities during the inspection have informed that dumping sites have been identified in the construction site and construction waste (muck) is being stored and disposed off at necessary intervals with the approval of the competent authority.

5. *The diesel generator sets to be used during construction phase should be low Sulphur diesel type and should conform to Environment (Protection) Rules prescribed for air and noise emission standards. The diesel required for operating DG sets shall be stored in underground tanks and if required, clearance from Chief Controller of Explosives shall be taken.*

Acoustic enclosures are provided to the DG sets and it was informed that regular monitoring is carried out to keep a vigil on the noise generated. Monitoring reports shows that the noise levels are within the prescribed limits.

6. *Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards and should be operated only during non-peak hours.*

Vehicles hired are in good condition and have PUC certificate confirming to the applicable air and noise emission standards.

7. *Fly ash usage shall be explored as building material in the construction as per the provisions of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003.*

The project authorities have assured compliance to this condition as applicable.

8. *Ready mixed concrete must be used in building construction.*

BIAL has informed that they establish ready mix concrete plants and will be using RMC only during construction.

- 9. Storm water control and its re-use as per CGWB and BIS standards for various applications.*

During the presentation BIAL authorities have explained about the design of the drainage system and informed that they will ensure that all the storm water will be collected properly and used for various purposes in the site.

- 10. Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.*

The project authorities have assured compliance once the concrete works commences.

- 11. Separation of grey and black water should be done by the use of dual plumbing line for separation of grey and black water.*

As per their plan in their expansion the Grey and Black water are separated inside the proposed Terminal - 2 and are planned to be sent to the proposed STP, where the grey/black water will be treated to the tertiary levels and the treated water will be used for landscape, HVAC makeup and flushing of toilets.

- 12. Use of glass may be reduced by upto 40% to reduce the electricity consumption and load on air-conditioning. If necessary, use high quality double glass with special reflective coating in windows.*

It was informed that the ratio of glass and opaque surface based on schematic design is less than 40%. At the end of schematic design, the energy model results show that the project has a predicted energy savings of 7.1% compared to ASHRAE 90.1 2010.

- 13. Roof should meet prescriptive requirement as per Conservation Building Code by using appropriate insulation material to fulfil requirement.*

The project authorities have assured compliance for this condition during construction.

- 14. Opaque wall should meet prescriptive requirement as per Energy Conservation Building Code which is proposed to be mandatory for all air-conditioned spaces while it is aspirational for non- air-conditioned spaces by use of appropriate thermal insulation material to fulfil requirement.*

It was informed that BIAL will comply with adequate energy requirement criteria based on a performance-based evaluation, rather than a prescriptive compliance path. In aggregate all energy saving strategies add up to energy savings that exceed code requirements, but some elements of the project may vary from baseline requirements to improve form and functionality. The design intent is to deliver a project that exceeds code provisions when evaluated through a performance-based methodology.

15. The green belt of the adequate width and density preferably with local species along the periphery of the plot shall be raised so as to provide protection against particulates and noise.

BIAL has a detailed Master plan to provide 1166 acres Green belt/landscape of which green belt of 474 acres on Airside and Landscaping of 92 acres on Landside has been developed. Regarding their landscape development, it was informed that the airport was initially commissioned & operations started in 2008 with only 40 acres of landscape & horticulture and the area is increasing in line with their new development expansion activities, i.e. 75 acres in 2013 and presently increased to around 92 acres under landscaping activities. Further works of Landscaping and green belt development are in progress.

16. Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.

In order to avoid the traffic congestion BIAL has developed an elaborate traffic management plan in which National and State highways passing by will be upgraded and interlinked. It was also informed that some of the local roads will also be upgraded and connected to the airport. A high speed metro connectivity is also planned. BIAL has a separate full-fledged team for managing traffic to avoid congestion.

17. The construction of the structures shall be undertaken as per the plans approved by the concerned local authorities/ local administration, meticulously conforming to the existing local and central rules & regulations.

The project authorities have assured compliance for this condition.

18. The construction material shall be obtained only from approved quarries. In case new quarries are to be opened, specific approvals from the competent authority shall be obtained in this regard.

It was informed that all the materials for filling and construction are procured from approved queries only. Mass balancing was carried out to ensure balance in cut and fill earthworks quantities which is ensuring them no additional earth needs to be brought from outside.

19. Adequate precautions shall be taken during transportation of the construction material so that it does not affect the environment adversely.

The project authorities are taking necessary care during transportation of construction material to avoid any adverse impact on environment. Dedicated access routes are provided for construction vehicle movement at site. Dust control measures like sprinkling of water on roads, watering of base surface before unloading of soil, use of covered vehicles for transport are implemented.

20. Full support shall be extended to the officers of this Ministry/ Regional Office by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities

BIAL has extended full support during the monitoring visit and provided all the necessary information on the mitigation measures and other environmental protection activities.

21. A six-Monthly monitoring report shall need to be submitted by the project proponents to the Regional Office of the Ministry regarding the implementation of the stipulated conditions

BIAL is complying with this condition and the reports are submitted regularly. The latest one submitted was in the month of March 2018.


(Dr U. Sridharan)
Scientist "SG"

**ANNEXURE-VI
CONSENT TO ESTABLISHMENT (CTE)**

☎ / Fax : 080-25586321
✉ / E-mail : ho@kspcb.gov.in
🌐 / Website : http://kspcb.gov.in



☎ 25581383, 25589112
25588151, 25588270
25588142, 25588520

**ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ
Karnataka State Pollution Control Board**

"ಪಾರ್ವಾಶ್ರಮ", 1 to 5th Floor, # 49, Church Street, Bengaluru - 560 001, Karnataka, India
"Parvashram", 1st to 5th Floor, # 49, Church Street, Bengaluru - 560 001, Karnataka, INDIA

H.D.Reg. No. 84516

dated 07.01.2015.

NO. PCB/

CON-GEN-52/12/ **H580**

DATED: **19 AUG 201**

/ BY REGD. POST WITH ACK. DUE /

(THIS ORDER CONTAINS 08 PAGES)

To

The Director - Finance,
M/s. Bangalore International Airport Ltd., (BIAL)
(M/s. Kempegowda International Airport)
Administration Block, Devanahalli,
Bengaluru-560 300.

Sir,

Sub: Consent for Establishment (CFE) to expand (2nd Stage) by enhancing the passenger handling capacity from 17.2 MPPA to 55 MPPA with development in Aeronautical and Non-aeronautical zones include construction of new passenger Terminals, Aircraft Stands, Cargo Terminal Buildings, new Parallel Runway, Aprons, Taxiways, Airfield Lighting Systems, ATF Storage, Road Network, Drainage, Utility Provisions, Parking Infrastructure etc., by M/s. Bangalore International Airport Ltd., (M/s. Kempegowda International Airport) - reg.

- Ref:**
1. E. C. No. F. No. 10-24/2012-1 All, dated 22.08.2014.
 2. Application for Consent for Establishment (CFE) received at Regional Office, KSPCB, Hoskote on 07.01.2015.
 3. Inspection of the proposed project site by Officer of the Regional Office, KSPCB, Hoskote on 09.03.2015.
 4. Proceedings of the consent committee meeting held on 13.05.2015;
 5. Board Office Memorandum No. 3954 dated 21.10.2013.
 6. This Office Memorandum No. 4834 dated 05.01.2015.
 7. Proceedings of the Technical Presentation of this office letter No. 2172 dated 14.07.2015.
 8. Proceedings of the consent committee meeting held on 17.07.2015.

◆◆◆◆

With reference to the above, it is to be informed that this Board hereby accords Consent for Establishment under the Water (Prevention & Control of Pollution) Act 1974 and Air (Prevention and Control of Pollution) Act, 1981.

Senior Environmental Officer

subject to the following conditions.

I. Environmental Aspects and Management during the course of construction:

- a) The applicant should cover the project site from all sides by raising sufficiently tall barricades with sheets to ensure that pollutants should not spill to the surroundings.
 - b) The applicant shall arrange services like housing facility, water supply, sewage facilities on a temporary basis at construction site and same shall be maintained without any adverse impact on the environment.
 - c) The applicant shall control the movement of vehicles carrying construction materials in order to avoid noise pollution in the surrounding.
 - d) The applicant shall not start the construction of the project without obtaining Environmental Clearance (E.C.)
 - e) The applicant shall leave clear buffer zone towards any lake and Naia as per the RCDP-2015 of BDA norms.
 - f) The applicant shall comply with action plan given w.r.t proceeding of the Technical Presentation held on 29.06.2015.
1. This consent for establishment shall be valid for a period of Five years from the date of issue of this Order.
 2. The applicant shall not take expansion/diversification without the prior consent of the Board.
 3. The applicant shall obtain necessary licence/clearance from their relevant agencies before taking up construction.
 4. The applicant shall maintain utilities including STP for a minimum period of five years.
 5. The applicant shall obtain Environmental Clearance before applying for consent for operation.
 6. The applicant shall use treated sewage for secondary purposes including construction.
 7. This CFE is issued only from the point of water pollution control only and does not have any relevance over land dispute, any pending cases with any Departments/Hon'ble Courts.
 8. Sewage Treatment Plant (STP) and Organic Waste Converter (OWC) shall be provided and operated satisfactorily by the project proponent himself before it is handed over to Association/Company.

II. WATER CONSUMPTION:

1. The project authorities shall use BVSSB tertiary treated water for construction works.
2. The water consumption shall not exceed 22 KLD. There shall not be drawal of ground water without obtaining permission from CGWA.


Senior Environmental Officer.

III. WATER POLLUTION CONTROL:

1. The quantity of sewage shall not exceed 18 KLD and shall be treated in the sewage treatment plant (STP) of capacity 25 MLD is proposed and existing STP of capacity 2 MLD with the treatment scheme as submitted in the STP proposal to meet the standards stipulated below before utilizing for Urban Reuse viz., landscape irrigation, vehicle washing, toilet flushing building construction use in fire protection and commercial air conditioners. STP shall be constructed on modular basis to cater to phase-wise development.

Sl.No	Parameter	Standards
1	pH	6-9
2	BOD ₅ mg/l	≤ 10
3	Turbidity, NTU	≤ 2
4	E.coli	None

2. Applicant shall add appropriate disinfectant to treated sewage to ensure some residual chlorine, preferably in the range of 1 mg/l. to 3 mg/l.
3. If the treatment plant do not achieve the effluent standards stipulated under conditions (1) above or if it is found to be inadequate, then the applicant shall have to modify the units so as to meet the standards with prior consent of the Board.
4. All the treatment units shall be made impervious and there shall not be any discharge of sewage outside the premises.
5. The applicant shall provide separate energy meter to liquid waste treatment plant and STP and also shall provide flow meters as per Water Cess Act, 1977. A log book of readings shall be maintained.
6. The applicant should make provisions for dual piping system to use the treated sewage water for toilet flushing, gardening and other purposes.
7. The applicant shall dispose excess treated sewage i.e. left after using for secondary purposes, to authorized BWSSB transporters for discharge into nearby BWSSB STP. The applicant shall maintain log book and vehicle details in this regard.

IV. AIR POLLUTION CONTROL:

1. The type of emissions, rate of emissions, tolerance limits, stack heights and the air pollution control equipment for the air pollution control sources to be installed shall be as specified in Annexure-I.
2. The discharge of emissions from the air pollution sources shall pass through the stacks/chimneys mentioned in Annexure-I where from the Board shall be free to collect the samples at any time in accordance with the provisions of the Act and Rules made there under.


 Senior Environmental Officer.

3. The stacks shall have port holes and platforms as per the guidelines specified in Annexure-II to facilitate monitoring of emissions.
4. The applicant shall upgrade/modify/replace the control equipments if they are found inadequate to meet the standards stipulated. Prior permission of the Board shall be obtained for the same.
5. The applicant during construction shall ensure that the ambient air quality in its premises shall conform to the National Ambient Air Quality Standards specified in Environment (Protection) Rules, 1986.
6. The applicant shall comply with the Environment (Protection) Third Amendment Rules, 2002.
7. The applicant shall provide acoustic measures to the DG Sets as per Sl. No. 94 in Schedule-I of Environment (Protection) Rules.

V. NOISE POLLUTION CONTROL:

1. The applicant shall ensure that the ambient noise levels and ambient air quality within its premises during construction and after construction shall not exceed the limits specified in the Environment (Protection) Rules, i.e. 65 dB(A) Leq during day time and 55 dB(A) Leq during night time during and after construction.
2. The applicant shall maintain the ambient noise standards as prescribed below during construction and after construction.

Category of Area/Zone	Limits in dB(A) Leq.	
	Day Time	Night Time
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Silence Zone	50	40

VI. SOLID WASTE & HAZARDOUS WASTE DISPOSAL:

1. The applicant shall collect, treat and dispose off all solid waste generated during construction i.e. Muck, and Garbage after construction if any in such manner so as not to cause environmental pollution.
2. The applicant shall apply and obtain authorization for management & handling of waste oil under Hazardous Waste (Management & Handling) Rules 1989.
3. The applicant shall convert the garbage into compost by providing organic converter.
4. The applicant shall comply with the action plan given under the letter dated 06.07.2015.


 Senior Environmental Officer,

VII. HEALTH & SAFETY:

1. The applicant shall provide all necessary healthcare facilities to workers and shall carry out routine health survey among workers.
2. The applicant shall provide all safety measures including personal protective equipments to workers during construction.

VIII. GENERAL :

1. The applicant shall adhere to the Zonal Regulations norms of competent authority.
2. The applicant shall comply with the provisions of Water (Prevention and Control of Pollution) Cess Act, 1977.
3. The applicant must create structure/storage facility for rain water harvesting and ground water recharge.
4. The applicant should make provisions for dual piping system to use the treated sewage water for toilet flushing, gardening and other purposes.
5. The applicant shall arrange for alternate power supply in the form of D.G.Set to run and operate the essential units of sewage treatment plant, in event of brake down of regular supply from Electricity Board.
6. The applicant shall implement the Environmental Management Plan during construction and after construction as given under EMP report.
7. The applicant shall not change or alter (a) building plan (b) the quality, quantity or rate of discharge/ emissions and (c) install/replace/alter the water or air pollution control measures without the prior approval of the Board.
8. The applicant shall immediately report to the Board of any accident or unforeseen act or event resulting in release or discharge of effluents or emissions or solid wastes etc., in excess of the standards stipulated, and the applicant shall immediately take appropriate corrective and preventive actions under intimation.
9. Exact date of commissioning of the sewage treatment plant shall be informed to this Board 45 days in advance so as to make necessary inspection of the plant and the pollution control measures provided by the applicant.
10. The applicant shall appoint a qualified Environmental Engineer/ Scientist for the Management of Environmental aspects and also establish Environmental Cell to oversee the operation of STP.
11. The Board reserves the right to review, impose additional condition or conditions, revoke, change or alter the terms and conditions.
12. This CFE does not give any right to the Party/Project Authority to forego any legal requirement, which is necessary for setting/operation of the project.


 Senior Environmental Officer

13. The application shall adopt Eco-sanitation system in the project.
14. The applicant is liable to reinstate or restore, damaged or destroyed elements of environment at his cost, failing which, the applicant/occupier as the case may be shall be liable to pay the entire cost of remediation or restoration and pay in advance an amount equal to the cost estimated by Competent Agency or Committee.
15. The project authorities shall dispose scientifically Bio-Medical waste and electronic waste to authorized common disposal facility and authorized recyclers respectively by entering into agreement.
16. The project authorities shall adopt green building concept.
17. The project authorities shall establish Environmental Cell during operation phase to comprehensively manage environment related issues.
18. Suitable local tree species shall be selected for greenery and minimum three rows of plant saplings shall be planted all along the periphery of the site.
19. The CFE is issued without prejudice to the Court case pending in any Hon'ble Court.

Please note that separate consents of the Board for discharge of liquid effluent and the emissions to the air shall have to be obtained by remitting prescribed consent fee. The application for consent has to be made 45 days in advance to the completion of construction work of Commercial complex. Issue of consent will be considered only after completion of Water pollution control measures, solid waste management facilities and installing air pollution control measures.

The receipt of this letter may please be acknowledged.

For and on behalf of
Karnataka State Pollution Control Board


Senior Environmental Officer

Note : Since the project attracts provisions of EIA Notification issued under the Environment (Protection) Act, 1986 the proponent is advised to obtain Environmental clearance from the competent authority i.e. State/Central Government. No construction work, preliminary or otherwise, relating to the construction of Commercial Complex shall be undertaken till the environmental clearance is obtained from the competent authority.

ANNEXURE-VII CONSENT TO OPERATE

Consent For Operation (CFO-Air,Water) Consent No. AWA-301756 Valid upto: 30/09/2021	Karnataka State Pollution Control Board Pollution Management Dept., 1st floor Airport, Bangalore-560001 Tel: 1-888-3559111/3, 25981163 Fax: 080-2598221 Email: kspcb@kspcb.gov.in
Industry/Category: R&D Industry Scale: LARGE	
This document contains 05 pages including annexure & including additional documents	

Combined Consent Order No. **AWA-301756** PCB ID: **10638** Date: **20/12/2018**

Consent to operate for discharge of effluents under the Water (Prevention and Control of Pollution) Act, 1974 and emission under the Air (Prevention and Control of Pollution) Act, 1981.

- Ref: 1. Application filed by the applicant organization on 08/08/2018
 2. Inspection of the industry/organization by PCB on 08/08/2018
 3. Proceedings of the CCM dated 03/12/2018 held on 20/11/2018

Consent is hereby granted to the Occupier under Section 22(4) of the Water (Prevention & Control of Pollution) Act, 1974 & Section 21 of the Air (Prevention & Control of Pollution) Act, 1981, (herein referred to as the Air Act) and the Rules and Orders made there under, and authorized the Occupier to operate (carry out) industry/activity & to make discharge of the effluents & emissions conforming to the stipulated standards from the premises mentioned below and subject to the terms and conditions as detailed in the Schedule Annexed to this order.

Location:

Name of the Industry: **Bangalore International Airport Ltd.**
 Address: **6th Devarahalli, Devarahalli Taluk**
 Industrial Area: **Itar in LA, Devarahalli,**
 Taluk: **Devarahalli, District: Bangalore Rural**

Conditions:

A) Discharge of effluents under the Water Act:

Sr.	Water Code	WQ/CLL	WQ/GK/ID	Remarks
1.	Surface Effluents	1411/00	1311/00	The effluent must be treated in TP of capacity 2 MLD

B) Discharge of Air emissions under the Air Act from the following stacks etc.

Sl. No. Description of chimney/stack Limits specified refer schedule
 The details of devices, control equipments and its specification, type of fuel, pollutants to be controlled or emissions etc. are detailed in Annexure-E.

The consent for operation is granted considering the following activities/products:

Sr.	Product Name	Applied Qty./Months	Unit
1.	Airport activities	1	YR/ANN

This consent is valid for the period from: **08/08/2018** to **30/09/2021**

For and on behalf of the
Karnataka State Pollution Control Board




H G NIMANKRISHNA

To:
Bangalore International Airport Ltd.

COPY TO:

1. The Environmental Officer, KSPCB, Regional Office: Mysuru for information and advisory action.
2. Master Register.
3. Copy/Gc.

	Consent For Operation (CFO-Air/Water)	Karnataka State Pollution Control Board Pollution Division, No. 41, Church Street, Bengaluru-560002 Tel: 080-227091200, 22881203 Fax: 080-22286321 email id: kspcb@kspcb.gov.in
	Consent No: AWH-301765 Valid upto: 2026/09/21	
Industry Colour: RED Industry Scale: LARGE		
(This consent number 6 pages including annexes & excluding additional conditions)		

I. Consent Fee paid (Rs. 40000)

SCHEDULE

TERMS AND CONDITIONS

A. TREATMENT AND DISPOSAL OF EFFLUENTS UNDER THE WATER ACT.

1. The discharge from the premises of the occupier shall pass through the terminal manhole/sump/bores where from the Board shall be free to collect samples in accordance with the provisions of the Act/Rules made there under.
- 2(a). The sewage/domestic effluent shall be treated in septic tank and with soak pit. No overflow from the soak pit is allowed. The septic tank and soak pit shall be as per IS 2470 Part-I & Part-II.
- 2(b). The treated sewage effluent discharged shall conform to the standards specified in Annexure-I.
- 3(a). The trade effluent generated in the industry shall be treated in the ETP and treated effluent shall conform to the standards stipulated by the Board in Annexure-I.
- 3(b). The trade effluent shall be handed over to CETP and maintain logbook of effluent generated & sent every day.
4. The applicant shall install flow measuring/recording devices to record the discharge quantity and maintain the record.
5. The applicant shall not change or alter either the quality or the quantity or the place of discharge or temperature or the point of discharge without the previous consent/permission of the Board.
6. The applicant shall not allow the discharge from the other premises to mix with the discharge from his premises. Storm water shall not be allowed to mix with the effluents on the upstream of the terminal manhole where the flow measuring device are installed.
7. The daily quantity of domestic effluent and trade effluent from the industry shall not exceed the limits as indicated in this consent order.
8. The applicant shall discharge the effluents only to the place mentioned in the Consent order and discharge of treated/untreated outside the premises is not permitted.

B. EMISSIONS:

1. The discharge of emissions from the premises of the applicant shall pass through the air pollution control equipment and discharged through stacks/chimneys mentioned in Annexure-II where from the Board shall be free to collect the samples at any time in accordance with the provisions of the Act and Rules made there under. The tolerance limits of the constituents forming the emissions in each of the stacks shall not exceed the limits laid down in Annexure-II.
2. The applicant shall provide port holes for sampling of emission, access platforms for carrying out stack sampling, electrical points and all other necessary arrangements including ladder as indicated in Annexure-II.
3. The applicant shall upgrade/modify/replace the control equipment with prior permission of the Board.

C. WATER CESS:

1. The applicant shall provide water meter at all the intake points as specified under Section (5) of the Water Cess Act, 1977 and shall file the Water Cess returns regularly before fifth of every month and also pay the Cess associated with the rates stipulated.

D. MONITORING & REPORTING:

1. The applicant shall get the samples of effluents & emissions collected and get them analyzed once a month/quarter by a board-recognised laboratory or through EP approved laboratories for the parameters as indicated in Annexure I & II.
2. The applicant shall maintain log books to reflect the working condition of pollution control systems and also self monitoring results and keep it open for inspection.

 <p>Consent For Operation (CFO-Air/Water)</p> <p>Consent No. AWP-301730 Valid upto: 30/06/2021</p> <p>Industry Code: RED Industry Scale: LARGE</p>	<p>Karnataka State Pollution Control Board Pollution Museum, No. 48, Church Street, Bangalore-560001 Tele: 080-22291123, 25581385 Fax: 080-25586373 email id: kspcb@kspcb.gov.in</p>
<p>(This document contains A pages including annexure & excluding additional conditions)</p>	

E. SOLID WASTE (OTHER THAN HAZARDOUS WASTE) DISPOSAL:

1. The applicant shall segregate solid waste from Hazardous Waste, Municipal Solid Waste and store it properly till transport/disposal without causing pollution to the surrounding Environment.
2. The solid waste generated shall be handled & disposed by scientific method without causing eye sore to the general public and to the surrounding environment.

F. NOISE POLLUTION CONTROL:


1. The industry shall ensure that the ambient noise levels within its premises shall not exceed the limits i.e 75 dB(A) Leq during day time and 70 dB(A) Leq during night time as specified in under the Air (Prevention and Control of Pollution) Act, 1981.

G. HAZARDOUS WASTES (MANAGEMENT, HANDLING & TRANSBOUNDARY MOVEMENT) 2006:

The applicant shall comply with the provisions of the Hazardous Waste (Management, Handling & Transboundary Movement) Rules 2006.

H. GENERAL CONDITIONS:

1. The applicant shall not allow the discharge from the other premises to mix with the discharge from his premises.
2. The applicant shall promptly comply with all orders and instructions issued by the Board, from time to time or any other officers of the Board duly authorized in this behalf.
3. The applicant shall set up Environmental Cell comprising of qualified and competent personnel for complying with the conditions specified.
4. The Board reserves the right to review, impose additional conditions, revoke, change or alter terms and conditions of this consent.
5. The applicant shall forthwith keep the Board informed of any accidental discharge of emissions/effluents into the atmosphere in excess of the standards laid down by the Board. The applicant shall also take corrective steps to mitigate the impact.
6. The applicant shall provide alternative power supply sufficient to operate all Pollution control equipments.
7. The entire premises shall always be kept clean. The effluent holding area, inspection chambers, canals, flow measuring points should made easily approachable.
8. The applicant shall display the consent granted as a prominent placard for perusal of the inspecting officers of the Board.
9. The applicant his heirs, legal representatives or assignee shall have no claims what so ever to the continuation or renewal of this consent after expiry of the validity of consent.
10. The applicant shall make an application for consent for subsequent period at least 45 days before expiry of this consent.
11. The applicant shall develop and maintain adequate green belt all around the periphery.
12. The applicant shall provide rain water harvesting system and shall provide proper storm water management system.
13. This consent is issued without prejudice to any Court Case pending in any Hon'ble Court.
14. The applicant shall furnish the Environmental statement for every financial year ending with 31st March in Form-V as per Environment (Protection) Rules, 1986. The statement shall be furnished before the end of September.
15. The applicant shall display flow diagram of the pollution control systems near the pollution control systems.

	Consent For Operation (CFO-Air,Water)	Karnataka State Pollution Control Board Parliament Building, No.49, Church Street, Bangalore-560001 Tele : 080-25589120, 25581203 Fax: 080-25593311 email: kspcb@kspcb.gov.in
	Consent No. AWH-381750 Valid upto: 31/06/2021	
Industry Category: RSD Industry Scale: LARGE		
(This document contains 8 pages including annexure & excluding additional conditions)		

NOTE:

The following Conditions A] 2a, 3a & 3b] mentioned in the schedule are not applicable.

Additional Conditions:

For and on behalf of the
Karnataka State Pollution Control Board



B. G. MOHANKRISHNA

Note: All efforts should be made to remove colour and unpleasant odour as far as practicable.

Sl. No.	Chimney attached to	Capacity/ KVA Rating	Minimum chimney height to be provided above ground level (in Mts)	Constituents to be controlled in the exhaust	Tolerance limits mg/NM3	Fuel	Air pollution Control equipment to be installed, in addition to chimney height in per cent.	Steps of which air pollution control equipments shall be provided to achieve the stipulated tolerance limits and chimney heights conforming to stipulated heights.
1	D.G. Sets	250 KVA-2 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
2	D.G. Sets	1.2 KVA-1 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
3	D.G. Sets	2.1 KVA-1 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
4	D.G. Sets	8 KVA-1 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
5	D.G. Sets	15 KVA-1 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
6	D.G. Sets	50 KVA-1 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
7	D.G. Sets	125 KVA-2 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
8	D.G. Sets	500 KVA-2 No.		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC	Before commissioning.
9	D.G. Sets	200 KVA-1 No.		5 PM(mg/NM3),SO2 (PPM),NOx(PPM)	0.0,0	DIE	DUS,HDC,P RT	Before commissioning.
10	D.G. Sets	62.7 KVA-2 Nos		3 PM(mg/NM3),SO2 (PPM),NOx(PPM)	46,12,18	DIE	DUS,HDC,P RT	Before commissioning.
11	D.G. Sets	725 KVA-1 No.		24 PM(mg/NM3),SO2 (PPM),NOx(PPM)	54,14,20	DIE	DUS,HDC,P RT	Before commissioning.
12	D.G. Sets	1010 KVA-1 No.		24 PM(mg/NM3),SO2 (PPM),NOx(PPM)	35,12,15	DIE	DUS,HDC,P RT	Before commissioning.
13	D.G. Sets	1000 KVA-10 nos		11 PM(mg/NM3),SO2 (PPM),NOx(PPM)	39,9,13	DIE	DUS,HDC,P RT	Before commissioning.
14	D.G. Sets	450 KVA-2 Nos.		4 PM(mg/NM3),SO2 (PPM),NOx(PPM)	37,11,14	DIE	DUS,HDC,P RT	Before commissioning.

Note:
DUS,HDC - Dust Collector
C
DUS,HDC - Dust Collector
C/PRT

- Note:
- The Noise level within the premises shall not exceed 75 dB (A) eq during day time and 70 dB(A) eq during night time respectively.
 - The DG set shall be provided with acoustic enclosures as per CI No.29 in Schedule-I of Environmental Protection Rules.
 - There shall be no smell or colour nuisance from the industry.



**Consent For Operation
(CFO-Air,Water)**

Consent No: AWP-301750
Valid upto: 30/09/2021

Industry Colour: RED Industry Size: LARGE

Karnataka State Pollution Control Board
Pollution Bhavan, No.45, Chandra
Street, Bengaluru-560011
Tele : 080-25589110, 25591203
Fax:080-25586333
email id: kspcb@kspcb.gov.in

(This document contains 6 pages including annexure & excluding additional conditions)

LOCATION OF SAMPLING PORTHOLES, PLATFORMS, ELECTRICAL OUTLET.

1. Location of Portholes and approach platform:-

Portholes shall be provided for all chimneys, stacks and other sources of emission. These shall serve as the sampling points. The sampling point should be located at a distance equal to atleast eight times the stack or duct diameter downstream and two diameters upstream from source of low disturbance such as a Bend, Expansion, Constriction Valve, Fitting or Visible Flame for rectangular stacks, the equivalent diameter can be calculated from the following equation.

$$\text{Equivalent Diameter} = \frac{2(\text{Length} \times \text{Width})}{(\text{Length} + \text{Width})}$$

2. The diameter of the sampling port should not be less than 100 mm dia". Arrangements should be made so that the porthole is closed firmly during the non-sampling period.
3. An easily accessible platform to accommodate 3 to 4 persons to conveniently monitor the stack emission from the portholes shall be provided. Arrangements for an Electric Outlet Point of 230 V 15 A with suitable switch control and 3 Pin Plug shall be provided at the Porthole location.
4. The ladder shall be provided with adequate safety features so as to approach the monitoring location with ease.

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Annexure-A

Ms. Bangalore International Airport Limited, Devanahalli, Bangalore-560308.

1. The consent is granted considering the Operation of Bangalore International Airport at Devanahalli.
2. This Consent is issued for the period from 01.07.2016 to 30.06.2021.
3. Consent fees : Rs. 20,00,000/- under both Water Act & Air Act through RTGS No. ICICR52016063000838522, dated: 30.06.2016 against the CI of Rs. 1714.00 Crores for 5 years.

A. TREATMENT AND DISPOSAL OF EFFLUENTS UNDER THE WATER ACT.

Sl. no.	Description	Permitted Quantity of discharge	Place of discharge
1	Airport	1200 KLD	The combined trade & sewage effluent generated shall be treated in the TP of capacity 2 MLD and utilized for secondary uses i.e. air conditioning, cooling, fire fighting, gardening within the airport premises.
2	Cargo complex	400 KLD	
3	Land side airline office building	20 KLD	
4	Air side airline office building	17 KLD	
5	House effluent generated from Vehicle washings within the airport area	20 KLD	
6	The applicant shall treat the combined trade & sewage effluent generated in the treatment plant of capacity 2 MLD and utilized for secondary uses i.e. air conditioning, cooling, fire fighting, gardening within the airport premises.		
7	The STP which consists of Raw Sewage Collection Tank, Fine Screen Chamber, Mechanical Oil Separator, Aeration Tank, Secondary Clarifier, Clarifier Water Tank, Sludge Thickener, Centrifuge House, Sludge Drying Beds, Pressure Sand & Carbon Filter, Chlorine dosing tank.		
8	There shall not be any bypass or discharge of effluents either within or outside the factory premises under any circumstances.		
9	The applicant shall install integrated flow measuring/recording devices on the sewage line. A record of daily sewage discharge shall be maintained.		
10	The applicant shall take suitable steps so that there will be reduction of the fresh water consumption as well as wastewater generation from the industry.		


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B. EMISSIONS


9. The applicant shall provide control equipments for the control of emissions. The rate of emissions discharged and the tolerance limits of the constituents forming the emissions in each of the stacks shall not exceed the limits laid down as below:

Sl. No.	Chimney Attached to	Minimum Chimney Height to be Provided	Constituents to be controlled in the emission.	Tolerance limits Mg/NSM ³	Air Pollution Control equipment to be installed, in addition to Chimney height as per Col (5)	Date of which air pollution Control equipments shall be provided to achieve the stipulated tolerance limits and chimney heights conforming to stipulated heights.
1-5	1500 KVA DG Set-5 No's	10.67 m AGL each	SO ₂ NO _x SMHC (as C) PM CO	-- 360 100 75 150	With acoustic enclosure	At All Time
6-8	450 KVA DG Set-3 No's	5.88 m AGL each	SO ₂	--	With acoustic enclosure	At All Time
9	1000 KVA DG Set	22 m AGL	SO ₂ SMHC (as C) PM CO	-- 360 100 75 150	With acoustic enclosure	At All Time
10	725 KVA DG Set	24 m AGL	SO ₂	--	With acoustic enclosure	At All Time
11	62.5 KVA DG Set	3m AGL	SO ₂	--	With acoustic enclosure	At All Time
12	200 KVA DG Set (Raker section)	5m AGL	SO ₂	--	With acoustic enclosure	At All Time

K. W.
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15	500 KVA DG Set-2 No's	Mobile DG Set	SO ₂	--	--	At All Time
16	125 KVA DG Set-2 No's	Mobile DG Set	SO ₂	--	--	At All Time
17	50 KVA DG Set	Mobile DG Set	SO ₂	--	--	At All Time
18	15 KVA DG Set	Mobile DG Set	SO ₂	--	--	At All Time
19	5 KVA DG Set	Mobile DG Set	SO ₂	--	--	At All Time
20	2.1 KVA DG Set	Mobile DG Set	SO ₂	--	--	At All Time
21	1.2 KVA DG Set	Mobile DG Set	SO ₂	--	--	At All Time
22	47.7 KVA DG Set 0.3020 Village	5m ARI	SO ₂	--	With acoustic enclosure	At All Time
23	500 KVA DG Set-2 No's	5m ARI	SO ₂ NO _x TSP/PM CO	-- 100 100 75 150	With acoustic enclosure	At All Time
24	250 KVA DG Set-2 No's	5m ARI	SO ₂	--	With acoustic enclosure	At All Time

10. The emission for the source where limits for pollutants is prescribed shall be monitored once or 6 months.
11. The Airport Authority shall establish continuous Ambient Air Quality & Ambient Noise monitoring station in the premises with display board of real time data.
12. If there is going to be any new Air pollution sources in future, the project authorities shall apply and obtain consent for establishment for the same from the Board.


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C. GENERAL CONDITIONS:

13. The solid waste generated shall be collected at each place in polythene bags & stored at dump yard concrete platforms and handed over to Board authorized agency for scientific treatment and disposal. The applicant shall put all efforts to ensure that the solid waste shall be collected and processed in-house and disposed scientifically. A report on the action taken shall be submitted within 15 days.
14. The applicant shall comply with the terms and conditions stipulated in Hazardous waste authorization which is valid upto 30/06/2024.
15. The industry shall ensure that the ambient air quality in its premises shall conform to the National Ambient Air Quality Standards specified in Environment (Protection) Rules, 1986.
16. The applicant shall provide necessary acoustic enclosures or measures to control noise levels generated from the DC Set as per Environment (Protection) Rules, 1986.

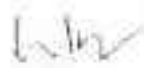


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ANNEXURE - I

Effluent Characteristics

Sl. No.	Characteristics	Tolerance Limits
1	pH	6-10
2	Biochemical Oxygen Demand (mg/l, max. 15 days at 20°C/Max)	10
3	Suspended Solids (mg/l, Max)	10
4	Oil and Grease (mg/l)	10
5	Turbidity, NTU	≤ 2
6	Lead	Nil
7	Residual Chlorine (mg/l)	≥ 1



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ANNEXURE-VI
SITE PHOTOGRAPHS – SHOWING THE AREA OF EASTERN TUNNEL
CONNECTIVITY



Pre- Feasibility Report

ADDITION OF EASTERN CONNECTIVITY TUNNEL AT
KEMPEGOWDA INTERNATIONAL AIRPORT,
Devanahalli, Bengaluru, Karnataka



September, 2018

Bangalore International Airport Limited,
Kempegowda International Airport, Devanahalli, Bengaluru - 560 300

Preface

The Government of India (GOI) as part of its policy to encourage private sector participation in the development of airport infrastructure and Government of Karnataka (GOK) as part of its policy to encourage and provide aviation, industrial development, tourism, cargo movement has granted its approval for the development of a Greenfield airport, with private sector participation at Devanahalli, located about 40 km north of the city center of Bengaluru.

Bangalore International Airport Limited (BIAL) has been established for the development, design, financing, construction, completion, maintenance, operation and management of Kempegowda International airport (KIA) (formely known as Bengaluru International Airport). KIA has been identified as a key project influencing rapid socio economic development of the Bangalore and its region.

BIAL; as a joint venture between private and public sectors has Karnataka State Industrial Investment & Development Corporation Limited (KSIIIDC) and Airport Authority of India (AAI) as Public sector partners.

BIAL has entered into a Concession Agreement with Government of India on July 5,2004 to develop Green field BIA in accordance with the master plan for carrying out Airport aeronautical and non-aeronautical airport activities & activities reasonably ancillary or incidental to these activities and the following :

- a) Implementing the Project;
- b) Developing, constructing, building, owning, operating, and maintaining the Airport;
- c) Designing, building, owning, operating and maintaining the utilities, services and facilities required for operating and maintaining the Airport;
- d) Designing, building, owning, operating, maintaining and using office, management, administration facilities including all infrastructure required for such facilities and canteen facilities;
- e) Extraction of ground water and harvesting of rain water for BIAL's requirements;
- f) Developing a greenbelt on the site as specified in the Master plan; and
- g) Developing and landscaping the site;

BIAL successfully started Kempegowda International Airport (KIA) operations on May 24, 2008. The total airport plot size is about 4,009 acres (or 1,622 ha). The initial development included a passenger terminal building (Terminal T1), a runway, entrance/ exit taxiways, Rapid Exit

taxiways, an isolation bay, an airside road system, access roads, along with other ancillary developments to cater the 11.40 Million Passengers Per Annum (MPPA).

Subsequently to cater the increasing demand, BIAL has taken Environmental Clearance in 2011 to enhance its capacity to handle 17.20 MPPA (with feasibility to handle up to 20 MPPA).

BIAL now intends to expand Bengaluru International Airport operations to cater 55 MPPA by 2029 - 2030 along with the required airport activities & non aeronautical airport activities and supporting ancillary projects required for International Airport operation. Based on the overall master plan, future extension of the airport facilities, e.g. airfields, operational areas, landside facilities etc shall be developed in stage to facilitate future expansion.

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1.0 **EXECUTIVE SUMMARY**

1.1 **Project Background**

The Bengaluru International Airport is planned to meet the growing aviation needs of the city and its surrounding region through development of a passenger friendly and efficient airport. Located east of the Bengaluru-Hyderabad national highway (NH-7), the airport is 37 km away from Bengaluru and 4 km south of Devanahalli. KIA was the fourth busiest airport in 2010-11 in the country in terms of overall passenger traffic of 11.63 million and fifth busiest in terms of international passenger traffic.

Bangalore International Airport Limited (BIAL) is the owner, developer and operator of Kempegowda international airport located at Devanahalli, Bengaluru, Karnataka. It is a public limited company and is a consortium of FIH Mauritius Investments Ltd, Simens project ventures GmbH, Government of Karnataka & Government of India.

Currently, KIA has a single terminal building which serves both domestic as well as international passengers. The airport has handled about 2, 00,000 metric tonnes of cargo in the year 2010-11. As per updated KIA Master Plan, Kempegowda international airport is expected to cater passenger traffic of 55 millions and 1.0 million metric tonnage of cargo by 2029-30.

Kempegowda International Airport, was commissioned in May 2008. The site was selected by Ramanathan Committee, appointed by Government of India. The committee suggested that the location, south of Devanahalli was best suited for airport development and accordingly GOI gave its approval for the KIA project at Devanahalli site. Subsequently, Ministry of Civil Aviation approved setting up of the airport of international standards at Bengaluru in February 2000.

The existing airport facilities were designed for air passenger capacity of 11.40 MPPA and cargo handling capacity of 350,000 Metric Tonnes Per Annum (MTPA). The KIA's airport expansion programme has been initiated in 2010 with expansion of existing terminal building and associated facilities to enhance the capacity and operational efficiency of the airport and to increase the passenger handling capacity from existing 11.40 MPPA to 17.20 MPPA (with flexibility of serving upto 20 MPPA). The construction of additional apron area on the airside; construction of new VVIP building on the west side of terminal building; construction of new energy center; construction of new chiller plant and utilities; Kerb side improvements on airside, landside and roads; and Terminal forecourt improvements is under progress.

MoEF granted environment clearance for expansion activities of the airport including enhancing the passenger handling capacity from 11.40 MPPA to 17.20 MPPA (flexible upto 20MPPA) with letter no. F. NO.J-16011/11/971A.III. dated July 08th 2011.

1.2 The Project

The objective of proposed KIA Airport development is to cater 55 million annual passengers and 1 million metric tonnage of cargo by 2029-30. This will include development in airside and land side area of airport, which will support the ultimate capacity.

BIAL's vision is to develop a world-class airport that will serve as a gateway to the southern India, create a hub of activity for the community in Bengaluru and set new standards for the aviation industry in India. As the proposed project is an expansion project, and is planned at the existing airport site without any new acquisition of land, alternate site(s) has not been considered.

Two National Highways (NH 7 and NH 207) and two state Highways (SH 35 and SH104) pass through the region in addition to broad gauge Railway line from Bengaluru to Kolar via Devanahalli. The existing NH-7 in this portion has 6-lane carriageway and the access road to airport is of 4 lanes configuration. The junction on the NH 7 is designed as a Trumpet interchange.

1.3 Project Proposal

Bangalore International Airport Limited (BIAL) is the owner, developer and operator of Kempegowda international airport located at Devanahalli, Bengaluru, Karnataka. It is a public limited company and is a consortium of FIH Mauritius Investments Ltd, Simens project ventures GmbH, Government of Karnataka & Government of India.

Bangalore International Airport Limited (BIAL) plans to initiate next stage of airport expansion, comprising aeronautical area development such as construction of a second runway, second Terminal (T2), other ancillary and supporting aeronautical uses along with Non aeronautical area development including commercial and infrastructure support facilities for the airport to meet its eventual Master Plan targets.

The proposed expansion project will be developed within the existing airport site area. As the site of Bangalore International Airport is well outside the Bangalore Urban Agglomeration and away from ecologically sensitive areas, it is ideally located for planning and implementing aviation

and non aviation developments on par with international aviation hubs. The key factors arising from the airport site appraisal are:

- No additional land acquisition is involved as all the expansion activities are planned within the KIA airport site area of 1622 Ha itself.
- The Airport site is well connected with the Bangalore city and neighborhood by a well developed highway infrastructure and road network.
- The site offers excellent opportunities for developing hospitality, business, logistic parks etc.
- The airport site offers large parcels of land for establishment of state-of-art aviation and non aviation infrastructure development.
- The airport development shall generate large scale employment for the city and its region.

The primary land area distribution at KIA and the details of the proposed additional features to the existing airport facility are as follows:

Sr. No.	Zone	Area in Ha	Area in Acres	Percentage (%)
1	Total Airside/ Aeronautical zone	1213	2998	74.79
2	Total Cityside/ Non-Aeronautical Zone	409	1011	25.21
	Grand Total	1622	4009	100

The major components planned under the proposed development include passenger and cargo terminal buildings, 2nd runway, aprons, taxiways, airfield, lighting system, NAVAIDs, utilities and infrastructure including roads, car parking, power supply system, fuel farm, airport fire service, aircraft maintenance facilities, new roads, car parking, maintenance, GSE Workshop, administrative building and security facilities, storm water drainage system, sewage treatment plant, commercial facilities, etc.

Around the world, airports have been expanding their facilities to include retail outlets, office spaces and other commercial developments. Encompassing all these non-aviation facilities Bengaluru International Airport aims at setting a benchmark for the development of future airports in India. KIA Master Plan ensures that the size and capacity of the airport's facilities are in line with passenger traffic forecast and projected cargo growth. KIA Master Plan is prepared in line with ICAO standards and recommendations, IATA guidelines and AAI requirements.

KIA is proposed to be developed on the concept of playing a leading role in economic development of the southern India by providing increased scheduled services for business, provide increasing choice and opportunities for leisure travel by residents within the airport catchment area, reducing the need for passenger to make surface journeys outside the airport area, act as gateway for tourist visiting south India and Karnataka in general, and to provide both business and leisure travel opportunities.

A. Aeronautical Zone (Airside area)

KIA Aeronautical Zone is spread on total site area of approx 2998 Acres (1213 Ha.) accounting for approximately 75% of total area of KIA. Aeronautical Zone is planned to provide all required aviation operational infrastructure to enable ultimate passenger capacity of approx. 55 million and about 1 million tonnes of Cargo handling per year.

The proposed new Terminal (T2), along with new second runway, taxiways, aprons & aircraft parking, all aviation facilities & structures shall be part of the Aeronautical Zone, and shall be suitably integrated with existing aeronautical development.

This Zone is high security area, with restricted entry controlled by BCAS and monitored by CISF, with controlled access through specific entrance gates. A large part of this zone shall be green and reserved as no development zone, as per the height restrictions and safety conditions required in airside area.

Proposed cargo warehouse, cargo offices, logistics and freight business facilities along with associated trade centers, administrative offices shall be located in the said part of Aeronautical Zone. Direct external road access to the proposed cargo and MRO facility area of aeronautical zone of the eastern edge of the site shall be provided from State Highway - 104 (SH-104) with a link to NH-7 & NH-209.

B. Non Aeronautical Zone

Along with expansion of terminal, airside and other airport facilities and in view of the growing demand, airport's proposed Non Aeronautical development shall complement overall airport development. The Non Aeronautical development shall include aviation and non-aviation commercial development, creation of new and expanded road network, drainage, utility provisions, parking infrastructure along with development of open / green areas, landscape etc. Non Aeronautical development shall also include uses like hospitality, entertainment, health care,

Business Park, institutional, recreation & commercial facilities, convention center, etc. The proposed Non Aeronautical development will support and complement the aviation operations.

KIA Non Aeronautical zone shall be environmentally compatible and resource efficient throughout its life-cycle with an objective to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving productivity
- Reducing waste, pollution and environmental degradation

Eastern Connectivity Tunnel

Kempegowda International Airport (KIA) proposes addition of a 4-lane tunnel to cater as an alternative access to the Terminal Forecourt from the Eastern part of the city. Connecting the under-construction Secondary Access Road (SAR) and the new Eastern Connectivity Road being constructed by the PWD on the Eastern Boundary of KIAB from KSRDCL road, this proposed tunnel is about 2.5 km long with approach road of about 1.28 km and passes under the aprons and the cross taxiway of the proposed Airside development. This section describes the factors which influence site selection for the proposed development, infrastructure and utilities available, water requirement and power requirement etc.

1.4 Need for the Project and its Importance to the Country

Airports play an eminent role in the economic development of a region, as well as the nation as a whole. Airports facilitate fast movement of man and materials, thereby fostering trade and commerce.

With increased economic activity and employment, consumer behavior changes, raising the standard of living of the people in the region. Thus, the availability of airports provides a thrust to the GDP of the local region, having a positively impact on the national economy. Airports offer increased accessibility, which in turn fuels the tourism sector. With an increase in the number of visitors and airport users, more money flows into the local economy.

Today, India is the ninth largest aviation market in the world and at the current rate of growth, it is expected that the country would be third largest after the United States and China in 2020 or so. The year 2009-2010 has seen a robust growth in terms of aircraft movement and passengers handled. The growth rate has been 3.4% in respect of aircraft movement, and 13.8% in respect of overall passenger movement in comparison to the year 2008-2009.

Bengaluru has experienced rapid growth in passenger volumes, and will continue to realize significant growth over the next 20 year period. Continued robust growth in the region and broader Indian economy are expected to be the primary drivers of domestic air travel at Bengaluru. Also, the historical and architecturally rich cultural heritage of Karnataka, Southern India and of the surrounding region of Bengaluru attracts international visitors throughout the year.

The Traffic forecast for KIA suggests 55 MPPA by 2029-30. It is therefore essential that airport expansion is planned and implemented to meet this demand, to serve the passengers and also the economy.

1.5 Employment Generation

KIA supports employment generation. KIA forecasts significant growth in employment due to proposed development, and with special reference to wider economic impact this will have on region as a whole.

Currently KIA has air traffic volume of 11.63 MPPA, and this is served by approximately 13,000 personnel, in a ratio of approx. 1100 employee for 1 million annual passengers. Based on this, for 55 MPPA the projected workforce requirement is expected around 60,000. Employment potential in non-aeronautical development and ancillary facilities is expected to be approx. 1.75 lakhs persons.

The total direct and indirect employment including induced employment is about 2, 50,275. There is likely to be a substantial requirement for skilled, semi-skilled personnel to helm with the growth at KIA.

1.6 Water Requirement - Demand & Supply

The total water requirement of BIAL by 2030 is 52.80 MLD based on the demand forecasts. The requirement of fresh water is 28.08 MLD and that of reclaimed water is 24.72 MLD. At present BIAL is getting 1.1 MLD of potable water from BWSSB and 1.0 MLD tertiary treated water from tertiary STP at Yelhanka.

BIAL has already got the confirmation from BWSSB for supply of 9 MLD of fresh water.

1.7 Power Requirement

The total power requirement for KIA by 2030 is projected to be 325 MVA. The power shall be supplied by Bangalore Electricity Supply Company (BESCOM).

1.8 Sewerage System

The presently well connected sewage collection system exists in BIAL premises which carry sewage to existing STP of 2.0 MLD design capacity. The STP uses extended aeration (EA) process to treat the sewage. The tertiary treated sewage with chlorination is used for HVAC and irrigation. The future sewage generation is estimated to be 33.30 MLD. New STP Plants, with technology to recycle waste water (MBR, MBBR, SBR) shall be installed for sewerage treatment.

1.9 Storm Water Drainage

Presently BIAL has implemented a comprehensive storm water drainage system. Storm water drains have been constructed all along the runway area, on the airside and landside area in pervious and non-pervious area. The entire KIA site area can be divided into 5 major drainage zones using contour map based on topographical survey. No wastewater will be discharged outside the airport site area.

1.10 Project Cost

The cost of proposed expansion program at KIA including development of aeronautical, non - aeronautical and ancillary facilities is estimated at INR 15531.00 crores.

1. Introduction to Project

1.1. Background

Airports play a significant role in globalization, connecting cities and countries. Airports are a major part of a country's infrastructure and foster economic activities by encouraging international commerce and tourism and generating employment.

Bengaluru is the principal administrative, cultural, commercial, industrial, and knowledge capital of the state of Karnataka. Greater Bengaluru, an area of 741 square kilometers agglomerating the city, neighboring municipal councils and outgrowths, was 'notified' in December 2006. With the growth in IT and ITES industries, Bengaluru houses numerous leading commercial and educational

institutions, and industries like textiles, aviation, space, biotechnology, etc. As an immediate consequence of this growth in the last decade, apart from creating a ripple effect in the local economy, there has also been great pressure on infrastructure, transportation.

In order to keep pace with the rapid development of Bengaluru as India's leader in information technology, biotechnology and the services industry, Government of Karnataka and Airports Authority of India initiated the Greenfield project. Bengaluru International Airport Limited (BIAL) is a Public Limited company under the Indian Companies Act, formed to build, own and operate the largest Greenfield private sector-owned and operated airport in India.

The Bengaluru International Airport is envisioned to meet the growing aviation needs of the city and its region through the development of a passenger friendly and efficient airport. Located east of the Bengaluru-Hyderabad national highway (NH-7), the airport is 37 km away from Bengaluru and 4 km south of Devanahalli. For the year 2010-11, KIA has been reported to be the fourth busiest airport in the country in terms of overall passenger traffic of 11.63 million and fifth busiest in terms of international passenger traffic.

Currently, KIA has a single terminal building which serves both domestic as well as international passengers. The airport has handled about 2, 00,000 metric tonnes of cargo in the year 2010-11. As per KIA updated Master Plan, Bengaluru International Airport is expected to cater passenger traffic of 55 millions and 1.0 million metric tonnage of cargo by 2029-30.

Bengaluru International Airport, located approximately 37 km to the north of Bengaluru, was commissioned in May 2008. The site was selected by Ramanathan Committee, appointed by Government of India. The committee suggested that the location, south of Devanahalli was best suited for airport development and accordingly GOI gave its approval for the KIA project at Devanahalli site. Subsequently, Ministry of Civil Aviation approved in principle for setting up of the airport of international standards at Bengaluru in February 2000.

The existing airport facilities were designed for air passenger capacity of 11.40 MPPA and cargo handling capacity of 350,000 Metric Tonnes Per Annum (MTPA). At present, the facilities include a terminal building for both domestic and international passengers, a runway of about 4000m length, 1 parallel taxiway including 3 rapid exit taxiways, 42 aircraft stands and 8 passenger boarding bridges including 1 double arm aerobridge, a 4 lane divided main access road, 2 lane undivided secondary access road and an airside service road, about 2000 car parks, various auxiliary buildings, a fuel farm, 3 major general / express cargo warehouses and 2 flight kitchens.

The KIA's airport expansion programme has been initiated in 2010 with expansion of existing terminal building and associated facilities to enhance the capacity and operational efficiency of the airport and to increase the passenger handling capacity from existing 11.40 MPPA to 17.20 MPPA (with flexibility of serving upto 20 mppa). The construction of additional apron area on the airside; construction of new VVIP building on the west side of terminal building; construction of new energy center; construction of new chiller plant and utilities; Kerb side improvements on airside, landside and roads; and Terminal forecourt improvements are under progress.

Statutory Clearances received for the existing airport are given below:

1. Letter from MoEF vide letter no J-16011/11/97-IA-III dated 27th August, 2002 to KSIIDC sanctioning environmental clearance
2. Letter from KSPCB No. CFE-CELL/BIAPL/EIA-47/2003-2004/1193 dated 29th August, 2003 to BIAL granting approval for the storm water Management plan and Environmental Management Plan
3. Letter from KSPCB No. CFE-CELL/BIAPL/2005-2006/330 dated 2nd May, 2005 to BIAL further extending the clearance to include "noise pollution" also
4. Letter from KSPCB No. CFE-CELL-BIAL/EIA-47/2007-09/109 dated 16th June, 2007 to BIAL giving consent for modification of the STP and DG sets; and Letter from MoEF No. 10-157/2007-IA-III dated 6th May, 2008 according environmental clearance for the improvisation/expansion of the facilities like taxiways, apron, STP etc.
5. Letter from MoEF No F. NO.J-16011/11/971A.III. dated July 08th 2011 according Environment Clearance for expansion activities of the airport including enhancing the passenger handling capacity from 11.40 MPPA to 17.20 MPPA (flexible upto 20MPPA). . The main components of this expansion programme include the following which would be completed by 2013:

- Expansion of existing passenger terminal;
- Construction of additional apron area on the airside west of existing apron;
- Construction of new VVIP building on the west side of terminal building;
- Construction of new energy center;
- Construction of new chiller plant and utilities;
- Kerb side improvements on airside, landside and roads; and
- Terminal forecourt improvements

2. Project Profile/Development

2.1. Project Proponent

Bangalore International Airport Limited (BIAL) is the owner, developer and operator of Bengaluru International Airport located at Devanahalli, Bengaluru, Karnataka. It is a public limited company and is a consortium of Fairfax Financial, Siemens, and Government of Karnataka & Government of India.

BIAL's vision is to develop a world-class airport that will serve as a gateway to the southern India, create a hub of activity for the Bengaluru community and set new standards for the aviation industry in India.

Bengaluru International Airport is an international airport serving as gateway to South India and city of Bengaluru. The airport handled about 11.63 million passengers and had air traffic movements (ATM) of about 350 per day in the year 2011. The airport is expected to handle 55 million passengers by year 2030. Presently, the airport is host to 10 domestic airlines and 21 international airlines connecting the city to about 50 destinations across India and rest of the world. For the financial year 2010-11, KIA was the fourth busiest airport in the country in terms of overall passenger traffic and fifth busiest in terms of international passenger traffic.

It has been awarded "India's best airport" for the year 2011 by the survey conducted by Skytrax. With new routes being introduced at an increasing pace, KIA is poised to become an important aviation hub for the South of India. Winning the Routes Asia Airport Marketing Award in 2009 reflect these sustained efforts of BIAL. BIAL has also received the following certificates/commendations for its operational excellence:

- ISO 14001:2004 certification for its efforts towards a greener airport and city;
- ISO 27001 certification for Information Security Management System Standards;
- Best Emerging Airport - Indian Sub-continent award by Emerging Markets Airports Awards (EMAA) hosted by the acclaimed Airport Expo, Dub;
- Platinum certification from IATA for becoming the first airport in India to be
- 100% Bar Coded Boarding Passes (BCBP) compliant; and
- Awarded the CNBC Awaaz Travel Award 2010 for the 'Best Managed Airport'.

2.2. Project Proposal

Bangalore International Airport Limited (BIAL) plans to initiate next stage of airport development, comprising aeronautical development such as construction of a second runway, second Terminal (T2), other ancillary & supporting aeronautical infrastructure and Non aeronautical development including commercial and infrastructure support facilities for the airport to meet its eventual Master Plan targets.

The proposed development is aimed to enhance the operational efficiency of the airport and to increase the passenger handling capacity to 55 MPPA, along with other allied facilities/development on the cityside.

The major components planned under the proposed development include passenger and cargo terminal buildings, runway system, aprons, taxiways, airfield lighting system, NAVAIDs, utilities and infrastructure including roads, car parking, power supply system, storm water drainage system, sewage treatment plant, commercial, etc.

The overall plan is planned to be developed, & implemented in phases, managed, and operated to internationally recognized standards. The design and development of high quality facilities will provide the users with a high level of service, positive working environment, a safe environment, advanced technologies, long life cycles, and excellent performance.

The proposed development at KIA shall be a symbol of national and regional manifest, which demonstrates the nation's status, its economic health, and sense of welcome in the quest for excellence and competitiveness in air transportation.

The airport is ultimately designed with a level of service adequate to satisfy a 55 million passenger's demand by creating second runway in southern part of airport in conjunction with the airfield facilities and other supporting infrastructure.

A. Aeronautical Zone (Airside area)

KIA Aeronautical Zone is proposed on total site area of approx 2998 Acres (1213 Ha.) accounting for approximately 75% of total area of KIA. Aeronautical Zone is planned to provide all required aviation operational infrastructure to enable ultimate passenger capacity of approx. 55 million and about 1 million tonnes of Cargo handling per year.

Proposed Aeronautical Zone shall be inclusive of, but not limited to; Runways, Taxiways, Aprons, Terminals (inclusive of all required uses, sub uses within it including retail &

commercial inside terminals), Hangars, Security Offices & installations , Fire Station, Water Storage & Pumping facilities, Power Sub- stations, Septic Tanks/STPs, Offices (for Radar, ATC, Airline, Airport, IT, banks, etc and all supporting/reserved services), NAVAIDs, Aircraft Maintenance Workshops, Mechanical Workshops, Vehicle Maintenance Workshops , GSE - Ground Service Depots and parking, ULD Parking Areas, Vehicle Parking, Internal roads, Security Gates, Airline Support Offices & Warehouses, Transport Workshops, Staff Canteens & Kitchens, Cargo Terminals, Offices & Warehouses, Flight Kitchens , VIP Lounges, MET Offices, Aircraft maintenance, MRO & other related uses, etc.

This Zone is high security area, with restricted entry controlled by BCAS and monitored by CISF, with controlled access through specific entrance gates. A large part of this zone shall be green and reserved as no development zone, as per the height restrictions and safety conditions required in airside area.

Aviation businesses like Cargo & MRO facilities are proposed in Aeronautical Zone of KIA (airside area) on the extreme eastern part of airport site area. These facilities shall have dedicated apron area/ aircraft stand and shall have direct internal airfield connectivity for aircraft movement.

Proposed cargo warehouse, cargo offices, logistics and freight business facilities along with associated trade centers, administrative offices shall be located in the said part of Aeronautical Zone. Direct external road access to the proposed cargo and MRO facility area of aeronautical zone of the eastern edge of the site shall be provided from State Highway - 104 (SH-104) with a link to NH-7 & NH-209.

B. Non Aeronautical Zone

Along with expansion of terminal, airside and other airport facilities and in view of the growing demand, airport's Non Aeronautical development is being proposed to complement overall airport development. The Non Aeronautical development shall include aviation and non-aviation commercial development, creation of new and expanded road network, drainage, utility provisions, parking infrastructure along with development of open / green areas, landscape etc. Non Aeronautical development shall also include uses like hospitality, entertainment, health care, business park institutional, recreation, commercial, convention center, etc. The proposed Non Aeronautical development will support and complement the aviation operations.

2.3. Need for the Project and its Importance to the Country

Airports play an eminent role in the economic development of a region, as well as the nation as a whole. Airports facilitate fast movement of man and materials, thereby fostering trade and commerce.

Airports offer increased accessibility, which in turn fuels the tourism sector. With an increase in the number of visitors and airport users, more money flows into the local economy.

With increased economic activity and employment, consumer behavior changes, raising the standard of living of the people in the region. Thus, the availability of airports provides a thrust to the GDP of the local region, having a positively impact on the national economy.

Today, India is the ninth largest aviation market in the world and at the current rate of growth, it is expected that the country would be third after the United States and China by 2020 or so. The year 2009-2010 has seen a robust growth in terms of aircraft movement and passengers handled. The growth rate has been 3.4% in respect of aircraft movement, and 13.8% in respect of overall passenger movement in comparison to the year 2008-2009.

In the last decade, domestic air traffic has quadrupled from 13 million to 52 million and international traffic more than tripled to 38 million. The rapidly expanding aviation sector handles 2.5 billion passengers across the world in a year; moves 45 million tonnes of cargo through 920 airlines, using 4,200 airports and deploys 27,000 aircraft. Today, 87 foreign airlines fly to and from India and five Indian carriers fly to and from 40 countries.

Passengers carried by domestic airlines during Jan-Nov 2011 were 55.03 million as against 46.81 million during the corresponding period of previous year thereby registering a growth of 17.6 per cent, according to data released by Directorate General Civil Aviation (DGCA).

Bengaluru has experienced rapid growth in passenger volumes, and will continue to realize significant growth over the 20 year period. Continued robust growth in the region and broader Indian economy are expected to be the primary drivers of domestic air travel at Bengaluru. Also, the historical and architecturally rich cultural heritage of Karnataka, Southern India and of the surrounding region of Bengaluru attracts international visitors throughout the year. The ruins of Hampi being a UNESCO world Heritage site, forms major tourist attraction leading to the development of various organized and unorganized businesses relying on tourism. Because of the presence of the natural, historical, cultural, contemporary tourism attractions in the

region, Bengaluru becomes the preferred destination/ origin for various tourism circuits in South India.

Bangalore is known as the silicon valley of India and is a major biotechnology hub in the country. Many business commentators have stated time and again that international airport facilities for Bangalore are essential for its continuing success in both commercial areas and in the tourist industry.

Bengaluru city also acts as a magnet to international investments in the fields of IT, services, research, bio-technology, aviation, automotive engineering, etc. Globally all aviation nodes/hubs serve and function as commercial districts, particularly for Convention, Offices, Conferences, Meetings, etc. The best examples in this regard are Schipol Amsterdam, Incheon Seoul, etc. This provides a unique opportunity for KIA to serve as a trade, business, services and hospitality hub for Bengaluru and its region.

The aviation activity forecasts of annual passengers, air cargo, and air transport movements (ATM) for the Bengaluru Airport are shown in Table 2-1. Bengaluru has a large population base, a diverse and a high value added economy from which to stimulate air travel. It is assumed that Bengaluru's economy will at a minimum, mirror and potentially exceed the economic growth of India as a whole over the forecast period.

In summary, passenger traffic at KIA is projected to increase from 9.9 million annual passengers in 2009-10 to 55 million annual passengers in 2029-30.

Summary; Aviation Activity Forecasts, BIAL

	2009-10 E	2015-16	2022-23	2025-26	2029-30
		(20 mppa)	(35 mppa)	(45 mppa)	(55 mppa)
Annual					
Total Passenger	9,987,838	19,471,000	36,030,600	43,928,000	55,540,300
Total Cargo (metric Tonnes)	170,900	367,000	657,840	790,340	975,700
Total ATMs	105,194	197,136	359,170	436,056	549,120

Source: Technical Memorandum - Aviation Activity Forecast, Landrum & Brown, August 2010

Due to the fast and previously unforeseen growth of air traffic at KIA in the last few years it was necessary to review the air traffic forecast. The review concluded that the actual growth was even higher than anticipated in the most optimistic forecasts from previous efforts. This growth not only requires an expansion of the airside infrastructure capacity (i.e second runway), but more immensely requires a new terminal.

Growth from the emerging markets, most notably India and China (i.e. the two major economies exhibiting positive growth during the global recessionary phase), is likely to drive demand for air transportation in the Asia- Pacific region. Boeing research notes that Asia, in particular India and China, which accounted for 5 percent of world GDP and operated 5 percent of the global commercial airplane fleet in 1970, had grown to 17 percent of world GDP. According to growth projections, the region is expected to represent a quarter of global GDP by 2012 and to operate 24 percent of the world's commercial fleet.

The Indian aviation industry is one of the fastest growing civil aviation industries in the world. With the liberalization of the Indian aerospace sector, the industry has evolved from a predominantly Government-owned industry to one with a growing number of privately owned airlines, low-cost carriers and international carriers that have increased flight routes to and from India. Private airlines account for 75 percent share of the domestic aerospace market.

The new large aircraft's physical and operational characteristics will dictate the design of future airports and their facilities. As the characteristics of the aircraft increase, an airport's ARC may have to be increased to the next higher level. The introduction of NLA, for many airports, will involve significant modifications to accommodate the size and weight of the new aircraft. Introduction of NLA will significantly affect the design of airport including airside and landside development.

Need of Non Aeronautical development

Bengaluru holds a certain panache and allure embodied by its cosmopolitan lifestyles and as the cluster of IT industries. KIA, as the gateway between outbound locations and the city itself, represents an important gateway for travelers arriving to India from outside, for travelers arriving to Bengaluru from rest of India, and for Bengalurians traveling outward to domestic and international destinations. There is a greater opportunity for KIA to reinforce and guide land use patterns already emerging around the airport and help to develop this part of Bengaluru as an important epicenter of the region.

The planning for KIA shall provide location, size and intensity of use of primary airport and aviation related landuses like airside, cargo, landside, aviation and non-aviation commercial, utilities, facilities and social infrastructure, residential (for staff), open space and transport facilities. Additionally several aviation infrastructure projects have been identified as part of proposed airport cityside development like Housing for Central Airport Security personnel, underground/elevated/at-grade High Speed Rail Link to Bengaluru city centre, expansion of

existing internal and external roads, multi-level car parks, additional utilities, Convention Centre, etc. The airport landside development is intended to extend its benefits and serve the public interest for the airport region, in addition to the global trade, tourism and travel destination that KIA aspires to become. The proposed planning of the airport is based on the airport's overall functional characteristics and projected traffic growth at KIA.

The Non Aeronautical development pattern for KIA is intended to be an integrated, contiguous vibrant 'Aerotropolis' development wherein a holistic transportation, business, trade, services, hospitality, utility and social infrastructure framework along with open spaces are pooled and integrated together in a vast green spatial physical structure, with segregation of vehicular and pedestrian movements as far as possible. This is aimed at achieving higher land utilization efficiency, increasing land use intensity with adequate open space, improving the quality of environment, providing required airport facilities for common public use with minimum disruption and offering holistic live-work-travel experience.

2.4. Employment Generation

KIA supports employment generation. KIA forecasts significant growth in employment in line with proposed development and with special reference to wider economic impact this will have on region as a whole. In order to calculate future employment generated by KIA, a distinction is made between direct, indirect and induced employment:

Direct Employment: employment generated by activities on site at the Airport. These include the airport operations and management, aircraft maintenance, storage facilities, charter services and leasing activities, airlines, shops and other concessions, catering ground engineering and handling air traffic control and car parking facilities.

Indirect Employment: employment generated through activities off site by organizations and companies supplying goods and services to the airport. These jobs may be locally based or more remote from the airport, depending on the nature of supply chain.

Induced Employment: employment generated through spending habits of salaried employee both in direct and indirect activities. This category is likely to provide jobs at regional level.

Currently KIA has air traffic volume of 11.63 MPPA, and these are served by approximately 13,000 personnel, in a ratio of approx. 1100 employee for 1 million annual passengers. Based on this, for 55 MPPA the projected workforce requirement is expected around 60,000.

The employment generation in Non-Aeronautical area is estimated as per the current industry norms i.e one person/50 sqm in Hospitality & Convention Center (or 2 persons per room of 1200 sqft) & services; one person/30 sqm in retail, entertainment & F&B; one person/15 sqm for offices etc. Employment potential in supporting services category includes manpower requirement for transportation related services (taxi operators, bus operators), traffic and parking management, landside/ city side security, maintenance services, horticulture, health, entertainment, commercial, etc. General norms for supporting services are 10% of total employment in Aeronautical & Non-Aeronautical uses. The total employment is expected to be approx. 1.75 lakhs persons.

The total employment potential of KIA by 2030 would be 2.35 lakhs. As all facilities and functions at KIA (like any other international airport) shall operate on 24X7 basis, Average no. of employees at airport at any one point of time shall be $2.35 \text{ lakhs} / 3 = \text{Approx. } 78000$, as all staff and employees shall be working in 3 shifts of 8 hours each.

Employment	Employees
Direct (60,000 aeronautical + 1.75 lakhs non-aeronautical)	2,35,000
Indirect	7,050
Induced	8,225
Total	2,50,275

The expansion of KIA will have a pronounced imprint on the local and regional economy. The above forecast confirms the importance of KIA as an employer in the region and Karnataka state and is expected to infuse regional development and economic growth of the region. There is likely to be a large manpower for skilled personnel to helm with the growth at KIA.

3. Project Description

3.1. Type of Project

The said project is an expansion project. Bangalore International Airport Limited (BIAL) is proceeding with planning & then implementation of next phase of airport expansion, by the construction of Second Parallel Runway, Terminal 2 (New) and Cityside development including commercial and support facilities for them. Main objective of the expansion project is to meet the ultimate phase of 55 MPPA along with supporting infrastructure required for the world class airport operation.

3.2. Location

The proposed expansion project will be developed within the existing airport site area. BIAL is located 4 km south of Devanahalli and is 37 km away from the central business district of Bengaluru. As the site of Bangalore International Airport is well outside the Bangalore Urban Agglomeration and away from ecologically sensitive areas, it is ideally located for planning and implementing aviation and non aviation developments on par with international aviation hubs. The key factors arising from the airport site appraisal are:

- No additional land acquisition is involved as all the expansion activities are planned within the KIA airport site area of 1622 Ha itself.
- The Airport site area is well connected with the Bangalore city and neighborhood by a well developed highway infrastructure and road network.
- The site offers excellent opportunities for developing hospitality, business, logistic parks etc.
- The airport site offers large parcels of land for establishment of state-of-art aviation and non aviation infrastructure development.

BIAL falls in Survey of India Toposheet No. 57 G/11, G/12, G/15 and G/16. The location map and 10 km radius study area map are given in **Figure-3.1** and **Figure-3.2** respectively.

3.3. Alternate Sites Considered

Since the proposed project is an expansion project, and is planned at the existing airport site without any new acquisition of land, alternate site(s) has not been considered.

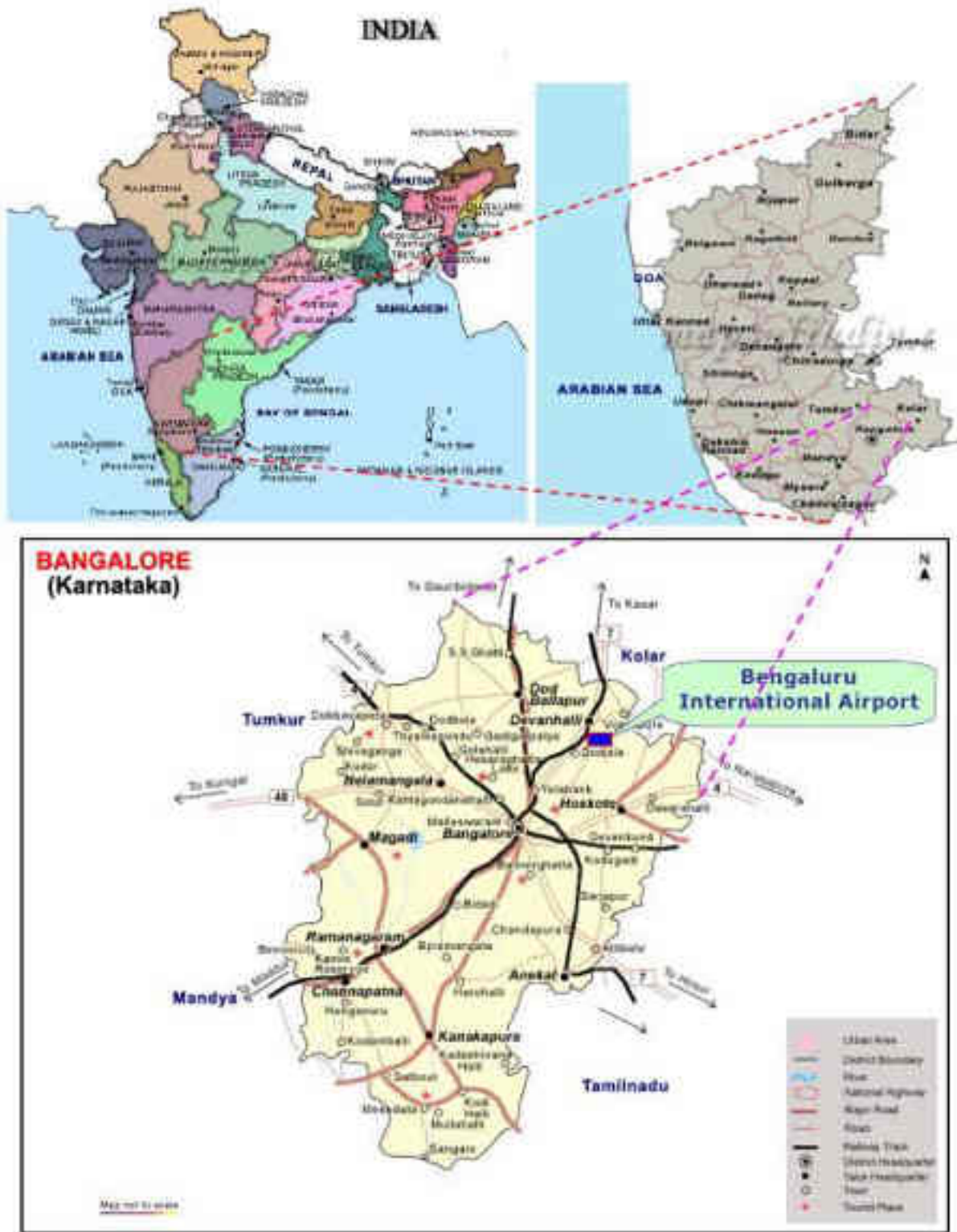


FIGURE-3.1 - INDEX MAP SHOWING THE PROJECT SITE



FIGURE-3.2 – LOCATION OF KIA IN BMR & CONNECTIVITY



FIGURE-3.3 - STUDY AREA MAP OF THE PROJECT (10 KM RADIUS)

3.4. Project Description

In view of growing demand, BIAL intends to proceed with expansion of airport development and support facilities by construction of second runway, New Terminal (T2), supporting & ancillary aeronautical facilities and city side development. The cost of additional proposed development and facilities is estimated at INR 15531.00 crores.

The objective of the proposed development is to cater 55 million annual passengers and 1 million metric tonnage of cargo by 2029-30. This will include development in Aeronautical zone and Non- Aeronautical Zone which will support the ultimate capacity of 55 MPPA and 1 million metric tons of cargo.

The primary land distribution at KIA is given in **Table-3.1** and the details of the proposed associated additional features to the existing airport facility is given in **Table-3.2**

TABLE 3.1 - PRIMARY LAND DISTRIBUTION

Sr. No.	Zone	Area in Ha	Area in Acres	Percentage (%)
1	Total Airside/ Aeronautical zone	1213	2998	74.79
2	Total Cityside/ Non-Aeronautical Zone	409	1011	25.21
	Grand Total	1622	4009	100

3.4.1. Aeronautical Zone (Airside Area)

KIA Aeronautical Zone is spread over on total site area of approximately 2998 Acres (1213 Ha.) accounting for approximately 75% of total area of KIA. Aeronautical Zone provides all required aviation operational infrastructure to enable ultimate passenger capacity of approximately 55 million and 1 million tonnes of Cargo handling per year.

Proposed aeronautical zone shall be inclusive of, but not limited to; runways, taxiways, aprons, terminals (inclusive of all required uses, sub uses within it including retail & commercial inside terminals), hangars, security offices & installations, fire Station, water storage & pumping facilities, power sub stations, septic tanks, offices (radar, ATC, airline, airport, IT, banks, etc), NAVAIDs, aircraft maintenance workshops, mechanical workshops, vehicle maintenance

workshops, GSD & GSE- ground service depots, ULD parking, vehicle parking, internal roads, security gates, airline support Offices & warehouses, transport workshops, staff canteens & kitchens, cargo terminals, offices & warehouses, flight kitchens, VIP lounges, MET offices, aircraft maintenance, MRO & other related uses, etc.. Master plan showing the overall layout and the Airside details are shown in figure 3.5 and 3.6 respectively.

TABLE 3.2 - AERONAUTICAL LAND DISTRIBUTION

Sr. No.	Aeronautical Development	Area in Ha.	Area in acres
1.0	Airfield	228	563
2.0	Passenger Terminal	208	514
3.0	Ground Transportation and Parking	117	289
4.0	Air Cargo	20	49
5.0	Airport and Airline Support	31	77
6.0	Aircraft Maintenance	16	40
7.0	General Aviation	3	7
8.0	Utilities	38	94
9.0	Aeronautical Reserve	62	153
10.0	Open Space non developable	490	1213
Total		1213	2998

a. Airfield

The capacity of existing Runway 9-27 is approximately 36 ATMs per hour, which is equivalent to an annual service volume (ASV) of 136,000 ATMs. This capacity could be increased to 46 ATMs per hour, or an annual ASV of 172,000, with improved air traffic control procedures and additional rapid exit taxiways.

By 2015 - 2016 (approximately 197,136 annual ATMs), the demand on the Airport's existing single runway will surpass its estimated capacity of 172,000 ATMs. Therefore, a second runway—the new south parallel runway (NSPR)—will be required before 2015 - 16. The need for this second runway at the Airport was established in prior planning studies and was confirmed in updated KIA Master Plan.



Figure 3.5- Master Plan-overall layout plan

New South Parallel Runway (NSPR)

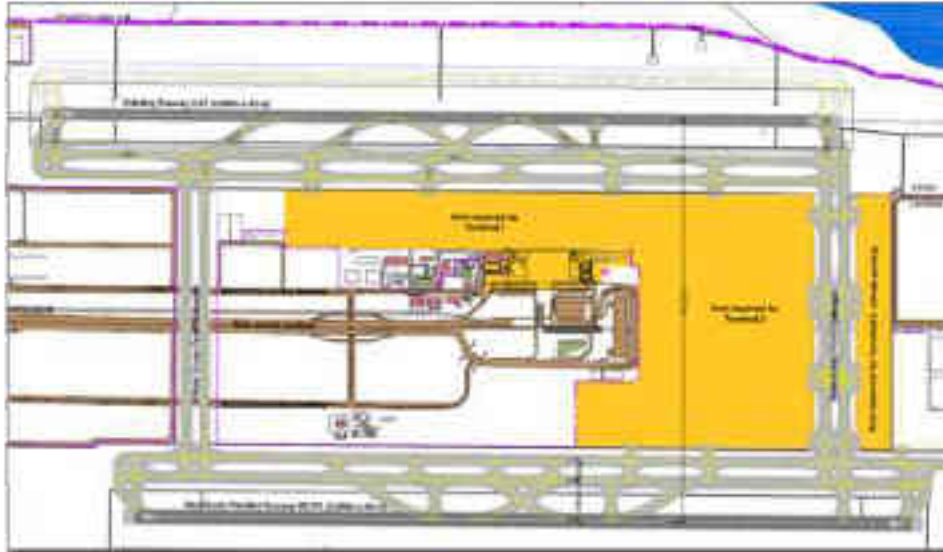
The NSPR is needed to accommodate the growing traffic demand by year 2014-15.

The spacing from the center line of existing Runway 9-27 to the NSPR is 1,925 m to provide for the appropriate length and required capacity, allow for optimal threshold locations, preserve the capability for a CAT-III instrument landing system, maximize the passenger terminal development envelope, and remain within the existing property boundaries of the Airport.

The NSPR is to be ICAO Code F compatible and 4,000 m long, the same as existing Runway 9-27. This length is sufficient to serve the existing and projected future fleet mixes at the Airport. The NSPR thresholds will be shifted approximately 440 m east of the corresponding thresholds on Runway 9-27. These locations were selected so that the runway will be within existing property boundaries, provide efficient taxi paths to existing and planned terminal locations, and remain clear of obstructions.

Two new Code F-compliant parallel taxiways to serve the NSPR are included in the design. The taxiways shall be approximately 4,000 m long and include connecting taxiways to the terminal apron and adjacent runway.

The NSPR and its supporting taxiway system are shown below.



East and West Cross Field Connector Taxiways

The Airport's taxiway system will include two pairs of two north-south cross field taxiways constructed to Code F standards. One pair of taxiways will be located to the east of the terminal complex and the other pair to the west to facilitate circulation between the north and south airfield as well as to provide convenient access to the terminal complex. The siting of these taxiways was accomplished considering airport design criteria, aircraft taxi patterns and distances, future passenger terminal development, and prior engineering assessments related to mass balance. The proposed cross field connector taxiways are shown in the figure above. The taxiways will be approximately 1,350 m long and include connecting taxiways to the terminal aprons in the case of the east cross field taxiways.

Apron

Terminal 2 will need an apron area to meet the contact and remote stands requirements. The apron layout will be configured to meet the stand requirements, minimize walking distances to contact stands and bus travel times to remote stands, ensure efficient aircraft flows on the taxiways surrounding the apron area, and minimize locations of cul-de-sacs that would be prone to aircraft congestion.

The layout and configuration of the apron shall be governed by the design of Terminal 2 which is to be developed further under the next stage of detailed planning and architectural design of T2. The apron layout will conform to relevant airfield planning guidelines, and will be developed within the site reserved for Terminal 2, and include the design of

supporting drainage infrastructure, airfield lighting, pavement markings and signage. The design of this apron will also include the fixed equipment required on aircraft parking stands, including a fuel hydrant system at each operational stand, passenger boarding bridges, apron flood lighting, vehicular service roads and GSE staging/storage areas. Wherever possible, stands will be designed for multi-aircraft range stand (MARS) configuration allowing for different aircraft types to be gated and in order to maximise flexibility and minimise costs.

A tunnel for Ground Support Equipment (GSE) beneath the apron and East Cross-field Taxiway is proposed to provide access between Terminal 2 and the remote stands as well as to the eastern sector of the airport. The alignment of the same is dependent on the geometry of Terminal 2 and the apron which is to be developed further. The location will be selected in an effort to optimize efficiency, maximize connectivity between the passenger terminal complex to the west and the remote stands and supporting facilities to the east of the cross-field taxiways, and minimize cost. This tunnel is essential for ensuring safe operation of the airfield and avoids risks of interactions between taxiing aircraft and ground support equipment.

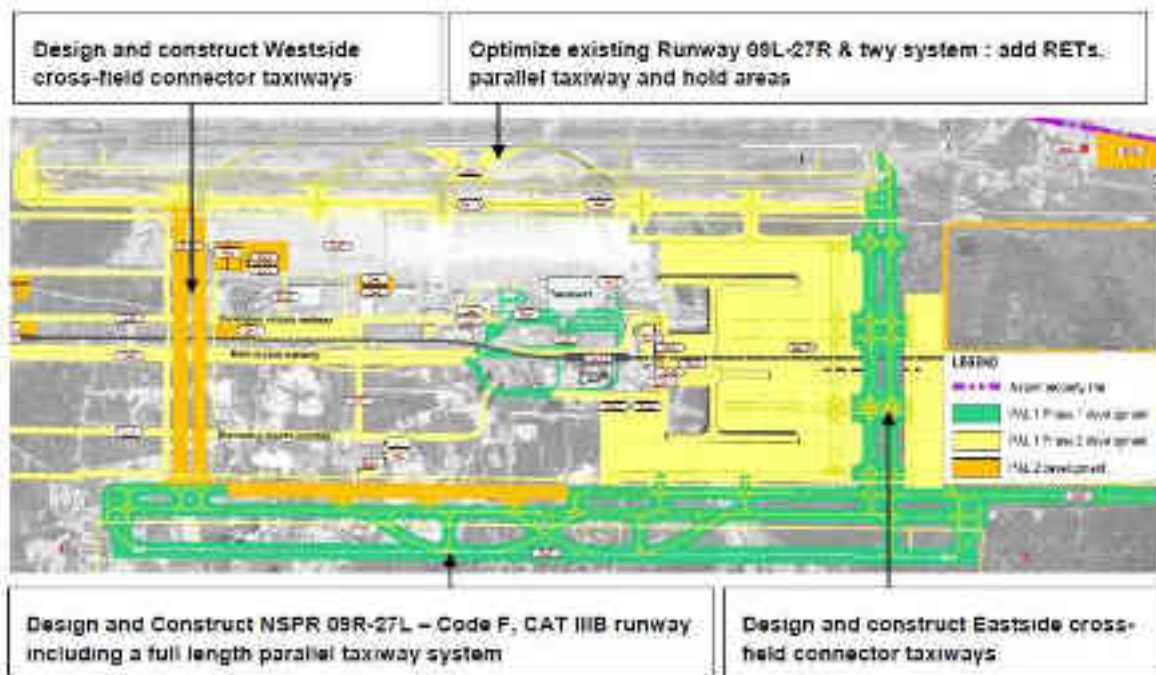
Runway 9-27

Modest improvements will be made to existing Runway 9-27 to maximize airfield capacity. These improvements include additional rapid exit taxiways (RETs) and an enhanced supporting taxiway system. In addition, an upgrade of the instrument landing system to CAT IIIB on at least one end of Runway 9-27 will be implemented as required. Provisions for upgrading the runway to Code F standards are being planned for. The recommended improvements to Runway 9-27 are shown in the figure above.

Phasing Strategy

The key phasing strategy is as follows, and further illustrated in the figure below:

- “ *PAL 1 (2015-16) :*
 - *Phase 1 (by 2014/15):* the New South Parallel Runway (NSPR) and associated taxiway infrastructure, including East cross-field taxiway system
 - *Phase 2 (by 2015/16):* improvements to the existing airfield & Runway 9/ -27
- “ *PAL 2 (2022-23) :*
 - *The west cross-field taxiway system*
 - *Remaining portion of the dual parallel taxiway system for NSPR*

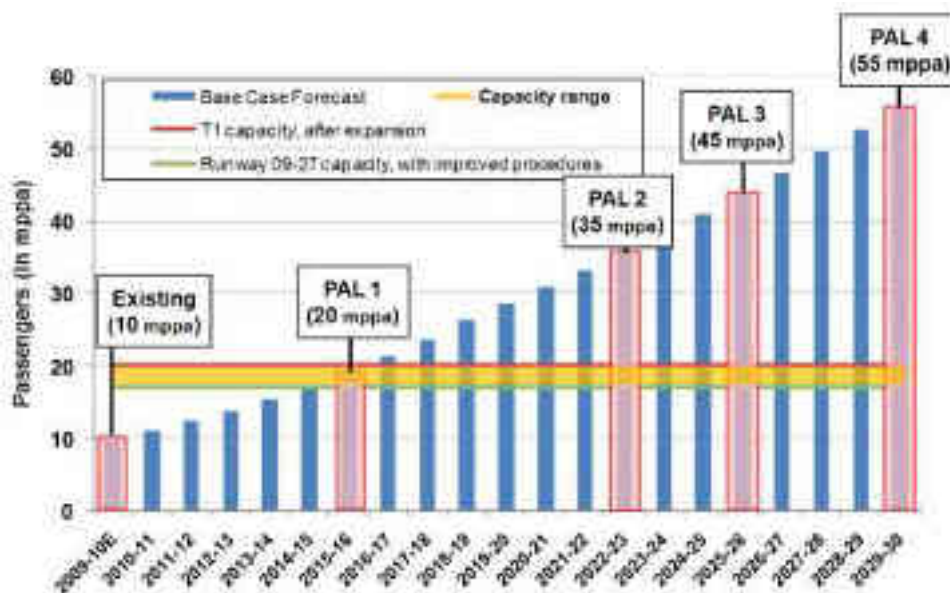


The expansion of Terminal 1 is scheduled for completion by 2012-13. With this expansion, Terminal 1 will accommodate approximately 20 mppa, a level of activity that could be reached by approximately 2015-16. In addition, BIAL is committed to the construction of Terminal 2.

Four levels of demand, referred to as planning activity levels (PALs), were identified at which key facilities will be necessary at the Airport. Each PAL corresponds to an individual development phase that will be designed to provide a pre-determined level of capacity measured in terms of million passengers per annum (mppa).

The Terminal 1 capacity after expansion will be 17.20 mppa with flexibility of serving up to 20 mppa whilst the traffic projection by PAL 4 (2029-30) is 55 mppa. Hence the shortfall is imminent and significant. The need for a new Terminal 2 to meet the demand growth is illustrated in the chart below. The on-going Terminal 1 expansion project can cope with the projected forecast demand for next 4 years (max annual capacity of 20 mppa) by which time the demand projections exceed maximum terminal capacity by approximately 2015/16. This is when the first phase of the second terminal is The terminal will be built in two phases to better time the expenditure of funds on capital projects with the materialization of forecast aviation demand.

Initial development of the proposed Terminal 2, is expected to be operational by PAL 1 (2015-16), and will provide a capacity of approximately 25 mppa and the combined capacity of Terminal 1 and Terminal 2 will be approximately 45 mppa. This is sufficient to accommodate demand through PAL 3 (2025-26) demand. Later development of Terminal 2, will be required for PAL 3, and will provide an additional passenger terminal capacity of 10 mppa. T2 will hence have an ultimate capacity to handle 35 mppa of combined domestic and international passenger activity. When Terminal 2 is eventually completed, the combined capacity of Terminal 1 and Terminal 2 will be approximately 55 mppa. This is sufficient to accommodate PAL 4 (2029-30) demand.



Key to the development strategy was determining the amount of capacity to build into initial development for T2 to achieve optimal investment as well as operating efficiency and passenger convenience. KIA master plan concluded that T2 initial development will provide a capacity of 25 mppa and will be enhanced later to provide an additional 10 mppa.

Airline allocation strategy

The addition of terminal capacity is linked to the allocation of airlines to the terminals. The aim of airline allocation exercise is to achieve operational efficiency, passenger convenience and an equitable distribution of traffic to the terminals. In order to provide maximum flexibility to accommodate a constantly changing airlines industry and to achieve the airline allocation goals, a two-terminal approach was determined to be the most feasible:

- New T2 with total capacity of 35mppa to be developed in two stages to accommodate domestic network airlines and their low fare affiliates and international airlines
- T1 to accommodate unaffiliated domestic low fare airlines and international low fare airlines

Terminal Concept

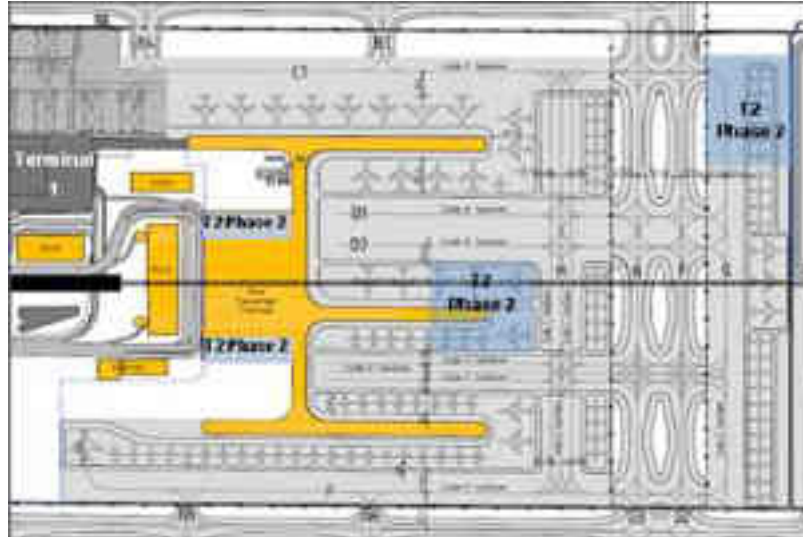
Through a rigorous evaluation process with internal stakeholders, the concept as shown below was selected as the preferred layout for the purpose of master plan due to:

- Reduced walking distances
- Operational flexibility
- Ease of phasing
- Proximity of international stands on the north pier to T1 international stands
- Potential for swing stands on the central pier
- Reduced cost (no airport people-mover system)
- Logical/efficient apron operations.

Terminal 2 will be located between the existing runway, proposed new south parallel runway and to the east of the existing main access roadway.

The majority of the terminal shall be constructed initially for 25 mppa with a size of approximately 290,000 sqm with 46 contact stands, while additional terminal space of about 75,000 Sq. Mtrs will be developed later for 10 mppa. Later development includes extending the main processor to the north and south, extension of the central concourse with eight additional contact stands, and six additional remote stands.

The Terminal 2 full build-out size is approximately 365,000 sqm with 54 contact stands for a passenger handling capacity of 35mppa.



Terminal 2 will consist of a multi-level main terminal processor building and concourses. This will include the construction of passenger processing facilities, including ticketing counters and associated lobby space, baggage reclaim and makeup, passenger and baggage security screening, passenger amenities (e.g. concessions, restrooms, and lounges), airline operations space, and other office and utility spaces. Additionally, this project also includes the construction of multi-level double-loaded passenger concourses, departure hold rooms for contact aircraft gates and the required passenger loading bridges, and departure hold rooms serving remote stands with interfaces for bussing operations.

The above terminal layout is at a very high level of concept planning and hence is preliminary only. This is subject to further development, optimization and refinement under the next stage of detailed planning and architectural design of T2 whereby a more comprehensive functional and layout planning will be carried out, including re-visiting the terminal sizing/phasing strategy & associated program requirements.



Figure 3.6 - Master Plan - Airside

TABLE-3.3 - PROPOSED IMPROVEMENT TO THE EXISTING AIRPORT FACILITIES

Sr. No.	Facility	Existing (2009-10)	Estimated Requirement (Capacity 55 MPPA)
Airfield			
1	Runways (parallel)	1	2
2	Runway 9-27 Parallel taxiway system Additional exit taxiways	1 4	2 4
3	NSPR parallel taxiways	--	2
Passenger Terminal			
1	Terminal Capacity (MAP) Terminal 1 Terminal 2	12 (17.20 after expansion)	20 35
2	Terminal building size (m ²) Terminal 1 Terminal 2	71,637 ---	150,550
3	Aircraft stands (Total)	33	161
Land Side			
1	Main Access Roadway	4 lane divided	6 lane divided
A	East of eastern roundabout Inbound (lanes) Outbound (lanes)	2 2	6 6
B	Between roundabouts Inbound (lanes) Outbound (lanes)	2 2	6 6
C	West of western roundabout Inbound (lanes) Outbound (lanes)	2 2	6 6
2	Secondary Access Roadway (North)	2 lane undivided	4 lane divided
3	Secondary Access Roadway (South)	--	6 lane divided
4	Eastern Connectivity Tunnel (Connecting		4 lane twin box tunnel
5	Public parking (spaces / area in m ²)		
A	Terminal 1 Cars/four wheel vehicles Two- wheel vehicles	1810 180	1150 50
B	Terminal 2 Cars/four wheel vehicles Two- wheel vehicles	-- --	2400 80
6	Kerb side (m)		
A	Terminal 1 Drop off length Pick u p length	90 120	400 385
B	Terminal 2 Drop off length Pick u p length	-- --	570 520
7	Bus station bays	11	14
8	Taxicab hold lot Spaces Area	315	1700-3400
9	Employee parking (spaces/area m ²)	230	1990

Sr. No.	Facility	Existing (2009-10)	Estimated Requirement (Capacity 55 MPPA)
Air Cargo			
1	Code E stands	5	7
2	High productivity scenario Warehouse built up area (m ²) Ware house footprint area (m ²) Site area (ha)	37600 37600 16.0	65050 43370 19.5
Airport and Airline Support			
1	Aircraft maintenance MRO campus Engine test facility Gross land area (ha)	- -	2 1 10.7
2	Airport maintenance (ha)	1.6	7.5
3	Ground support equipment staging area (m ²) Mid-term hold area (m ²) Maintenance facility Workshop area (m ²) Gross land area (ha)	- - 3,480 2.7	61,150 44,110 9,680 6.8
4	Flight catering Gross floor area (m ²) Building footprint (m ²) Gross land area (ha)	- 4,300 1.9	17,130 6,850 3.0
5	Aircraft rescue and firefighting (number of stations)	1	3
6	Isolation area (ha)	1	1
7	Fuel storage Storage capacity (m ²) Gross land area (ha)	10,000 2.1	48,020 6.0
8	General aviation Apron area (m ²) Helipad area (m ²) Hajj terminal (m ²) Executive terminal (m ²) Gross land area (ha)	- 13,000 - - 1.3	20,000 13,000 1,500 2,000 3.1
9	Airport and airline administration Gross floor area (m ²) Building footprint (m ²) Gross land area (m ²)	- 8,800 2.5	100,080 17,020 4.3

c. Landside Access

Two National Highways (NH-7 and NH-207) and State Highway SH-104 pass through the region in addition to a broad gauge Railway lines from Bengaluru to Kolar via. Devanahalli and Chikballapur.

The existing road network around KIA is shown in Figure 1.2. Currently, the NH-7 is the single major arterial providing access to the traffic bound to KIA. The existing NH-7 in this portion has 6-lane carriageway and the access road to airport is of 4 lane configuration. The junction on the NH 7 is designed as a Trumpet Interchange.



Figure 3.7: Existing road network surrounding Bengaluru International Airport

The outer semi-direct ramp of the interchange gives access to traffic from Bengaluru city destined to the Airport forming the major inflow component of airport traffic. The inner exit loop serves traffic leaving the airport going towards the northern side (towards Devanahalli and Hyderabad). The diagonal ramps of the trumpet serve as exit to traffic leaving the airport towards Bengaluru city and entry to traffic from Northern side into the airport. The railway track from Bengaluru to Kolar runs alongside the NH-7 at this location.

Landside access facilities include the airport access road addressed as Main Access Road (MAR) which is a two lane dual carriageway road, other terminal area roadways including secondary access road and kerb side roadways; Apart from the road network, public and employee parking, bus station, and taxicab holding area also are the transport facilities presently available at KIA.

▫ **Access and Circulation Roadways**

Separate roads are present for passenger related and airport service related traffic movement within the airport area.

The Main Access Road (MAR) is the only access to the present Terminal T1 from outside. MAR is presently 5.5 km long two lane dual carriageway road from the Trumpet interchange at NH7 intersection. All passenger related traffic uses this road to access the terminal.

All airport service related traffic (cargo, maintenance, etc.) uses the landside service road or secondary access road.

In the forecourt area the 4 lane access road splits into two 2-lane single direction road, one leading to the Terminal 1 kerbs and the other leading to the parking areas and the hotel. The kerbroads, at grade, is divided into an inner and outer kerb, the inner kerb is used for pickup by airport taxis & VIPs/VVIPs and the outer kerb is used for drop off by taxis and private vehicles and pickup by private vehicle only. Both kerbs together have a total length of approximately 400 m.

In the forecourt area the 4-lane access road will splits into two single direction roads of 2 lane each, one leading to Terminal 1 departure kerb and the other leading to the parking areas, the arrival kerb and the hotel.

Main Access Road:

The present MAR is proposed to be widened to 6-lane capacity with provision to widen it further to 8 lanes in the future and provide for service road/ramps along it for grade separated interchanges for smooth movement of air passengers at an acceptable LOS. The proposed ROW on the MAR is 70 m. The MAR is presently connected to the NH-7 by a Trumpet Interchange (2-lanes each from Bengaluru City & Devanahalli and 2-lanes each to Bengaluru City & Devanahalli). The Trumpet arms from/to Bengaluru City are proposed to be widened to 4 lanes each to cater to the additional demand of traffic. To accommodate the vehicular traffic expected to carry employees related to non-aviation commercial development in the airport area, it is suggested that 3-lanes each be provided for entry and egress from the airport on the MAR from the proposed Airport Expressway or the widened SH-104 which will provide a smooth connectivity to the air traffic from the planned industrial and other developments proposed around the airport by extending northwards by crossing the MAR by an existing underpass and joining the MAR through an up ramp/down ramp.

Secondary Access Roads:

The existing SAR on the North is proposed to be widened to 40 m ROW and upgraded into a 4 lane divided road with provision of expanding into a 6- lane road and bylanes for entry into the adjacent properties. Another SAR in the South is proposed with a 40 m ROW for a 6-lane road and bylanes for entry into the adjacent properties or ramps for interchange. This SAR is proposed to be connected to the proposed 2nd Access Road to KIA on the South West from the proposed Airport Expressway or the widened SH- 104 to cater to mainly cityside traffic.

Eastern Connectivity Tunnel

The primary access and circulation roadway for Kempegowda International Airport (KIA) is the main access roadway (MAR) connecting the NH7 to the terminal area facilities. Traffic leading to the Airport and leaving the Airport use this road.

Robust growth in the passenger traffic to airport is noted over last few years leading to congestion on NH-7. In-order to de-congest the traffic on NH-7, Office of Commissioner of Police, Traffic Bangalore vide letter dated 23rd August 2016 advised Bangalore International Airport Limited (BIAL) to evaluate alternate connectivity option to the Terminal Forecourt of Kempegowda International Airport. Additionally, from uninterrupted operational requirements for airport of size of KIA, alternate additional access are required.

It may be noted that in the Detail Project Report (DPR), submitted for the KIA expansion program, (DPR, 6.6.2 Roadways & Kerbside proposals, page no149.) connectivity to the eastern plot of the airport for of Cargo, MRO and commercial development is being proposed. Based on the requirement of GOK, this cargo, MRO, commercial connectivity is now planned to be extended to the Terminal facilities for passengers.

BIAL has developed a South West Connectivity Road from BK Halli road to Main Access road as an alternate access to airport (operational from Mar'18).

BIAL has carried out studies to identify alternate connectivity to the terminal. Following options were evaluated.

Option 1: Underground connectivity from south crossing the proposed NSPR as a tunnel connectivity.

Option 2: Underground connectivity from Eastern side (Option2) of below proposed airfield taxiway connecting SH-104 and terminal

Based on pros and cons, Eastern access road is found to be a better and feasible option given the reduction in traffic load it brings to the other airport access roads

The State of Karnataka plans to develop a second highway providing access to the Airport to relieve anticipated congestion on NH-7. Access to BIA from Eastern side through SH-104 (Eastern Access) catering to the eastern developments of BIA comprising of Cargo, MRO and commercial developments proposed in that area. This will be proposed as a six lane divided road with possibility of up gradation to a 10 lane road in the future. This entry will help in segregating the passenger traffic and the cargo traffic by providing separate access for them

to the airport, thus dividing the load on any particular road. This will also be a major road for the cargo traffic originating or destined to the KIADB

BIAL has explored all the possible options and decided to build an access tunnel of length approximately 2,500 M and a link road of length approximately 1280 M. Approximately 300 m of tunnel portion falls within the boundary of the NSPR which needs to be constructed along Second stage of expansion (ongoing project) to avoid any construction in the cross field taxiway in the future once it is operationalized. The tunnel is proposed with 5.5m clear height with 4 lane twin box tunnel connecting the access road of the tunnel to the State Highway-104 via a new approach road being constructed by PWD.

It is expected that the proposed alternate road connectivity will reduce approximately 20% of traffic load on NH-7.

Terminal Access for T2 and Kerbs

A 6-lane elevated road is proposed to cater to the traffic of proposed Terminal 2 in the forecourt area which will split into 3 2-lane roads, one leading to the T2 departure kerbs, second leading to the T2 arrival kerbs and parking areas and third going down at-grade to the service docks and utility areas. Based on preliminary estimates of the length of Terminal 2, it is expected that kerbside requirements will justify two parallel kerbsides on both the departures and arrivals levels. The approx departure and arrival kerb lengths proposed for T2 is 570 m and 520 m respectively each arranged into 2 parallel kerbs, with pedestrian connectivity to both the proposed terminal and MLCP/Multi-modal transportation Hub in the forecourt.

- Kerbside Facilities

The existing outer kerbside includes 90 m long Drop-off kerb and 120 m long Pick-up kerb for taxis and private vehicles.

Due to the ongoing expansion of the terminal building and improvements in the landside of the terminal, the access road on the land side and the bus routes on the airside are proposed to be modified and augmented.

The departure kerb roads will be further split into two 4 lane kerbside roads for drop off which will merge into 2 lanes and turn south after drop off for exit from the forecourt. The departure kerb total length will be approximately 350 m.

The arrival kerb road will be segregated into kerb for private car pick-up which will be close to the arrival parking away from the terminal and the taxi kerb which will have approx 39 stalls for pick-up by airport taxis.

▫ **Public Parking**

The existing parking facilities in KIAL consist of:

- Kerbside Parking
- 2W Parking - 213 spaces
- Long term parking (P1, P2 & P3), total parking capacity = 1,380 places
- Short term parking (P4 and P5), total parking capacity = 430 places (Being used as departure/arrival kerb due to ongoing Terminal 1 expansion)
- Bus bays for Vayu Vajra service (an air-conditioned volvo service run by KSRTC from Bengaluru City) = 11 places
- Taxi staging = 205 places

The existing parking spaces will be modified into the following:

- 2W Parking - 213 spaces
- Lot on the departure side, total parking capacity = 830 places
- Lot on the arrival side, total parking capacity = 458 places
- Bus bays for Vayu Vajra service (an air-conditioned volvo service run by KSRTC from Bengaluru City) = 14 places
- Taxi staging = 290 places

In addition to the taxicab loading positions at the kerb side and associated feeder queues, a taxi hold lot of capacity around 300 spaces, located near the present STP is planned for taxicabs while they await dispatch to the terminals. The capacity of remote taxi hold lot is planned to be increased to around 600 slots/spaces in the future.

- T1 MLCP is proposed at the T1 forecourt in the present surface parking areas with a footprint of approx 17,000 m² with space for parking 1500 cars at 2 lower basement levels and one ground level.
- T2 MLCP is proposed at the T2 forecourt with a footprint of approx 38,000 m² with space for parking 4000 cars at 2 lower basement levels and one ground level.

The MLCP's are planned to be connected at the basement levels for optimizing the utilization of both the MLCP's.

▣ **Bus Station Parking Stalls**

Presently the public transport system connecting airport to Bengaluru city is only via the Vayu Vajra service (AC Volvo bus) run by KSRTC. There are currently eleven routes operating scheduled services to and from the Airport. There are 11 bus bays/slots presently available for parking of buses.

Bus boarding/alighting facility is proposed in the modified T1 forecourt area between the arrival and departure kerbs for 14 stalls with provision of pedestrian underpass/elevated connections for T1, T2, proposed MLCP's and the proposed HSRL stations.

▪ **Taxicab Hold Facilities**

A transportation hub is proposed in the cityside area near the present fuel farm for all the airside related taxi staging requirement, employee parking requirement, bus parking requirement with efficient and quick connectivity to the operational area gates, offices related to airport functions, terminals etc by proposed feeder service planned for the airport in the form of electric buses or PRT system or traditional buses. The hold lot is proposed to accommodate around 3,400 taxis.

There will be other 3-4 taxi hold lots / MLCP's combined with other amenities of various sizes proposed in the cityside to cater to the parking and travel needs of the cityside employees and visitors.

▣ **Employees Parking Facilities**

Presently the staffs parking are located in Open Air parking of 64 Slots in front of Alpha 1 to Alpha 3 building (admin buildings) & there are 58 Parking slots in Alpha 3 Basement. In addition to above, about 75 car parking slots, 230 two wheelers parking slots and 25 buses parking slots are available opposite Alpha 1, 2&3 buildings..

All employees parking will be either accommodated in respective building or the common MLCP's/Transportations hubs spread all over the cityside with suitable efficient, clean and regular connectivity to all work areas.

▫ **Parking for Cargo Trucks and Station Wagons**

The cargo vehicles and the employee service bus/station wagons are parked at the following locations

- Opp to Cargo Area for Trucks
- Between Blue Dart & AISATS for Station Wagons

(Modification being undertaken to accommodate 17.20 mppa as per the T1 Expansion)

The Terminal 1 is presently being expanded to accommodate the increasing passenger traffic of 17.20 MPPA from 11.40 MPPA for which BIAL has already got approval.

Owing to this expansion the following changes will happen to the existing landside transport facilities related to the air passenger.

Open space in front of Haj Terminal is provided for Cargo Vehicles, 50 to 70 Huge Trucks can be parked.

▫ **HSRL/Metro Stations**

Two HSRL/Metro stations are proposed in BIAL with the capability to expand the line for a third station in the future if sufficient demand arises. One station is proposed close to KIA entrance on west part of airport for the cityside employees and visitors near the first roundabout with buses and pedestrian connectivity to the surrounding developments. The other station is proposed in the Terminal forecourt area as an underground station with provision of pedestrian underpass/elevated connections for T1, T2, proposed MLCP's and forecourt developments. This station will have baggage handling facility for transferring baggage checked in the city stations.

d. Air Cargo Facilities

Existing air cargo facilities, including apron areas, warehousing, and express cargo facilities are located on to the west of the existing passenger terminal building and south of Taxiway A. Warehouse and offices for freight forwarders are provided adjacent to the fuel farm in the cargo village, which is located near the south-western boundary of the runway 09L-27R, north of the secondary access roadway.

The existing cargo facilities are proposed to be shifted into bigger cargo facilities planned on the eastern part of the airport in the KIA master plan considering the following points:

- In the future more aircraft stands will be concentrated in the eastern part due to the future terminal layout which will make the airside roads more congested due to tugging of cargo from the terminal at the present location to the aircraft stands for loading
- The proposed eastern area will complete segregate the cargo functions from the air passengers and major part of the cityside development but still reducing distance to the aircraft stands from the cargo processing areas/warehouses
 - The landside cargo traffic will be completely segregated and will have an alternate access through NH-209 or SH-104 which is planned to be widened to cater to the future development thus decongesting NH-7.

The proposed Aircargo facilities, based on the high productivity scenario will be approximately 65,050 m² builtup of air cargo warehouse space and an overall 20.00 Ha site, including Apron area, sufficient to accommodate truck, trailer, and logistics cargo vehicle parking and maneuvering, employee parking, and freight forwarders.

e. Airline and Airport Support Facilities

Airport and airline support facilities consist of aircraft maintenance, airport facility maintenance, ground service equipment storage and maintenance, flight catering, isolation areas, aircraft rescue and firefighting, fuel storage, administration buildings, and security facilities.

▫ Aircraft Maintenance

There are no existing airline- or third party-operated aircraft maintenance, repair, and overhaul (MRO) facilities at the Airport. However, BIAL has concluded that a long-term need exists for such facilities, including an engine run-up/test facility in the vicinity of a future MRO facility campus.

Prototypical MRO facilities were considered for both a short-haul campus and a long-haul campus; the primary difference is that the long-haul campus would accommodate wide body aircraft. Table 3-1 presents the long-term land requirements. The proposed MRO facility is located on the south eastern side of the Airport.

▢ **Airport Maintenance**

Airport maintenance areas provide parking, garaging and line maintenance facilities (including related offices) for all vehicles associated with the routing maintenance of the Airport including airside pavements and terminal areas. Approximately 7.5 hectares of land area is required for airport maintenance.

▪ **Ground Support Equipment Parking and Maintenance**

Growth in the number of aircraft stands will provide sufficient land area to meet both the staged GSE and mid-term hold GSE requirements.

A GSE maintenance facility is required throughout the planning period and should provide approximately 9,680 m² of workshop area at 2029-30, which is more than double the size of the existing workshop. It is important that sufficient land area be provided adjacent to the maintenance area for parking and miscellaneous storage of GSE.

▢ **Flight Catering**

Two existing flight catering buildings, with combined footprints of approximately 4,300 m², are located to the west of Terminal 1 and occupy an area of approximately 1.9 hectares. The buildings have a combined declared capacity of 25,000 meals per day. The existing flight catering buildings are capable of meeting 2022-23 requirements. The overall building area and site requirements are approximately 17,130 m² and 3.0 hectares, respectively. However these builds are proposed to be relocated in the north western corner of the first runway to minimize their impact on the landside traffic.

▢ **Aircraft Rescue and Firefighting**

The current aircraft rescue and firefighting facilities (ARFF) are located to the west of Terminal 1 and to the south of the aircraft parking apron on a site occupying approximately 0.6 hectares. The proposed new south parallel runway will result in response times exceeding the design requirements from the existing ARFF. As a result, a second ARFF will be required to provide the required coverage and will need to be located on the southwest of the passenger terminal complex. Emergency access roads separate from airfield movement areas will also need to be provided to facilitate the minimum response time of two minutes. The new south side fire station will also need direct access to the runways, taxiways, and perimeter roads. Additionally, a cityside fire station and

static water tanks will need to be provided on the south side to allow for firefighting purposes.

▫ **Aircraft Isolation Area**

The current aircraft isolation area is located to the west of the air cargo facilities and is accessed from Taxiway A. The existing 1.0-hectare site and its location are adequate to meet the long-term operational needs of the Airport. However, additional growth of passenger terminal, air cargo, and airline and airport support facilities ultimately will require relocation of the isolation area. Given the infrequency with which the isolation area is used, it is possible to locate the facility on taxiways or apron areas provided setback criteria can be satisfied when it is used.

▫ **Fuel Storage**

Existing fuel storage facilities are located on a 2.1-hectare site on the west side of the Airport, to the southwest of the Runway 9 threshold, and provide 10,000 m³ of capacity in several above-ground tanks.

The existing fuel site and storage capacity will need to be increased throughout the planning period to meet requirements. For maximum capacity, these requirements are approximately 6.0 hectares and 48,000 m³, respectively.

▫ **General Aviation**

There are currently no dedicated facilities serving general aviation activity at the Airport. General aviation aircraft operators use the aircraft parking apron adjacent to T1 and selected dignitaries use the VVIP facilities (e.g. lounges and amenities) adjacent to the passenger terminal as appropriate.

A 3.1 hectare site is reserved for future general aviation facilities at ultimate phase, of which approximately 20,000 m², reserved for an aircraft parking apron. The remaining land has been reserved for supporting facilities (e.g. executive terminal, Hajj terminal, helipads, aircraft storage hangars and vehicle parking). The unforeseen evolution of a general aviation facility that more closely resembles an FBO (i.e. containing expansive aircraft storage areas, minor maintenance facilities, or fuel storage) would require re-examination of land area required. Requirements

for a future general aviation aircraft parking apron and land area are summarized in Table 3-2.

▫ **Airport and Airline administration**

Existing Airport administration facilities are located to the west of Terminal 1 in the Alpha Block 1 and 2 administration building, which occupy a footprint of approximately 8,800 m² on a 2.5 hectare site.

Additional land is required of 4.3 hectares at later stage. Table 3-2 provides an indication of the airport and airline administration building and land area facility requirements.

A new KIA Airport management office is proposed on 1.24 acre site (5033.16 sq. m) on secondary access road, west of existing terminal. This building is expected to have built-up area of approximately about 21041 sq. m.

3.4.2. Non Aeronautical Area

The overall total Non Aeronautical zone is proposed on 409 Ha (1011 Acres) of KIA site area. The said Non Aeronautical zone comprises of:

▫ Non Aviation Commercial Area	188 acres
▫ Aviation related commercial area	138 acres
▫ Aviation / Non aviation commercial area	371 acres
▫ Green Belt	61 acres
▫ Transport zone	253 acres

Aviation related commercial area is located in close proximity of other operational aviation uses and is designated for aviation related commercial use. As aviation related commercial area and aviation / Non-aviation commercial area are in close proximity of each other, their combined plan area is 206 Ha. (509 acres).

The said commercial areas form an integral part of airport's development and shall be spread over & along northern and southern part of airport access road in western part of airport & also on eastern part of the site. This zone shall offer aviation as well as non-aviation uses for airport.

Non-Aeronautical commercial zone is located along southern side of main airport access road, and partly in central area and covers an area of approx 76 ha. (188 acres). This zone shall offer uses like hospitality (in various types), commercial, business parks & offices, retail, entertainment & recreational, educational, healthcare, etc. Proposed development in this zone shall be integrated with overall site level transportation network with direct access to intermodal facilities, MLCPs, HSRL stations, and other transportation centers.

Vision for Non - Aeronautical Development

Non Aeronautical area development is proposed to be a dynamic environment integrating and enhancing people and businesses, logistics and shopping, information and entertainment. It will house efficient, multi-modal hub for air, rail and road transport which will provide visitors a unique experience. It will offer its visitors and locally based national and international businesses all the services they require on a 24x7 basis, providing extensive level of service, not only in the area of transport and aviation, but also in entertainment, commerce, hospitality, recreation, offices and the establishment of businesses.

Airport 'Green' City

Non Aeronautical area development shall be a green Aerotropolis, environmentally compatible and resource efficient throughout its life-cycle with an objective to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving productivity
- Reducing waste, pollution and environmental degradation

KIA City will house building and Infrastructure having sustainable design and green architecture. It will meet the needs of present generations without compromising the ability of future generations to meet their needs. It will have many benefits including environmental, economic, and social benefits. The KIA City will be developed with energy efficient and environmentally friendly planning, design and construction practices.

A fundamental principle of the master plan is to put environmental consideration issues on an equal footing with the project's commercial, functional, technical and aesthetic considerations. This will also involve creation of 'green collar jobs' and the use of

environmental best practice in the running of KIA including rain water harvesting and renewable energy. KIA targets to deliver a radical, new sustainability benchmark for commercial development in the cityside and beyond.

Proposed development of KIA is intended to conform to the best practices and norms for sustainability and environmental up gradation. KIA shall be developed incorporating green building technology, recycling of waste water system and rainwater harvesting. KIA shall have one of the largest landscape areas within an airport, for both airport users and for people of Bengaluru.

Transportation Network & Nodes

The proposed Transportation network shall include central nodes, serving as public transportation centers & multi-modal hubs for KIA. Primary aim of the nodes is to establish multi-modal public transportation interface and network to increase accessibility and mobility of all users, within KIA and to the surrounding airport catchment including the city of Bengaluru, surrounding region, all major places of tourist, business and cultural interest. The nodes will offer increased accessibility by providing modes/system of transportation at all the Zones of KIA City at a Regional Level. It will provide an efficient system by making traveling more scheduled and hassle free.

Proposed Transportation network shall include the world class stations on High Speed Rail (HSRL) and on area adjoining it to provide seamless, obstacle free transport connectivity to the KIA City and the Region, integrated with surface transport nodes and parking areas. This landuse category will include uses like all roads, and parking areas, High Speed Rail Link (HSRL) Stations, PRT, Bus Stops (for Airport Express Buses/ Shuttle Buses), MLCPs for Terminal Parking (for Passengers), MLCPs for Taxi Staging, MLCPs for Cityside Users, pedestrian walkways, under passes and skywalks, etc.

3.4.3.Green Belt/ Greenery Development

The principal airport level green space/ open area in the form of central linear green is located along the airport access road. Secondary open areas shall be planned in various locations in different landuse zones. The total area under this zone shall be approximately 24.95 ha (61.64 acres).

I. GREEN AREA/GREEN BELT DEVELOPMENT IN THE CONTEXT OF AIRPORT DEVELOPMENT

Green Development as part of Airport Development Project needs to be considered in view of typical airport related constraints, such as -

- A. **Height restriction** -Development of green areas and planting of trees including their types (as per height at maturity) is guided by the height restrictions imposed by Airport Authority of India & DGCA Guidelines, hence any type of dense vegetations with bigger height trees cannot be developed in the vicinity of Airport operational area. Green Area dev at BIAL is being done accordingly.
- B. **Bird Menace**- Trees attract insects and birds which have potential to cause maximum damage to aircraft. This requires a careful restricted selection of trees to be planted on an airport premise, as a part of Airport Safety measures. Green Area dev at BIAL is being done accordingly.
- C. **Restriction In Operational Area** - As part of Airport Operational requirements, typically almost 70% of total Airport land area is defined as Operational Area (Airside) where in the regular movement of flight movement demands clear and clean area, without any form of vegetation (except grass), which may affect the flight operations due to plants leading to bird nuisance. Green Area dev at BIAL is being done accordingly.

II. 2. GREEN AREA/GREEN BELT DEVELOPMENT AT KIA

a) Bengaluru Airport Development is a greenfield project developed on vacant, mostly rocky land outside Bengaluru city, with limited water supply resources. Green Area dev at BIAL is being planned and implemented in this context.

- = The percent age of the Green Belt Development in terms of the overall Airport Development Area [4009 acres] is about 32 % including turfed area on the airside between the runway, taxiway and apron.

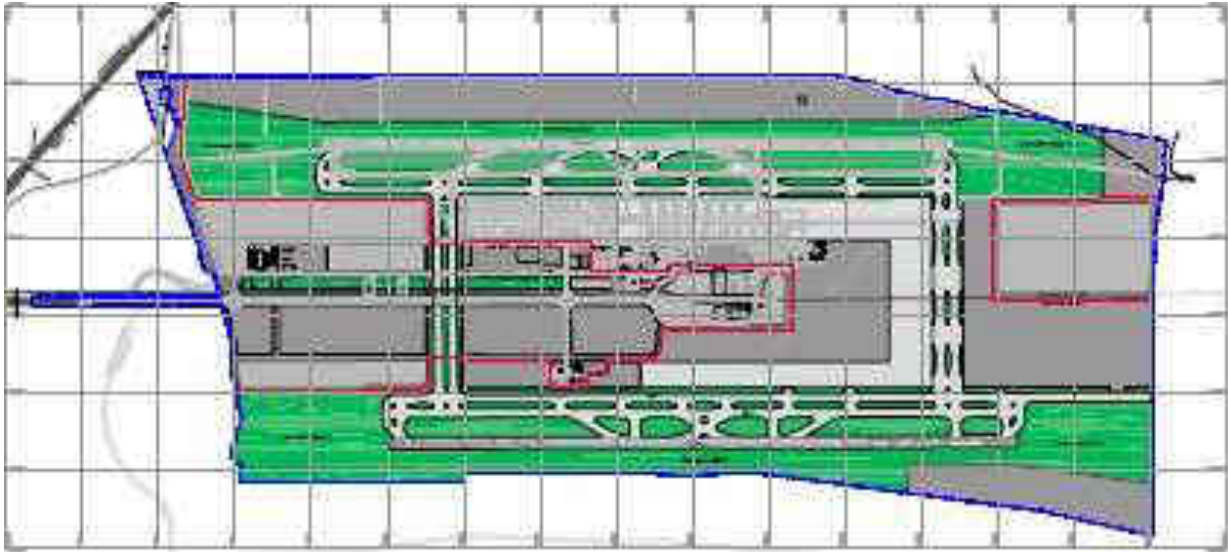
III. First Phase of Green Area/Green Belt Development using indigenous species of plants. The areas in this phase on the landside include,

- Green area along the entrance road,
- Tree plantation on peripheral areas of north and south slopes along with Median planting on the Main Access Road
- Slope stabilization through grassed embankment along the swale
- Landscape area near ATC
- Landscape in Forecourt area
- Landscape area adjacent to trumpet cloverleaf

Green Area Development Plan on the Landside



Green Area Development Plan on the Airside



IV. PROPOSED GREEN AREA/GREEN BELT DEVELOPMENT AT KIA

BIAL is preparing over all Master Plan for Green Area / Landscape Development for implementation in phases. Phase 1 of this is currently under progress. The total plan shall be implemented in next 4-5 years.

Photographs of Existing Green Area Development - Landside



SPRING LAKE ROAD



ALSO KEY TO BE LAKE



FORMERIAL TREE PLANTATION ON THE ROAD



BEHIND PLANTATION ON THE ROAD



GRADED SURFACE NEAR TO THE ROAD



GREEN AREA DEVELOPMENT ALONG MAIN ACCESS ROAD



LANDSCAPE DEVELOPMENT AT TERMINAL FORECOURT

Photographs of Ongoing Green Area Development - Landside



PRIORITY IMPLEMENTATION PROJECT—PHASE 01 ALONG MAIN ACCESSROAD



Slope stabilization through hardy and draught tolerant ground covers



3.5. Water & Power Availability & its Source

3.5.1. Water Requirement - Demand & Supply

The total water demand for Kempegowda International Airport (KIA) by the year 2030 is estimated to be 52.80 MLD, inclusive of both aeronautical & non- aeronautical uses. Aeronautical use water demand is projected to be 18.00 MLD, while water demand from non- aeronautical uses is estimated to be 34.8 MLD. The fresh water requirement for aeronautical is 7.20 MLD and for non- aeronautical is 20.88 MLD. The total fresh water requirement is approximately 28.08 MLD. The rest of the water demand for non potable use will generated through waste water recycling and rain water harvesting initiatives proposed.

Sr. No.	Particulars	Aeronautical development	Non-Aeronautical development	Total
1.0	Potable Water Demand	7.20	20.88	28.08
2.0	Non-Potable Water Demand	10.80	13.92	24.72
Total		18.00	34.8	52.80

3.5.2. Power Requirement

The power demand for BIAL is estimated to be approximately 325 million volt amperes by 2029-30. The demand estimation for Aeronautical Zone and Non Aeronautical Zone is as follows:

Zone	in MVA
Aeronautical development	100
Non Aeronautical Development	225
Total	325

It is proposed to install five power houses of approximately 2500 m² and 70 MVA each. The power requirement for existing airport facilities is about 25.8 MVA which is being met from the power supply of BESCO to the airport. The backup power supply available for the airport is about 10.9 MVA and shall be further augmented as required.

3.6. Wastewater Generation and its Management

3.6.1. Sewerage System

The presently well connected sewage collection system exists in BIAL premise which carries sewage to existing STP of 2.0 MLD design capacity. The STP uses extended aeration (EA) process to treat the sewage. The treated wastewater is disinfected using chlorination and subsequently recycled for irrigation. The tertiary treated sewage with chlorination is used for HVAC and irrigation.

The total wastewater generated from the BIAL for the year 2030 is estimated to be about 33.30 MLD, the sewage generated will be routed to the proposed 34 MLD STP facility in phased modular of 11.50 MLD capacity for different phases. The total tertiary treated water demand by BIAL is 24.72 MLD and tertiary treated water available from BIAL STP by 2030 is 25.00 MLD.

To reduce the load on fresh water demand BIAL is committed in implementing the Zero discharge concept for sewage system. The entire sewage that is generated from the BIAL campus will be recycled and reused for non potable purposes.

3.6.2. Storm Water Drainage

Presently BIAL has implemented a comprehensive storm water drainage system. Storm water drains have been constructed all along the runway area, pervious and non-pervious area. As per BIAL data a total of 12,960 m of storm water drains have been constructed along airside and 13,809 m of storm water drains have been constructed along land side. 6 No. of storm water catch pits are constructed along airside, 34 No. catch pits along apron and 6 No. catch pits along land side are constructed.

The entire BIAL site area is divided into 5 major drainage zones using contour map based on topographical survey and rainwater drains into nearby lakes.

For the proposed development of aeronautical and non-aeronautical, the storm water drainage master plan is prepared with rainfall intensity of 10 year return period. The invert level / bed level at outfall locations are retained. The total length of proposed storm water drains network is about 38,368 m.

The runoff from apron shall be passed through oil water separator in order to discharge oil free water into rainwater storage pond. Entire storm water shall be captured into the rainwater

harvesting ponds proposed to be developed in the BIAL campus for non domestic uses of the airport. The harvesting ponds shall serve two purposes, i.e. as storage pond as well as ground water recharge pond.

All the storm water arising/ passing out of apron is treated with oil water separator as per standards. The oil waste collected shall be disposed as per standards stipulated by authorities.

No wastewater will be discharged outside the airport complex and due to this proposed treatment system, the impact due to the wastewater generation will be minimum.

3.6.3. Rainwater Harvesting

Presently two types of rain water harvesting wells are constructed in BIAL complex viz., recharge bore wells and recharge pits with bore wells. Recharge bore wells consists of a vertical shaft of 200 mm diameter penetrating to 10 m depth from ground level. They are filled with 40 mm angular aggregates. These recharge bore wells are constructed at an interval of 30 m all along the storm water drains. Recharge pits with bore wells are basically pits having an upper diameter of 1.8 m and a depth of 1.75 m. In addition to this, a vertical shaft of 200 mm diameter penetrating to 10 m depth from ground level is constructed. They are filled with 1.5 mm to 2 mm sand layer for a depth of 450 mm. It is followed by a 300 mm layer of gravel. A 250 mm thick layer of boulders forms a final layer. A combination of 274 RWH-1 type wells and 41 RWH-2 type wells are constructed all along the BIAL complex.

The total area of BIAL is 1622 Ha and if rooftop area is excluded then the available area for rainwater harvesting is 1591 Ha. Six locations have been identified for storing rainwater. Total catchment for these six tanks is 1267 Ha.

The total quantity of rainwater available at these six locations in bad monsoon year is 17,54,792 cum (equivalent of 5.0 MLD in a year) and in average monsoon year is 39,19,031 cum (equivalent of 11 MLD in a year).

Based on the runoff calculations for bad monsoon and average monsoon year, it is found that 8.0 MLD of water is available at these six locations at 81% dependability. To get an 8.0 MLD of rainwater, storage ponds shall be created in the BIAL campus at appropriate places.

3.6.4. Wastewater Management

The 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 treated in Sewage Treatment Plant (STP) comprising primary, secondary and tertiary treatment facilities. The treated wastewater from the STP is used for air conditioning, cooling water make-up and green belt development.

Due to the adequate sewage and wastewater treatment facilities and re-use schemes during the operation of existing airport, no wastewater is discharged outside the airport premises.

The existing STP flow diagram is shown in Figure-3.9.

3.6.5. Solid Waste Management

Solid waste generated from the airport area comprises of sludge generated from STP, separated oil from oily wastewater and garbage from the restaurants and airport operations in the operational phase as well as solid waste generated due to spill containment in any untoward event. The details of existing solid waste generation are given in Table-4.2.

TABLE-3.4 - SOLID WASTE GENERATION

Sr. No.	Type of Waste	Solid Waste Generation (Tonnes/Day)	Mode of Disposal
1	Food waste and garbage from the Terminal & PTC	4.5	Entire waste will be disposed through authorized agents for disposal & feeding to animals
2	Sludge from STP	0.8	Used as manure
3	Separated oil from STP	0.1	Disposed through authorized vendors
4	Oily waste	0.1	
5	Waste from the Cargo complex	2.0	Recyclable is segregated & given to recyclers and inerts disposed to authorized agents
6	Medical waste	0.01	Sent to KSPCB authorized medical waste vendors
7	Other Solid waste	4.0	Suitably disposed
	Total Solid Waste	11.51	

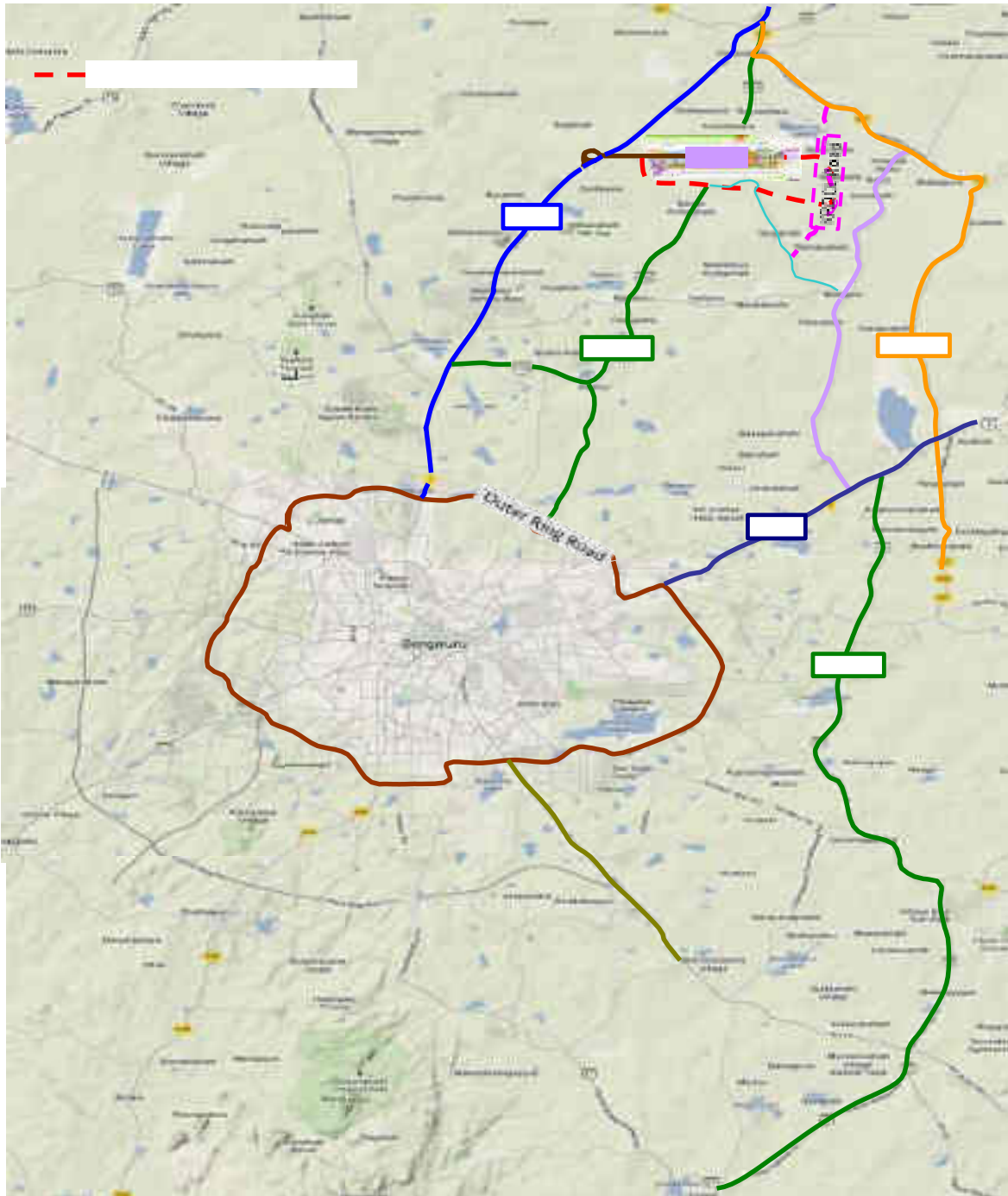
4. SITE ANALYSIS

4.1. Connectivity to KIA

Two National Highways (NH 7 and NH 207) and two state Highways (SH 35 and SH104) pass through the region in addition to broad gauge Railway line from Bengaluru to Kolar via Devanahalli.

The existing road network around KIA is shown in Figure 1.2. Currently, the National Highway no 7 is the single major arterial providing access to the traffic bound to KIA. The existing NH-7 in this portion has 6-lane carriageway and the access road to airport is of 4 lanes configuration. The junction on the NH 7 is designed as a Trumpet interchange.

The outer semi-direct ramp of the interchange gives access to traffic from Bangalore city destined to the Airport forming the major inflow component of airport traffic. The inner exit loop serves traffic leaving the airport going towards the northern side (towards Devanahalli and



Required East-West

Figure 4.1 - Regional Connectivity, KIA

Hyderabad). The diagonal ramps of the trumpet serve as exit to traffic leaving the airport towards Bangalore city and entry to traffic from Northern side into the airport.

A single line Railway track from Bangalore to Chikkaballapur runs alongside the NH at this location.

The other major/minor roads around KIA are the following:

1. NH207 (Dobbaspet- Hosur) - provides connectivity between the Eastern suburbs of Bangalore like Sarjapur and Devanahalli town, on the eastern side of the airport zone.
2. SH 104: This road, partially upgraded to four lane configuration, along with other link roads provides connectivity between Outer Ring Road and Devanahalli through Bagaluru and also connects Yelahanka on NH7.
3. Link road between NH-4 and NH207(Link-1-IRR): This road connects NH207 and NH-4 through Budigere and provides connectivity to eastern outskirts of Bangalore through the SH-35.
4. KRDC Road connecting NH207 and Ramanahalli (Proposed Cargo Road): This PWD road is an MDR provides connectivity from Devanahalli to Budigere through Bettakote running close to the airport boundary on the east. This road is proposed as the future road to the proposed cargo terminal on the east. This road meets another MDR between Budigere and Singahalli which further connects to the SH 104. ROW of 40 m is available. (source -KIADB)
5. Link road between SH104 and Budigere through Singanahalli(Link-2)- - This MDR connects Budigere to Bande Kodigehalli on SH104 linking to the KRDC road at Ramanahalli. The Aerospace SEZ and IT/Hardware parks are proposed on either sides of this road. ROW of 20 m is available. (source - KIADB)
6. Link road between NH-7- Bagalur and Budigere(Link-3)- - This two lane road starts from Budigere cross near Yelahanka Airforce station passes through Bagaluru meeting SH104 and runs further east through Yadiyuru, Maralakunte villages and ends at Budigere.

4.2. Land Form, Land Use and Land Ownership

4.2.1. Land Form

Land form for proposed project site is plain, accommodating parallel independent runways for simultaneous and independent operations with a provision of full length taxiway on either side of the runways. The airport site is large enough to develop a two runway system.

4.2.2. Land Use

The proposed project site is non- agricultural land owned by BIAL. It is designated for airport development. The existing land use details are given in **Table-4.1**.

TABLE-4.1 - Summary of Existing Landuse

Sr. No.	Land Use Category	Developed Area (Ha.)	Developed Area (acres)	(%)
1.0	Airfield	676	1670	41.72
2.0	Vacant	648	1601	40
3.0	Non Aeronautical development	188	465	11.61
4.0	Passenger Terminal	40	99	2.47
5.0	Ground transportation and parking	31	77	1.92
6.0	Air cargo	16	40	0.98
7.0	Airport and airline support	14	35	0.86
8.0	Utilities	9	23	0.43
	Total Area	1622	4009	100

4.2.3. Land Ownership

Total Land for the proposed project site is owned by BIAL. Survey numbers of the BIAL project area are enclosed as **Annexure I**.

4.3. Topography

Topography of the 10 km radial study area is observed that an almost straight ridge line passes through Nandi hill and Bengaluru west. This divides the study area into two catchment areas for rivers on either side. The western part of the area is the basin for Arkavathi River and eastern part of the area is basin for Ponnaiyar River (Dakshina Pinakini River). Due to the special topography of the area, number of tanks (called 'Kere') form in the rainy season. These tanks are one of the sources of water for irrigation and for recharging groundwater. Hoskote Kere and Badna Kere are two main tanks, which are almost perennial. The Ponnaiyar River passes through these two tanks.

No major change in the topography is envisaged as the additional features will be developed within the existing complex which has uniform topography.

4.4. Existing Land Use Pattern

Entire project site is located on the non-agricultural area and no forest land is involved. The existing land use details are given in **Table-4.1**.

4.5. Existing Infrastructure and Amenities

The following infrastructure exists

- All weather metal top road connectivity to the nearest NH-7 (0.4 Kms, WNW);
- NH 207 (1.5 km, NE);
- Well connected internal roads and internal electrical lines;
- Electrical substation and guest house facility;
- Hospital;
- Drinking water facility; and
- Post office, bus station, railway station, banks, shopping complex, community halls, senior secondary schools, worship places etc, exists.

4.6. Soil Classification

The texture of soil is mostly sandy clayey in the study area. The common color of the soil ranged from brown to brownish black. pH of the soil ranges from 6.6 to 7.5 indicating that the soils are usually alkaline in nature.

The nitrogen value ranges between 55 to 125 kg/ha g indicating that the soils are categorized as very less to good quantity of nitrogen.

The phosphorus values ranged between 39 to 99 Kg/ha indicating that the soils have medium to sufficient of phosphorus.

The potassium values range between 73 to 176 kg/ha indicating that the soil has average quantity of potassium.

4.7. Climatic Data and Secondary Sources

The climatic data from IMD Bengaluru is given in following Table-4.2.

TABLE-4.2 - CLIMATOLOGICAL DATA FOR IMD, BENGALURU

Month	Temperature (°C)		Relative Humidity (%)				Rainfall (mm)	Atmospheric Pressure (mb)			
			0830 hrs		1730 hrs			0830 hrs		1730 hrs	
	Max	Min	Max	Min	Max	Min	Mean	Max	Min	Max	Min
January	28.9	13.8	87	68	43	30	2.0	915.3	912.0	912.0	908.8
February	31.3	15.5	84	58	35	22	0.02	914.2	911.5	910.6	908.1
March	33.9	18.1	73	52	34	17	10.5	912.8	910.7	909.8	907.0
April	34.5	21.5	79	66	41	25	39.2	911.3	907.7	907.3	905.5
May	35.2	21.3	82	65	55	37	115.9	910.6	908.0	906.9	904.3
June	30.5	19.8	89	80	73	56	110.6	908.1	906.0	905.5	903.8
July	29.7	19.5	90	86	86	51	106.8	909.0	906.4	906.4	904.3
August	28.2	19.2	92	87	74	55	152.6	909.1	907.8	906.4	905.7
September	29.7	20.4	90	80	72	46	211.6	910.3	907.7	907.0	905.0
October	29.2	19.0	89	83	84	54	171.1	911.1	909.4	908.0	906.7
November	28.7	17.0	87	70	64	47	38.7	913.3	910.9	910.3	907.9
December	27.7	14.8	89	77	71	35	20.8	914.8	912.7	909.8	911.7

Source: IMD Data, Bengaluru

4.8. Social Infrastructure Available

The existing social infrastructure in the area includes the following and will further be strengthened (as required):

- Hospital with ambulance;
- Bank;
- Post office;

- Railway station;
- Bus station;
- Fire station;
- Secondary school;
- Police station;
- Shopping complex;
- Sports infrastructure (Stadium & Camps etc) ;
- Self help groups;
- Community halls;
- Cinema halls; and
- Primary health care centres.

5. PLANNING

5.1. Planning Concept

In view of the continuing rapid growth of the regional and national economy and consequent increase in aviation traffic demand, Bangalore International Airport Limited (BIAL) is proceeding with the second stage of airport expansion consisting of construction of new terminal, second runway, and other associated aeronautical and non aeronautical facilities.

The aim of the Bengaluru International Airport is to meet the need of air travel in southern India, as its main airport serving the region. Kempegowda International Airport (KIA), India's first greenfield airport, has been envisioned as an aviation business and travel hub for South India. In keeping with this, KIA plans are designed to provide facilities and services to all passengers by expanding required infrastructure.

Around the world, airports have been expanding their facilities to include retail outlets, office spaces and other commercial developments. Encompassing all these non-aviation facilities and beyond Bengaluru International Airport aims at setting a benchmark for the development of future airports in India. KIA Master Plan ensures that the size and capacity of the airport's facilities are in line with passenger traffic forecast and projected cargo growth. The facilities include runways, taxiways, apron, passenger terminal building, fuel farm, airport fire service, aircraft maintenance facilities, access roads, car parking, control tower, technical building, maintenance, GSE Workshop, administrative building and security. KIA Master Plan is prepared in line with current ICAO standards and recommendations, IATA guidelines and AAI requirements.

KIA is proposed to be developed on the concept of playing a leading role in economic development of Southern India by providing increased scheduled services for business, provide increasing choice and opportunities for leisure, travel, business by international and domestic travelers within the airport area, reducing the need for passenger to make surface journeys outside the airport area, act as gateway for tourist visiting south India and Karnataka in general and to provide business, leisure, travel opportunities and infrastructure.

Proposed KIA expansion and development would meet aviation demand, community acceptance, and environmental compatibility and harmonize with other modes of local, state and national transportation. The development will define the type and extent of proposed activities necessary for the airport to meet projected aviation demand. The airport plan conceptualizes the long-term development required at KIA.

The proposed development concept for KIA is for the period of 15 to 20 year. Its focus is on the future aeronautical & non aeronautical development and on aviation activity forecasts, to cater for future aviation growth. To cater for this growth, the proposed development includes Development Concepts for:

- the airfield;
- terminal and passenger systems;
- freight facilities;
- aviation support facilities and utilities;
- landside access; and
- Non Aeronautical (Commercial) development.

The Non Aeronautical development of KIA is visualized as a vibrant, dynamic green 'Aerotropolis'. It is proposed to be a dynamic environment integrating and enhancing opportunities for all airport users & city resident for businesses, logistics and shopping, information and entertainment. It will house efficient, multi-modal hub for air, rail (HSRL / Metro) and road transport which will provide visitors a unique experience. It will offer its visitors and locally based national and international businesses all the services they require on a 24x7 basis, providing extensive level of service, not only in the area of transport and aviation, but also in entertainment, commerce, hospitality, recreation, offices and the establishment of businesses.

5.2. Population Projection

As per 2001 census the study area consists of 191409 persons inhabited in the study area of 10 km radial distance from the periphery of the proposed project area. The distribution of population in the study area is given in **Table-5.1**.

TABLE-5.1 - DISTRIBUTION OF POPULATION

Particulars	0-3 km	3-7 km	7-10 km	0-10 km
No. of Households	4803	19899	12616	37318
Male Population	12893	52356	33754	99003
Female Population	11949	49050	31407	92406
Total Population	24842	101406	65161	191409
Boys Population (0-6 years)	1622	6596	4209	12427
Girls Population (0-6 years)	1520	6412	3940	11872
Total Children Population (0-6 years)	3142	13008	8149	24299
Average Household Size	5.2	5.1	5.2	5.1
% of males to the total population	51.9	51.6	51.8	51.7
% of females to the total population	48.1	48.4	48.2	48.3
Sex Ratio (no of females per 1000 males)	926.8	936.9	930.5	933.4

Source: District Census Hand Books -2001

The proposed expansion project would create many job opportunities for the local people. There will be influx of people from other districts because of which socio economic changes are expected to take place within 4-5 km from the airport.

5.3. Land Use Planning

The objectives of the Airport land use plan are to illustrate the extent of land potentially required to accommodate projected aviation activity and to recommend how land should be allocated among the Airport's major functional areas. The proposed land use plan reflects the highest and best uses of land based on a careful balancing of both operational and commercial requirements. The proposed Landuse Plan is approved by BIAAPA.

The proposed land use plan reflects the highest and best uses of land based on a careful balancing of operational, environmental and commercial requirements. The land use strategy has been formulated taking into account several salient factors, viz

- Existing & Contextual development
- Future growth potential of Bangalore region
- Infrastructural scenario and connectivity
- Market potential
- Urban Development
- Land usage and phasing

The proposed land use plan has five principal zones as shown in **Table-5.2**.

TABLE 5.2 - LAND USE STATEMENT

Sr. No	Land use Index	Area in Ha.	Area (acres)	%
1	Aeronautical zone	1213	2998	74.79
2	Non - Aeronautical commercial zone	76	188	4.68
3	Aeronautical commercial zone	206	509	12.69
4	Green zone	25	61	1.53
5	Transport zone	102	253	6.31
	Total	1622	4009	100

5.4. Assessment of Infrastructure Demand (Physical and Social)

For the proposed expansion project, there shall be demand for the following physical and social infrastructure:

- i. Road network;
- ii. Railway network;
- iii. Water supply;
- iv. Power transmission;
- v. Sewerage system
- vi. Solid waste management

5.5. Amenities and Facilities

Cityside development shall house range of commercial uses, along with required physical and social infrastructure, like hospitality & commercial facilities, hotels, F&B, retail & entertainment, convention center, exhibition areas, etc along with institutional facilities, ancillary aviation uses like fuel farms, offices for logistics & freight, catering facilities, offices for airline & airport partners, police stations, hospitals, and other support facilities for operating the airport. Utilities required for entire airport shall also be located in this Zone.

6. PROPOSED INFRASTRUCTURE

6.1. Connectivity

The primary access and circulation roadway is the main access roadway (MAR) connecting the NH7 to the terminal area facilities. During the planning period, the State of Karnataka plans to develop a second highway providing access to the Airport to relieve anticipated congestion on NH7. This new highway will be east of NH7 and will connect with the MAR just

west of Airport property. The following additional external access/connectivity is required to cater to the higher travel demands of KIA, in future.

1. Access to KIA from South West corner of the BIAL Area (2nd Western Access) - This new access is proposed from the existing SH-104 as an alternate access to KIA from the South Western corner to ease off the load in the trumpet junction. The alignment of this road will partially be through the present MDR which runs parallel to the airport boundary from Mailanhalli village to Begur power substation (East to West) turning North and connecting to KIA. This will be proposed as a six lane divided road with possibility of upgradation to a 8 lane road in the future. This entry will also be a prime entry to KIA when the alternate Airport Expressway is built by GoK or alternately SH-104 is widened from Outer Ring Road, Bengaluru city to KIADB Aerospace SEZ and KIA.
2. Access to KIA from Eastern side through SH-104 (Eastern Access) - Another access to KIA is proposed from the existing SH-104 on the East, catering to the eastern developments of KIA comprising of Cargo, MRO and commercial developments proposed in that area. This will be proposed as a six lane divided road with possibility of upgradation to a 10 lane road in the future. This entry will help in segregating the passenger traffic and the cargo traffic by providing separate access for them to the airport, thus dividing the load on any particular road. This will also be a major road for the cargo traffic originating or destined to the KIADB Aerospace SEZ.
3. Access to KIA from NH-7 from North Western corner of BIAL Area (Emergency Access) - This access presently available in a rudimentary form is from the NH-7 near the ROB via the Devanhalli Business Park Area. This access though not planned as a major access needs to be maintained for emergency and purposes in case the other two roads get blocked.
4. High Speed Rail Connectivity - DMRC/RITES Ltd. had undertaken feasibility studies and prepared Detailed Project Report for the development of High Speed Rail connecting Bengaluru city centre to the airport. The project was proposed by DMRC on BOT format for max capacity of 11500 passengers/hr/direction by the year 2026. DMRC proposed five stations: Cubbon road, Hebbal, Yelahanka, and two stations within BIAL with baggage check in facilities at the Cubbon Road and Hebbal stations.

6.2. Solid Waste Management

Solid waste generated at the airport area shall comprise of sludge generated from STP, separated oil from oily wastewater and garbage from the restaurants and airport operations in the operational phase as well as solid waste generated due to spill containment in any untoward event. The details of estimated solid waste generation are given in **Table-6.1**.

TABLE-6.1 - SOLID WASTE GENERATION

Sr. No.	Type of Waste	Solid Waste Generation (Tonnes/Day)	Mode of Disposal
1	Food waste and garbage from the Terminal & PTC	14.39	Entire waste will be disposed through authorized agents for disposal & feeding to animals
2	Sludge from STP	2.56	Used as manure
3	Separated oil from STP	0.32	Disposed through authorized vendors
4	Oily waste	0.32	
5	Waste from the Cargo complex	6.4	Recyclable is segregated & given to recyclers and inerts disposed to authorized agents
6	Medical waste	0.03	Sent to KSPCB authorized medical waste vendors
7	Other Solid waste	12.79	Suitably disposed
	Total Solid Waste	36.81	

6.3. Social Infrastructure

The KIA Master Plan has reserved land for world class Vocational Institutes, Cultural Institutions, Research Centers, Multi specialty Hospital, Museums, Libraries, etc coupled with environmental friendly development to match global standards.

The development will also house Police Stations, Post Offices, Fuel Stations and place of worship to serve the proposed facilities in KIA.

KIA Master Plan shall implant social infrastructure that breathe life deep into the fabric of the entire development, not in separated precincts, into urban environments and public space amenity, will enable the proposed development to embrace urbanism and drive the output of world class airport.

7. REHABILITATION AND RESETTLEMENT (R&R) PLAN

The entire land required for the project is within the existing premises of BIAL limited and does not have any settlement issues. So, there shall be no Rehabilitation & Resettlement (R&R) in the proposed expansion.

8. PROJECT BENEFITS:

- Improvements in the physical infrastructure by way of addition of project infrastructure, ancillary industries that may come up on account of the project
- Improvements in the social infrastructure like roads, railways, townships, housing, watersupply, electrical power, drainage, educational institutions, hospitals, effluent treatment plants, improved waste disposal systems, improved environmental conditions, etc.
- Employment potential -skilled; semi-skilled and unskilled labour both during construction and operational phases of the project with specific attention to employment potential of local population as well as necessity for imparting any specialized skills to them to be eligible for such employment in the project on a long term basis i.e., during operational and maintenance stages of the project and
- Other tangible benefits like improved standards of living, health, education etc.

9. SOCIO-ECONOMIC BENEFITS

- provision of additional revenue generation in terms of foreign exchange earned from operations,
- Triggering growth in the region;
- provision of additional employment;
- development of ancillary industries and trade centres;
- improvement in quality of life, flight safety awareness and literacy of people in the area and
- promote direct foreign investment in the region due to access to international markets

10. PROJECT SCHEDULE AND COST ESTIMATES

10.1. Capital Cost Estimates

Total project cost including aeronautical and non aeronautical development is

estimated at Rs. 15531.00 crore.

Sr. No	Development	Cost (in Cr.)
1.0	Aeronautical development	13654.00
2.0	Non Aeronautical Development	1877.00
Total		15531.00

A. Aeronautical development Project Cost

Sr. No.	Particulars	Amount
		In crore
1.0	Airfield	5171
2.0	Passenger Terminal 2 (T 2)	6359
3.0	Landside Access and Parking	742
4.0	Air Cargo	424
5.0	Aircraft Maintenance	320
6.0	Airport Maintenance	126
7.0	Ground Support Equipment Workshop	26
8.0	Flight Catering	20
9.0	Aircraft Rescue And Firefighting	10
10.0	Fuel Storage and Distribution	203
11.0	General Aviation	64
12.0	Airport And Airline Administration	169
13.0	Utilities	18
	Total	13654

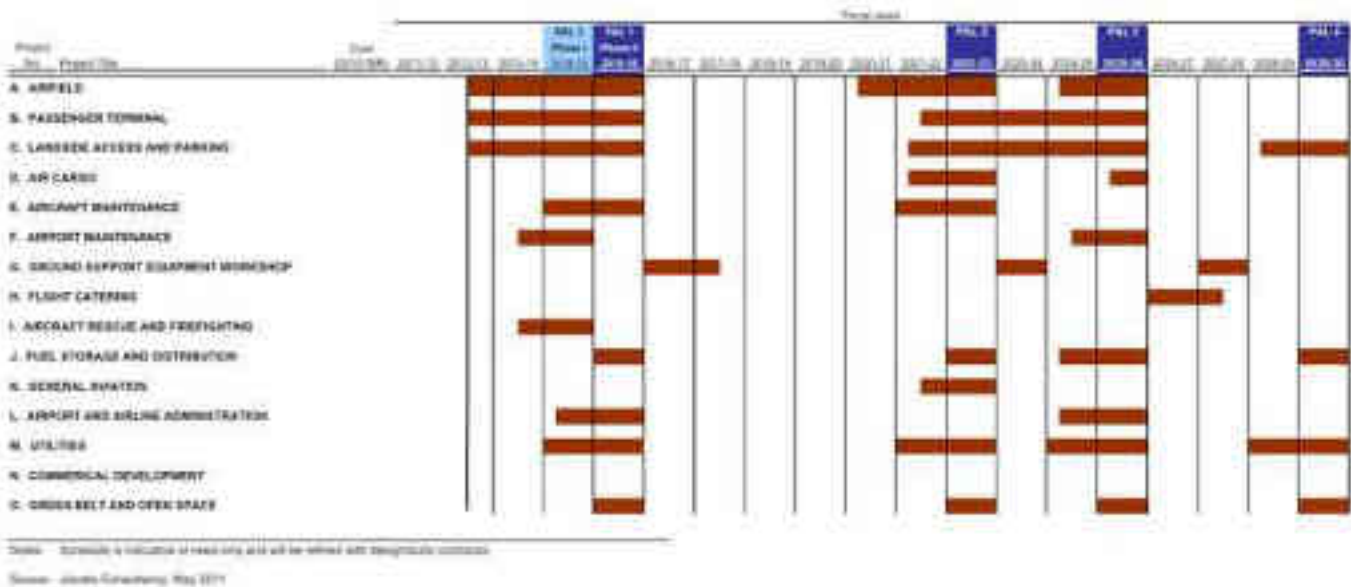
B. Non Aeronautical Development

Sr. No.	Particulars	Total Cost (Cr.)
1.0	Roads	945
2.0	Storm Water (Other than Roadside Drains)	2
3.0	Skywalk / Underpass (Pedestrian & Vehicular / Bridges)	67
4.0	Water Supply	40
5.0	Sewage Management	250
6.0	Rain Water Harvesting	45
7.0	Recycle Water	39
8.0	Power & Electricity	147

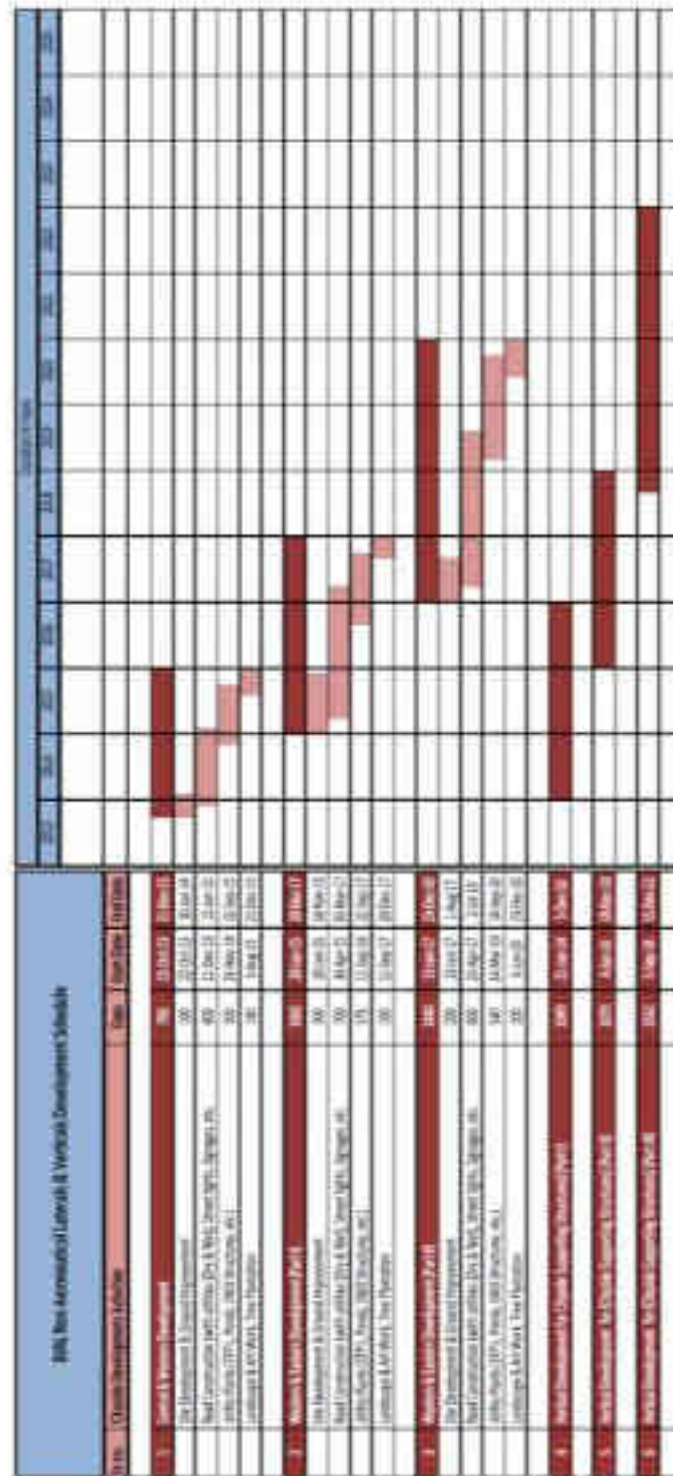
9.0	IT & Security	28
10.0	Gas Supply	68
11.0	Fire Hydrant	44
12.0	Solid waste Disposal System (Approximate Cost)	20
13.0	Site Development	56
14.0	Car Parks	30
15.0	Landscape/Parks	95
		1877

10.2. Project Schedule

10.2.1. Project Schedule of Aeronautical / Airside development



10.2.2. Project Schedule of Cityside Development



11. ANALYSIS OF PROPOSAL

The proposed development of next stage at KIA shall proactively participate in the upliftment of socio economic index of the communities around the project site by way of financial and administrative support. The project will open up large employment opportunities, directly and also indirectly. There shall be opportunities for entrepreneurs to engage in many service sectors directly or indirectly associated with the project. Also the proposed aeronautical and non aeronautical development at Bangalore International Airport would act as a multi-faceted global destination, a vibrant metropolitan environment, offering a range of hospitality, commercial, recreational, cultural, entertainment, convention & exhibition facilities, along with dedicated business parks and aviation related institutions (educational, training & research). The physical ambience, quality of infrastructure, diversity in offerings in natural green setting of proposed Bangalore International Airport City with strong local and global identity and positioning, shall create a unique business brand for KIA, attracting new businesses, creating new jobs and opening new commercial possibilities, introducing a vibrant business model that shall accommodate intensive air travel needs in an environmentally responsible way.

Sl. No.	Ac No.	Extent		SO No.	By No.	Dist.	
		Area	Qenta			Area	Qenta
22	126	4	3	2	100	2	8
23	128	4	3	2	100	4	3
24	130	1	31	1	104	4	0
25	132	1	21	2	106	4	0
26	134	2	27	2	101	4	0
27	136	2	18	20	106	4	2
28	138	2	26	11	107	4	2
29	140	2	26	12	107	2	0
30	142	4	2	15	108	2	18
31	144	4	2	14	100	1	24
32	146	4	21	15	100	15	1
33	148	2	21	16	107	4	1
34	150	1	24	17	111	1	18
35	152	1	19	18	105	1	1
36	154	4	0	19	103	1	4
37	156	1	2	20	101	2	4
38	158	1	18	21	105	1	2
39	160	1	11	22	105	1	2
40	162	4	18	23	101	1	4
41	164	4	1	24	102	1	24
42	166	1	16	25	101	1	18
43	168	1	19	26	101	1	1
44	170	1	19	27	105	1	1
45	172	0	1	28	2	1	11
46	174	0	17	28	4	1	18
47	176	0	18	30	1	1	2
48	178	0	18	31	2	1	20
49	180	1	17	32	10	2	24
50	182	1	1	33	11	4	12
51	184	1	1	34	11	1	12
52	186	1	1	35	13	1	1
53	188	1	1	36	13	1	1
54	190	1	1	37	14	4	18
55	192	1	11	38	16	4	18
56	194	2	4	39	17	1	1
57	196	1	17	40	18	1	2
58	198	1	21	41	17	2	27
59	200	1	1	42	201	2	4
60	202	1	1	43	202	2	1
61	204	200	2	44	211	4	22
62	206	1	21	45	210	1	4
63	208	2	2	46	21	1	20
64	210	2	21	47	21	4	20
65	212	2	17	48	21	4	18
66	214	2	20	49	21	4	14
67	216	1	5	51	28	4	12
68	218	4	1	51	28	2	7
69	220	4	0	52	31	1	21

I have checked the details of the above lands and found them correct.
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Sl. No.	Type	Easement		S. No.	By No.	Area	
		Acres	Cents			Acres	Cents
59	31	3	25	111	161	3	13
60	31	3	7	111	165	3	13
61	31	4	8	111	165	3	13
62	31	8	11	111	165	3	13
63	31	1	17	111	165	3	13
64	31	1	21	111	165	3	13
65	31	1	21	111	165	3	13
66	31	1	21	111	165	3	13
67	31	1	21	111	165	3	13
68	31	1	21	111	165	3	13
69	31	1	21	111	165	3	13
70	31	1	21	111	165	3	13
71	31	1	21	111	165	3	13
72	31	1	21	111	165	3	13
73	31	1	21	111	165	3	13
74	31	1	21	111	165	3	13
75	31	1	21	111	165	3	13
76	31	1	21	111	165	3	13
77	31	1	21	111	165	3	13
78	31	1	21	111	165	3	13
79	31	1	21	111	165	3	13
80	31	1	21	111	165	3	13
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96	31	1	21	111	165	3	13
97	31	1	21	111	165	3	13
98	31	1	21	111	165	3	13
99	31	1	21	111	165	3	13
100	31	1	21	111	165	3	13

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Sl. No.	Sq. Mts	Area		Sl. No.	Sq. Mts	Area	
		Area	Content			Sl. No.	Content
100	84	4	20	188	1302	3	18
101	86	4	6	189	1305	2	12
102	881	2	8	190	1308	1	1
103	883	2	18	191	1311	1	24
104	884	2	2	192	1314	1	12
105	885	2	12	193	1317	2	24
106	886	2	4	194	1320	1	12
107	887	2	8	195	1323	1	12
108	888	2	16	196	1326	1	12
109	889	2	8	197	1329	1	12
110	890	2	16	198	1332	1	12
111	891	2	8	199	1335	1	12
112	892	2	16	200	1338	1	12
113	893	2	8	201	1341	1	12
114	894	2	16	202	1344	1	12
115	895	2	8	203	1347	1	12
116	896	2	16	204	1350	1	12
117	897	2	8	205	1353	1	12
118	898	2	16	206	1356	1	12
119	899	2	8	207	1359	1	12
120	900	2	16	208	1362	1	12
121	901	2	8	209	1365	1	12
122	902	2	16	210	1368	1	12
123	903	2	8	211	1371	1	12
124	904	2	16	212	1374	1	12
125	905	2	8	213	1377	1	12
126	906	2	16	214	1380	1	12
127	907	2	8	215	1383	1	12
128	908	2	16	216	1386	1	12
129	909	2	8	217	1389	1	12
130	910	2	16	218	1392	1	12
131	911	2	8	219	1395	1	12
132	912	2	16	220	1398	1	12
133	913	2	8	221	1401	1	12
134	914	2	16	222	1404	1	12
135	915	2	8	223	1407	1	12
136	916	2	16	224	1410	1	12
137	917	2	8	225	1413	1	12
138	918	2	16	226	1416	1	12
139	919	2	8	227	1419	1	12
140	920	2	16	228	1422	1	12
141	921	2	8	229	1425	1	12
142	922	2	16	230	1428	1	12
143	923	2	8	231	1431	1	12
144	924	2	16	232	1434	1	12
145	925	2	8	233	1437	1	12
146	926	2	16	234	1440	1	12
147	927	2	8	235	1443	1	12
148	928	2	16	236	1446	1	12
149	929	2	8	237	1449	1	12
150	930	2	16	238	1452	1	12
151	931	2	8	239	1455	1	12
152	932	2	16	240	1458	1	12
153	933	2	8	241	1461	1	12
154	934	2	16	242	1464	1	12
155	935	2	8	243	1467	1	12
156	936	2	16	244	1470	1	12

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 the plan 85
 Date:

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No	Ex.No	Dist		P.No	St. No	Passe	
		Acte	Quart			Acte	Quart
174	4	4	25	21	0	8	
175	4	4	26	22	0	4	
177	4	4	27	23	0	2	
178	4	4	28	24	0	2	
179	4	4	29	25	4	22	
180	4	4	30	26	4	2	
181	4	4	31	27	2	21	
182	4	4	32	28	0	5	
183	4	4	33	29	1	2	
184	4	4	34	30	2	2	
185	4	4	35	31	0	4	
186	4	4	36	32	1	4	
187	4	4	37	33	1	4	
188	4	4	38	34	1	4	
189	4	4	39	35	4	20	
190	4	4	40	36	4	4	
191	4	4	41	37	4	4	
192	4	4	42	38	4	21	
193	4	4	43	39	4	22	
194	4	4	44	40	2	4	
195	4	4	45	41	0	21	
196	4	4	46	42	1	21	
Total		13	49	47	20	12	
TEMPE: GANAGHUTIMARALI							
1	11	3	43	22	0	22	
2	12	11	44	23	1	11	
3	13	1	45	24	2	6	
4	14	4	46	25	1	21	
5	15	4	47	26	1	6	
6	16	1	48	27	1	3	
7	17	2	49	28	1	7	
8	18	2	50	29	3	7	
9	19	2	51	30	3	14	
10	20	2	52	31	3	8	
11	21	2	53	32	1	8	
12	22	0	54	33	2	11	
13	23	0	55	34	1	14	
14	24	0	56	35	1	14	
15	25	0	57	36	4	14	
16	26	0	58	37	4	11	
17	27	0	59	38	4	14	
18	28	0	60	39	4	14	
19	29	0	61	40	4	14	
20	30	0	62	41	4	14	
21	31	0	63	42	4	14	
22	32	0	64	43	4	14	

BEAT-RSIEDC

Page # 28

Land Lease Deed

I de signed zones of
 zone area 30

Sl. No.	S.No.	Status		Sl. No.	S.No.	Status	
		Active	Deactive			Active	Deactive
86	283	1	1	142	48313	0	0
87	284	1	1	143	48314	0	0
88	285	1	1	144	48315	0	0
89	286	1	1	145	48316	0	0
90	287	1	1	146	48317	0	0
91	288	1	1	147	48318	0	0
92	289	1	1	148	48319	0	0
93	290	1	1	149	48320	0	0
94	291	1	1	150	48321	0	0
95	292	1	1	151	48322	0	0
96	293	1	1	152	48323	0	0
97	294	1	1	153	48324	0	0
98	295	1	1	154	48325	0	0
99	296	1	1	155	48326	0	0
100	297	1	1	156	48327	0	0
101	298	1	1	157	48328	0	0
102	299	1	1	158	48329	0	0
103	300	1	1	159	48330	0	0
104	301	1	1	160	48331	0	0
105	302	1	1	161	48332	0	0
106	303	1	1	162	48333	0	0
107	304	1	1	163	48334	0	0
108	305	1	1	164	48335	0	0
109	306	1	1	165	48336	0	0
110	307	1	1	166	48337	0	0
111	308	1	1	167	48338	0	0
112	309	1	1	168	48339	0	0
113	310	1	1	169	48340	0	0
114	311	1	1	170	48341	0	0
115	312	1	1	171	48342	0	0
116	313	1	1	172	48343	0	0
117	314	1	1	173	48344	0	0
118	315	1	1	174	48345	0	0
119	316	1	1	175	48346	0	0
120	317	1	1	176	48347	0	0
121	318	1	1	177	48348	0	0
122	319	1	1	178	48349	0	0
123	320	1	1	179	48350	0	0
124	321	1	1	180	48351	0	0
125	322	1	1	181	48352	0	0
126	323	1	1	182	48353	0	0
127	324	1	1	183	48354	0	0
128	325	1	1	184	48355	0	0
129	326	1	1	185	48356	0	0
130	327	1	1	186	48357	0	0
131	328	1	1	187	48358	0	0
132	329	1	1	188	48359	0	0
133	330	1	1	189	48360	0	0
134	331	1	1	190	48361	0	0
135	332	1	1	191	48362	0	0
136	333	1	1	192	48363	0	0
137	334	1	1	193	48364	0	0
138	335	1	1	194	48365	0	0
139	336	1	1	195	48366	0	0
140	337	1	1	196	48367	0	0
141	338	1	1	197	48368	0	0
142	339	1	1	198	48369	0	0
143	340	1	1	199	48370	0	0
144	341	1	1	200	48371	0	0

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Sl No.	Ex No.	Extent		Sl No.	Ex No.	Extent	
		Acres	Plains			Acres	Plains
101	75	2	0	10	5000	0	20
102	76	2	0	11	200	0	20
103	77	2	0	12	200	0	20
104	78	2	0	13	5000	0	20
105	79	2	0	14	5000	0	20
106	80	2	0	15	5000	0	20
107	81	2	0	16	5000	0	20
108	82	2	0	17	5000	0	20
109	83	2	0	18	5000	0	20
110	84	2	0	19	5000	0	20
111	85	2	0	20	5000	0	20
112	86	2	0	21	5000	0	20
113	87	2	0	22	5000	0	20
114	88	2	0	23	5000	0	20
115	89	2	0	24	5000	0	20
116	90	2	0	25	5000	0	20
117	91	2	0	26	5000	0	20
118	92	2	0	27	5000	0	20
119	93	2	0	28	5000	0	20
120	94	2	0	29	5000	0	20
121	95	2	0	30	5000	0	20
122	96	2	0	31	5000	0	20
123	97	2	0	32	5000	0	20
124	98	2	0	33	5000	0	20
125	99	2	0	34	5000	0	20
126	100	2	0	35	5000	0	20
127	101	2	0	36	5000	0	20
128	102	2	0	37	5000	0	20
129	103	2	0	38	5000	0	20
130	104	2	0	39	5000	0	20
131	105	2	0	40	5000	0	20
132	106	2	0	41	5000	0	20
133	107	2	0	42	5000	0	20
134	108	2	0	43	5000	0	20
135	109	2	0	44	5000	0	20
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137	111	2	0	46	5000	0	20
138	112	2	0	47	5000	0	20
139	113	2	0	48	5000	0	20
140	114	2	0	49	5000	0	20
141	115	2	0	50	5000	0	20
142	116	2	0	51	5000	0	20
143	117	2	0	52	5000	0	20
144	118	2	0	53	5000	0	20
145	119	2	0	54	5000	0	20
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147	121	2	0	56	5000	0	20
148	122	2	0	57	5000	0	20
149	123	2	0	58	5000	0	20
150	124	2	0	59	5000	0	20
151	125	2	0	60	5000	0	20
152	126	2	0	61	5000	0	20
153	127	2	0	62	5000	0	20
154	128	2	0	63	5000	0	20
155	129	2	0	64	5000	0	20
156	130	2	0	65	5000	0	20
157	131	2	0	66	5000	0	20
158	132	2	0	67	5000	0	20
159	133	2	0	68	5000	0	20
160	134	2	0	69	5000	0	20
161	135	2	0	70	5000	0	20
162	136	2	0	71	5000	0	20
163	137	2	0	72	5000	0	20
164	138	2	0	73	5000	0	20
165	139	2	0	74	5000	0	20
166	140	2	0	75	5000	0	20
167	141	2	0	76	5000	0	20
168	142	2	0	77	5000	0	20
169	143	2	0	78	5000	0	20
170	144	2	0	79	5000	0	20
171	145	2	0	80	5000	0	20
172	146	2	0	81	5000	0	20
173	147	2	0	82	5000	0	20
174	148	2	0	83	5000	0	20
175	149	2	0	84	5000	0	20
176	150	2	0	85	5000	0	20
177	151	2	0	86	5000	0	20
178	152	2	0	87	5000	0	20
179	153	2	0	88	5000	0	20
180	154	2	0	89	5000	0	20
181	155	2	0	90	5000	0	20
182	156	2	0	91	5000	0	20
183	157	2	0	92	5000	0	20
184	158	2	0	93	5000	0	20
185	159	2	0	94	5000	0	20
186	160	2	0	95	5000	0	20
187	161	2	0	96	5000	0	20
188	162	2	0	97	5000	0	20
189	163	2	0	98	5000	0	20
190	164	2	0	99	5000	0	20
191	165	2	0	100	5000	0	20
192	166	2	0	101	5000	0	20
193	167	2	0	102	5000	0	20
194	168	2	0	103	5000	0	20
195	169	2	0	104	5000	0	20
196	170	2	0	105	5000	0	20
197	171	2	0	106	5000	0	20
198	172	2	0	107	5000	0	20
199	173	2	0	108	5000	0	20
200	174	2	0	109	5000	0	20
201	175	2	0	110	5000	0	20
202	176	2	0	111	5000	0	20
203	177	2	0	112	5000	0	20
204	178	2	0	113	5000	0	20
205	179	2	0	114	5000	0	20
206	180	2	0	115	5000	0	20
207	181	2	0	116	5000	0	20
208	182	2	0	117	5000	0	20
209	183	2	0	118	5000	0	20
210	184	2	0	119	5000	0	20
211	185	2	0	120	5000	0	20
212	186	2	0	121	5000	0	20
213	187	2	0	122	5000	0	20
214	188	2	0	123	5000	0	20
215	189	2	0	124	5000	0	20
216	190	2	0	125	5000	0	20
217	191	2	0	126	5000	0	20
218	192	2	0	127	5000	0	20
219	193	2	0	128	5000	0	20
220	194	2	0	129	5000	0	20
221	195	2	0	130	5000	0	20
222	196	2	0	131	5000	0	20
223	197	2	0	132	5000	0	20
224	198	2	0	133	5000	0	20
225	199	2	0	134	5000	0	20
226	200	2	0	135	5000	0	20
227	201	2	0	136	5000	0	20
228	202	2	0	137	5000	0	20
229	203	2	0	138	5000	0	20
230	204	2	0	139	5000	0	20
231	205	2	0	140	5000	0	20
232	206	2	0	141	5000	0	20
233	207	2	0	142	5000	0	20
234	208	2	0	143	5000	0	20
235	209	2	0	144	5000	0	20
236	210	2	0	145	5000	0	20
237	211	2	0	146	5000	0	20
238	212	2	0	147	5000	0	20
239	213	2	0	148	5000	0	20
240	214	2	0	149	5000	0	20
241	215	2	0	150	5000	0	20
242	216	2	0	151	5000	0	20
243	217	2	0	152	5000	0	20
244	218	2	0	153	5000	0	20
245	219	2	0	154	5000	0	20
246	220	2	0	155	5000	0	20
247	221	2	0	156	5000	0	20
248	222	2	0	157	5000	0	20
249	223	2	0	158	5000	0	20
250	224	2	0	159	5000	0	20
251	225	2	0	160	5000	0	20
252	226	2	0	161	5000	0	20
253	227	2	0	162	5000	0	20
254	228	2	0	163	5000	0	20
255	229	2	0	164	5000	0	20
256	230	2	0	165	5000	0	20
257	231	2	0	166	5000	0	20
258	232	2	0	167	5000	0	20
259	233	2	0	168	5000	0	20
260	234	2	0	169	5000	0	20
261	235	2	0	170	5000	0	20
262	236	2	0	171	5000	0	20
263	237	2	0	172	5000	0	20
264	238	2	0	173	5000	0	20
265	239	2	0	174	5000	0	20
266	240	2	0	175	5000	0	20
267	241	2	0	176	5000	0	20
268	242	2	0	177	5000	0	20
269	243	2	0	178	5000	0	20
270	244	2	0	179	5000	0	20
271	245	2	0	180	5000	0	20
272	246	2	0	181	5000	0	20
273	247	2	0	182	5000	0	20
274	248	2	0	183	5000	0	20
275	249	2	0	184	5000	0	20
276	250	2	0	185	5000	0	20
277	251	2	0	186	5000	0	20
278	252	2	0	187	5000	0	20
279	253	2	0	188	5000	0	20
280	254	2	0	189	5000	0	20
281	255	2	0	190	5000	0	20
282	256	2	0	191	5000	0	20
283	257	2	0	192	5000	0	20
284	258	2	0	193	5000	0	20
285	259	2	0	194	5000	0	20
286	260	2	0	195	5000	0	20
287	261	2	0	196	5000	0	20
288	262	2	0	197	5000	0	20
289	263	2	0	198	5000	0	20
290	264	2	0	199	5000	0	20
291	265	2	0	200	5000	0	20
292	266	2	0	201	5000	0	20
293	267	2	0	202	5000	0	20
294	268	2	0	203	5000	0	20
295	269	2					

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 25/10/09

S.No.	Tahsil	Distt.		S.No.	T. Hs.	Distt.	
		Agri	Other			Agri	Other
81	545	0	4	126	117	2	6
82	491/1	0	11	118	114	2	0
83	560	0	15	121	113	2	0
84	162A	0	18	122	112	12	12
85	240B	0	21				
86	547	0	0				
87	583	0	18				
88	557	0	10	1	107	7	23
89	555	0	24	2	100	0	27
90	57	1	22	3	112	7	16
91	581	1	7	4	117/1	13	27
92	512	1	1	5	11	2	10
93	513	1	1	6	24	3	11
94	514	1	3	7	15	7	14
95	501	1	18	8	26	3	20
96	202A	1	17	9	17	4	21
97	52/11	1	8	14	18	1	14
98	111	1	20	11	20	3	11
99	113	2	4	12	150	3	1
100	493	2	12	13	49/100	0	13
101	115	0	23	14	41/1	6	15
102	412	0	7	15	412	6	7
103	117	0	8	16	427	1	17
104	414	0	4	17	423	1	13
105	415	0	10	18	43/101	3	17
106	416	0	17	19	43/101	0	12
107	417	0	2	20	11/11	0	1
108	218A	0	19				
109	218B	0	15				
110	218C	0	13				
111	218D	0	11				
112	218E	0	12	1	11/1	4	11
113	218F	0	1	2	11/1	7	1
114	218G	0	4	3	11/1	1	17
115	218H	0	21	4	11/10	1	20
116	41	1	13	5	102/5	1	24
117	412	1	22	6	101	1	20
118	413	1	11	7	101	1	1
119	414	1	11	8	101	1	11
120	415	1	18	9	107	1	18
121	416	1	16	10	111	1	16
122	417	1	17	11	112	1	21
123	1120	1	13	12	113	1	3
124	1121	1	14	13	114	1	1
125	1122	1	13	14	11	2	6
126	114	2	0	15	142/5	4	22
127	115	1	0	16	117	1	20
128	116	1	0	17	118	1	20

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Land Lease Deed

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3. at page 200/25
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4. Lands controlled by KATHIC by both direct & indirect.

5. Right of way and portion of lands measuring 525 Acres 11 Banna controlled by the village Gramapanchayat, Anantapur, A.P. and the Gramapanchayat, Bannary, Warangal, Andhra Pradesh.

6. Detailed Table, Bangalore Rural District and Chickaballur and Vijayanagara Districts, Bangalore District of Karnataka State, as per details below:

Detailed Table, Bangalore Rural District

Sl. No.	S.No.	Village		S.No.	S. No.	Area	
		Acres	Cents			Acres	Cents
Village		SRI VANAHALLI		Village		GANGAHATHANAHALLI	
	1	547	7		2	44	3
	Total	547	7		44	3	
Village		ANANDAWADA		Village		SETTANUR	
	1	87	7		1	11	11
	Total	87	7		11	11	
Village		SHANMUGHANUR		Village		SETTANUR	
	1	23	14		1	20	18
	Total	23	14		20	18	
Village		SRI VANAHALLI		Village		SETTANUR	
	1	194	1		1	62	3
	Total	194	1		62	3	
Village		SRI VANAHALLI		Village		SETTANUR	
	1	62	0		1	51	1
	Total	62	0		51	1	
Village		SRI VANAHALLI		Village		SETTANUR	
	1	55	15		1	20	0
	Total	55	15		20	0	
Detailed Table, Chickaballur District							
Village		SRI VANAHALLI		Village		SETTANUR	
	1	20	36		1	10	18
	Total	20	36		10	18	
Detailed Table, Vijayanagara District							
Village		SRI VANAHALLI		Village		SETTANUR	
	1	2	18		1	2	18
	Total	2	18		2	18	

Abstract of Lands under (2) of Part

Received	14	7
Assigned	24	10
Controlled	20	7
Disputed	59	1
Disputed	14	8
Disputed	30	1
Disputed	2	18
Disputed	184	25
TOTAL	245	25

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22/05/2019
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Sl.No.	By No.	Survey		Sl.No.	By No.	Area	
		Sl.No.	By No.			Acres	Cents
Part II - Portion of the Ehs of which KSEDC is the proprietor lessee:							
BANGALORE URBAL DISTRICT, DEYANAHALLI TALUK							
Purani - BETTAKURFI							
Village	BETTAKURFI			38	97	0	
	BALABHIMANAHALLI			23	143	10	
	CHIVACHER			8	134	0	
				68	374	10	
				Total	480	20	
Forest - ANGANMATHANAHALLI							
Village	ANGANMATHANAHALLI			13	165	0	
				Total	165	0	
Forest - TAITIRIGANAHALLI							
	TAITIRIGANAHALLI			35	177	14	
	MELKONAHALLI			7	118	5	
	DEMDASANDU			49	196	30	
				Total	91	53	
Total Forest Lands						156	7
Analysis of Total Lands							
As per details in (1) of Part I						2321	36.0
As per details in (2) of Part I						200	31
As per details in Part II						1287	7
Total						3808	74.0
Add: Additional extent of Land As per Engineering Measurement by G. Suresh Suresh Pvt Ltd						16	30.0
Grand Total						3824	104

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Date: 28/05/2016
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SCHEDULE E

PART-I: Additional Land abutting southern boundary to accommodate second runway

All those pieces and parcels of land measuring 109 acres 22 Guntas comprised in the villages Begur, Chikolahalli and Mylanahalli of Bangalore North Taluk (Additional), Bangalore District of Karnataka State as per details below:

SLNO	SURVEY NO	EXTENT	
		ACRES	GUNTAS
VILLAGE	BEGURU		
1	84	02	26
2	85	01	14
3	86	01	00
4	100/1	00	17
5	101/1	00	05
6	101/2	01	03
7	99	01	30
8	98/1	04	02
9	98/2	03	10
10	97/2	02	15
11	97/1	03	15
12	96/1	03	12
13	96/2	03	09
14	89/3	00	30
15	88/2	01	13
16	89/1	01	37
17	90/2	00	36
18	90/1	00	19
19	84	00	23
20	95/1	00	15
21	95/2	00	16
	TOTAL	34	33

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Land Lease Dept

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Sl.No	SURVEY NO	EXTENT	
		ACRES	GUNTAS
VILLAGE	CHIKKANAHALLI		
1	32	06	06
2	33	01	11
3	31/1	01	26
4	31/2	00	21
5	31/3	00	25
6	31/4	00	02
7	31/5	00	04
8	30/1	01	03
9	30/2	01	15
10	29/1	02	12
11	29/2	01	26
12	28/1	02	03
13	28/2	01	01
14	28/3	00	23
15	28/4	01	01
16	27/1	01	25
17	27/2	02	04
18	26/1	01	07
19	26/2	01	12
20	26/3	00	01
21	44/1	01	35
22	44/2	01	18
23	43/1	01	19
24	43/4	00	05
25	43/5	00	04
26	43/6	00	05
27	42/4	01	02
28	42/1	01	15
29	42/2	01	32
30	42/3	01	37
31	41/3	00	21
32	41/2	00	19
33	41/1	04	22
34	40/2	01	33
35	40/1	00	33
	TOTAL	48	37

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Land Lease Deed

SL.NO	SURVEY NO	EXTENT	
		ACRES	GUNTAS
VILLAGE	MYLANAHALLI		
1	110/1B	00	07
2	110/2	00	28
3	110/3	00	28
4	3	03	17
5	2	03	24
6	4	01	25
7	1	00	15
8	5	02	04
9	6/1A	01	08
10	6/1B	00	25
11	6/2	01	30
12	12	01	13
13	13	01	23
14	14	04	29
15	18	00	20
16	19	01	01
17	116	00	25
	TOTAL	26	02

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ABSTRACT OF LANDS UNDER PART-I

Boguru	34-33
Chikkamohalli	48-37
Mylanahalli	26-02
TOTAL	109-32

BIAL-KSHDC

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Land Lease Deed

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PART-II: Additional Land for the main access road from the termination of Trumpet Interchange to the airport site boundary.

All these pieces and parcels of land measuring 23 acres 24 Guntas comprised in the villages Akkenamallenchalli and Yarthiganahalli of Devanahalli Taluk, Bangalore Rural District of Karnataka State as per details below:

SI. NO	SURVEY NO	EXTENT	
		ACRES	GUNTAS
VILLAGE	AKKENAMALLENAHALI		
1	37	12	26
	TOTAL	12	26

SL.NO	SURVEY NO	EXTENT	
		ACRES	GUNTAS
VILLAGE	YARTHIGANAHALLI		
1	78	01	27
2	55	04	01
3	69	00	01
4	10/4	00	26
5	10/7	01	21
6	7	00	01
7	4/1	00	01
8	4/4	00	25
9	9	00	10
10	8/1	00	23
11	6	00	15
12	17	01	03
13	16	00	04
	TOTAL	10	38

Original Survey Map 10/5-06
 50 Acres

ABSTRACT OF LANDS UNDER PART-II

Akkenamallenchalli	12-26
Yarthiganahalli	10-38
TOTAL	23-24