

File No. AV. 20014 / 002 / 2000 – AAI (Vol. II)
Government of India
Ministry of Civil Aviation
AD Section

“B” Block, Rajiv Gandhi Bhavan,
Safdarjung Airport, New Delhi – 03.
Dated: the 22nd November 2006.

To,

Mr. Albert Brunner,
Chief Executive Officer,
Bangalore International Airport Limited (BIAL),
118, Gayathri Lakefront, Outer Ring Road,
Hebbal, Near Flyover, Bangalore – 560 024.
Fax No. 91 80 2333 3400

Subject: **Amendment Agreement to the Concession Agreement and Direct Agreement.**

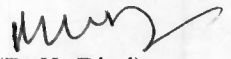
Sir,

I am directed to refer your letter no. nil dated the 19th October 2006 regarding the subject mentioned above and to enclose following documents:-

- (i) One set of Amendment Agreement to the Concession Agreement duly signed by Secretary, Ministry of Civil Aviation.
- (ii) Three sets of Amendment Agreement to the Direct Agreement under the Concession Agreement, duly signed by Secretary, Ministry of Civil Aviation.

It is requested that the three sets of Amendment Agreement to the Direct Agreement under the Concession Agreement may please be got signed by “The Western India Trustee and Executor Company Limited”, and thereafter one set of the Amendment Agreement to the Direct Agreement under the Concession Agreement duly signed and complete in all respect may be sent to this Ministry for necessary action and record.

Yours faithfully,



(B. K. Dhal)

Under Secretary to the Government of India
Tel. / Fax No. 2464 0214.

Enclosures: As above.

o/e

*Received: 24th November 06
Brunner, BIAL*

 Dated 20th Nov. 2006,

AMENDMENT TO THE CONCESSION AGREEMENT

between

THE GOVERNMENT OF INDIA

And

BANGALORE INTERNATIONAL AIRPORT LIMITED

Government of Karnataka
Registration & Stamps Department

Issued by MSP/B100/05-06 0342879
State Bank of Mysore

Certified that a sum of **Rs. 100/- (Rupees One Hundred only)** has been paid towards Karnataka Stamp duty by
Sri/Smt. Bangalore International Airport
s/d/w/o _____ residing at _____

Br. Name : MALLESHWARAM (017)

Date :

29 SEP 2006

BANGALORE
Authorised Agent to collect stamp duty on
behalf of Government of Karnataka
[Signature]
Manager, Malleshwaram Branch

THIS AGREEMENT is made in New Delhi on the 20th day of November 2006 *[Signature]*

BETWEEN:

- (1) **THE PRESIDENT OF INDIA** acting through the Secretary, Ministry of Civil Aviation of Government of India, New Delhi (hereinafter referred to as "**GoI**" which expression shall be deemed to include its successors and assigns); and
- (2) **BANGALORE INTERNATIONAL AIRPORT LIMITED** a company incorporated with limited liability under the Companies Act, 1956, having its registered office at 118, Gayathri Lakefront, Outer Ring Road, Hebbal, Bangalore-560 024 (hereinafter referred to as "**BIAL**", which expression shall be deemed to include its successors and permitted assigns),

WHEREAS

- (A) BIAL and GoI have entered into a Concession Agreement dated July 05, 2004 (hereinafter referred to as the "**Original Concession Agreement**"), for the development, construction, operation and maintenance of a greenfield Airport at Devanahalli, near Bangalore in the State of Karnataka (hereinafter referred to as the "**Airport**").
- (B) Subsequent to the execution of the Original Concession Agreement, and due to unforeseen commercial developments in the civil aviation sector in India leading to an increase in air traffic and passengers, the Parties have discussed and mutually agreed to amend the Original Concession Agreement to the extent and on the terms and conditions set out below.

[Signature]

NOW IT IS HEREBY AGREED as follows:

1 Definitions and interpretation

1.1 Definitions

In this Agreement:

"**Original Concession Agreement**" means the Concession Agreement dated July 05, 2004 between GoI and BIAL.

1.2 Incorporation of defined terms

1.2.1 Unless a contrary indication appears, a term defined in the Original Concession Agreement has the same meaning in this Agreement.

1.2.2 The principles of construction set out in the Original Concession Agreement shall have effect as if set out in this Agreement.

1.3 Clauses

In this Agreement any reference to a "Clause" or a "Schedule" is, unless the context otherwise requires, a reference to a Clause of or a Schedule to this Agreement.

2 Amendments

2.1 Amendments

With effect from the date of this Agreement the Original Concession Agreement shall be amended as follows (and all references to Articles and paragraphs in this Clause 2 shall be references to the respective Articles and paragraphs in the Original Concession Agreement unless stated otherwise in this Clause 2):

2.1.1 In Article 1.1., the definition of "Financial Close" shall be replaced with the following: "Financial Close" means or refers to June 23, 2005 being the date on which financial close was achieved by BIAL.

2.1.2 In Article 1.1, the definition of "Shareholders' Agreement" shall be amended as follows: "Shareholders Agreement" means the agreement originally dated January 23, 2002 as amended on June 10, 2005 and subsequently amended on or about the date of this Agreement

between KSIIDC, AAI, Siemens Project Ventures GmbH, Flughafen Zuerich AG, Larsen & Toubro and BIAL.

- 2.1.3 Schedule 2, Description of Initial Phase of the Airport shall be replaced with the revised description of the Initial Phase annexed hereto as **Annexure I**.
- 2.1.4 Part 1 of Schedule 9, Specifications shall be replaced with the Specifications annexed hereto as **Annexure II**.
- 2.1.5 Attachment I, Master Plan to be replaced with the revised Master Plan annexed hereto as **Annexure III**.

2.2 Continuing obligations

The provisions of the Original Concession Agreement shall, save as amended by this Agreement, continue in full force and effect.

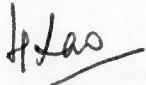
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IN WITNESS whereof GoI and BIAL have signed this Agreement through their authorised representatives, as above stated, as of the date first hereinabove mentioned.

SIGNED for and on behalf of

THE PRESIDENT OF INDIA

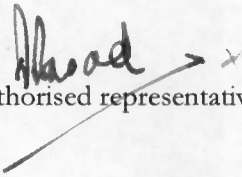
Acting through the Secretary,
Ministry of Civil Aviation
Government of India
in the presence of:



Signature of witness

HEMANT RAO, DIRECTOR,
MINISTRY OF CIVIL AVIATION
RAJIV GANDHI BHAWAN,
NEW DELHI

Name and address of witness



Signature of authorised representative

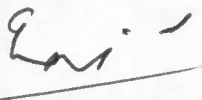
AJAY PRASAD
SECRETARY, CIVIL AVIATION

Name of Authorised representative

SIGNED for and on behalf of

Bangalore International Airport Limited

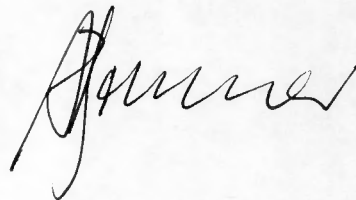
by a duly authorised representative
in the presence of:



Signature of witness

A. R. RAJARAM
118, GAYATHRI LAKEFRONT
HEBBAL, OUTER RING ROAD
BANGALORE - 560 024

Name and address of witness



Signature of authorised representative

A. Brunner

Name of Authorised representative

ANNEXURE I

DESCRIPTION OF INITIAL PHASE

1 Location

The site for the proposed international airport falls east of Bangalore – Hyderabad National Highway No.7 between 29 Kms and 30 Kms from Bangalore and 4 Kms south of Devanhalli town. The site covers an area of 3884 acres (1572 ha) and is bounded by latitude 13° 15' 50" to 13° 12' 15" N and longitude 77° 40' 20" to 77° 44' 09" East.

The airport layout design allows for a second parallel runway (future) within the site. A separation distance of 1925 m between the runways is allowed. This distance allows for safe independent runway operation in accordance with ICAO guidelines and provides for optimum use of the area between the runways for terminal and other commercial developments.

2 Taxiways

The taxiway system proposed between the runway and the apron will enable aircraft to travel with the minimum of delay and permit the runway to operate to its maximum capacity. In the initial phase the airport taxiway system will include the following:

- Full parallel taxiway
- Entry/exit taxiway
- apron taxi lane

In the initial phase, the rapid exits and entry / exit taxiways for the runway are proposed (as shown on the master plan), so as to expedite the movement of aircrafts to and from the runway and to reduce taxiing time and distance.

3 Apron

The layout of the apron and the terminal and the relationship between the two is designed to reflect international standards.

The objectives of the apron design include:

- To minimise taxiing distance to/from the runway
- To provide sufficient taxi lanes to avoid delays
- To provide airside roads and equipment parking areas so as to ensure that the ground support for aircraft is sufficient and efficient.
- To ensure that operations can be conducted safely.

In the initial phase provision is made for 18 terminal stands (of which 8 connected with PBB to the terminal building) and 14 remote stands.

4 Airside Service Roads

An airside road system to transport the vehicles, which sustain the operation of aircraft, both on the airside and to link with the landside road system is proposed. An airside service road (apron service road) will run on the airside face of the terminal building. It serves the isolation bay, fire station, cargo, fuel farm, and maintenance area and continues as a gravel road around the airport perimeter.

5 Main Access Road

A four lane bituminous approach road is proposed, parallel to the runway, linking the NH7 to the terminal complex.

This road serving primarily the passenger terminal will also link the airport support facilities. Round about are proposed at important junctions.

6 Air Traffic Control Tower

The height of control tower proposed is 65 metres. This height will provide a free line of sight of the operational areas and the approaches. The control tower is located on the land side at a distance of 890m from the centre line of the runway.

An ATC complex (Technical Block) with a floor area of approx. 2300 sqm is proposed for air traffic control services not performed in the tower, e.g. approach control. The technical block also houses ATC briefing, Anti-hijacking control room, MET department, electronics work shop, Data management system, library, training rooms and offices.

7 Airfield Lighting

The runway lighting system shall consist of threshold, edge and end lights. PAPI will be installed at both approaches together with CAT I Precision Approach lighting system.

Taxiway lighting system with elevated omni-directional edge lights will be provided for the full parallel taxiway, the exit and entry taxiways and the connections to the apron. Apron floodlighting is provided, to allow for efficient and safe handling of aircraft during night operations. Signage will be provided.

8 Rescue and Fire Fighting Facilities

The airport shall be equipped to provide a level of protection corresponding with aerodrome category IX. The fire station is located such that the response time shall be the lowest to any part of the movement area in optimum visibility and surface condition. The total area of fire station planned is 1457sqm. A watchtower is located above the fire station.

9 Water Supply

Potable water shall be supplied by Bangalore Water Supply and Sewerage Board to the service area earmarked on the master plan in sufficient quantity and pressure. Potable water storage tanks for an average daily demand for 2 days and raw water storage tanks for one day demand for fire-fighting including distribution networks to the airport facilities shall be constructed. In the initial phase the capacity of potable under ground sump proposed is 6000cum and raw water sump is 1800cum. The water shall be pumped using a hydro pneumatic pumping system.

The potable water will be distributed by means of a land-side main pipeline running in east-western direction, originating in the service area. Separately, a distribution network of similar concept will be provided for fire protection. This network will be equipped with hydrants.

10 Sewage Disposal

The sewerage and storm-water drainage are designed as separate systems. The sewerage system will include a collection network, pump pits, a sewage treatment plant, etc. Sewage water of the airport-related facilities will be collected by means of a landside and an airside main duct running in east-west direction and equipped with man-holes. A sewage treatment plant of 2000 cum capacity will be constructed. The effluent from the sewage treatment plant would be treated and the treated water recycled for horticulture.

11 Drainage

The design of the drainage system is determined by the topography, finished formation levels, surface run-off from paved areas and building roofs. The topographical conditions of the existing surface and, consequently, that of the graded strip of all airport-related facilities, result in a north-south oriented watershed. Open lined drains will be constructed. RCC box culverts or pipe culverts shall be provided beneath pavements.

12 Telecommunications

The telecommunications system will contain an exchange facility and distribution network.

13 Electrical

The power supply to the airport shall be provided by BESCO/ KPTCL at 66kv level. The main incoming substation will be provided with 3 nos 16mva transformers for stepping down 66kv to 11kv. From these transformers the main power system of the airport will be supplied at 11kv level. The electrical power system includes transformer stations, a distribution network, and emergency power supply. The distribution network will be planned with ring mains, so that power supply is always possible from two different sources. An auxiliary power generator system (approx. 6 MVA) is installed in the power station north which will supply the essential consumers of the airport in case of power supply failure.

14 Passenger Terminal Building:

14.1 Layout Concept

The passenger terminal is proposed as single, two level terminal building capable of accommodating international and domestic operations. The arrival and departure are separated vertically with a modern, simple, straight-ahead flow system. The Domestic and International Departure lounges, and the majority of the retail outlets are located on level 2 (first floor). The check-in – facilities and baggage reclaim are located in level 1 (ground floor). VIP lounge is located on level 2 (first floor). The entire terminal is designed for ease of operation and for minimum maintenance. The terminal is fully air- conditioned.

14.2 Capacities of the Terminal Building

The terminal building shall be designed for 2733 passengers in the peak hour in the initial development. [The design/standards proposed would reflect the best industry practice and operating standards.] The design would cater for 24 hours operations under all weather conditions. The facilities provided would meet IATA/ICAO standards. The total floor area planned is approximately 71000 m². Modular expansion of terminal with traffic growth is possible without disturbing the operations and matching the existing facade. The terminal equipment proposed includes:

- In-line X-Ray baggage scanner for hold baggage
- Flight Information system

- CCTV/PA system
- Fire alarm & smoke detection
- Baggage conveyors
- Escalators, Elevators & automatic doors
- Counters for immigration, customs
- Passenger seating/public furniture
- Restaurant furniture
- Signs/ pictographs
- Building Management System
- Baggage trolleys
- Check-in counters

15 Fuel Farm

It is essential to provide a storage area for the supply of aviation fuel for the refuelling of aircraft that land at Bangalore. The master plan has allocated a space for the fuel farm to the west of the airport site.

Provision of fuel hydrant system to transport fuel from the depot to the aircraft shall be included in the concession agreement with the supplier.

16 Terminal Parking

In the first phase of development car park in front of the terminal building at ground level is planned. The location would be convenient for passengers and visitors to the airport. Separate zones for pick-up and drop off are earmarked. Parking for private cars, taxis, staff car, staff vehicles, VIP cars and VVIP cars provided.

17 Administration Building

A separate administrative building to house the offices for airport management, aircraft operators, security and staff canteen is planned adjacent to the technical block on the land side. The total area of the administrative block planned is 3000sqm.

18 Maintenance Building

Maintenance facilities are required for airport vehicles, electrical & mechanical equipment and for other uses. The maintenance facility would include storage space for materials and spare parts. The space provided for this facility is 2190sqm.

19 Ground Equipment Maintenance Area

The ground equipment used on the apron is bulky and unsuitable for use on normal roads. A GSE maintenance area is planned on the air side. The GSE building measures an area of approx. 2000sqm.

20 Security Wall

The security wall separating the land side and air side facilities will be constructed according to BCAS specifications. In addition a boundary wall will also be constructed to protect the BIAL property.

[Handwritten marks: a stylized signature on the left, a small 'x' in the center, and a stylized signature on the right.]

ANNEXURE II

SPECIFICATIONS

TERMINAL BUILDING

The total built up area of the passenger terminal building is approximately 71000sqm. The terminal building is designed as a two level RCC framed structure to facilitate passenger check-in, baggage make-up, baggage break down and baggage claim at ground level; retail, shopping centres, security check, passport control and holding areas at level one. The services are located at basement below ground. The total length of the terminal building is 216m, depth 144m and total height 19.05m above ground level. The H shaped columns are spaced on a grid of 24m x 24m. The roof at 19.05m supports a precast prestressed concrete shell element. The ground floor slab and the first floor slab rest on a 12mx12m column grid respectively.

All passenger areas are laid with granite flooring, In non-public areas such as baggage make-up and break down areas the floors are laid with concrete, finished using vacuum dewatering technique. All passenger toilets are provided with vitrified matt finished tiles and matching ceramic tiles dado. The VIP/CIP/ Business lounge toilets are laid with granite floorings. Rubber sheet flooring shall be provided for the boarding bridge fingers.

The north and south facades of the terminal building shall be double wall glazed elements to the full length and height of the facades. The east and west facades are provided with pre-cast reinforced concrete panels with glass block inserts. The roof skylights shall be double glazed units inside the building and single laminated glass panels in the curb area.

All external walls shall be 200mm thick block work and all toilet internal walls are provided with 100mm block walls. Gypsum board wall partitions are provided in offices areas such as airlines, customs offices, staff rooms etc. All columns in the ground and first floor are cladded.. The basement columns are cladded with cemboard panels.

The terminal equipment provided shall include:

- In-line X-Ray baggage scanner for hold baggage
- AODB/ CUTE /Flight Information system
- CCTV/PA system
- Fire alarm & smoke detection
- Baggage conveyors
- Escalators, Elevators & automatic doors
- Counters for immigration, customs
- Passenger seating/public furniture

- Restaurant furniture
- signs / pictographs
- Building Management System
- Baggage trolleys
- check-in counters
- Passenger Boarding bridges
- Building Management System
- HVAC

Control Tower, Technical Block, Administration, Staff Canteen and Security Office

The total built up area is 5741sqm. The Admin /Technical/ Security block shall be a three storied RCC column beam framed structure. The building is 72m in length and 24m in depth. The total height of the building is 14.25m above ground level. The floor to floor clear height is 4.30m. The first floor slab, second floor slab and roof slab are designed as a grid floor system supported on a RCC column grid of 8m-x 8m.

The air traffic control tower is 65m in height and shall be a signature structure. The control tower is connected to the Technical Block at +4.3m level by an access bridge 1.50 m in width. The structure consists of RCC shaft of size 10.5m x 5.10m enclosing a staircase and lift inside. The tower cab is made of light weight steel tubes and clad with panorama glazing. The radius of the cab is 8.30m and 4m in height. The cab is supported on the RCC shaft at + 61.25m level.

Finishing Specification

- Vitrified ceramic tile flooring in Office / staff dining
- Vitrified mat tile flooring in toilets and pantry
- Kota stone flooring in kitchen
- Polished kota stone slabs in stair case
- Acoustic suspended ceiling in offices
- Teak wood flush partly glazed/ partly paneled partitions for cabins
- False flooring with PVC tile finish inside control tower cabin
- Exterior of the building is finished with curtain glazing, sand stone jalli and matt paint finish.

Ground Support Equipment Building

The GSE building is a two storied RCC structure with mono slope steel roofing system and RCC mezzanine floor for the offices inside the building. The total built up area is approximately 2000sqm. The GSE building is 63.25m in length, 26m in depth and 16.35m in height. Structural steel roofing system is adopted for work shop areas with roof trusses supported on RCC columns spaced at 9m intervals.

Finishing Specifications

- Vacuum dewatered flooring inside workshop
- Kota stone flooring in Offices and staircase
- Aluminum glazed paneled partitions in offices
- Color coated GI steel sheet roof for workshop.
- Vitrified matt finished tiles in toilets
- External surface painted with water proof cement paint and internal wall with OBD paint

Maintenance Building (Motor transport, civil and electrical)

The Maintenance building shall provide for vehicle maintenance workshop, civil and electrical offices and storage yards. The total built up area of mechanical workshop is 2190sqm with office and service area covering 270sqm. The maintenance workshop is 90m in length and 24m in depth. The total height of the workshop is 11.75 m above ground level. Parking bays of size 60 m x 9 m is provided. Structural steel roofing system is provided for workshop with the roof trusses spanning for 15 m.

The total built up area for civil and electrical building is 321sqm. This is a single storied RCC framed structure and houses the offices of civil and electrical staff. The stores and rest rooms are provided as annex and the built up area for this is 291sqm. The car parking shed for the staff covers an area of 107sqm with a provision for parking 8 vehicles.

Finishing items

- Vacuum dewatered floor for workshop
- Kota stone floor in stores/ tool grib area
- Vitrified polished tile in offices/ rest room
- Vitrified ceramic mat finished tile in floor/ dado for toilets
- External surface painted with water proof cement paint and internal wall with OBD paint
- Color coated GI sheet roof for workshop
- Gyp Board partitions in offices

Fire Station building

The Fire station is designed to provide a level of protection corresponding with ICAO aerodrome category 9. The station is designed to house five crash fire tenders and three ambulances. The design caters for one medical room to accommodate 3 beds, storage space for foam, offices for fire officers, control room, rest rooms for fire crew, training room etc. The total built up area including appliance bays is 1457sqm. The Fire station is 70.20m in length and 14.53m in depth. The building area is 19m in length, 14.53m in depth and 10.45m above ground level. A watchtower is provided on top of the building. First floor slab and roof slab are supported on RCC column and beam arrangement.

The fire station is provided with 100 000 litres under ground static tank and 50 000 litres over head tank.

Finishing items

- Vacuum dewatered floor for bays and store
- Vitrified ceramic matt finished tiles in floor/ dado for toilets
- PVC tile false floor in watch tower
- Kota stone floor for office/ rest room and other areas
- External surfaces painted with water proof cement paint and internal walls with OBD paint

A/C Plant building

The total built up area of AC plant building is 685sqm. The building measures a length of 47.25m and 14m in depth with seven bays evenly spaced at 6.75m column spacing. The total height of the building is 7.45 m above ground level and is single storied. The roof is supported on RCC column and beam arrangement. Staircase is provided outside the building for access to the roof.

Finishing items

- Vacuum dewatered floor
- External surfaces painted with water proof cement paint and internal walls with OBD paint

Sub station building

The airport has four sub stations located at strategic locations to satisfy the electrical and aviation requirements. The total built up area of the main power station is approximately 699sqm. The building measures 45.25m in length, 17.70m in depth and 7.90m in height. The total built up area of the power house north is 198sqm and it measures 21m in length, 9m in depth and 5.65m in height. The total built up area of the two nos compact station for the airfield lighting is 182sqm each.

Finishing items

- Vacuum dewatered floor
- External surfaces painted with water proof cement paint and internal walls with OBD paint

VVIP BLOCK

The total built up area of the VVIP block is 282sqm. The building is 24m in length and 10.50m in depth. The block is finished with granite flooring. The VVIP lounge is designed with impressive and elegant interiors. The north and south facades are provided with double glazed curtain wall. Furnished spacious rest rooms with well appointed toilets are also provided.

OTHER BUILDINGS

The other buildings comprise of two nos public convenience, Radar Tx building, pump houses and security cabins. The total built up area of the two public conveniences is 326sqm. The flooring is laid with vitrified matt finished ceramic tiles and matching dado.

The security cabins are self contained measuring 4.5m x 4.5m square. It includes a change room with attached toilet. Kota stone flooring is provided in change room and vitrified matt finished tiles in toilets.

The Radar Tx building is 15m in length, 6m in depth and 4.50m high. The building is provided with false floor for housing the electrical equipments.

Pump house will be provided on top of the underground water sumps. For all the above structures the external wall will be painted with water proof paint and internal walls with OBD paint.

RUNWAY

The runway is designed to accept B 747 aircraft and the ICAO aerodrome reference code is 4E.

The characteristics of the runway specification are:

- Runway length - 4000m
- Runway width - 45m
- width of runway plus light paved shoulders - 60m
- pavement type - flexible
- Pavement classification number - 80
- Runway strip width - 300m
- Stop-ways at each threshold - 60m x60m
- Runway orientation - 09/27
- Usability factor - >95%

The longitudinal and transverse profile, slope changes, sight distance, distance between slope changes, pavement markings, signage and surface accuracy are designed in accordance with the Standards and Recommended practices stipulated in ICAO Annex 14. The design life for the flexible pavement is 20 years.

TAXIWAYS

The characteristics of the taxiway specification are:

- width - 25m (code F)
- Width of taxiway plus shoulder - 45m
- Separation distance between the centre line of runway and taxiway - 190m
- taxiway centre line to taxiway centre line - 97.50m
- pavement type - flexible
- PCN - 80

The longitudinal and transverse profile, slope changes, sight distance, distance between slope changes, pavement markings, signage and surface accuracy shall be in accordance with the Standards and Recommended Practices stipulated in ICAO Annex 14. The design life for the flexible pavement is 20 years.

APRON.

The area of the concrete apron is 268 210sqm. This apron can accommodate 32 code C aircraft or 16 Code D / E aircraft. Isolation bay will be designed for B-747 and constructed in the first phase. The pavement type is rigid. The PCN is 80 and the design life is 30 years. The width of the apron service road shall be 10m.

The longitudinal and transverse profile, slope changes, sight distance, distance between slope changes, pavement markings, signage and surface accuracy shall be in accordance with the Standards and Recommended Practices stipulated in ICAO Annex 14.

AIRSIDE SERVICE ROADS

Airside service roads outside the apron area will have a width of 7m and 1.5m wide gravel shoulders. The two lane bituminous pavement will be provided to connect the terminal, fire station, GSE, cargo and fuel farm. The emergency road linking the fire station to the runway shall also be designed with 7.0m width.

The airport perimeter road provided along the airport security wall and other airside inspection roads will be granular pavement with top width of 3.50m.

MAIN ACCESS, SECONDARY ACCESS ROAD & CAR PARK

The main access road will be constructed as a four lane carriage way with two lane for each direction, including gravel shoulders. The flexible pavement will be designed for the projected traffic and loading in terms of standard axels.

The main access road will primarily serve the passenger terminal and it will also link other airport support facilities. Roundabouts are proposed at the major junctions.

The secondary access road shall be constructed with flexible pavement and designed for the projected traffic. The width of the secondary access road shall be in total 10m.

In the Initial Phase a car park in front of the terminal building at ground level is planned. The location would be convenient for passengers and visitors to the airport. Separate zones for pick-up and drop off are earmarked. Parking for private cars, taxis, staff car, staff vehicles, VIP cars and VVIP cars provided

AIRFIELD LIGHTING

A fully operational airfield lighting shall be provided which shall include the following:

- A high intensity CAT I approach lighting system(900m) for runway direction 09 & 27 shall be installed
- For both approach direction 09 & 27 a Precision approach path indicator system(PAPI) will be installed

- The runway lighting system shall consist the following individual lighting:
 - Runway threshold lighting
 - Runway edge and end lighting
- For marking of the taxiway edge, elevated omni directional lights will be provided
- Illuminated signs will be provided
- Control and monitoring system
- Remote control and monitoring
- Airfield lighting control work station
- Illuminated Wind direction indicator for both landing direction will be provided
- Aerodrome rotating beacon
- Apron flood lights

The systems shall be provided in compliance with relevant ICAO manuals, standards and recommendations.

INTERNAL AND EXTERNAL LIGHTING

Internal and external lighting will be provided for the following buildings/ areas:

- Terminal building
- Admin / Technical / security and ATC
- Maintenance building
- Ground support equipment building & other buildings
- Fire station
- Street lighting
- Car park lighting

Adequate number of power sockets for computers, water coolers, coffee machines, advertisement modules, hand drier, CCTV/ TV, pictographs etc will be installed.

Power requirements for conveyor belts at departure and arrival area are included. Power requirements included for escalators, lifts, automatic doors and HVAC.

Earthing system is included.

Lightning protection for all buildings are included.

Power distribution

The power supply to the airport shall be provided by BESCOM/ KPTCL at 66kv level. The main power station will be provided with 3 nos16mva transformers for stepping down 66kv to 11kv. From these transformers the main power system of the airport will be supplied at 11kv level. The electrical power system includes transformer stations, a distribution network, and emergency power supply. The distribution network will be planned with ring mains, so that power supply is always possible from two different sources. An auxiliary power generator

system (approx. 6 MVA) is installed in the power station north which will supply the essential consumers of the Airport in case of power supply failure.

Cable system

- Incoming normal and emergency power supply shall be provided at the respective buildings. Cables shall be PVC insulated Aluminum / Copper, armored / unarmored. Cables will be routed through overhead cable trays / cable trench based on the locations of the panel / equipment.
- Electrical distribution for Heating Ventilation and Air Conditioning systems is considered in HVAC system.
- From centralized Battery and battery charger system, control supply feeder would be provided to the respective buildings.

Internal lighting system

The design lux level considered is:

- Check-in - 450lux.
- Office areas - 300lux.
- Technical areas - 300lux.
- Baggage claim - 300lux.
- Departure/arrival areas - 300lux
- Shopping areas - 300lux

External area lighting

Road lighting will be provided for the main access road, secondary access road and other access to buildings as shown below:

- Main access road - 20lux
- Secondary access road - 14lux
- Access to buildings - 14lux
- Lighting for parking areas will be provided with a illumination of. Fire Protection System - 14lux

System Proposed

The following fire protection systems shall be provided:

- Hydrant system
- Sprinkler system
- Fire alarm system
- Portable extinguishers

Airconditioning and Ventilation System

Air-conditioning system shall be provided for the following buildings. Central air-conditioning system will be provided to cater to these areas.

- Passenger Terminal building
- Administrative Block
- Technical building
- ATC tower
- Ventilation system for Toilets.

Drinking Water, Raw Water and Sewage Network

Drinking Water System

Potable water supplied by BWSSB shall be tapped and stored in the UG sumps. Potable water storage for two days demand shall be provided. The capacity of the UG sump shall be 6000cum. Water from the UG sump shall be distributed to the various buildings indicated below by a hydro- pneumatic system.

- Terminal Building
- Administration building
- Fire station building
- Air Traffic Control Complex
- Airport Maintenance building
- Ground Support equipment building
- Security office / police station/ staff canteen

Hydro pneumatic pumping system shall consist of potable water transfer pumps, air compressor and air vessel with necessary piping, instrumentation controls such as level controllers, level probes etc. Hydro pneumatic system shall have 50% standby capacity.

Raw Water

BWSSB will provide untreated raw water up to the airport battery limits. Raw water storage shall be provided for one day demand. The capacity of the sump will be 1800 cum. Untreated water shall be tapped and stored in the UG sumps. This water shall be pumped using a hydro pneumatic pumping system and distributed through HDPE pipe network of the airport complex to cater for floor / equipment washing and gardening.

Sewer Network

Sewer network for the entire airport complex premises has been considered with suitable diameter cast Iron pipes buried underground with required number of man holes and inspection chambers. Sewage thus collected through the network shall be treated in the sewage treatment plant and shall be disposed as per bye laws.

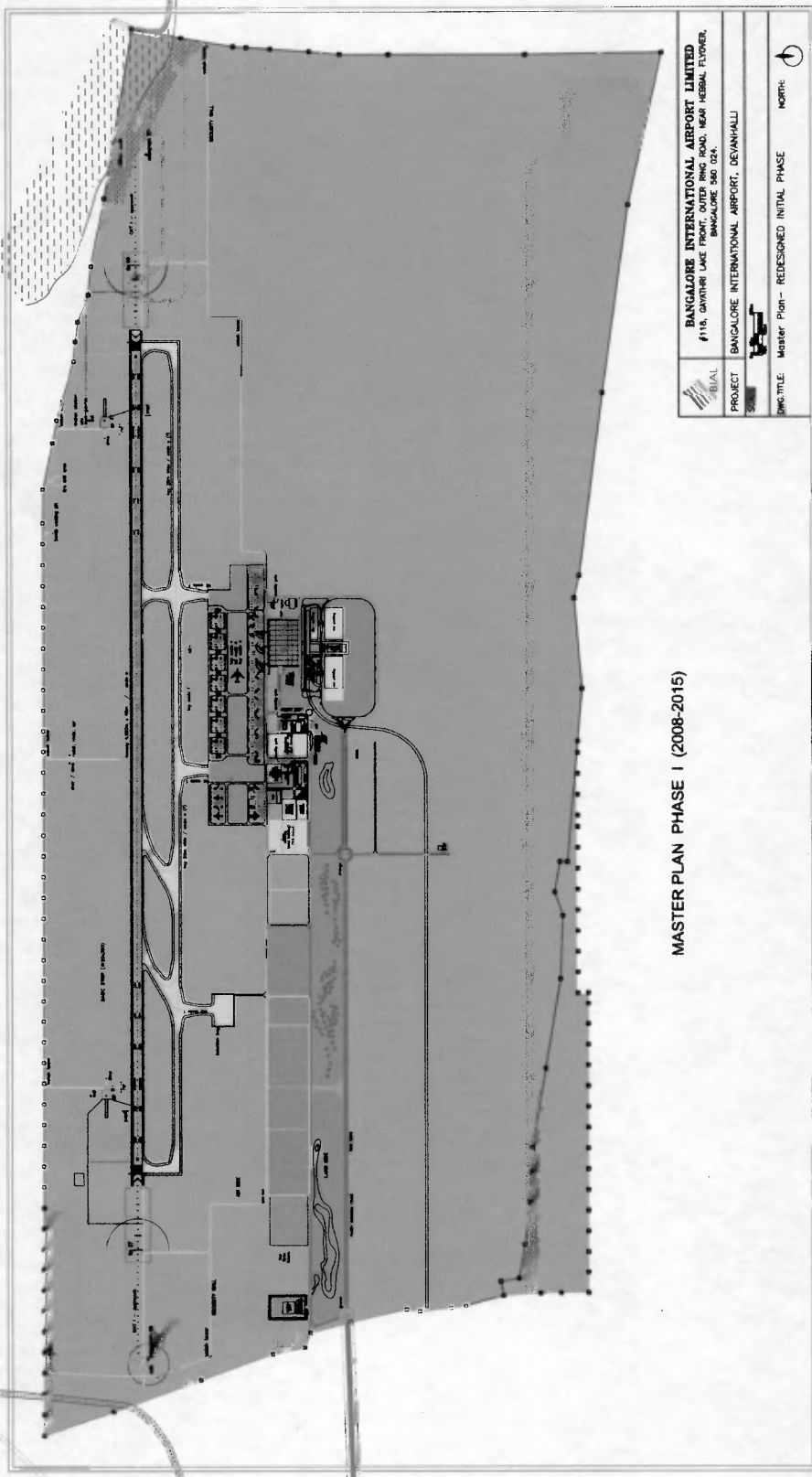
Sewage Treatment Plant (2000 cum/day)

The sewage treatment plant shall be provided to treat the waste water generated by the airport facility. The STP is designed to treat 2000 m³ per day of sewage. The process scheme is extended aeration process with operating cycle of 24 hours.

STORM WATER DISPOSAL

The storm water from the hard landscaped areas i.e. mainly between taxi-ways and runway, shall flow into open lined drains (constructed outside the basic strip) and or underground pipes and culverts. The ground surface of molds are graded according to the designed slopes and connected between each other by culverts beneath taxiways and road crossings, so that run-off storm water is discharged in to the silting basin. Paved areas have been designed with transverse surface slopes to enable the storm water to run off adequately. Open drains, inlets and pipe culverts shall be constructed to collect the water and connected to discharge into the airport storm-water drainage system.

ANNEXURE III MASTER PLAN



MASTER PLAN PHASE I (2008-2015)

	BANGALORE INTERNATIONAL AIRPORT LIMITED #118, SAVITHRI LAKE FRONT, OUTER HMC ROAD, NEAR HERBAL FLOWER, BANGALORE 560 024.
PROJECT	BANGALORE INTERNATIONAL AIRPORT, DEVANAHALLI
SCALE	
DWG. TITLE	Master Plan - REDESIGNED INITIAL PHASE
	NORTH