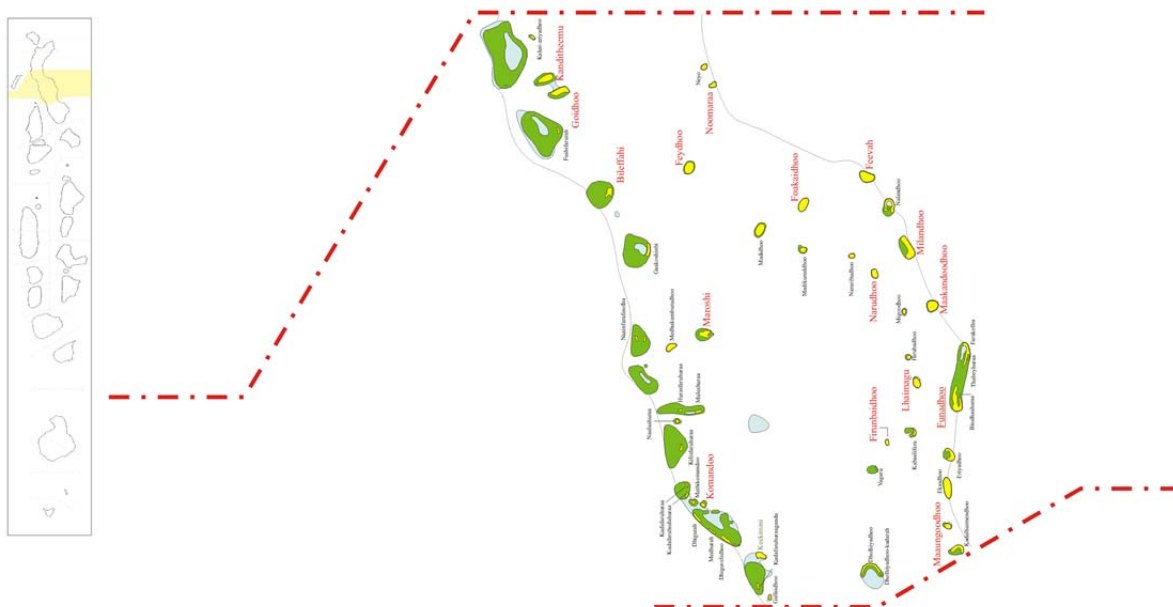




Technical Document for Construction of Sh. Funadhoo Airport



Volume II

- Section A – Minimum Requirement
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Ministry of Tourism
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Section – A
Minimum Requirement

A. MNIMUM STANDARDS

2.1 General

This section specifies the minimum technical requirements of facilities and infrastructure to be designed and constructed within the proposed period by the Developer.

Development concepts provided with this document is a basic idea of an airport infrastructure that meets the employer's requirement of this development.

Future developments as required in the lease period shall be designed and constructed to the same minimum design and regulatory standards, updated as applicable.

The Developer can also put forward his own airport development concept plans as required and shall meet the following requirements:

2.2 Applicable Standards

All planning, design and construction works undertaken by the Developer and his representatives shall, as a minimum, be in accordance with the laws, rules and regulations of the following Maldivian authorities:

- Ministry of Tourism (MoT)
- Maldives Civil Aviation Authority (MCAA)
- Regional Airports / MoT
- Ministry of Housing and Infrastructure (MHI)
- Environmental Protection Agency (EPA)
- Other relevant bodies

In addition to the above, the following standards and recommended practices shall be adopted as the minimum requirements of all design and planning.

2.2.1 Maldives Civil Aviation Authority's (MCAA), Regulations:- MCAR, CARs, ASC, Civil Aviation Advisory Publications (CAAPs) & any other relevant regulations.

Where applicable, CARs and MCARs take precedence over all other standards. When MCAA regulations do not exist, FAA and other relevant standards shall be applied in that order of priority.

Applicable Regulation include, but are not limited to;

- CAR Part 13 Aerodromes, Aviation Fuel Supply and Air Navigation
- 16 Protection of the Environment

- 18 Aerodrome Rules
- 19 Airport and Aircraft Security
- Applicable MCARs include, but are not limited to :
 - MCAR 139 - Aerodrome Rules
 - MCAR 14 Aerodrome Standards Manual
 - MCAR 4 - Aeronautical Charts
- Applicable Air Safety Circulars, but are not limited to:
 - ASC 139 -1 Aerodrome Rescue and Fire Fighting
 - ASC 139 - 3 The Maldives Runway Safety Programme
 - ASC 139- 4 Formation of Local Runway Safety Team
 - ASC 00-2 Safety Management System
 - ASC OPS 25 - Manual on Certification of Aerodromes
- ICAO Standards and Recommended Practices (SARPS)- Airside

The Developer shall ensure that at all times the planning, design and maintenance of the airside infrastructure and facilities of the Airport comply with the ICAO Standard and Recommended Practices (SARPs), including, but not restricted to the following:

- ICAO Annex 12 – Search and Rescue
- ICAO Annex 14 – Aerodrome Design and Operations
- ICAO Annex 15 – Aeronautical Information Services
- ICAO Annex 16 – Environmental Protection
- ICAO Annex 17 – Security International Civil Aviation against acts of unlawful interference
- IATA Airport Development Reference Manual;

2.2.2 ICAO Airport Planning Manuals (APM)

2.2.3 ICAO Aerodrome Design Manuals (ADM)

Part 1: Runways

- Part 2: Taxiways, Aprons and Holding Bays
- Part 3: Pavements
- Part 4: Visual Aids
- Part 5: Electrical Systems
- ICAO Airport Service Manuals (ASM)
- Part 1: Rescue and Fire Fighting
- Part 2: Pavement Surface Conditions
- Part 3: Bird Control and Reduction
- Part 4: Fog Dispersal
- Part 5: Removal of Disabled Aircraft
- Part 6: Control of Obstacles
- Part 7: Airport Emergency Planning
- Part 8: Airport Operational Services
-
- Part 9: Airport Maintenance Services

2.3 *Investigations and Surveys*

The Developer shall satisfy himself of the existing site conditions and shall, as a minimum, undertake geotechnical and topographic surveys of the site to gain accurate and complete records of the existing situation.

The geotechnical investigation shall be specified, undertaken and reported in accordance with appropriate international standards. The investigation shall provide sufficient data to inform the design of structures, pavements, reclamation works, embankments and revetments, underground services and airfield pavements. It shall also be sufficiently detailed to identify any existing ground/groundwater pollutants which will require remediation and/or control measures.

The Developer shall undertake a comprehensive and detailed topographic and bathymetric survey of the concession area, to fully understand the existing conditions for the use of airport planning, designing and construction.

Copies of all investigations and reports shall be provided, free of charge, Employer in hard copy and electronic format.

2.4 *Environment and Sustainability*

The Developer shall ensure that all planning, design, development works and airport operations are undertaken with full regard to and in compliance with GOM laws and regulations on environment, planning and sustainability. The Developer shall demonstrate his understanding and awareness of the issues associated with the investment and, as required by the Maldives Environment Protection and Preservation Act, shall prepare all necessary environmental impacts assessments, compliance documentation and environmental management plans for the sustainable and efficient management of Airport. The Developer shall comply with all relevant environmental and sustainability legislation including, but not limited to:

- The Environment Protection and Preservation Act (Law 4/93)
- The National Environmental Action Plan (NEAP 2009-2013)
- The Maldives National Strategy for Sustainable Development (NSDS)

B. MINIMUM TECHNICAL REQUIREMENTS

2.5 Planning, designing and construction

2.5.1 Basic Aerodrome physical requirements

The Scope of the Airport is based on the requirements outlined below:

Runway Length:	1200 m
Runway Width:	30 m
Strip Length:	60 m from each end of runway
Strip Width:	75 m from each side of runway
Taxiway Length:	110 m or as agreed
Taxiway Width:	15 m
Apron Length:	150 or as agreed
Apron Width:	50 m or as agreed
Stopway Length:	60 m from Runway end
Stopway Width:	60 m
Runway End Safety Area (RESA) Length:	90 m from stopway end
Runway End Safety Area (RESA) Width:	60 m
Transverse gradient:	1.5% from Runway & Taxiway. 0.5% for Apron
Transitional surface:	1:7 slope
Approach slope:	2%
Divergence angle:	15%
2	4%
Pavement Classification (PCN)	15 estimated (proposed critical aircraft is ATR 72-500)
Designation No:	12/30
Aerodrome Reference Code	2C

2.5.2 Types of Aircraft expected to operate to the Airport.

- Dash 8 Q 200, with passenger capacity 37 seats.
- Dash 8 Q 300, with passenger capacity 50 seats.
- ATR 42, 50 with passenger capacity 48 seats
- ATR 72, with passenger capacity 70 seats

2.5.3 The basic parameters for facility planning.

The annual demand for Baa Dharavandhoo Airport is calculated based on traffic records for the last 3 Years and are tabulated in the table below:

Air Traffic Records for Last 3 years at Dharavandhoo Airport

Type of Aircraft	Year	Arrivals	Departures
Dash 8 - 300	2015	1817	1817
Dash 8 - 200		741	741
ATR 72 - 600		442	442
ATR 72 - 500		831	831
ATR 42 - 500		103	103
Dash 8 - 300	2014	2059	2059
Dash 8 - 200		852	852
ATR 72 - 600		397	397
ATR 72 - 500		0	0
ATR 42 - 500		940	940
Dash 8 - 300	2013	1618	1618
Dash 8 - 200		1030	1030
ATR 72 - 600		109	109
ATR 72 - 500		0	0
ATR 42 - 500		758	758

2.5.3 Critical Aircraft

- The Critical Aircraft selected for the Airport is ATR 72 - 500 with a seating capacity of 70 passengers.

2.5.4 Aerodrome Reference Code

- Aerodrome Reference Code shall be as Code Number 2, Code Letter C (C)

2.5.5 Airfield Pavements

- Physical planning Runway, Taxiways and Apron shall be in accordance with the standards and recommendations of MCAR Part 14, ICAO Annex 14 and ICAO Aerodrome Design Manual Part 2 with respect to physical clearances and safeguarding.
- Runway, Taxiways and Apron construction and shall be designed to have a 20 year design life or as specified in the minimum requirement or in accordance with the forecast schedule.
- Slopes on Runway, Taxiways and Apron shall comply with the requirements of MCAR Part 14, ICAO Annex 14 and ICAO Aerodrome Design Manual Part 2 and, where stands are used for

aircraft refueling, with NFPA 415. In any case, apron slopes shall not be less than 0.5% in any direction to facilitate positive drainage.

- Pavement markings, signage and AGL shall be in accordance with the requirements of MCAR Part 14, ICAO Annex 14, ICAO Aerodrome Design Manuals. The Developer shall, as a minimum submit the proposed Airport development concept plans at 1:5000 showing the proposed general arrangement of Airport infrastructure layout.

2.5.6 Airside roads

- a) Airside roads shall be provided to facilitate safe and efficient operation and movement of airside vehicles. The road system shall provide;
 - Access to and on aprons
 - Connections between aprons passenger terminal buildings including, ground support equipment areas
 - Connections and approaches to rescue and fire fighting stations
- b) The layout and operating strategy of the network shall be established in the master plan and developed during the design process to demonstrate the adequacy of the proposed system. It shall be designed to provide as direct a route as possible between facilities and shall have sufficient capacity to avoid traffic congestion at junctions at peak periods of operation.
- c) Road geometry and structure shall be designed to suit the characteristics of the vehicles operating and in compliance with relevant requirements of GOM highway design standards where appropriate. Clearances to roads from operational airside areas shall be in accordance with the minimum requirements of MCARs.
- d) Pavements shall be a flexible construction and shall be designed to GOM Highway Design Standards where these exist, otherwise to recognized international standards. Flexible pavements shall be designed to have a 15 year design life.
- e) Airside and Land side roads shall be suitably marked and signed be in accordance with the recommendations of MCAA, ICAO, Transport Authority of Maldives to ensure that priority of turn and direction is clearly shown.

2.5.7 Boundary & Security fence

- a) Boundary Fence shall be done as per the boundary layout approved by Regional Airports/MoT.
- b) Security Fence shall be completed as per Maldives Civil Aviation Regulations (MCAR)

2.5.8 Lightning Protection System

- c) Lightning Protection system shall be design and installed upon approval of drawings and specifications as required from Regional Airports/MoT.

2.6 Buildings planning, designing and construction

- 2.6.1 The design concepts shall allow provisions for the future expansions at building site, should expansion for the airport be necessary at a later date.

2.6.2 The design lifespan shall meet the following requirements:

- a) Construction elements – 25 years
- b) Facade and roof – 15 years
- c) Building finish – 15 years
- d) Design features – 15 years
- e) Furnishing – 7 to 10 years
- f) Information and telecommunication systems - 7 years
- g) Aviation technologies – 7 to 15 years.

2.7 *Passenger terminal*

2.7.1 Principal terminal functions include at minimum:

2.7.2 Check -in hall shall be completed with Check-In Counter systems (minimum 2 counters with chair and 2 weighing scale), seats, tables, cabinets, air conditioning, telephone, information technology system and public addressing system, etc. as required.

2.7.3 Departure lounge shall be completed with minimum 2 counters with chair, 100 seats, tables, cabinets air conditioning, telephone, information technology system, public addressing system and TV etc. as required.

Toilet facilities with all necessary fittings.

Refreshment corner shall complete with service counter and other relevant facilities as required.

2.7.4 Arrival hall shall be completed with public address system, seats, baggage clearing bench etc. as required and toilet facilities with all necessary fittings.

2.7.5 First Aid services shall be completed with toilet facilities and furniture, wheel chair, stretcher, patient bed, IV stand etc. as required.

2.7.6 Airline and Airport offices shall be completed with furniture and fittings, air conditioning, telephone, information technology system, etc. as required.

2.7.7 Prayer rooms segregated for women and men.

2.7.8 Baggage loading / unloading area.

2.7.9 Left luggage room.

2.7.10 Operations Office.

2.7.11 Security Office.

2.7.12 Cafe / restaurant shall be completed with furniture and fittings, telephone, information technology system, TV etc. as required.

2.7.13 Toilet facilities for public use.

2.7.14 Public flight information display system with screens and flat panel boards.

2.7.15 Internal and external sign boards (including security signboards).

2.8 Control Tower

2.8.1 Principal terminal functions include at minimum:

- Control tower building design shall include office areas toilets, Air traffic control room. The building shall be completed with furniture and fittings, air conditioning to the ATC room telephone, information technology system, and navigational aids and MET equipment etc. as required.

2.9 Fire Station

2.9.1 Principal terminal functions include at minimum:

- Fire station building design shall include watch room, office& resting areas and toilet facilities, as required. The building shall be completed with furniture and fittings, telephone, information technology system etc. as required.
- Specific office space with necessary furniture and equipment for the need of Emergency Operation Centre (EOC)

2.10 Staff Accommodation

2.10.1 Principal terminal functions include at minimum:

- Building design shall include staff room areas and toilet facilities as required. The building shall be completed with furniture and fittings as required.

2.11 Administrative Office

2.11.1 Principal terminal functions include at minimum:

- Building design shall include office areas, waiting areas and toilet facilities as required. The building shall be completed with furniture and fittings, telephone, information technology system etc. as required.

2.12 Power House

2.12.1 Principal terminal functions include at minimum:

- Building design shall include office areas, and toilet facilities as required. The building shall be completed with furniture and fittings, telephone, information technology system, adequate power system to support the airport, etc as required.

2.13 Guard Post

2.13.1 Principal terminal functions include at minimum:

- Building design shall complete with furniture and fittings etc. as required.

2.14 Public Canteen / Restaurant

2.14.1 Principal terminal functions include at minimum:

- Building design shall include seating area, kitchen area, store, toilet facilities as required. The building shall be completed with furniture and fittings, telephone (extension) as required.

Section – B

General Construction Specification

SECTION B – GENERAL MINIMUM CONSTRUCTION SPECIFICATIONS

3.1 *Design Concept*

Airport concepts shall be developed to establish the primary services and facilities required including the provisions for improvement and modification for the future as regulated in ICAO and Maldives Civil Aviation Authority.

3.2 *Pavement Structure*

Design Concept of pavement structure is assumed based on the visual observation to estimate the project cost. Final design calculations, detail drawings shall be submitted for approval after the completion soil investigations and engineering study is the responsibility of the Contractor.

3.3 *Assumed Elevation*

1.80 m (Runway midpoint) from M.S.L. (Elevation will be finalised after the site investigation)

3.4 *Runway, Apron and Taxiways*

3.4.1 Sub grade

- Compacted sub grade
- CBR value shall be not less than 20%

3.4.2 Sub base

- 300mm thick compacted sub base material
- CBR value shall be not less than 40%

3.4.3 Base Course

- 100mm thick crushed coral or aggregate compacted (ABC)
- CBR value shall be not less than 80%

3.4.4 Wearing Course

- 75mm thick Hot mix Asphalt Surface

3.5 *Service Roads*

3.5.1 Sub grade

- Compacted sub grade

- CBR value shall be not less than 20%

3.5.2 Sub base / Base

- 250mm thick compacted sub base material
- CBR value shall be not less than 40%

3.5.3 Wearing Course

35mm thick Hot mix Asphalt Surface

3.6 Drainage System

Drainage system specially for runway and apron: A graded area is needed from runway shoulder and strip. Strip shall be graded 40m from centre line on each side.

3.7 Harbour & Jetty

Funadhoo Harbour and Jetty is the only preferred accessible option to facilitate the airport staff and passengers, the arrangement shall be made with Funadhoo Island Council and relevant authorities

3.8 Security equipment

- | | |
|-----------------------------------|---------|
| • Walk Through Detectors | 02 nos |
| • Hand Held Metal Detectors | 03 nos. |
| • X-ray machine (checked baggage) | 01 no. |
| • X-ray machine (hold baggage) | 01 no. |

3.9 Fire Services

Fire category – 5

- | | |
|------------------------------|---------------------|
| • Water Tank Capacity | 5,400 L |
| • Foam liquid tank capacity | 450 L |
| • Monitor discharge rate | 3,000 L/min at high |
| • Dry powder system capacity | 235 kg |

3.10 Fuel services

Refuelling platform with storage tank with filter, pump - Cap.6,500 Litre with hose system laid to apron. This item will be required on the Airline requirement. The Developer is responsible to clarify all related issues to provide the fuel services.

3.11 Ground handling equipment

- Baggage Cart 04 Nos
- Passenger Bus 01 Nos
- Baggage Trolley 85 Nos
- Ground Power Unit (GPU) 01 Nos
- Terminal Arrival Baggage Conveyor Belt accessible area) 01 Nos (min 15m passenger accessible area)

3.12 Inspection, Operation & Documentation

- Vehicle for Runway Inspection 1 No
- Rotarlasher with Tractor 1 No
- Wheel chairs 2 Nos
- Vehicle suitable for first-aid usage 1 No
- Accountable Manager
- Adequate staffing:
 - Technical / Administrative
- Safety Management System (including SMS for ATS and Aerodrome)
- Aerodrome Manual as ASC – OPS 25
- Standard Operating Procedures / Hand books/ Manuals for the following areas of work:
 - Rescue and Fire Fighting
 - Pavement Surface Condition Inspection and Maintenance
 - Bird Control Reduction

- Removal of disabled aircraft
- Control of Obstacles
- Airport Emergency Planning Manual
- Airport Operational Services(Unit Operation Instructions)
- Airport Management Services
- Air Traffic Services

3.13 Navigation Aids and MET Equipment

• VHF Main	01 No
• VHF Standby	01 No
• VHF Emergency Frequency 121.5	01 No
• PABX System:- suitable for Airport	01 No
• UPS	03 Nos
• Motorola Handset GP – 328 / equivalent	06 Nos
• Repeater Station	01 No
• Digital Clock with Temperature gauge	01 No
• Binocular (day / night)	01 No
• Barometer	01 No
• Anemometer and wind direction indicator	01 No
• Provision of Crash Alarm System	01 No

3.14 Minimum Navigational Aids & Airfield Lighting System Required

Aerodrome Identification Sign

A sign board to show the name of the Aerodrome, visible at night. Font, Colour and size etc shall be approved.

- Typical Lamp power rating: 2 x 40W fluorescent tube lights

- Power supply: 220V

Information Signs

Taxiway designation sign board must be visible from both sides and shall be illuminated and fixed at the entrance of each Taxiway. These lights could be controlled automatically by connecting a light dependent switch to the circuit and hence might minimize the need for remote control cabling.

- Typical Lamp power rating: 2 x 20W fluorescent tube lights
- Power supply: 220V

Illuminated Wind Direction Indicator

Wind direction Indicator shall be illuminated so as to be visible for the approaching pilot at night. An obstruction light shall also be fixed on top of the mast, if it is considered as an obstacle. This illumination could be controlled automatically by connecting a light dependant switch to the circuit and hence might minimize the need for remote control cabling.

- Lamp Power rating: 100W
- Obstruction lamp rating: 60W
- Input Power supply: 220V

Obstruction Light

After an obstacle survey on the aerodrome, all objects considered as Obstacles shall be properly marked and fixed with obstruction lights for use at night. These lights could be controlled automatically by connecting a light dependant switch to the circuit and hence might minimize the need for remote control cabling.

- Typical Low intensity Obstruction lamp power rating: 60W
- Input Power supply: 220V

Airfield Lighting System (for night operation)

Airfield Lighting System shall comply with the ICAO International standards and recommended practices for Aerodromes given in Annex 14, Volume 1 for Aerodrome Design and Operations. Reference should also be made to Aerodrome Design Manual

Part 4 – visual aids and Part 5 – Electrical Systems.

Signalling Lamp

Used as an alternative device for communication between the aircraft and the Air Traffic Controller. This is located at the Tower cab.

- Lamp Power rating: 100W / 24V
- Input Power supply: 220V

Runway edge lights

- To be placed along the full length of the runway, in two parallel rows equidistant from the runway center line.
- To be placed along the edges of the area declared for use as the runway or outside the edges of the area at a distance of not more than 3 meters.
- To be uniformly spaced in rows at intervals of not more than 60 meters.
- Lights on opposite sides of the runway axis shall be on lines at right angles to that axis.
- Shall be fixed lights showing variables white.

Runway End Lights

Located at the end of the runway, 06 lights on each end giving 12 lights in total for both runway ends.

Taxiway edge lights (including both turning pads)

- Should be spaced at intervals of not more than 60 meters.
- Lights on curves should be spaced at intervals less than 60 meters, so that a clear indication of the curve is provided.
- Retro-reflective blue markers (reflector) is also an economical option can be used instead of Lights

Series Loop Circuits

Runway Edge Lights and Runway End Lights can be connected together. This circuit is connected in a series loop and supplied through a Constant Current Regulator (CCR). An isolating

transformer has to be connected at each lamp to ensure circuit continuity in the case of a lamp failure.

These Lights require to be connected in two series circuits. Alternate series of lamps connected to one circuit and the remaining lamps to the second circuit. 02 CCR are required in total.

System rating

- Runway Edge Lamp Power rating: 2 x 20 x 150W
- Wing Bar Lamp Power rating: 2 x 10 x 150W
- Runway End Lights: 2 x 6 x 150W
- Secondary current: 6.6A

Apron Flood Lighting

Apron flood lighting has to be fixed on masts so as to minimize shadows and glare to the pilot. 04 Apron flood Lights shall be fixed on two masts of height 12m, 02 lights on each mast aligned for best illumination. High Pressure sodium lamps are preferred. Each light unit consists of two lamps. Mast should be painted with red and white.

An obstruction light shall also be fixed on top of the mast, if it is considered as an obstacle.

- Lamp Power rating: 4 x 2 x 400W
- Obstruction lamp rating: 60W
- Input Power supply: 220V connected to mains supply through a lamp Switching-gear box

Remote Switching and Monitoring

Switching and monitoring console shall be fixed at the Tower cab. At a controlled Aerodrome, the Air Traffic Controller shall be able to control the Aerodrome lighting and shall be able to monitor their serviceability.

Control and monitoring devices shall be fixed at the console for the following circuits

- Aerodrome Beacon
- APAPI

- Series loop Circuits – both circuits shall be switched together
- Apron Flood lighting – all floods could be switched together
- Sign Boards - all signs could be switched together
- Windsock (obstruction lights)

Alternate Control Panel

This is required as an alternative to switch the lighting in case the Tower console fails, this is situated at the CCR Vault and could be used as a maintenance technicians' requirement. All the circuits shall be controllable from here when control transfer switch is on at the Tower console.

Emergency Lighting Units

These are self-powered portable units to be sited at each Runway Light fixing in case of a power failure. Emergency lighting units shall be provided if an Aerodrome is not supplied with a Standby power system. The maximum power failure time for non-instrument Runway is 2 minutes. If the power persists to be longer, then Emergency Lighting Units shall be employed.

Personal Recommendation

As no approach lights or vasis will be provided, a minimum distance of 30m between runway edge lights needs to be maintained on either side of the runway.

- PVC ducts laid under sub base for Runway light cabling for future
- PVC ducts laid under sub base for Road light cabling for future

3.15 Passenger Terminal Building

- **General finishes required**
 - General Floor minimum area expected: 1200 sqm excluding loading area.
 - Structural finishes of the buildings
 - Reinforced Concrete structure or Structural Steel frame shall be adopted for Footing, Columns and Roof beams. For any alternative building system shall submit for prior approval of MoT.
 - Roof structure: Mild steel angles / G.I pipes / Timber

Timber used for construction will be in accordance with the requirements of BS 1186 'Quantity of Timber and Workmanship in Joinery', Part 1, 'Quality of Timber'.

Roof covered with Corrugated iron sheet with roofing paint or Lysaght roofing sheet with 100 mm one sided aluminium foiled heat insulation or as agreed.

- External Wall finishes of the building

Walls are generally shall be with cement plaster on hollow / solid block masonry wall or any approved wall system. External walls shall be finish with Nippon paint or equivalent and incorporated aluminium / Timber windows and doors.

- Internal finishes of the building

Walls are generally shall be with cement plaster on hollow / solid block masonry wall or any approved wall system / stud partition (gypsum board) with paint finish. All door frames are to be Aluminium or timber and PVC, door panels are to be with teak plywood and varnish finish. Suspended / Sloped ceiling provided in all required areas with Nippon paint finish or equivalent.

- Floor finishes of the building

Internal and external floor finishes: Glazed Ceramic Tile shall comply with British Standard specification No. 1281, Unglazed Ceramic Tile shall comply with British Standard specification No. 1286.

Toilet floor and wall finishes: Glazed Ceramic Tile shall comply with British Standard specification No. 1281, Unglazed Ceramic Tile shall comply with British Standard specification No. 1286

- Other areas:

Cement screed floor finish Loading and Unloading area: Mass Concrete floor finish

- Building Services

Building services shall include: Electrical and water supply, Sewerage and drainage system, Air conditioning as required in Departure Lounge (if the proper natural ventilation system is not adopted), Fire extinguisher as required, Communication, Data and IT network, Public address system.

3.16 Staff Accommodation Building, Administrative Office, Power House with RO plant and Security Post. (minimum floor areas given in the cost proposal sheet)

- **General finishes required**

- Structural finishes of the buildings

Reinforced Concrete structure or Structural Steel frame shall be adopted for Footing, Columns and Roof beams. For any alternative building system shall submit for prior approval of MoT.

Roof structure: Mild steel angles / G.I pipes / Timber

Timber shall be in accordance with the requirements of BS 1186 'Quantity of Timber and Workmanship in Joinery', Part 1, 'Quality of Timber'.

Roof covered with Corrugated iron sheet with roofing paint or Lysaght roofing sheet with 100 mm one sided aluminium foiled heat insulation or as agreed.

- External Wall finishes of the building

Walls are generally shall be with cement plaster on hollow / solid block masonry wall or any approved wall system. External walls shall be finish with Nippon paint or equivalent and incorporated aluminium / Timber windows and doors.

- Internal finishes of the building

Internal walls are generally with rendered cement hollow block masonry wall or any approved wall system / stud partition (gypsum board) with paint finish. All door frames are to be aluminium or timber and PVC, door panels are to be with teak plywood and varnish finish. Suspended / Sloped ceiling provided in all required areas with Nippon paint finish or equivalent.

- Floor finishes of the building

Internal and external floor finishes:

Glazed Ceramic Tile shall comply with British Standard specification No. 1281, Unglazed Ceramic Tile shall comply with British Standard specification No. 1286

Toilet floor and wall finishes: Glazed Ceramic Tile shall comply with British Standard specification No. 1281, Unglazed Ceramic Tile shall comply with British Standard specification No. 1286.

- Other areas:

Cement screed floor finish

- Building Services

Building services include: Electrical and water supply, Sewerage and drainage system, Fire extinguisher as required, and IT network.

3.17 Fire Garage / Control Tower (minimum floor areas given in the cost proposal sheet)

- **General finishes required**

- Structural finishes of the buildings

Reinforced Concrete structure or Structural Steel frame shall be adopted for Footing, Columns and Roof beams. For any alternative building system shall submit for prior approval of MoT.

Roof structure:

Mild steel angles / G.I pipes / Timber

Timber shall be in accordance with the requirements of BS 1186 'Quantity of Timber and Workmanship in Joinery', Part 1, 'Quality of Timber'.

Roof covered with Corrugated iron sheet with roofing paint or Lysaght roofing sheet with 100 mm one sided aluminium foiled heat insulation or as agreed.

- External Wall finishes of the building

Walls are generally shall be with cement plaster on hollow / solid block masonry wall or any approved wall system. External walls shall be finish with Nippon paint or equivalent and incorporated aluminium / Timber windows and doors.

- Internal finishes of the building

Internal walls are generally with rendered cement hollow block masonry wall or any approved wall system / stud partition (gypsum board) with paint finish. All door frames are to be aluminium or timber and PVC, door panels are to be with teak plywood and varnish finish. Suspended / Sloped ceiling provided in all required areas with Nippon paint finish or equivalent.

- Floor finishes of the building

Garage area:

Reinforced concrete floor finish

Internal and external floor finishes:

Glazed Ceramic Tile shall comply with British Standard specification No. 1281,

Unglazed Ceramic Tile shall comply with British Standard specification No. 1286

Toilet floor and wall finishes: Glazed Ceramic Tile shall comply with British Standard specification No. 1281, Unglazed Ceramic Tile shall comply with British Standard specification No. 1286

- Other areas:

Cement screed floor finish

- Building Services

Building services include: Electrical and water supply, Sewerage and drainage system, Air conditioning as required (only 1st and 2nd Floor, Fire extinguisher as required, Communication, Data and IT network.

Note: If the Developer's need to construct a separate Control Tower is also accepted.

Tower facilities attached to the Fire Garage is preferred to minimize the initial investment cost.

3.18 Public Canteen / Restaurant (minimum floor areas given in the cost proposal sheet)

- **General finishes required**

- Structural finishes of the buildings

Reinforced Concrete structure or Structural Steel frame shall be adopted for Footing, Columns and Roof beams. For any alternative building system shall submit for prior approval of MoT.

Roof structure:

Mild steel angles / G.I pipes / Timber

Timber shall be in accordance with the requirements of BS 1186 'Quantity of Timber and Workmanship in Joinery', Part 1, 'Quality of Timber'.

Roof covered with Corrugated iron sheet with roofing paint or Lysaght roofing sheet with 100 mm one sided aluminium foiled heat insulation or as agreed.

- External Wall finishes of the building

Walls are generally shall be with cement plaster on hollow / solid block masonry wall or any approved wall system. External walls shall be finish with Nippon paint or equivalent and incorporated aluminium / Timber windows and doors.

- Internal finishes of the building

Internal walls are generally with rendered cement hollow block masonry wall or any approved wall system / stud partition (gypsum board) with paint finish. All door frames are to be aluminium or timber and PVC, door panels are to be with teak plywood and

varnish finish. Suspended / Sloped ceiling provided in all required areas with Nippon paint finish or equivalent.

- Floor finishes of the building

Internal and external floor finishes:

Glazed Ceramic Tile shall comply with British Standard specification No. 1281, Unglazed Ceramic Tile shall comply with British Standard specification No. 1286

Toilet floor and wall finishes: Glazed Ceramic Tile shall comply with British Standard specification No. 1281, Unglazed Ceramic Tile shall comply with British Standard specification No. 1286

- Other areas:

Cement screed floor finish

- Building Services

Building services include: Electrical and water supply, Sewerage and drainage system, Fire extinguisher as required, and IT network.

Note: If the Developer needs to introduce any alternative construction or prefabricated system for the building system will be judged the quality and durability to the local environment and feasibility for future modifications as required.

3.19 Septic Tank Waste Disposal System

150mm thick Solid Block Masonry with Cement Plaster on 2 sides or Reinforced Concrete.

3.20 Water Collection Tank System

PVC Tanks or RC Concrete Tanks

EMPLOYER'S REQUIREMENTS

Preliminary Reclamation depth assumed as 1.4 m from M.S.L. to all areas covered in the scope.

Submit

- Provide the detail plan of how to organize material to prepare the sub base. (location of barrow areas)
- Details of proposed equipment to carry out the works.
- Design Calculations, Specifications, Method statements and drawings

Contractor is responsible to conduct all related surveys, material testing procedure, soil investigation reports for the approval. Design calculations drawing as required shall be submitted for the approval after awarding the project.

- Project costing;

BOQ for tender purpose is attached in the document to estimate the project cost. Contractor is responsible to check the accuracy of the quantities before submission of the bid. Any additions or Omissions of the quantity can be submitted by the Contractor as a separate bill.

- Work schedule;

The contractor shall submit proposed work schedule. The work schedule shall indicate the major works to be carried out under the scope of the project. The work schedule shall clearly show the proposed date for the start of work on site.

Other Information

It is contractors' responsibility to obtain all the permits required (from regulatory authorities, service providers etc.) for dredging and reclamation works.

The metric system of units shall be used throughout.

The maximum advance payment is 15% would be released on submission of a Bank Guarantee equal to the amount as specified in the contract.

Note.

All approvals required in relation to the project shall be the responsibility of the contractor including Environmental Impact Assessment.

Section – C

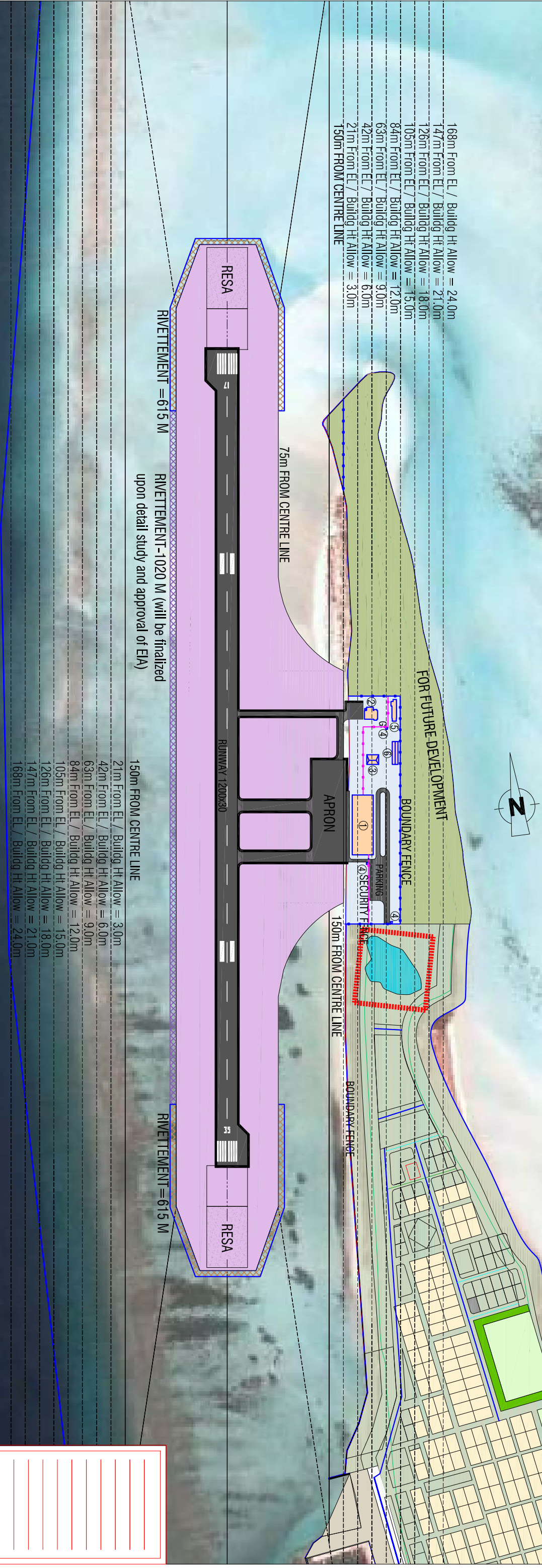
Bills of Quantities

Section – D

Drawings

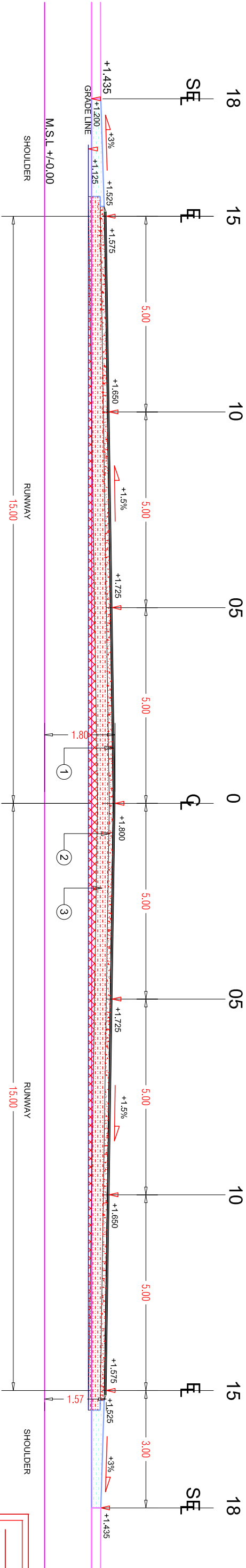
- General Layout – Airport Infrastructure
- Height Restriction
- Cross Section
- Area calculation
- Passenger Terminal Layout

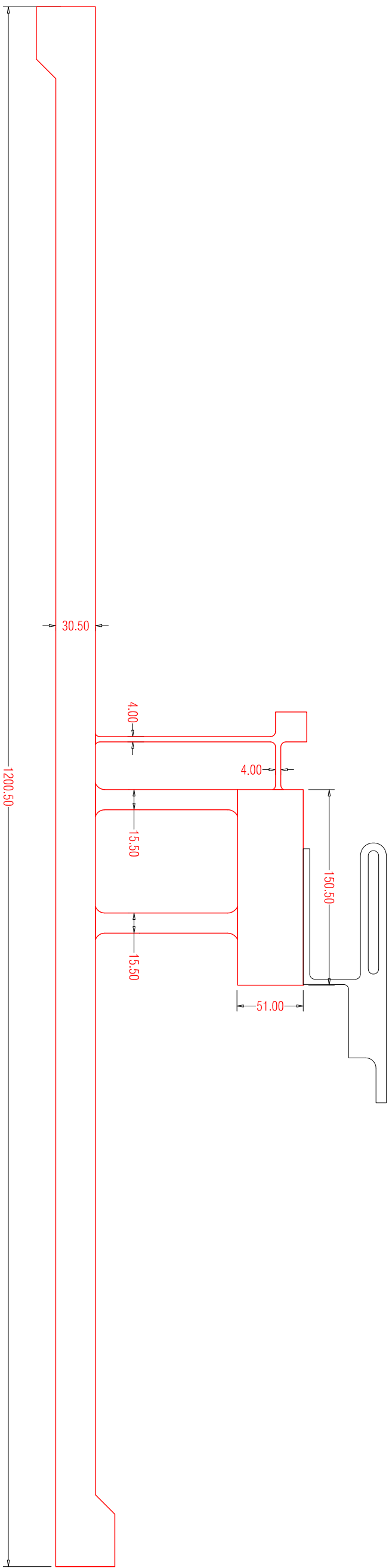
THIS CONCEPT IS DEVELOPED FOR DISCUSSION USE.
INVESTOR CAN PROPOSED HIS OWN OPTIONS AFTER
DETAIL STUDY AND UPON APPROVAL OF EIA DECISION
STATEMENT FOR THE FINAL CONCEPT APPROVAL.



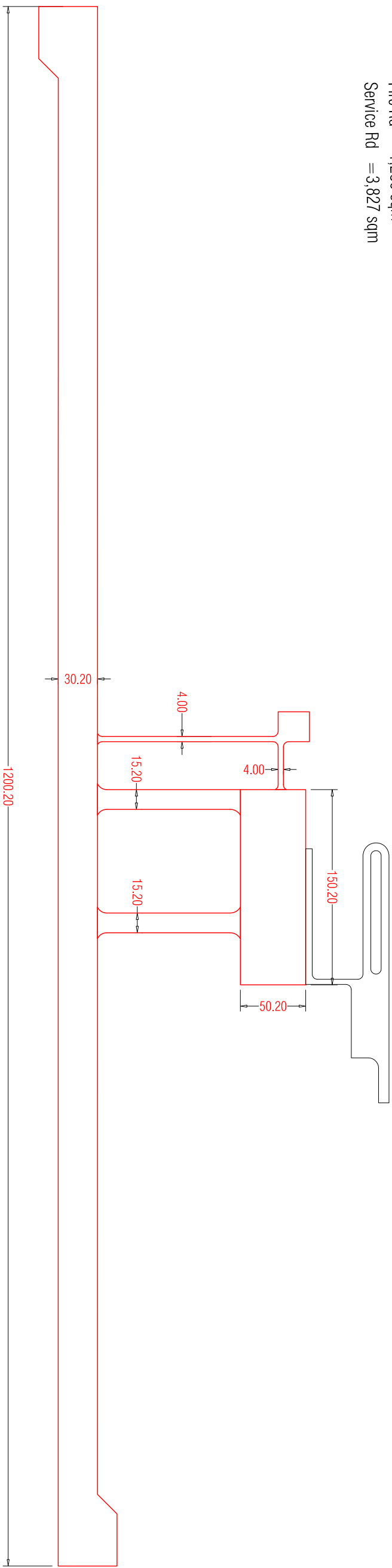
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TITLE:		GENERAL LAYOUT	
DRAWN BY:		MAHREEN / SAMIR	
DESIGN BY:		MAHREEN / SAMIR	
DRAWING NO:		GL/01/16	
SCALE:		SCALE:-	
DATE:		APRIL-2016	
CHECKED BY:		MAHREEN	

①	75MM THK ASPHALT WEARING COURSE
②	100MM THK COMPACTED AGGREGATE BASE COURSE
③	300MM THK COMPACTED SUB BASE MATERIAL





BASE COURSE



WEARING COURSE

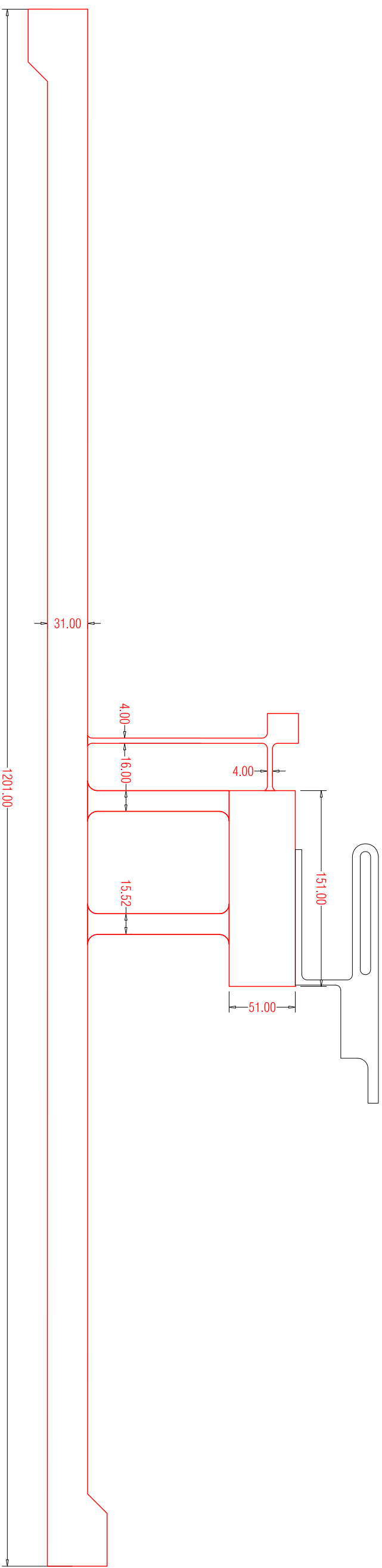
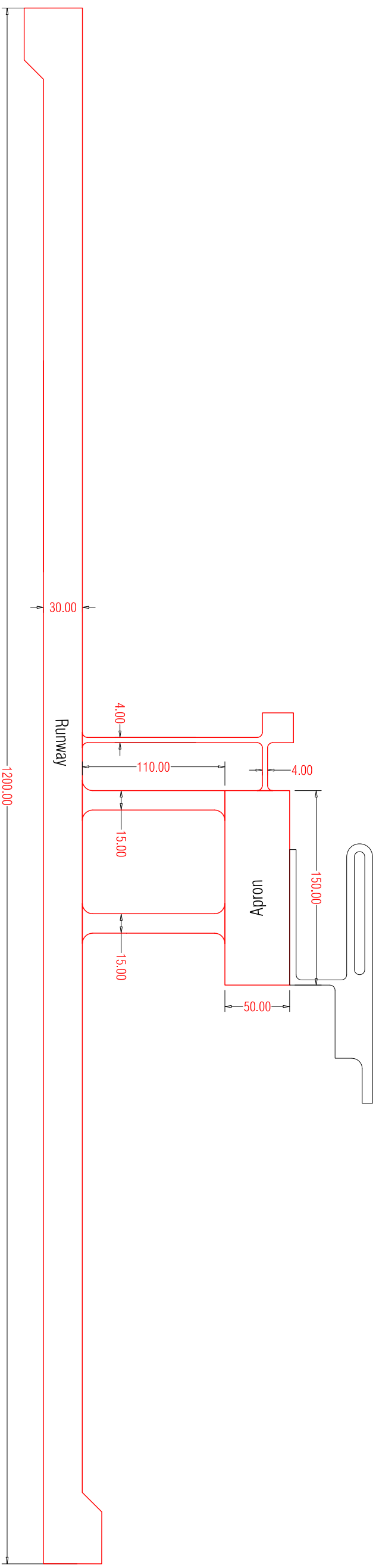
DRAWN BY:	MAHREEN / SAMIR
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DRAWING NO:	AC/02/16
SCALE:	SCALE: -
DATE:	APRIL -2016
CHECKED BY:	MAHREEN

PROJECT:
SH. FUNADHOO AIRPORT

FILE:

REGIONAL AIRPORTS
MIN. OF TOURISM
MALE'
REP. OF MALDIVES
TEL: 323805, FAX: 320911
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PROJECT:
SH. FUNADHOO AIRPORT

AREA CALCULATION-1

REGIONAL AIRPORTS
MIN. OF TOURISM
MALÉ
MARP. OF MALDIVES
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