

2016

PROJECT DESCRIPTION

L.F. WADE INTERNATIONAL AIRPORT
PROPOSED TERMINAL REDEVELOPMENT

AECOM

LAS Int'l Consulting



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1. INTRODUCTION

The following document provides current information with respect to the proposed Project. As new information becomes available, updates and edits will be made to the Project Description to accurately describe the scope of the Project.

1.1 PROJECT OBJECTIVES

The proposed Project is to construct a New Passenger Terminal Building and associated airside apron areas and landside access roads and parking facilities at the L.F. Wade International Airport in Bermuda, replacing the existing Terminal which cannot be modified to meet fully modern safety standards or to meet expected future demand for passenger capacity and is in a location vulnerable to storm surge and sea level rise.

This document provides a description of the Project components, which include the new Passenger Terminal Building and the supporting airside and landside facilities.

1.2 PROJECT PROPONENTS

1.2.1 Bermuda Government

The Bermuda Government as represented by the Ministry of Tourism Development and Transport, owns and operates L.F. Wade International Airport (the “Airport”) located in the parish of St. George’s.

1.2.2 Canadian Commercial Corporation (CCC)

CCC is a Crown corporation of the Government of Canada that connects government buyers with Canadian industrial solutions. CCC has identified Aecon Constructors, a division of Aecon Construction, as its proposed subcontractor to perform construction services and Aecon Construction, as represented by Aecon Concessions, as an equity provider for a special purpose entity (“Project Co”) to deliver the balance of the Project deliverables.

1.2.3 Aecon Concessions

Aecon Concessions, a division of Aecon Construction, is a Canadian based global infrastructure developer and investor specializing in airports, transportation and transit projects.

2. BRIEF PROJECT OVERVIEW

The proposed terminal redevelopment at the L.F. Wade International Airport (see **Figure 1**) has been considered since the 2006 Airport Master Plan was undertaken by HNTB, a US based airport consultancy. The Project includes the construction and operation of a new terminal at a different site within the airport grounds, the construction and operation of additional apron space, the installation of apron lighting systems, modifications to taxiway interconnects and interface, the installation and operation of a new aircraft hydrant refuelling system and the de-commissioning of the majority of the existing terminal, the remainder of which may be used for airport operations and office space. A more detailed description of the proposed project is included in Section 2.3.

A description of the current airport facilities has also been included in Section 2.2 in order to provide the reader with some context with respect to the site in order to better visualize the changes proposed as part of the terminal redevelopment project.

2.1 THE AIRPORT STUDY AREA AND LAND USE

The local study area for the Environmental and Social Impact Assessment comprises the airport lands and the land and water that abut the Airport. The regional study area is still being defined. Areas of environmental sensitivity in the area of the airport that fall under the Bermuda Plan 2008 are zoned as nature reserves, coastal reserves and parks. Land use to the north of the airport is predominantly a combination of industrial and mixed use, while to the north-east it is considered open space reserve.

The land to the south-east of the Airport, known as Cooper's Island, comprises the Cooper's Island Nature Reserve (a National Park) and the former NASA tracking station, which together constitute one of the largest tracts of undeveloped land in Bermuda (and form part of a World Heritage Site) and is also subject to the draft Cooper's Island Land Use and Management Proposals Plan.

Nonsuch Island, zoned as a Nature Reserve, has the status of "Living Museum" given the presence of a rare bird species on the Island. The Bermuda Petrel, or Cahow, thought to be extinct, was rediscovered in 1951. This endemic bird is critically endangered, and is the subject of a Government conservation program to ensure the survival of the species. The nesting sites for the Cahow are located to the south-east of the airport site. A landfill is located just east of the existing terminal, off of the airport grounds.

AIRPORT LOCATION MAP AND PROPOSED DEVELOPMENT AREA L. F. WADE INTERNATIONAL AIRPORT

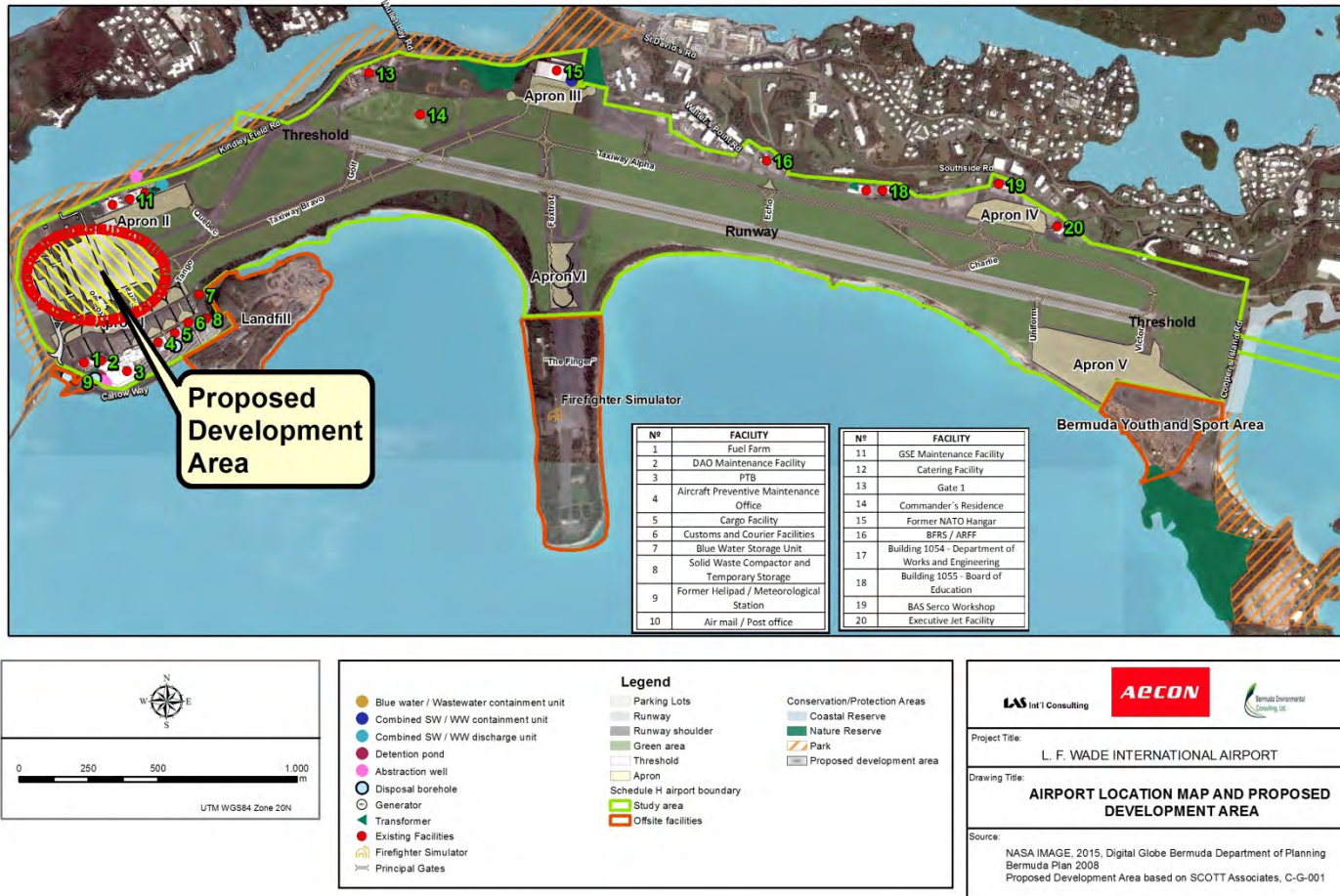


Figure 1 – Location Map and Proposed Development

2.2 EXISTING FACILITIES

The L.F. Wade International Airport, which is owned by the Bermuda Government and operated by the Department of Airport Operations (DAO), is the only airport in Bermuda. It is located in the north-eastern portion of the country on St. David's Island in St. George's Parish, approximately 16 kilometres east of the Country's capital city of Hamilton.

Construction of the Bermuda airport began in 1940 by the U.S. military, with a significant portion of the facility being built with ocean-dredged fill. Continuous improvements were made to the facility over the next several decades, including the construction of the civilian terminal building on the south-west side of the Airport. The US military maintained control of the field until June 1995 when control passed to the Bermuda Government.

The Airport site area is 217 hectares with a 2,961 metre runway, taxiways, a passenger terminal, cargo facility, executive jet facility, and various support facilities.

2.2.1 Landside Access Infrastructure

2.2.1.1 Roadways

Two roads service the airport: one over the Causeway and the second is Kindley Field Road to St. George's. In addition, Cahow Way provides for two way traffic along south-western perimeter of the airport.

2.2.1.2 Public and Airport Operations Car Parking

The existing terminal operations provide 237 car spaces and 55 scooter spaces, plus 130 parking and 50 queuing spaces for taxis. In addition, the cargo area has 30 spaces, customs 12 spaces, staff parking 100 spaces plus a scooter zone and the Terminal manager has 30 parking spaces and 5 scooter spots.

2.2.2 Airside Infrastructure

Following is a general description of the airfield and airside infrastructure:

2.2.2.1 Runway

The Airport is served by a single north-west by south-east asphalt runway bearing 120⁰/300⁰ with a total length of 2,961 metres and 45 metres in width. Extensions or modifications to the runway are not considered as part of the Airport redevelopment.

2.2.2.2 Taxiways

Twelve airside taxiways connect the runway with the different aprons, hangars, buildings and service areas of the airport. Following is a description of each taxiway:

Alpha: a 23m wide taxiway running parallel to runway 12/30 along the north side of the runway.

Bravo: the south-west north-east taxiway from the west end of the main runway at the NATO hangar into the terminal area.

Charlie: Connects the main runway with Alpha.

Echo: Connects the main runway with Alpha.

Foxtrot: Connects the main runway with Alpha.

Golf: Connects the main runway with Bravo.

Quebec: Connects the military aircraft apron (Apron II) with taxiway Bravo.

Romeo: Connects the existing passenger terminal apron (Apron I) with Bravo and the military aircraft apron.

Sierra: Connects the existing terminal apron (Apron I) with Bravo.

Tango: Connects the existing terminal apron (Apron I) with Quebec.

Uniform: Connects the runway with Apron V at the south-east extreme of the airfield.

Victor: Connects the runway with Apron V at the south-east extreme of the airfield.

2.2.2.3 Aprons

There are six (6) aircraft aprons at the Bermuda Airport. A general description is as follows:

- Apron I - serves the existing passenger terminal and supports eight (8) hard stands.
- Apron II - served the prior military aircraft and was the former executive jet apron.
- Apron III – formerly served as the NATO hangar apron.
- Apron IV – is located north of Alpha, adjacent to Charlie. Currently serves the Executive Jet Facility.
- Apron V – is located south of the runway 30 threshold at the south-east extreme of the airfield. The northern portion of Apron V is used for aircraft manoeuvring while the remainder of Apron V is inactive. Adjacent to this apron is the Bermuda Youth and Sports Area.
- Apron VI – is located at the northern part of the finger. This area was previously used by the military as a runway and is currently used as a quarantine area for military aircraft with hazardous goods.

The southern part of the finger has been turned over to the government for Clean Energy Development Projects, although a small portion of it on the western side is still being used by the Airport Rescue and Fire Fighters Department for training purposes.

2.2.3 Passenger Terminal Building

The existing passenger terminal is located on the south-western part of the Airport, south of runway 12/30 with airfield operations at Apron I. The original section of the Passenger Terminal Building was built in the 1940s with several subsequent phases of expansions undertaken in the 1950s, 1960s and 1980s. In 1997, renovations were completed in various areas of the terminal.

The two levels terminal is approximately 24,221 m² in overall area and supports all international flights. This two level building is not equipped with passenger boarding bridges.

The Department of Airport Operations and airline administrative offices are also accommodated on the second floor of the Administrative Building which is a part of the Terminal Building.

2.2.4 Ancillary Technical Facilities

2.2.4.1 Former NATO Facility

The former NATO hangar, with an area of 7,250 m², is located north of the runway and opposite taxiway Foxtrot and has approximately 5,500 m² of ancillary area including workshops, offices, crew quarters etc. The apron in front of the NATO hangar is approximately 19,000 m² in area and is called Apron III.

2.2.4.2 Executive Jet Facility

This facility is located at Apron IV. This Executive Jet Facility supports general aviation activity and is located north-east of the runway. It is operated by Cedar Aviation Services and comprises a small passenger terminal.

2.2.4.3 Air Cargo

Both belly cargo and dedicated freighter cargo is processed from a facility located east of the existing passenger terminal building. This facility also houses customs and inbound operations. Cargo aircraft park at the east end of the terminal on Apron I.

2.2.4.4 Courier Building

The Courier building is located east of the cargo facility with approximately 240 m² of processing space.

2.2.4.5 Former Helicopter Facility

This building is located west of the existing passenger terminal and has approximately 160 m² in area, is in fair condition and is considered suitable for alternate operations.

2.2.4.6 Aircraft Rescue and Fire Fighting Facility

The Aircraft Rescue and Fire Fighting facilities are operated in two buildings on the north side of the airfield. This facility has two (2) drive-through bays plus two back-in bays in one structure, with training and maintenance in the adjacent structure. The airport is classified as an International Civil Aviation Organization (ICAO) Category 9 facility, which may be upgraded to Category 10 in the future, allowing for the airport to cater to the largest aircraft (including the Airbus A380) and will therefore require increased coverage (water, dry chemical powder and discharge rates of the crash tenders) by the Aircraft Rescue and Fire Fighting service.

2.2.4.7 *Catering Building*

The 2,400 m² Catering Facility is located to the north of the terminal and east of the Ground Service Equipment Workshop.

2.2.4.8 *Ground Service Equipment Workshop*

This workshop facility, with 1,180 m², is located on the north side of the airport.

2.2.4.9 *Post Office/Air Mail*

The Air Mail facility has 1000 m² of surface area located adjacent to the Ground Service Equipment Workshop on the north side of the airport.

2.2.4.10 *Fuel Farm*

There are six (6) 25,000 gallon Jet A-1 tanks located on the west side of the existing terminal apron (Apron I) with connection to the Ferry Reach fuel farm north of the airport. The existing passenger terminal apron is equipped with a hydrant fuelling system.

2.2.4.11 *BAS-Serco Offices*

The BAS-Serco offices are located in a 500 m² building located directly north of taxiway Alpha.

2.2.5 **Utilities**

2.2.5.1 *Electricity*

Power, with backup for terminal systems only, is provided to the airport by the Bermuda Electric Light Company (BELCO) at 4,160 volts from the incoming source vault located at the west side of the airport. In addition, the Department of Airport Operations has an existing generator with 650 volt capacity supplying power to the existing terminal capable of maintaining terminal systems operational but does not support the ventilation and air conditioning systems. The airfield lighting systems are powered from the Field Electrical Centre which is located near the middle of the runway and is also connected to a 4,160 volts power source from BELCO. The airfield is also supported by backup power generators in compliance with ICAO standards.

2.2.5.2 *Water*

There are six underground water storage tanks beneath the existing passenger terminal with a combined capacity of 450,000 gallons (1703 m³). Topping off for the water tanks is provided from two sources; rainwater from roof runoff and via a reverse osmosis plant of 7,000 gallons (26.5 m³) located on the roof of the existing terminal for onsite treatment.

2.2.5.3 *Sanitary Sewer*

Sanitary sewage is disposed into multiple cesspits and septic tanks/boreholes to the east of the existing terminal which are routinely pumped out for off-site treatment and disposal.

2.2.5.4 *Communications*

Service to the airport is via numerous conduits throughout the airfield. Distribution of telephone, telegraph and fire alarm are routed to the various facilities throughout the airport from these main incoming conduits via fibre and copper cables.

2.2.5.5 *Stormwater*

Stormwater management uses two (2) gravity networks located in the vicinity of the Executive Jet apron and drains into Castle Harbour and Ware Lake. In addition, soak away areas are provided in strategic locations throughout the airport.

2.2.5.6 *Air Traffic Control Tower*

The Air Traffic Control Tower is located north-east of the existing passenger terminal and outside the airport boundary. There are three (3) Air Traffic Control positions in the third level of the tower.

2.2.5.7 *Weather Services*

The Bermuda Weather Service is located in a building north of the control tower.

2.3 THE NEED FOR A NEW TERMINAL

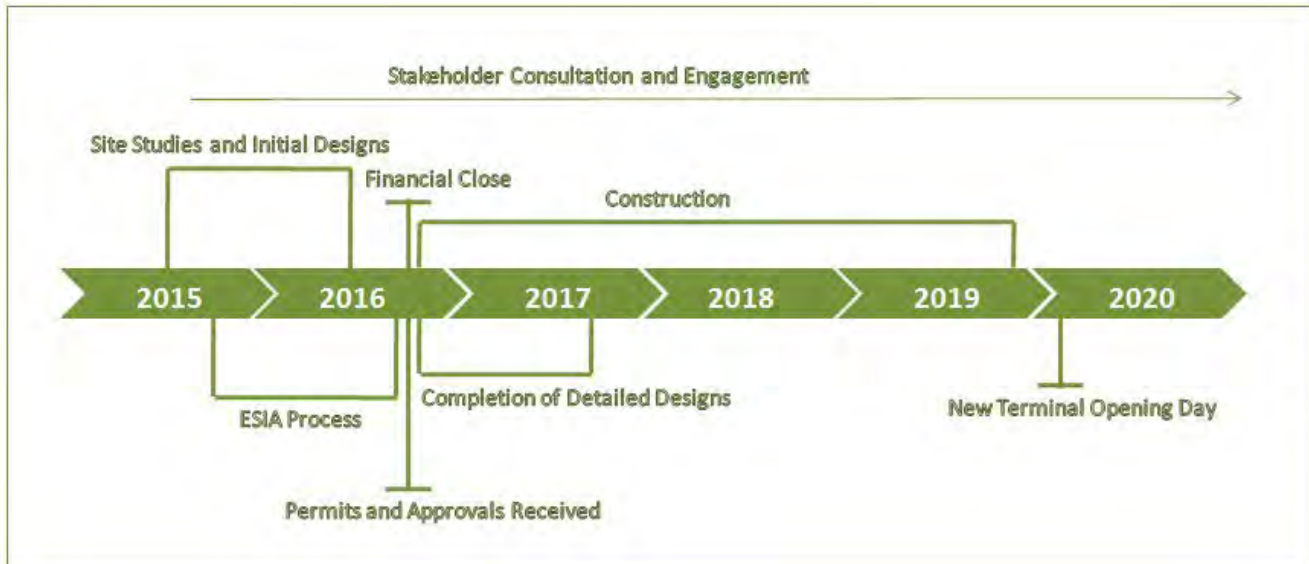
Since the 1940s, L.F. Wade International Airport has played an essential role in connecting Bermuda to the world as it is the island's lifeline for the development of international tourism and trade, and fundamental to the growth and wellbeing of Bermuda's economy. Opened in January 1944 by the US military, ownership and control of the airport passed to the Bermuda Government in 1995, marking the most recent phase of terminal renovation. Now approaching its 70th year of operation, the L.F. Wade International Terminal facilities are badly in need of a complete overhaul.

According to the HNTB Bermuda International Airport Master Plan (2006), the focus and direction of the Master Plan were driven by several key issues, including:

- ✓ To provide a modern world class Terminal Facility
- ✓ To provide sufficient capability for future growth of landside facilities

2.3.1 Project Time Schedules

The following schedule is anticipated for the new terminal construction:



2.3.2 Proposed Project

The construction of the new terminal and auxiliary facilities (see **Figure 2**) consist of many design studies and engineering reports. Construction activities also have a number of required actions to ensure all relevant aspects are covered. Transport and transfer of materials, machinery, equipment and personnel for construction are important for all elements of the terminal and apron construction.

2.3.2.1 Project Components

The proposed new facilities are divided into two components: temporary construction and permanent airside and landside facilities.

All facilities, which will be constructed and made operational by AECON, are as follows:

- *Temporary Construction Facilities*
 - AECON Site Offices and Warehouse
 - Concrete Plant
 - Asphalt Plant
 - Temporary Topsoil Stockpile Area
 - Aggregates Stockpile Area
 - Fuel Storage
 - Chemical Storage
 - Waste Management Area
 - Maintenance Area
 - Construction Area Temporary Fence and Access Controls

- *Permanent Facilities – Airside*
 - Passenger Terminal Building

- Aircraft Parking Stands
 - Airside Roads
 - New taxiways and upgrades to existing taxiways and taxilanes
 - Airfield lighting
 - Perimeter Roads, Access Roads and Security Fencing
 - Stormwater Management System (Fuel Interceptors and Oil / Water Separators)
 - Wastewater Management System (Including Blue water)
 - Drainage Pipeline (for Stormwater and Wastewater)
- *Permanent Facilities – Landside*
- Administrative Building
 - Terminal Access Roads and Parking Lots
 - New Gate 103 secure entry
 - Bus and Taxi Drivers facilities
 - Utilities (power/communications)
 - Potable Water Treatment Plant
 - Sanitary Treatment Plant
 - Fire Protection Hydrants
 - Signage and Landscaping

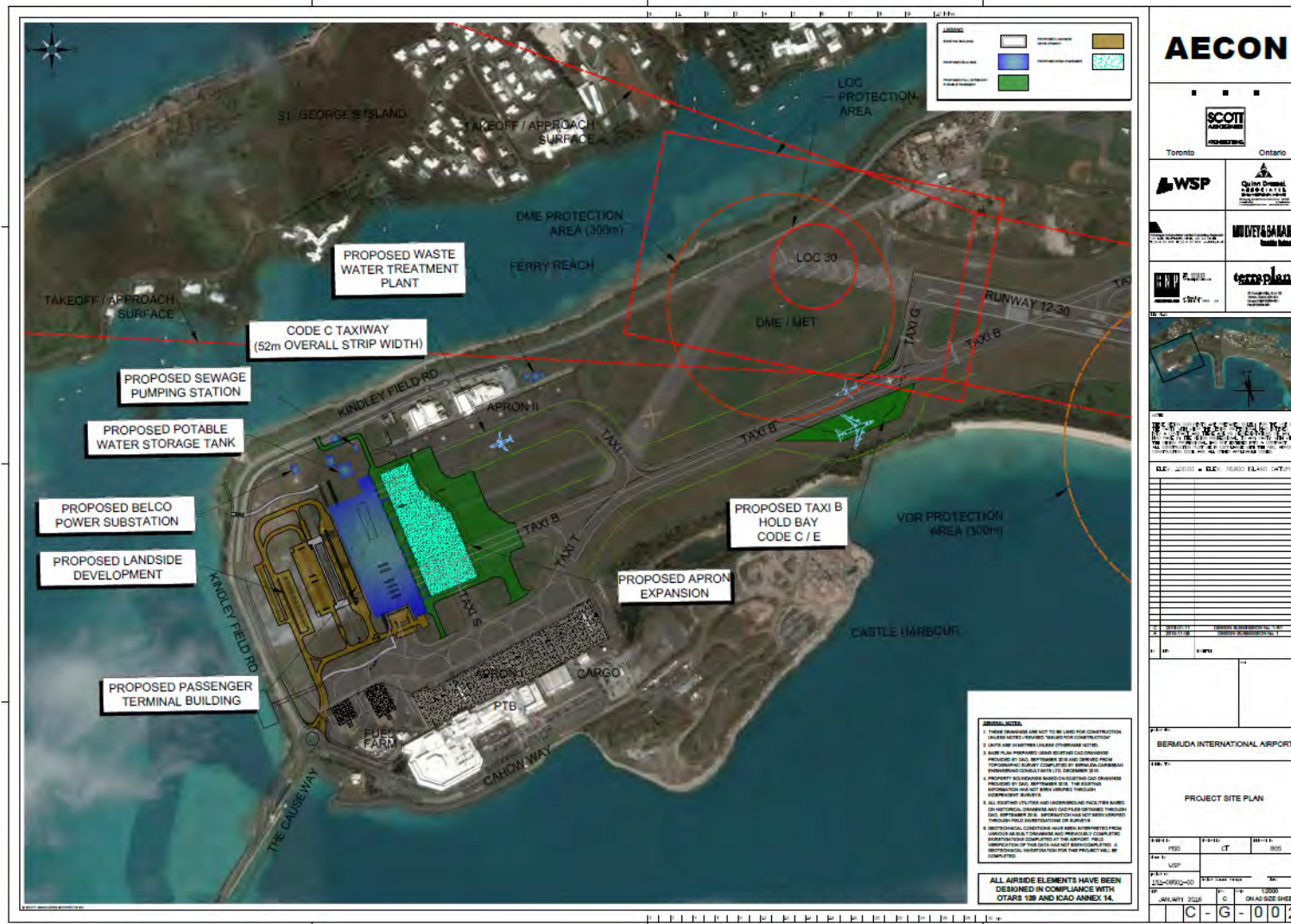


Figure 2 – Proposed Development Area

2.3.3 Preconstruction Activities

This includes designs, geotechnical studies, topographic survey, environmental, social and economic studies as well as storm surge studies. In addition, logistical planning, security plans, Plan of Construction Operations and aeronautical and regulatory approvals will be required.

2.3.4 Construction Activities

Construction activities for the New Terminal and associated facilities are scheduled to occur over a 40 month period. Some of the facility locations are yet to be determined.

Every attempt will be made to recruit qualified local personnel wherever practical to do so.

Major equipment requirements are anticipated to include:

- ✓ Barges
- ✓ Trucks
- ✓ Loaders and /or Excavators
- ✓ Tractors/Bulldozers
- ✓ Paving equipment (asphalt and concrete)
- ✓ Motor Graders
- ✓ Vibratory Compactors
- ✓ Cranes

The above will be supported by a fleet of ancillary equipment such as fuel trucks, water trucks and service vehicles to suit the demand. Changes to the fleet requirement may occur based on size of equipment, i.e., increase in the number of small pieces of equipment.

The source of the equipment has not yet been determined; the first choice will be to use locally available suitable equipment. Whatever is not locally available will be imported as required. In addition, it is anticipated that some heavy equipment will be provided, operated, and maintained by local subcontractors.

Construction activities at the L. F. Wade International Airport will include:

- Earth moving;
- Site preparation;
- Sub-base preparation;
- Compaction and Stabilization of Soils;
- Asphalt and Concrete Pavement; and
- Building and Infrastructure Construction.

The new terminal and supporting infrastructure is scheduled to be substantially complete in 40 months from the start of construction.

2.3.5 Description of the Proposed Temporary Facilities

2.3.5.1 *AECON Site Offices and Warehouse*

AECON will develop a multi-purpose office site to accommodate on duty management, administrative and technical staff for the construction period. The offices and warehouse required during the construction period will include all facilities required for the construction site.

2.3.5.2 *Concrete Plant*

A concrete plant will be used for the construction activities and will be decommissioned and dismantled thereafter. The location of the concrete plant is to be defined. This concrete plant will have an air emissions control system with an air quality monitoring point, will follow requirements for noise abatement and visual barriers, and will have an associated stockpile for the storage of materials.

2.3.5.3 *Asphalt Plant*

An asphalt plant will be used for the construction activities and will be decommissioned and dismantled thereafter. The location of the asphalt plant will be defined. The asphalt plant will be located on an impervious surface and will have an associated stockpile for storage of materials. The asphalt plant will have an air emissions control system along with an air quality monitoring port and will follow requirements for noise abatement.

2.3.5.4 *Temporary Topsoil Stockpile Area*

A previously cleared and grubbed area will be designated to store topsoil and disturbed vegetation from ongoing clearing and grubbing activities. Mitigation measures will be incorporated into the Environmental Management Plan with respect to run-off and airborne dust impacts.

2.3.5.5 *Fuel Storage*

There will be a temporary fuelling supply station; the site is still to be defined. This fuel station will include above ground storage tanks and associated fuelling facilities. The tanks will be installed in accordance with Industry Best Management Practices, including secondary containment, a closed system of grease traps, grounding, and fire extinguishers. The fuelling area will be paved to inhibit spills reaching the soil.

2.3.5.6 *Chemical Storage*

Chemical storage will be conducted on site; a general warehouse will be implemented with an adequate area for storing chemicals. Chemical inventories will be limited to those that will be used for construction operations and maintenance of equipment.

2.3.5.7 *Waste Management Area*

Proper waste containers will be placed in the construction area for sorting and management of all types of waste. A temporary storage area will be implemented close to the construction site in

order to classify waste before final disposal. Hazardous waste will be separated from common, recyclable and construction waste and will be properly disposed off-site through a waste management company.

2.3.5.8 *Maintenance Area*

An on-site maintenance area for equipment and machinery will be implemented. The location of this area is still to be defined. Proper impervious areas will be prepared for maintenance activities including runoff water control, oil / water separators, etc.

2.3.5.9 *Construction Area Temporary Fence and Access Controls*

The construction site will be properly separated and fenced from the operational areas of the Airport in order to ensure safety for passengers and workers during construction. Access to construction areas will be controlled.

2.3.6 **Description of the Proposed New Terminal and Auxiliary Facilities – Permanent Facilities**

The new terminal apron will be interconnected to the existing taxiway system via Apron II, Taxiways Bravo, Tango and the re-aligned Sierra. The project will incorporate improvements to Taxiway Bravo including a possible holding bay and widening to support independent dual narrow body taxiways (International Civil Aviation Organization Code C) and single Code E taxiway operations.

Airport Certification and Level of Service:

The airport will continue to operate as a Code 4 instrument and precision airport capable of supporting operations down to a Runway Visible Range of 800m (2600 ft.). The proposed development will be capable of supporting aircraft operations under these conditions.

Design Aircraft:

The design aircraft for the new apron will include wingspan capability for the following aircraft:

- B737-900 ER Winglets – Narrow body (Code C)
- B777-900 MAX – Code E
- B787 – Code E (based on 2028 Schedule)
- B747-400 Code E

The apron will be designed based on maximum wing spans published in International Civil Aviation Organization Annex 14 for Code C and E aircraft rather than for specific aircraft. However, the depth of the apron will be determined by the maximum length of the largest aircraft.

The interconnecting taxiways and aprons will consider a wider range of aircraft due to the airport's ability to support diversions, military operations or special events.

The Terminal

The terminal layout is comprised of a main level and a second level with the following criteria:

- Consists of a one-level building landside plus partial mezzanine and a two-level back-split building airside.
- The mezzanine level supports airline offices and IT facilities.
- The second level supports departure hold rooms and concessions with ready access to the aircraft provided through apron drive passenger boarding bridges.
- The main level supports Customs and Immigration processing space as well as baggage handling services and security screening.
- The main level also supports passenger check-in, well-wisher and meter/greeter spaces along with airline and airport office spaces.
- Commercial spaces are located both airside and landside on both levels.

2.3.7 Key New Terminal Building Components

Following is a description of the processing procedures for the linear terminal:

2.3.7.1 *Ground Level Processing*

Departure functions are located at the north end of the centralized processor while arrival facilities are located at the south end.

2.3.7.2 *Ground Level Departures*

Departing passengers enter the departures hall from the terminal curb. Check-in facilities for both self-check-in plus conventional check-in are arranged directly opposite the entry. All checked bags will be processed through a centralized hold bag screening facility.

Consistent with current United States Customs and Border Protection pre-clearance planning and operating standards, all passengers (non-US plus US) access the Security Screening Check Point directly after check-in. Screened passengers then separate, with non-US passengers accessing the stair/escalator/elevator leading directly to the second level non-US concourse and holding lounges while US destination passengers exit the Security Screening Check Point and directly enter the primary United States Customs and Border Protection processing queue.

2.3.7.3 *Upper Level Departures*

United States destination hold lounges are located in the north quadrant of the upper level. A large mixed use concession facility is located directly adjacent to the holding lounges. International destination hold lounges are located in the south quadrant of the linear concourse. As with the US concourse, departing passengers have access to mixed concession facilities positioned directly adjacent to the hold lounges. Both US and non-US passengers access the gate bridge via a sterile airside corridor.

Centrally located between the US and International hold lounge areas is a swing lounge which will support either International flights or US flights.

2.3.7.4 *Remote Departures*

In addition to departures from bridged gates, remote departures may occur from both the non-US and US Concourses. Passengers would access the apron level and board buses for transfer to the remote aircraft stands.

2.3.7.5 *Upper Level Arrivals*

Passengers arriving from the US or other non-US destinations are processed through a common facility. They exit the aircraft through the passenger boarding bridge and enter the sterile airside corridor. The sterile airside corridor is equipped with a series of control doors that effectively segregate arriving from departing passengers.

2.3.7.6 *Ground Level Arrivals*

All arriving passengers proceed directly to one of two centralized stairs/escalators/elevators and descend to the ground level arrivals Immigration hall. Passengers proceed through passport control to baggage claim and from baggage claim pass arrivals duty free to the customs control facility to the main arrivals hall.

2.3.7.7 *Apron Drive Passenger Boarding Bridges*

The Project will include all foundations and utility services required for the installation of the apron drive passenger boarding bridges and associated bridge connectors, including 400 Hz power supply at each bridge.

2.3.8 Runway 12-30

Apart from an aircraft Holding Bay/Bypass at Taxiway Bravo and Runway 12-30, no further work is proposed beyond the limits of the junctions of Taxiway Golf and Taxiway Bravo at Runway 12-30. Interfaces at this point may need to be partially reconstructed to accept any modifications for the taxiways. No additional work is proposed on Runway 12-30 or any of the associated visual and navigational aids.

2.3.9 Taxiways

Taxiways will be designed to International Civil Aviation Organization compliance and will be appropriately lighted and marked. Taxiways will be constructed using flexible asphalt pavements with drainage along taxiways by over-land flow into adjacent swales or ditches; using existing storm outlets as is practical.

2.3.10 Terminal Apron

The following are key requirements of the new terminal apron design:

The proposed apron system will accommodate Passenger Boarding Bridges. The apron will be sloped away from the building with slopes within the aircraft stands. The apron will accommodate on-stand hydrant fuelling, will include Ground Services Equipment parking areas and apron roads at head of stand and tail of stand. The apron will be rigid Portland Cement Concrete construction for all aircraft stands; all other areas will be flexible pavement (asphalt). Flood lighting will be based on the use of high-mast Light Emitting Diode floodlights mounted between the apron and head of stand road. The number, height and aiming angles will be designed to ensure the apron is illuminated in full compliance with applicable standards.

Hydrant Fuelling System

An in-ground hydrant fuelling system shall be provided at each aircraft stand. The fuelling consortium shall be responsible for coordinating the installation of the hydrant fuelling system and co-ordination with the terminal/apron constructor.

The existing fuel farm is connected by pipeline to the fuel farm located on Ferry Reach and contains, at any moment, about 18,000 US gallons of aircraft fuel. The existing fuel line currently runs through the proposed new development area and will need to be partially relocated as part of the construction where the current fuel line location conflicts with the new development.



Figure 3 – Map of the Bermuda Airport Supply Jet Fuel Pipeline

2.3.11 General Airfield - Drainage Design Criteria

Drainage design will be completed in accordance with sound engineering practice and, at a minimum, meet the requirements of local authorities or practice and meet the safety and operational requirements set out in International Civil Aviation Organization Annex 14 with the following:

Ponding is not permitted within the runway or taxiway strips or within the paved apron area. Soak-away pits may also be used consistent with local practices and soil conditions. The drainage system will be designed to avoid adverse impacts on any natural or constructed drainage course outside the airport boundary. Major flow paths will be designed to minimize any structural damage to the site under significant storm events.

Fire stops will have a maximum spacing of 38 meters, or as required under the National Fire Protection Association, will be provided along any channels where there is a risk of fuel spillage.

Culverts will be constructed from pre-cast concrete sewer pipes, concrete encased corrugated steel pipe or concrete box culvert sections as applicable to support the design loads of aircraft, operations or emergency equipment. Storm drainage using a combination of overland and piped flows to either existing outlets or direct to the sea will have road drainage to adjacent ditches and/or channels.

The new Passenger Terminal Building will drain to storm sewers designed to avoid infiltration which could affect existing ground water regimes. The general concept is to drain the majority to Castle Harbour and the Ferry Reach areas with concentrated flows in ditches piped under the circulation and access roads.

Storm Surge

As part of the coastal modelling effort, design for flood water levels and the associated flood loads will be modelled in order to maintain a coastal protection solution for the airport. These will be fully integrated within the overall airport layout and will respect the “Bermuda Image” as presented in the Bermuda Plan 2008.

The specific mitigation measures to be considered will depend upon the results of the Storm Surge Study, but an overview of applicable strategies may include:

- Offshore structural mitigation measures:
- Structural shoreline protection;
- Soft protection measures (reduction of wave energy); and
- Flood-proofing structures; relocation of sensitive airport facilities.

The most appropriate storm surge mitigation strategies will be selected in collaboration with the relevant stakeholders.

2.3.12 Sewerage (Including Aircraft Liquid Waste)

A modular packaged sewage treatment plant is proposed, located north of Apron II, including sewage collection and effluent disposal systems. The Plant will be sized to the 2028 forecast in the initial development, with the ability to expand based on the 2040 forecasts.

Treated water will also be used for toilet flushing and irrigation purposes; any excess will be discharged to on-site boreholes.

Aircraft Liquid Waste (Bluewater):

- ✓ Aircraft lavatory water (blue water) will be collected and discharged into the sanitary treatment system. Discharge will be controlled so that the blue water is sufficiently diluted by sanitary flow.
- ✓ The location of the blue water equalization tank will be next to the sewage treatment plant.

2.3.13 Potable Water Treatment

The current potable water system at the Passenger Terminal Building consists of seven rainwater harvesting (catchment) tanks designated A to G. All existing air terminal tanks except for A and G may be decommissioned as part of the transition to the new Passenger Terminal Building. A and G tanks could remain and be used for the remaining cargo area and the office building. A new water treatment plant for domestic water (on site – sized to 2028 forecast in the initial development, but with ability to expand to 2040 forecasts) will be installed. All water demand is predicated on the Non-US and US Terminal Peak Hour Traffic with water demand expected to be 30 L/php (peak hour passenger), including office and concession requirements. An estimated minimal volume of potable water will be reserved for Ground Service Equipment servicing peak aircraft airside gate traffic per day. Bermuda building codes require the capture and retention of rainwater, the volume of water required to be retained will be discussed with the Planning Department.

2.3.14 Non-Potable Water System

The non-potable system at the new terminal will consider the use of treated effluents to supply the system used for toilet flushing.

2.3.15 Fire Protection Water Supply System

The new Passenger Terminal Building fire protection requirements will be served by the new water storage system. Appropriate pumps will be sized to supply the required fire flow requirements for the building systems along with an external hydrant system in compliance with NFPA 415.

2.3.16 Solid Waste Management

The Department of Airport Operations currently manages solid waste through an on-site trash compactor located adjacent to Gate 102. It is proposed to re-use the existing trash compactor and integrate waste management practices in conjunction with the Department of Airport Operations. Proper operational procedures to ensure that international waste is being properly segregated will be implemented. All international waste will be delivered to an existing incinerator on the island. On-site incineration is not considered as a part of the project.

2.3.17 Power and Communications

The existing BELCO transformer at Gate #103 will need to be relocated. The new program proposes a switch-over strategy from the existing power source to a new one being built for the Passenger Terminal Building development to support continued airport operations. This work is being coordinated with BELCO, who has committed to upgrading the power infrastructure outside the limits of the airport to support the new development.

Communication cables are also located onsite and will need to be re-routed and coordinated with the building Information Technology systems and the telephone company. Ultimately, construction strategy/staging plans will be developed to ensure no or minimal disruption to airport operations.

2.3.18 Airport Roadway Systems

All transportation systems and technical specifications which are a part of the landside development plans will comply with the Bermuda Ministry of Tourism, Development and Transport and/or the relevant (US, UK, CAN) standard applicable, including design and operating speeds, number of lanes and lane widths.

2.3.19 Parking Facility Requirements

Passenger Terminal Building landside parking will address:

- ✓ A parking curb for buses and shuttles.
- ✓ A short-term parking lot for public vehicles.
- ✓ A parking lot for taxis and limousines (possibly located adjacent to the long-term parking lot).
- ✓ A 'cell phone' lot for public vehicles (possibly located adjacent to the long-term parking lot).
- ✓ Bicycle parking plus scooter parking.
- ✓ Parking for management personnel adjacent to the terminal.

Supplementary parking for employees, government personnel and public long-term parking will use refurbished facilities at the existing (decommissioned terminal).

2.4 DECOMMISSIONING

The majority of the existing terminal will be decommissioned once the new terminal commences operations, and will be potentially used for airport operations and office space. The current fuel

hydrant line servicing the existing terminal building apron will also need to be partially decommissioned where aircraft stands are abandoned or re-purposed.

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