

Construction Works Schedule and Location Plans

Expansion of Hong Kong International Airport into
a Three-Runway System

April 2023

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a Three-Runway System

April 2023

This Submission of Construction Works Schedule and Location Plans

has been reviewed and certified by

the Environmental Team Leader (ETL) in accordance with

Condition 2.5 of Environmental Permit No. EP-489/2014.

Certified by:



Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date

20 April 2023



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By Email

Airport Authority Hong Kong
HKIA Tower, 1 Sky Plaza Road
Hong Kong International Airport
Lantau, Hong Kong

Attn: Mr. Lawrence Tsui, Principal Manager, Environmental Compliance

24 April 2023

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Construction Works Schedule and Location Plans

Reference is made to the submission of Construction Works Schedule and Location Plans under Condition 2.5 of the Environmental Permit No. EP-489/2014 certified by the ET Leader on 20 April 2023.

We would like to inform you that we have no comment on the captioned plan. Therefore we write to verify the captioned submission in accordance with the requirement stipulated in Condition 1.9 of the Environmental Permit No. EP-489/2014.

Should you have any query, please feel free to contact the undersigned at 3922 9141.

Yours faithfully,
AECOM Asia Co. Ltd.

Roy Man
Independent Environmental Checker

Contents

1	Introduction	3
2	Overall Phasing Programme of Construction Works	4
3	Status of the Submarine Aviation Fuel Pipeline Diversion by Horizontal Directional Drilling	5
4	Status of the Submarine Cable Diversion	6
5	Status for the Land Formation Works	7
6	Location Plan for Planned Construction Works	8

Attachments

I. Overall Phasing Programme

II. Location Plans for Planned Construction Works

1 Introduction

The Environmental Impact Assessment (EIA) Report (Register No.: AEIAR-185/2014) prepared for the “Expansion of Hong Kong International Airport into a Three-Runway System” (the Project) has been approved by the Director of Environmental Protection, and an Environmental Permit (EP) (Permit No.: EP-489/2014) has been issued for the project under the Environmental Impact Assessment Ordinance.

The first submission of Construction Works Schedule and Location Plans (CWSLP), in compliance with Condition 2.5 of the EP, was made to the Environmental Protection Department (EPD) on 18 September 2015, and finalized and released via the project’s dedicated website in October 2015. This updated submission is to include the latest status of the overall programme of construction works, the completion date of Horizontal Directional Drilling (HDD) works for the diversion of existing submarine aviation fuel pipeline, the completion date of the diversion of submarine cable, the latest information of land formation works, road networks and the associated airport facilities and utilities.

The structure of this submission includes the following:

- a) An overall phasing programme of construction works (in Section 2);
- b) Status of the HDD works for the diversion of submarine aviation fuel pipeline (in Section 3);
- c) Status of the diversion of the submarine cable (in Section 4);
- d) Status of land formation works (in Section 5); and
- e) Location plans of the planned construction works (in Section 6).

2 Overall Phasing Programme of Construction Works

The commencement of initial reclamation works was announced on 1 August 2016. The eight-year construction of the three-runway system is expected to be completed in 2024, with the commissioning of the North Runway in 2022. The overall phasing programme of all construction works is updated since the first submission and presented in **Attachment I**. The diversion of submarine aviation fuel pipelines and submarine power cable, and the marine-based deep cement mixing (DCM) for ground improvement works were completed.

Before full operation of the Three-Runway System (3RS) planned in 2024, the Interim Two Runway System (I-2RS) Stage is the present mode of operation, in which the new North Runway and the associated taxiways and facilities are operated together with the South Runway and existing airport facilities, with the Centre Runway closed down for modification works and targeted to complete along with other works of the 3RS project, including Terminal 2 (T2) expansion, new T2 Concourse, Automatic People Mover and Baggage Handling System, in 2024 as scheduled.

3 Status of the Submarine Aviation Fuel Pipeline Diversion by Horizontal Directional Drilling

Diversion of the existing submarine aviation fuel pipelines was undertaken using a HDD method forming two rock drill holes by drilling through bedrock from/to a launching site located at the west of the airport island to/from a daylighting point adjacent to the offshore aviation fuel receiving platform at Sha Chau. Two new 500 mm diameter pipelines were installed through the drilled tunnels. The total length of each pipeline is approximately 5 km.

After completion of the drilling and reaming of the HDD holes, the permanent aviation fuel pipes were pushed from/to the HDD launching site to/from Sha Chau. To limit the impact to Sha Chau Island, pipe fabrication was done at the airport island side; however, a barge was required and used as a temporary working platform between Sha Chau Island and the offshore receiving platform to facilitate the works. The remainder of the pipe laying between the HDD launching site on the airport island and connection point to the existing pipeline was installed by open trench method. The HDD works was completed in the first quarter of 2018.

4 Status of the Submarine Cable Diversion

Diversion of the existing power cables was required in order to maintain continuous power supply to the facilities at Sha Chau. Diversion of the submarine cables used a direct bury (water jetting) method. The use of water jetting as the preferred method avoided the need for trench excavation and associated disposal of excavated materials. Works was conducted beneath the seabed from the edge of the airport island to the 'connecting location' at least 500m outside the boundary of Sha Chau and Lung Kwu Chau Marine Park. The length of cable installation is approximately 6km marine, with a burial depth of 3m to 5m below seabed level, and approximately 0.3km landside.

At the daylighting point of the submarine cables, the cables crossed the existing seawall. A works area on the west side of the existing airport island was required for the cable daylighting and joining to the existing landside cables. A small section of the existing seawall at Hong Kong International Airport (HKIA) was excavated by open cut method and cable ducts were installed before reinstating the seawall. The cables were then run underground, crossing the existing roadway (via cross road ducts) and along the east shoulder area of the roadway to the designated jointing location. The Submarine Cable Diversion works was completed in March 2017.

5 Status for the Land Formation Works

Land formation (see **Attachment II Figure 1**) comprising approximately 650ha of land to be formed to the north of existing airport island with associated seawalls. The major components of land formation works include modification and integration of the existing seawall, ground improvement of the underlying marine sediments, seawall construction and marine filling. There will also be minor marine structure including the runway approach lights and the Hong Kong International Airport Approach Area (HKIAAA) marker buoys. The ground improvement works, reclamation filling works and seawall construction were substantially completed.

The key construction activities associated with the land formation works are described below:

- a) Modification of Existing Seawall – the existing rock armour from the seawall will be retained or removed for reuse as far as practicable.
- b) Ground Improvement – the deep cement mixing (DCM) method was adopted within the contaminated mud pit (CMP) areas, while DCM as well as other methods (including stone column, prefabricated vertical drain and vertical sand drains) was adopted outside the CMP areas. Prior to the commencement of ground improvement, hard materials including rock fill left from previous works in the project area (such as existing fuel pipes and existing seawalls) and rubbish on the seabed that would cause obstruction to the works need to be removed. A sand blanket was then laid on the seabed within the CMP areas to contain and minimise the release of contaminant during ground improvement activities. For specific obstructions that could neither be removed nor overcome, another type of DCM known as Deep Jet Mixing, which cores through the obstruction and is generally not used for area-wide application due to slow speed, was used for ground improvement below the obstructions.
- c) Seawall Construction – the majority of the seawalls for the airport expansion will comprise rock sloping seawalls, except for some localised areas (e.g. at the sea rescue landing points and marine loading points) where blockwork vertical seawalls are required. The seawalls will be founded on grounds improved previously by DCM, in which after DCM works the seabed will heave and undulate. The undulate surface, comprise of sandfill and lumps of cement mixed sand, will then be trim back and re-levelled to facilitate seawall blocks placement (for vertical seawall) or core rocks to armours placement (for sloping seawalls). The trimmed material will be reused as fill material. Beyond the toe of the seawall, scour (stone) aprons will be laid to protect the seawall toe against erosion.
- d) Filling Works – different fill materials including rock fill, public fill, sand fill, rock armour and graded filter layer will be used to form the land and seawalls. Seawalls will comprise of rock fill as the seawall core, and rock armour and graded filter layer to form the protective layers. Sand fill or a mix of sand fill and public fill will be adopted as the marine filling material, while a combination of sand fill and public fill will be adopted for land filling activities.

6 Location Plan for Planned Construction Works

The location plans for the planned construction works of the project based on best available information are presented in **Attachment II**. The major construction works involved are described below:

- a) Airfield Facilities (see **Attachment II Figure 2**) – paving structures include the third runway, taxiways, aircraft parking stands, apron roads and airside roads located on the newly formed land, as well as modifications to the existing north runway and midfield apron. Superstructures include the air traffic control towers, fire stations, a fire training pit (to be relocated from the southern part of the airport island), petrol filling station, aircraft maintenance hangars, an aircraft engine run-up facility for performing aircraft engine test runs for the purpose of troubleshooting or maintenance, air cargo staging facilities, flight catering facilities, ground service equipment maintenance facilities and storage area, airside communications and office buildings, cross dock facility, seawater pumping stations, meteorological station and other airport support facilities or aviation-related developments.
- b) Passenger Facilities (see **Attachment II Figure 3**) – these include the Terminal 2 Concourse (T2C) (including fixed linked bridges and passenger loading bridges), the Terminal 2 (T2) expansion, the automated people mover (APM) and the baggage handling system (BHS), with associated tunnelling works and ancillary buildings. The T2C will be constructed in phases, with Phase 1 to be completed first, and the remaining T2C area to be completed at a later stage depending on demand. The T2 building will be expanded into a full service processing terminal serving the T2C, comprising an expanded main terminal building, new annex buildings, an underground APM interchange station (AIS), a combined depot for the T2C line and the T1/ SkyPier Lines, and BHS basement. Landside supporting facilities and utilities will also be expanded and enhanced to support T2 operation.
- c) Road Network (see **Attachment II Figures 4 to 6**) – these include the airside road network and tunnels connecting the new land formation facilities to the existing airport island facilities, as well as landside road improvement works at Terminal 2, the southern cargo area and the airside road works at the western of the Centre Runway.
- d) Infrastructure and Utilities – various infrastructure and utilities will be laid both on the newly formed land and within the existing airport island, including the fuel hydrant system, seawater cooling and flushing system, drainage network, potable water supply, fire fighting system, sewerage network, gas, power, telecommunications, airport systems, and other aviation related utilities and systems. A section of gravity sewer located outside the airport island will also be upgraded (see **Attachment II Figure 7**), subject to the future sewage capacity demand.

Attachments

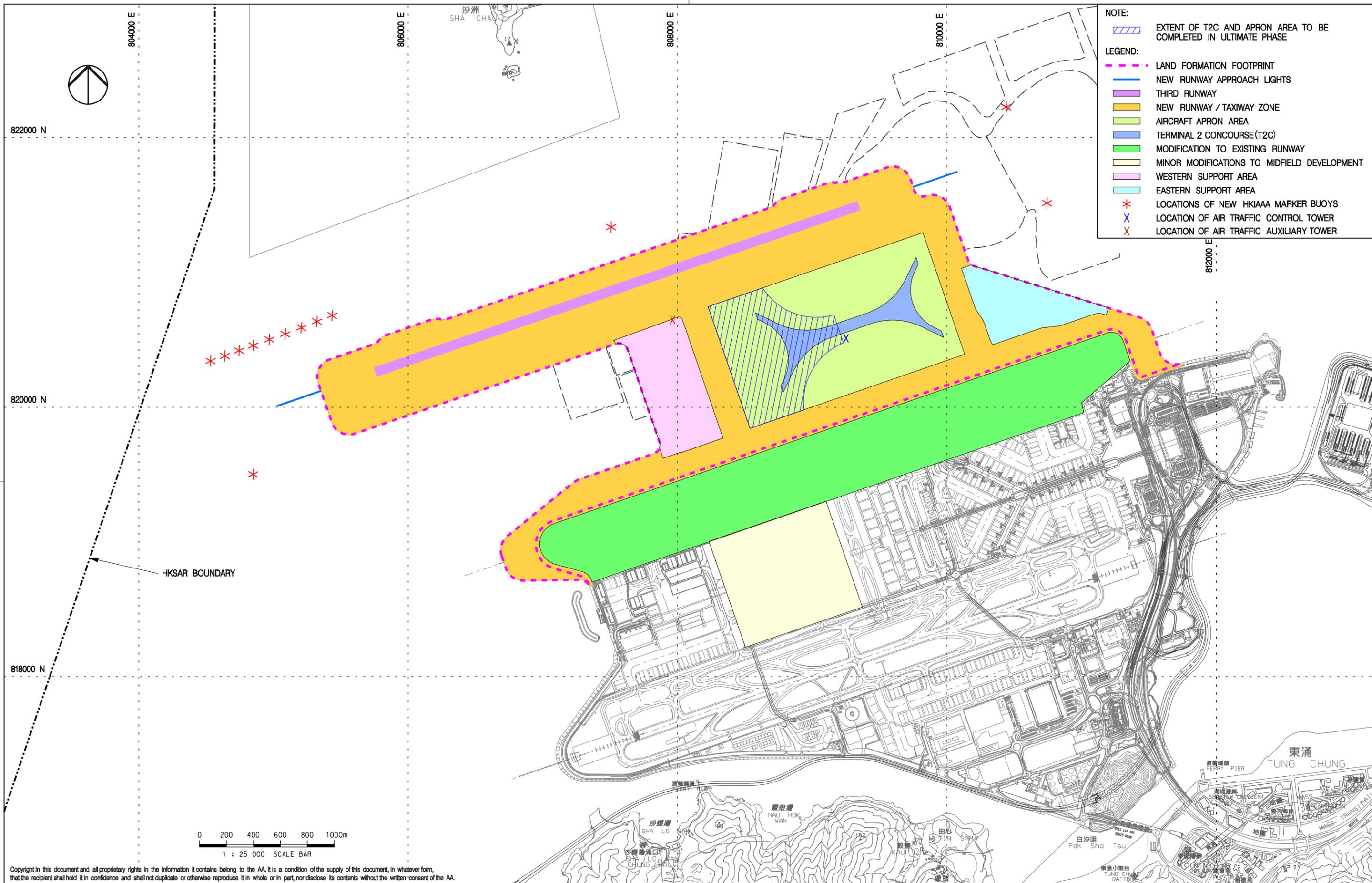
I. Overall Phasing Programme

II Location Plans for Planned Construction Works

I. Overall Phasing Programme

Line	Name	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Advanced Works											
1	Aviation Fuel Pipeline Diversion	1									
2	Power Cable Diversion		2								
Land Formation											
4	Mobilization	4									
5	Sand Blanket Laying		5								
6	Ground Improvement Works		6								
7	Construction of Seawall		7								
8	Marine Filling			8							
9	Land Filling			9							
10	Surcharge			10							
11	Works After Closure of Existing North Runway							11			
12	North Runway (New)				12						
13	Centre Runway Modification		13							13	
14	TRC/ Apron					14					
15	T2 Expansion (Advance Works)		15								
16	T2 Expansion (Main Works)				16						
17	Underground Tunnel (APM/ BHS)		17								
18	APM System			18							
19	BHS						19				
20	Operation Trials									20	
Programme No.	3-AAP-EPP-0-A0	3RS Phasing Programme									
Revision/Date	'A'/(12-Jul-16)										
Prepared	VT										
Checked	PY										

II. Location Plans for Planned Construction Works



- NOTE:**
- EXTENT OF T2C AND APRON AREA TO BE COMPLETED IN ULTIMATE PHASE
- LEGEND:**
- LAND FORMATION FOOTPRINT
 - NEW RUNWAY APPROACH LIGHTS
 - THIRD RUNWAY
 - NEW RUNWAY / TAXIWAY ZONE
 - AIRCRAFT APRON AREA
 - TERMINAL 2 CONCOURSE (T2C)
 - MODIFICATION TO EXISTING RUNWAY
 - MINOR MODIFICATIONS TO MIDFIELD DEVELOPMENT
 - WESTERN SUPPORT AREA
 - EASTERN SUPPORT AREA
 - LOCATIONS OF NEW HKIAAA MARKER BUOYS
 - LOCATION OF AIR TRAFFIC CONTROL TOWER
 - LOCATION OF AIR TRAFFIC AUXILIARY TOWER

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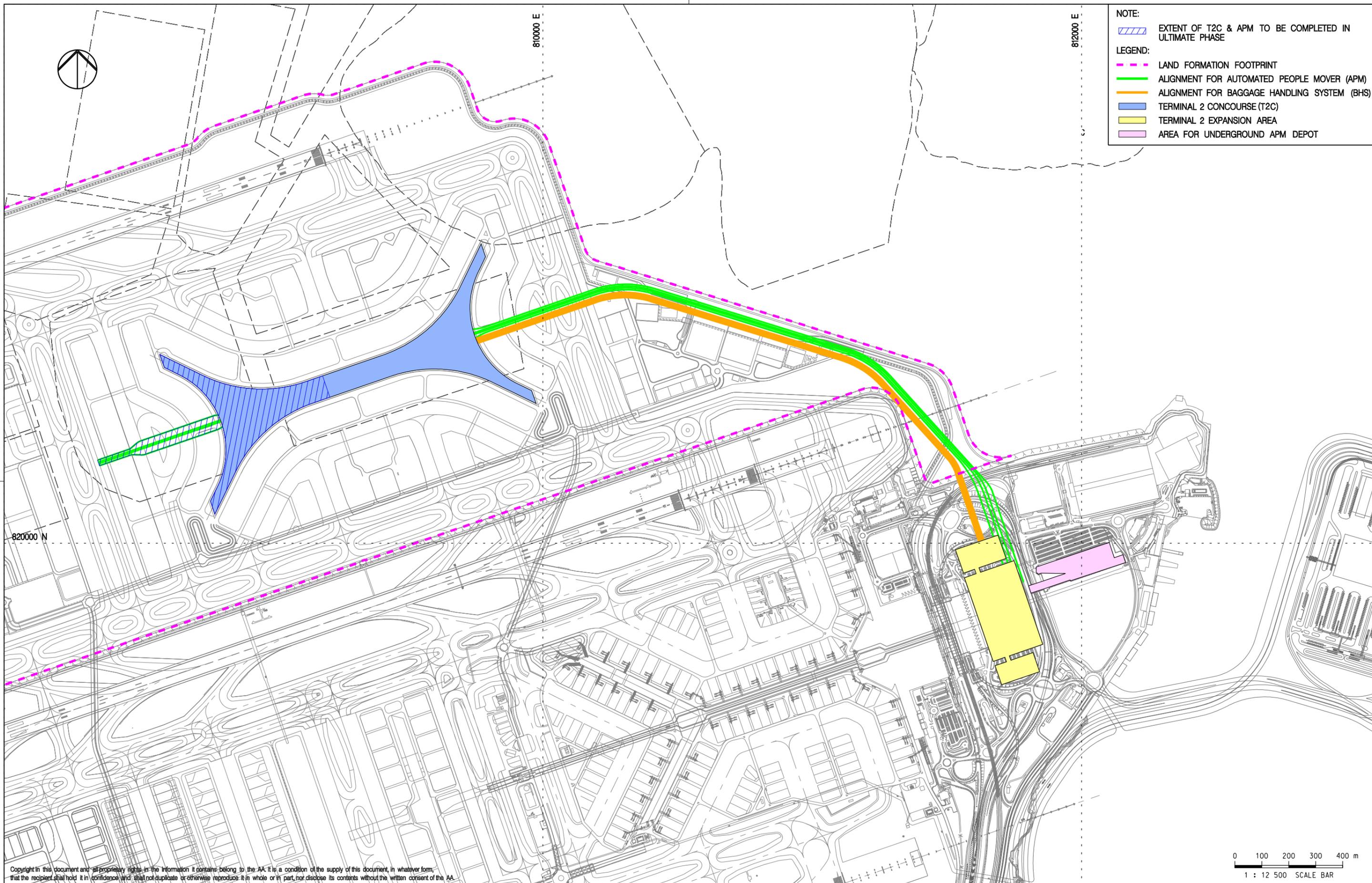
Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC
B	17SEP15	GENERAL REVISION	DC
C	22OCT15	GENERAL REVISION	DC
D	05JUN17	GENERAL REVISION	AM



Title
LOCATION PLAN – AIRFIELD FACILITIES

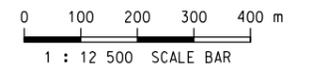
Consultant's Signatures for Approval		Date
Design	DC	05JUN17
Checkers	DC	05JUN17
Approver	EC	05JUN17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Scale at A3 1 : 25000
Figure 2	Rev. D

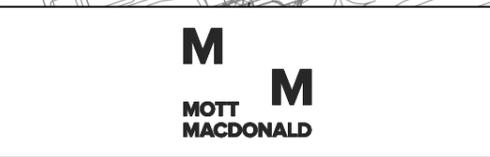


- NOTE:**
 [Hatched area symbol] EXTENT OF T2C & APM TO BE COMPLETED IN ULTIMATE PHASE
- LEGEND:**
- [Dashed magenta line symbol] LAND FORMATION FOOTPRINT
 - [Green line symbol] ALIGNMENT FOR AUTOMATED PEOPLE MOVER (APM)
 - [Orange line symbol] ALIGNMENT FOR BAGGAGE HANDLING SYSTEM (BHS)
 - [Blue area symbol] TERMINAL 2 CONCOURSE (T2C)
 - [Yellow area symbol] TERMINAL 2 EXPANSION AREA
 - [Pink area symbol] AREA FOR UNDERGROUND APM DEPOT

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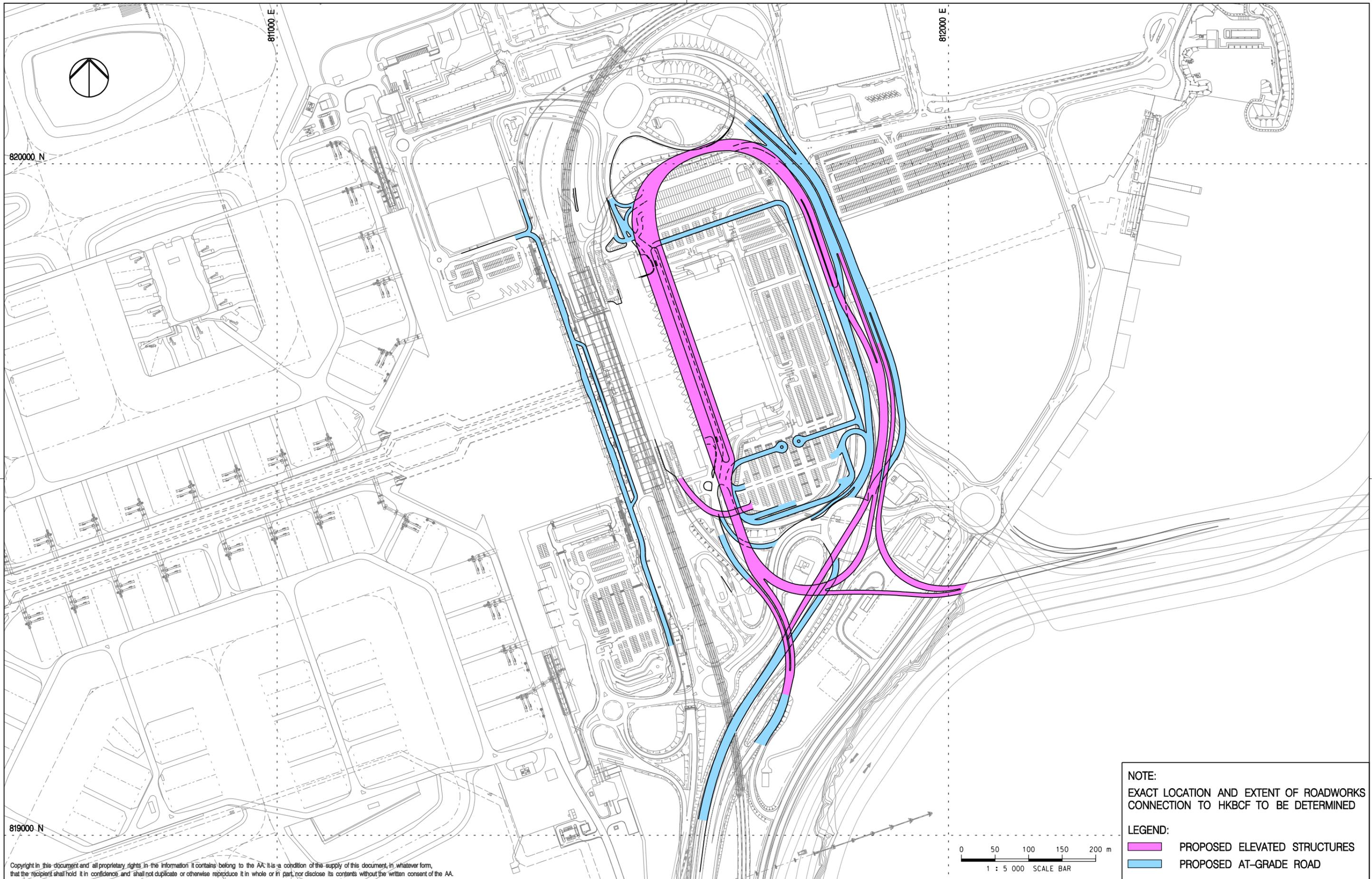
Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC
B	22OCT15	GENERAL REVISION	DC
C	05JUN17	GENERAL REVISION	AM



Title
LOCATION PLAN – PASSENGER FACILITIES

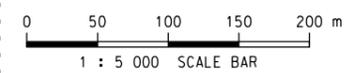
Consultant's Signatures for Approval		Date
Design	DC	05JUN17
Checkers	DC	05JUN17
Approver	EC	05JUN17

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Figure 3
Scale at A3	1 : 12500
Rev.	C



NOTE:
EXACT LOCATION AND EXTENT OF ROADWORKS
CONNECTION TO HKBCF TO BE DETERMINED

LEGEND:
 PROPOSED ELEVATED STRUCTURES
 PROPOSED AT-GRADE ROAD



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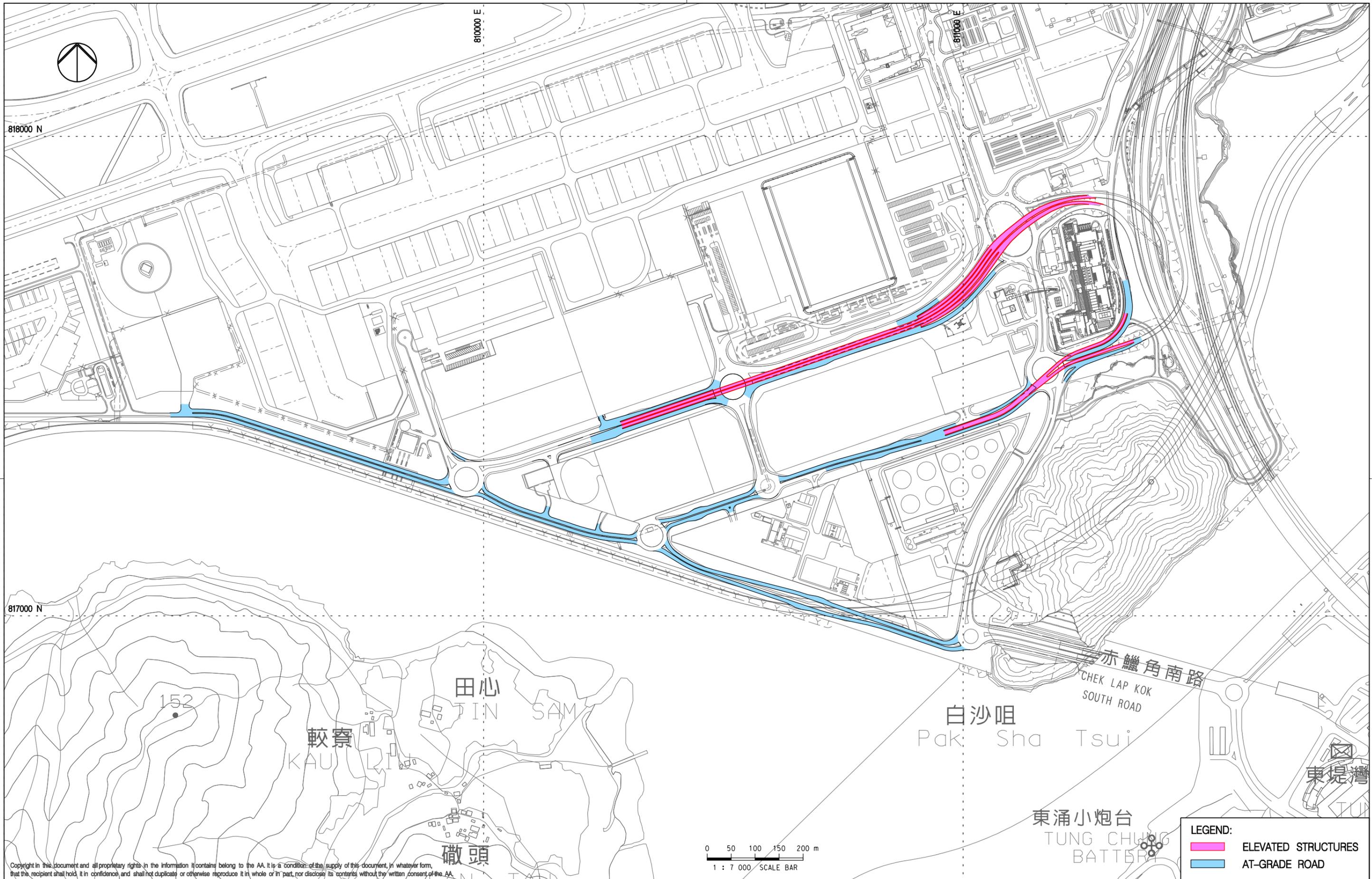
Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC
B	22OCT15	GENERAL REVISION	DC



Title
**LOCATION PLAN –
TERMINAL 2 ROAD NETWORK**

Consultant's Signatures for Approval		Date
Design	DC	22OCT15
Checkers	DC	22OCT15
Approver	EC	22OCT15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Figure 4
Scale at A3	1 : 5000
Rev.	B



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Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC
B	22OCT15	GENERAL REVISION	DC



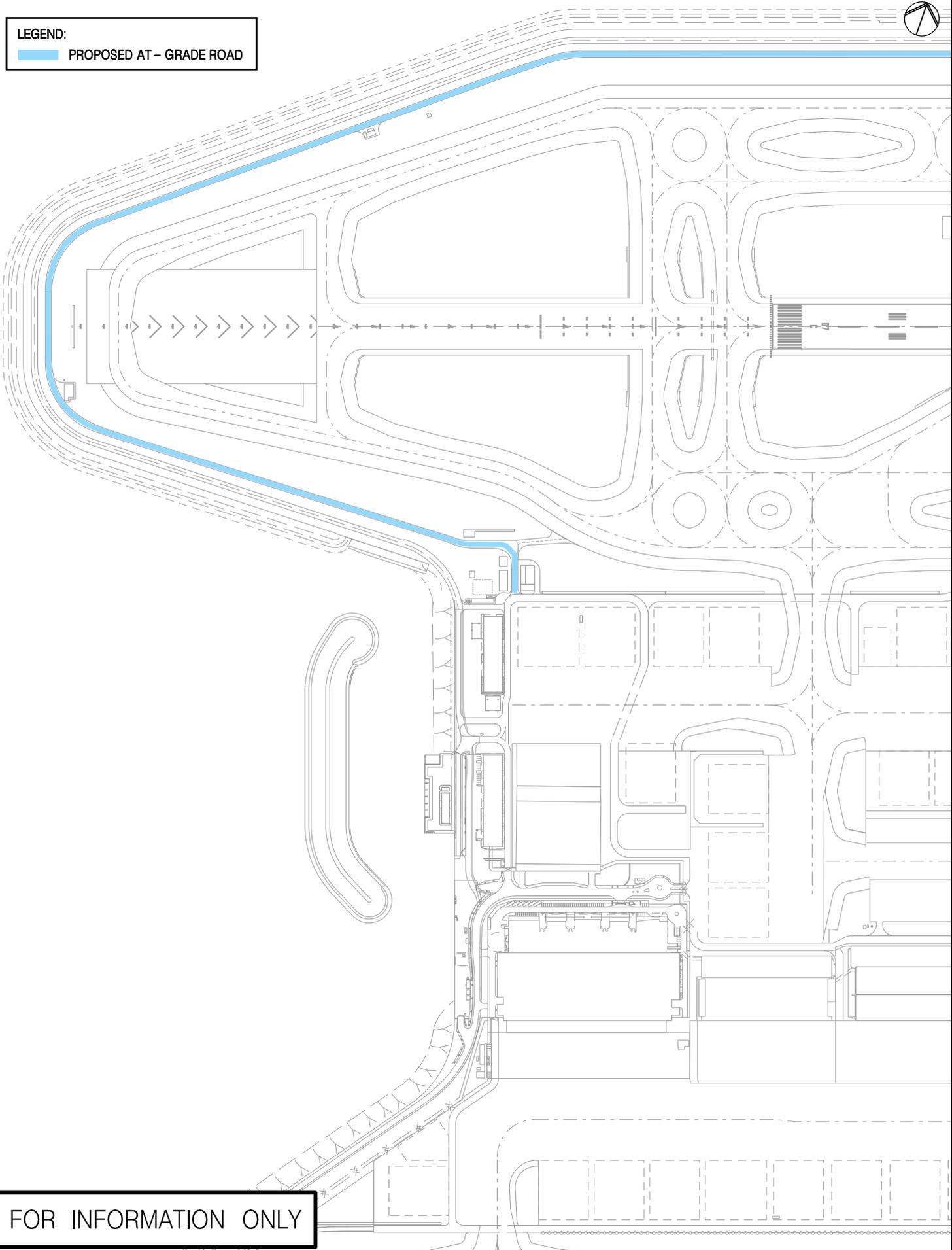
Title
LOCATION PLAN - SOUTH CARGO ROAD IMPROVEMENT WORKS

Consultant's Signatures for Approval		Date
Design	DC	22OCT15
Checkers	DC	22OCT15
Approver	EC	22OCT15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Figure 5
Scale at A3	1 : 7000
Rev.	B



LEGEND:
 PROPOSED AT - GRADE ROAD



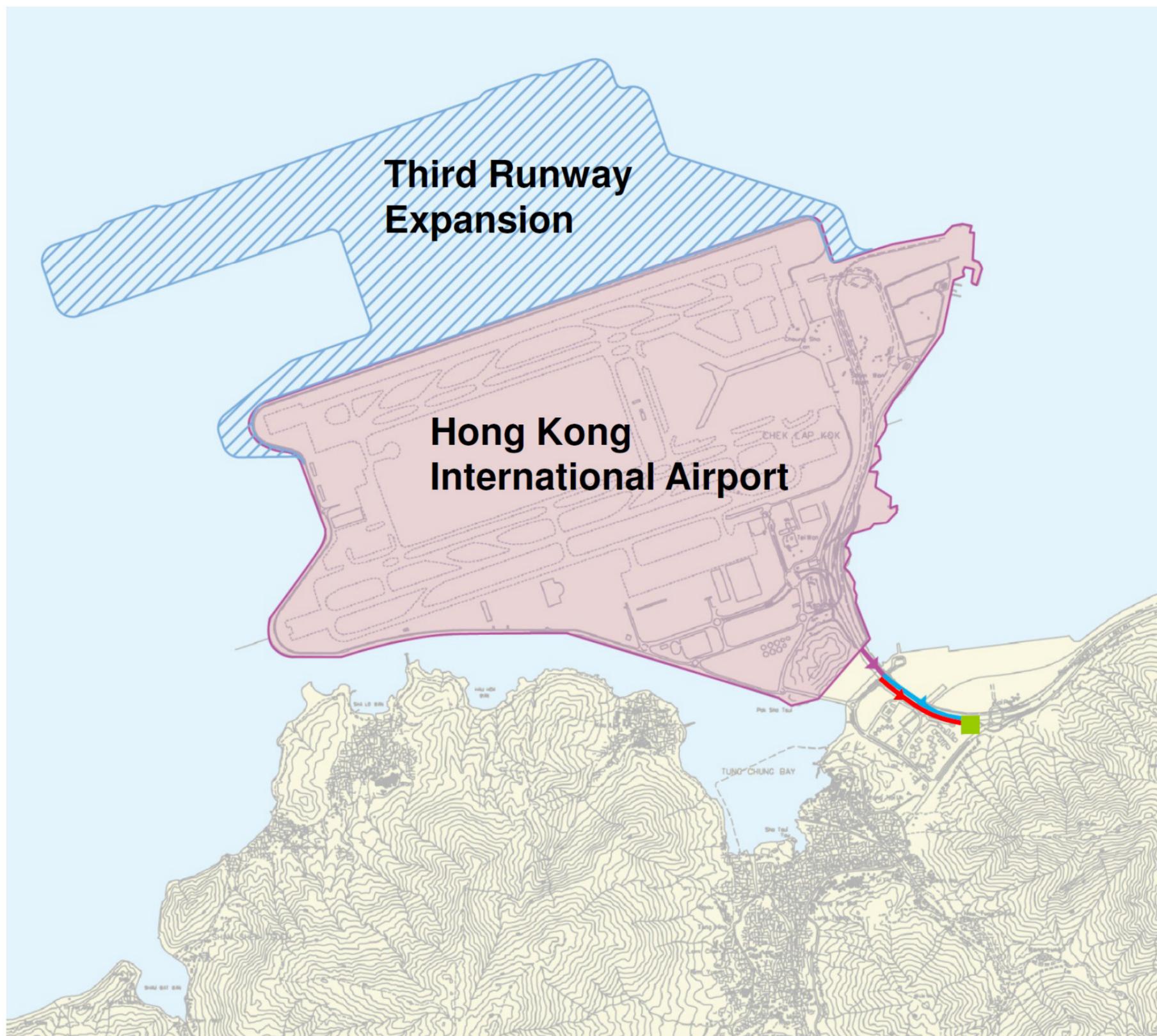
FOR INFORMATION ONLY



Title	Design	Date
Location Plan - Proposed At-grade Road	-	-
	Checked	-
	Approved	-

Hong Kong International Airport	
Drawing No.	Figure 6
Scale	1 : 6500 (A4)
Rev.	A

Plot file : PD_halfstone_A3_A4.pdf_Luphoig



-  Gravity Sewer to be upgraded by AAHK
-  Existing Rising Main from Airport to Tung Chung
-  Existing Gravity Sewer from Airport to TCSPS
-  Tung Chung Sewage Pumping Station (TCSPS)

Rev.	Date	Description	Checked
A	31AUG15	FIRST ISSUE	DC



Title
GRAVITY SEWER TO BE UPGRADED

Consultant's Signatures for Approval	Date
Design DC	31AUG15
Checkers DC	31AUG15
Design Supervisor EC	31AUG15
Authorised Representative JFP	31AUG15

EXPANSION OF HONG KONG INTERNATIONAL AIRPORT INTO A THREE-RUNWAY SYSTEM	
Drawing No.	Figure 7
Scale at A3	1 : 30000
Rev.	A

