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



Appendix 10.2

Correspondence from PFC on the Allocation of Space at PFRFs for Receipt of the Surplus Inert C&D



Our ref KMY/AFK/EC/TK/dc/T308875/02/02/L0207

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Your ref (110YK-01) in FM PF/GEN/01

Civil Engineering and Development Department Civil Engineering Office Fill Management Division 5/F, Civil Engineering and Development Building, 101 Princess Margaret Rd, Homantin, Kowloon

Attn: Mr. James C Y Sze

28 February 2014
By Fax (2714 0013) and
by Post

Dear Sir,

Expansion of Hong Kong International Airport into a Three Runway System - Environmental Impact Assessment Study

<u>Revised Technical Note on Cut and Fill Materials</u>

We refer to our submission of the Technical Note on Cut and Fill Materials for the captioned Project via our letter (Ref: KMY/AFK/EC/TK/dc/T308875/02/02/L0181) dated 12 November 2013. Subsequent to the submission, the estimated total quantity of inert construction and demolition (C&D) material to be generated from the Project has been revised from 9,426,000 m³ to 9,543,500 m³, i.e., an increase of 117,500 m³. Such a change is because of the following updated information:

- Ground investigation (GI) works on the existing airport island were completed in late 2013. Based on
 the recent GI results, the amount of marine deposit to be excavated from the Terminal 2 (T2)
 expansion area would be less than the quantity anticipated based on earlier GI records. Therefore,
 the amount of inert C&D materials to be excavated from the T2 expansion area would be accordingly
 increased.
- 2. According to the latest engineering scheme design, the footprint of proposed Automated People Mover (APM) depot has been finalised as shown in the enclosed Figure 3. Based on the recent GI findings, the amount of marine deposit to be excavated from the proposed APM depot footprint would be less than the quantity anticipated based on earlier GI records. Therefore, the amount of inert C&D materials to be excavated from the depot footprint would be accordingly increased.

In view of the above updated information, the estimated quantities of C&D material to be generated, reused on-site and delivered off-site as well as the estimated amount of public fill materials to be imported for the Project have been accordingly amended. As such, we have revised the Technical Note on Cut and Fill Materials, which is enclosed for your record, please.



We noted that the current temporary government land allocations for the Government's Public Fill Reception Facilities (PFRF) will be expired in end of 2018, and therefore we will continue to liaise with PFC on the future arrangement for delivery of the surplus inert C&D materials from our Project to the PFRF.

Should you have any queries, please contact our Mr. Eric Ching at 2828 5825 or Mr. Terence Kong at 2828 5919.

Yours faithfully,

MOTT MACDONALD HONG KONG LIMITED

Dr. Anne Kerr

Encl.

c.c. Airport Authority Hong Kong – Mr Peter Lee / Ms Gigi Chong AEPCO – Mr Vincent Chu

Environmental Protection Department - Mr. Kenny Leung



1. Background

The Airport Authority Hong Kong (AAHK) commissioned Mott MacDonald Hong Kong Limited (MMHK) in 2008 to provide preliminary engineering and environmental assessment studies for Contract P132 Phase 1 Study. The Study is part of the Airport Master Plan 2030 tasked to identify a preferred airport expansion scheme and to prepare preliminary design and environmental assessments to compare the identified airport expansion options. The findings of the assessments were used to support AAHK's public consultation of the Hong Kong International Airport (HKIA) Master Plan 2030, which was held from 3 June 2011 to 2 September 2011.

Following the completion of the public consultation, on 20 March 2012, the Government of Hong Kong Special Administrative Region (HKSAR) approved the adoption of Option 2 (i.e., the three-runway system) as the future development option for HKIA for planning purposes, and for AAHK to proceed with the statutory Environmental Impact Assessment (EIA) process.

In March 2012, MMHK was instructed by AAHK to proceed with the statutory EIA for the proposed expansion of Hong Kong International Airport into a Three-Runway System (hereafter referred to as the Project) and to seek an Environmental Permit (EP) for the construction and operation of the Project. A Project Profile was prepared for application for an EIA Study Brief and submitted to the Environmental Protection Department (EPD) on 28 May 2012. Following the statutory public inspection, a request for further information under Section 5(4) of the EIA Ordinance (EIAO) was issued by EPD on 13 June 2012. The further information requested by EPD for the Project Profile was submitted to EPD on 29 June 2012. The EIA Study Brief (No. ESB-250/2012) for the Project was issued on 10 August 2012.

2. Project Description

The Project will consist primarily of a new Third Runway with associated taxiways, aprons (or aircraft stands), as well as new passenger concourse buildings and expansion of the existing Terminal 2 building. Included in the Project will be related airside and landside works and associated ancillary and supporting facilities, which are briefly described as follows:

Land Formation

Land is required to be formed to the north of the existing Airport island through land formation, which will provide a platform for the development. The proposed land formation works will mainly include:

- Land formation of not more than 650 ha to the north of the existing airport island with partial construction over the contaminated mud pits (CMP); and
- Modification and integration of the existing seawall at the northern, western and eastern sides of the existing north runway into the new land formation and construction of new seawall around the land formation.

Airfield Facilities

The proposed airfield facilities will mainly include:

Construction of a Third Runway, related taxiway systems, associated airfield infrastructure, aircraft navigational aids, approach lighting systems and new Hong Kong International Airport Approach Area (HKIAAA) beacons:

Page 1 28 February 2014



- Construction of the Third Runway passenger concourse aprons;
- Temporary closure and modification of the existing north runway along with related taxiway systems; and
- Expansion of the freighter aprons in the existing midfield area between the existing north and south runways.

Passenger Facilities

The proposed passenger facilities will mainly include:

- Construction of the Third Runway passenger concourse (TRC) and passenger fixed link bridges;
- Expansion of the existing passenger Terminal 2 (T2) and associated depot and maintenance / stabling areas;
- Extension of the automated people mover (APM); and
- Expansion of the Baggage Handling System (BHS) and associated baggage halls and early bag store.

Ancillary Facilities

New ancillary facilities will be provided to support the operational needs of the Third Runway passenger concourse and airfield facilities. These ancillary facilities will be located on the west and east sides of the proposed land formation area (i.e., within the Western Support Area and the Eastern Support Area respectively) and will accommodate utility buildings, cargo, catering, aircraft maintenance, aircraft engine run-up (engine testing) facilities, ground services equipment area, early bag storage facility, fire station, fire training facility, petrol fuelling station, new Air Traffic Control (ATC) tower, Hong Kong Observatory (HKO) facility, mobile phone system antenna towers, stores, security gate houses, etc.

Infrastructure and Utilities

The proposed infrastructure and utilities will mainly include:

- Expansion of the landside and airside road network in the passenger, cargo and maintenance areas and landside transportation facilities, including new car parks;
- Construction of new airside road access, including the construction of new airside road tunnels and ramps, to connect the new Third Runway facilities with the existing Airport;
- Modification of existing and construction of new land-based infrastructure including the seawater cooling and flushing system, stormwater drainage system, greywater system, sewerage network and potable water supply, Towngas supply, 132 kV / 11kV power supply network, communication network; and
- Modifications and re-provisions to existing marine facilities including the underwater aviation fuel pipelines between HKIA and the off-airport fuel receiving facilities at Sha Chau, the associated underwater 11kV cable and pilot cable and sea rescue boat points.

The key Project components are shown in **Figure 1 to Figure 4**.

Page 2 28 February 2014



3. Purpose of this Document

This document serves as a Preliminary Construction and Demolition Material Management Plan (C&DMMP), which aims is to present the estimated quantities of construction and demolition (C&D) material to be generated, reused on-site and delivered off-site as well as the estimated amount of fill materials to be required by the Project. This document is prepared for submission to the Public Fill Committee (PFC) of the Civil Engineering and Development Department (CEDD) for the purpose of seeking the agreement-in-principle to allocate space for the disposal of surplus inert C&D materials generated from this Project

4. Sources and Generation of C&D Materials

It is anticipated that the majority of inert C&D materials will be generated from the following key construction activities of the Project:

- Excavation works would be required to:
 - extend the APM tunnels from the T2 APM Interchange Station (AIS) to the TRC and associated APM stations in TRC;
 - extend the BHS tunnels from the T2 Baggage Hall to the Baggage Hall associated with the TRC;
 - construct the new AIS facility;
 - construct the APM Depot;
 - extend the airside road tunnels from the existing system to serve the new TRC;
 - construct the drainage culvert; and
 - install major underground utilities.
- Permanent piling works will be carried out for foundation construction of the TRC and other buildings within the proposed land formation area. Temporary lateral support using piling or sheet pile may be required to form a coffer dam to facilitate excavation of the basement or any underground structure.
- Temporary surcharge material will be used to facilitate the settlement of individual work areas during the land formation. Upon completion of the surcharge process for a work area, the material will be reused in other work areas as fill or surcharge materials. Although every effort will be made to reduce surplus surcharge materials requiring off-site disposal, there may be surplus surcharge materials that cannot be reused.
- Modification of the existing northern seawall will be required to enable the proposed land formation work.
- Excavation and demolition works will be carried out at part of the existing T2 for its expansion.
- Excavation works would be required as part of the proposed foundation of new road networks and improvements to the existing road networks for T2 expansion, as well as at the cargo area on the existing Airport site.
- For diversion of the existing submarine fuel pipelines, the Horizontal Directional Drill (HDD) method
 is proposed for installing new fuel pipelines directly from the west end of the existing Airport island

Page 3 28 February 2014



to Sha Chau by underground drilling (mostly at sub-seabed rock level). Minimal excavation works will be required at the proposed launching and land points of the submarine fuel pipelines.

Based on the tentative construction programme as presented in **Annex A**, initial estimates indicate that a total of about 9,543,500 m³ of inert C&D materials would be generated from the aforementioned activities during the period from Q3 of 2015 to Q4 of 2022, as summarised in **Table 1**. Detailed estimates of the generation of inert C&D materials from the Project are given in **Annex B**.

Table 1 Estimates of Inert C&D Materials to be Generated by the Project

Key Sources of Inert C&D materials	Estimated Quantity of Inert C&D Materials Generated (in-situ volume, m³)	Tentative Timeframe of Generation			
Excavation works for APM & BHS tunnels, new APM depot and airside tunnels and piling works for TRC and other facilities as well as superstructure construction works	4,812,230	Q1 of 2017 – Q4 of 2022			
Surplus surcharge material	3,793,000	Q4 of 2018 – Q3 of 2022			
Modification of existing northern seawall	487,000	Q1 of 2016 – Q3 of 2021			
Excavation and demolition works for T2 expansion as well as superstructure construction works	437,270	Q4 of 2016 – Q4 of 2019			
Excavation works for improvement of the road networks	8,000	Q1 of 2017 – Q3 of 2017			
HDD for diversion of existing submarine fuel pipelines	6,000	Q3 of 2015 – Q4 of 2015			
Total	9,543,500	Q3 of 2015 – Q4 of 2022			

The yearly breakdown of the inert C&D material generation is as shown in **Table 2**.

Table 2 Yearly Generation of Inert C&D Materials

Year	Estimated Amount of Inert C&D Materials to be Generated by the Project (in-situ volume, m ³)						
2015		6,000					
2016	·	398,000					
2017	·	710,000					
2018	·	4,359,230					
2019	·	1,344,270					
2020		1,531,000					
2021	·	689,000					
2022	·	506,000					
	Total	9,543,500					

5. On-site Reuse of Inert C&D Materials and Import of Public Fill Materials

Page 4 28 February 2014



The approach pursued by the Project is a strategy that seeks to maximise the earthworks balance, thereby minimising the volumes of fill that would be required to be imported to and exported from the site. Every effort would be made to minimise the extent of excavation and to ensure that as much of the inert C&D materials generated by the Project as practicable will be reused on-site. For this, the relevant construction activities (particularly for the tunnel works) and construction programme have been carefully planned and developed. The combination of these initiatives is anticipated to maximise the on-site reuse of inert C&D materials as fill material for the proposed land formation as far as practicable, hence minimising the quantities of any surplus inert C&D materials requiring off-site delivery and the impact resulting from the associated collection and transportation works.

It is estimated that the Project would require a total of 14,551,000 m³ of public fill materials for the land formation work. While all practicable measures will be employed for reuse of inert C&D material generated by the Project before consideration of importing material, it is anticipated that approximately 3,639,230 m³ (or about 38%) of the inert C&D materials generated by the Project would be reused as the fill material for land formation work, as summarised in **Table 3**. Therefore, approximately 10,911,770 m³ (14,551,000 – 3,639,230 m³) of public fill materials will need to be imported to this Project. Priority will be given to maximise the use of suitable fill materials available from other concurrent projects and the Government's Public Fill Reception Facilities (PFRF). AAHK will continue to liaise with the relevant concurrent projects for direct reuse of their surplus public fill for the proposed land formation works of this Project. Details of the estimated on-site reuse and import quantities are given in **Annex B**.

Table 3 Estimates of Inert C&D Materials to be Reused On-site as Fill Materials for Land Formation

Year	Estimated Demand of Public Fill Materials for Land Formation (in-situ volume, m³)	Estimated Amount of Inert C&D Materials to be Reused On-site for Land Formation (in-situ volume, m³)	Estimated Amount of Public Fill Materials to be Imported for Land Formation (in-situ volume,m³)
2015*	0	6,000	0
2016*	1,912,000	398,000	1,508,000
2017	6,099,000	710,000	5,389,000
2018	4,788,000	773,230	4,014,770
2019	674,000	674,000	0
2020	835,000	835,000	0
2021	243,000	243,000	0
2022	0	0	0
Total	14,551,000	3,639,230	10,911,770

*Note: Inert C&D materials generated from Q3 of 2015 to Q3 of 2016 would be temporarily stored in stockpiles, which would then be reused for land formation from Q3 of 2016 onwards.

6. Off-site Reuse of Surplus Inert C&D Materials

It is estimated that about 5,904,270 m³ (9,543,500 – 3,639,230 m³) of inert C&D materials generated by the Project could not be reused on-site. Therefore, this volume of surplus inert C&D materials would require off-site delivery to any projects that require fill materials and/or the Government's PFRF for beneficial use by other projects in Hong Kong. **Table 4** summarises the annual quantities of such surplus materials requiring off-site delivery. Details of the relevant estimates are given in **Annex B**.

Table 4 Estimates of Surplus Inert C&D Materials to be Delivered Off-site

Page 5 28 February 2014



Year	Estimated Amount of Inert C&D Materials to be Generated by the Project (in-situ volume, m ³)	Estimated Amount of Inert C&D Materials to be Reused On-site for Land Formation (in-situ volume, m³)	Estimated Amount of Surplus Inert C&D Materials to be Delivered Off-site (in-situ volume,m³)			
2015	6,000	6,000	0			
2016	398,000	398,000	0			
2017	710,000	710,000	0			
2018	4, 359,230	773,230	3,586,000			
2019	1,344,270	674,000	670,270			
2020	1,531,000	835,000	696,000			
2021	689,000	243,000	446,000			
2022	506,000	0	506,000			
Total	9,543,500	3,639,230	5,904,270			

AAHK is exploring any potential projects that could receive any surplus inert C&D materials generated from this Project during the years of 2018 to 2022. Subject to the identification of such potential projects, it is anticipated that up to about 5,904,270 m³ of inert C&D materials would be delivered to the PFRF from 2018 to 2022. Priority will be given to deliver the surplus inert C&D materials of this Project to any identified projects that would require public fill during those years, and therefore delivery of the surplus inert C&D materials to the PFRF will be considered as the last resort. It is also understood that any surplus inert C&D materials received by the PFRF should be not exceed 250mm in size.

A detailed C&DMMP will be provided and submitted to the Public Fill Committee of CEDD when more information is available.

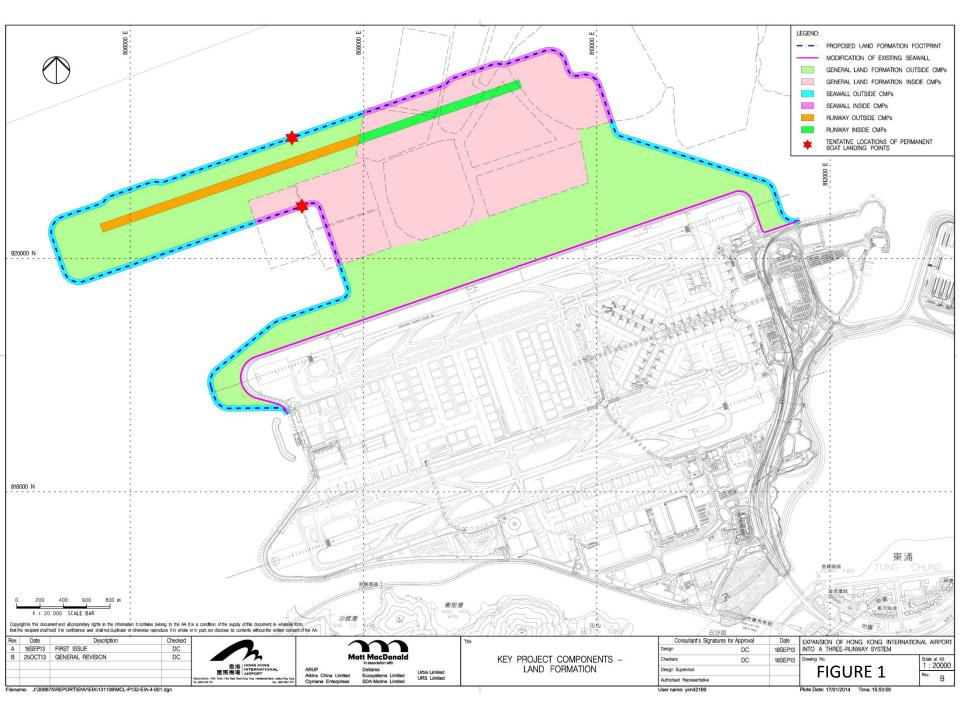
7. Conclusions

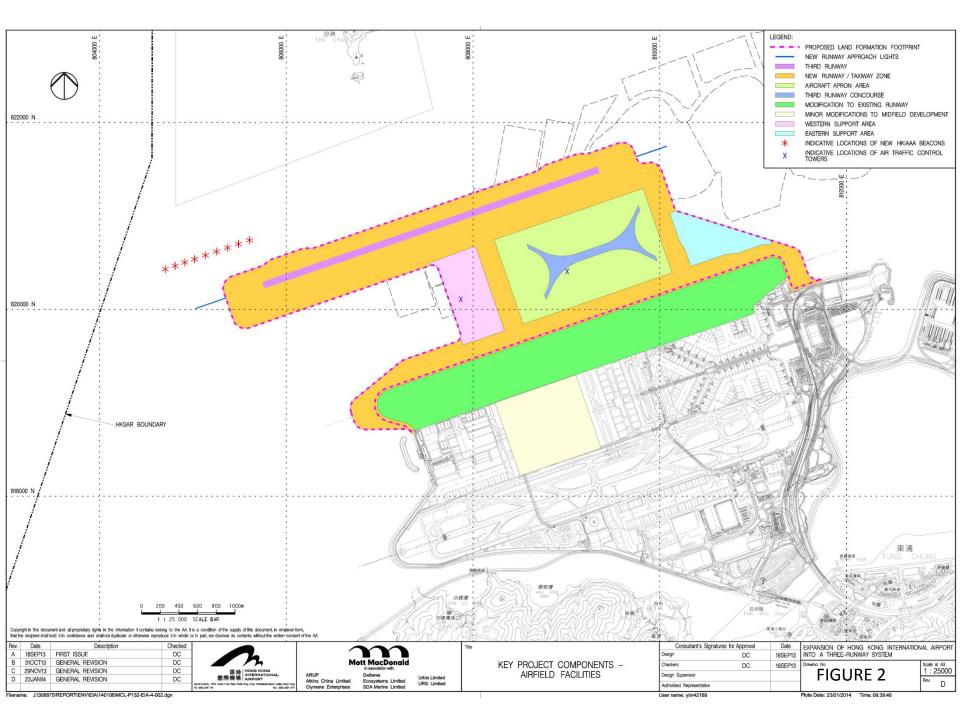
According to the tentative construction programme, it is estimated that approximately 9,543,500 m³ of inert C&D materials would be generated from the various key construction activities of the Project from 2015 to 2022. While it has been planned to reuse the inert C&D materials generated as fill materials for the proposed land formation as far as practicable, it is estimated that approximately 3,639,230 m³ (or 38%) of the materials would be reused on-site and the remaining 5,904,270 m³ (or 62%) would need to be delivered off-site to any identified projects that will need fill materials and/or to the Government's PFRF for beneficial use by other projects in Hong Kong.

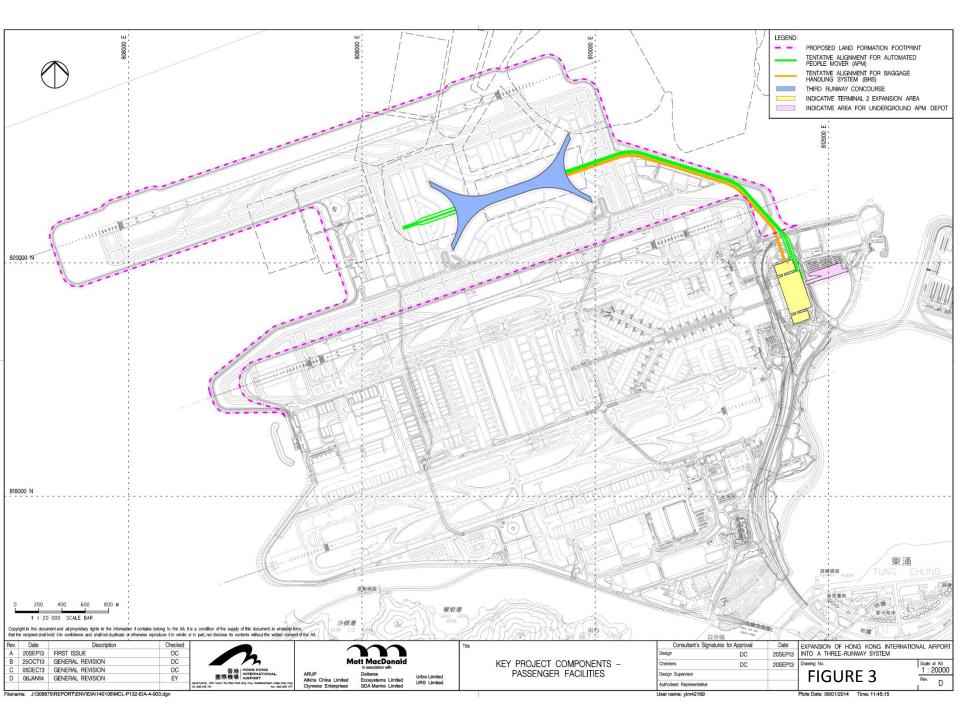
The Project would require a total of 14,551,000 m³ of public fill materials for the proposed land formation work from 2016 to 2021. After deducting the amount of inert C&D material that would be reused on-site as fill materials (i.e., 3,639,230 m³), about 10,911,770 m³ of public fill materials will need to be imported to this Project. Priority will be given to maximise the use of suitable fill materials available from other concurrent projects and the Government's PFRF.

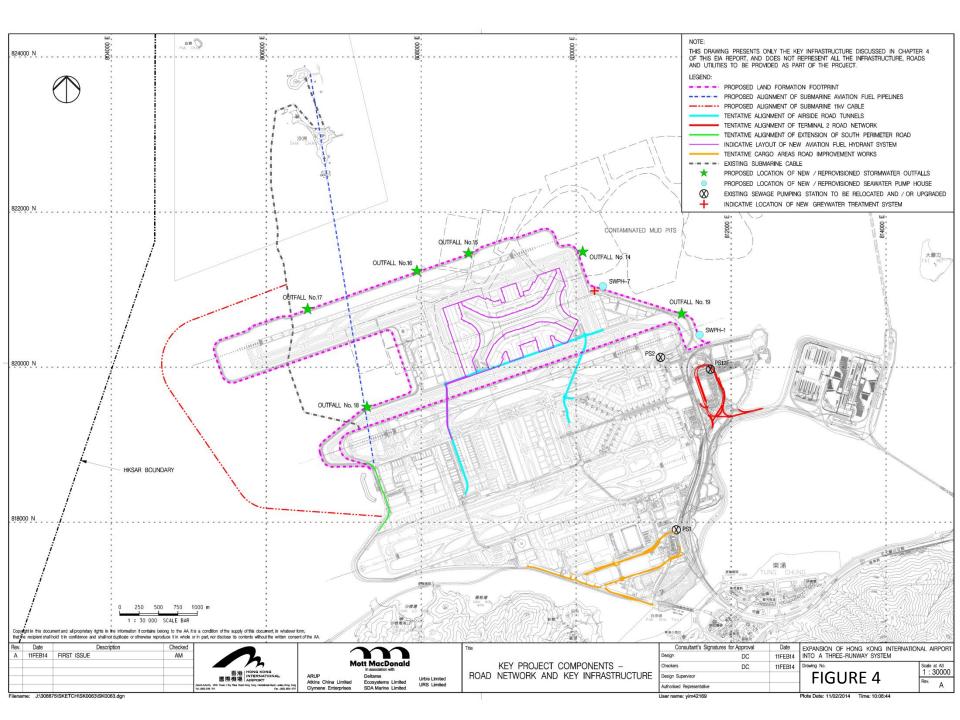
This document will be reviewed and updated to form the detailed C&DMMP, which will be submitted to the Public Fill Committee of CEDD when more information is available.

Page 6 28 February 2014

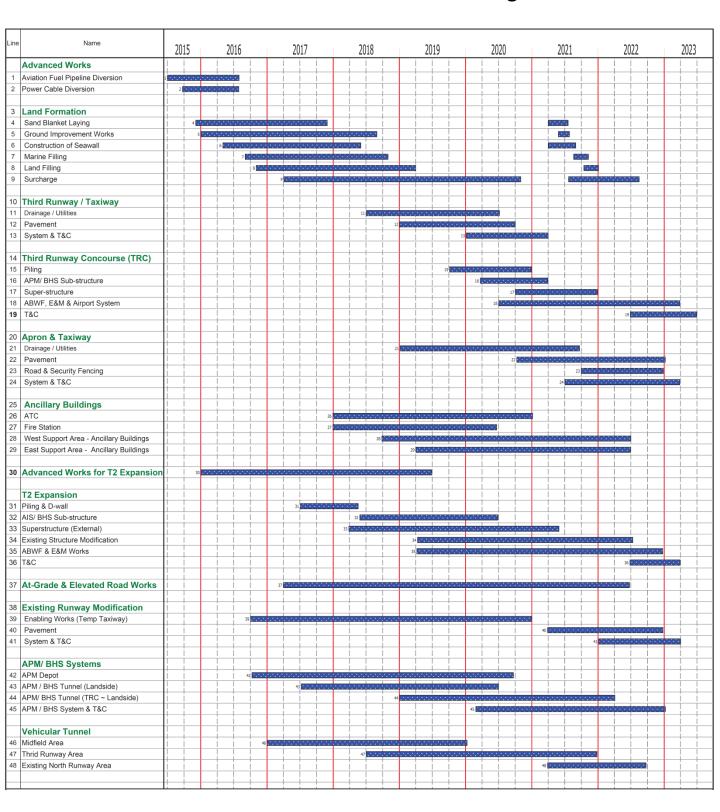








Annex A – Tentative Construction Programme



Annex B Estimated Quantities of Inert C&D Materials to be Generated, Reused On-site and Delivered Off-site

		Inert C&D Materials Generated from the Project (in-situ volume, m³)														
Timeframe	Excavation for APM & BHS Tunnels, New APM Depot & Airside Tunnels, Piling Works for TRC & Other Facilities and Superstructure Construction Works	Surplus Surcharge Materials		Excavation & Demolition and Superstructure Construction Works for T2 Expansion	Excavation for Improvement of Road Networks	HDD for Diversion of Existing Submarine Fuel Pipelines	Total Am Gener		Public Fill Demand for Land Formation (in- situ volume, m³)		Inert C&D Materials Reused On-site for Land Formation (in- situ volume, m³)		Inert C&D Materials Requiring Off-site Delivery (in-situ volume, m³)		Public Fill to be Imported (in-situ volume, m³)	
Q1 2015	O	0	0	0	0	0	O	Aillidally	0	Aillidaily	O	Aillidally	0	Aillidally	0	Aillidally
Q2 2015	0	0	0	0	0	0	0		0		0		0		0	
Q3 2015*	0	0	0	0	0	3,000	3,000	6,000	0	0	3,000	6,000	0	0	0	0
Q4 2015*	0	0	0	0	0	3,000	3,000		0		3,000		0		0	
Q1 2016*	0	0	58,000	0	0	0	58,000		0		58,000		0		0	
Q2 2016*	0	0	98,000	0	0	0	98,000		0		98,000		0		0	
Q3 2016*	0	0	144.000	0	0	0	144,000	398,000	467,000	1,912,000	144,000	398,000	0	0	161,000	1,508,000
Q4 2016	0	0	61,000	37,000	0	0	98,000		1,445,000	1	98,000		0		1,347,000	
Q1 2017	56,000	0	61,000	37,000	2,000	0	156,000		1,504,000		156,000		0		1,348,000	
Q2 2017	130,000	0	40,000	37,000	3,000	0	210,000		1,557,000		210,000		0	0	1,347,000	
Q3 2017	130,000	0	7,000	37.000	3,000	0	177,000	710,000	1,524,000	6,099,000	177,000	710,000	0		1,347,000	5,389,000
Q4 2017	130,000	0	0	37,000	0	0	167,000		1,514,000	1	167,000		0		1,347,000	
Q1 2018	140,230	0	0	37,000	0	0	177,230		1,514,000		177,230		0		1,336,770	
Q2 2018	120,000	0	0	37,000	0	0	157,000		1,496,000	l	157,000	773,230	0	3,586,000	1,339,000	
Q3 2018	212,000	0	0	37,000	0	0	249,000	4,359,230	1,588,000	4,788,000	249,000		0		1,339,000	4,014,770
Q4 2018	192,000	3,547,000	0	37,000	0	0	3,776,000		190,000	1	190,000		3,586,000		0	
Q1 2019	303,000	0	0	41,270	0	0	344,270		301,000		301,000		43,270		0	
Q2 2019	330,000	0	0	49,000	0	0	379,000	1,344,270	164,000	674,000	164,000	674,000	215,000		0	0
Q3 2019	264,000	0	0	7,000	0	0	271,000	1,344,270	128,000	674,000	128,000		143,000 269,000		0	0
Q4 2019	343,000	0	0	7,000	0	0	350,000		81,000		81,000				0	
Q1 2020	360,000	0	0	0	0	0	360,000		116,000		116,000		244,000		0	
Q2 2020	394,000	0	0	0	0	0	394,000	1,531,000	209,000	835,000	209,000	835,000	185,000	696.000	0	0
Q3 2020	408,000	0	0	0	0	0	408,000	1,531,000	255,000	033,000	255,000	635,000	153,000	090,000	0	
Q4 2020	369,000	0	0	0	0	0	369,000		255,000		255,000		114,000		0	
Q1 2021	357,000	0	0	0	0	0	357,000		243,000	243,000	243,000	242 000 8	114,000		0	
Q2 2021	89,000	0	0	0	0	0	89,000	689,000	0		0		89,000	446,000	0	0
Q3 2021	103,000	0	18,000	0	0	0	121,000		0	240,000	0	240,000	121,000	440,000	0	
Q4 2021	122,000	0	0	0	0	0	122,000		0		0		122,000		0	
Q1 2022	133,000	0	0	0	0	0	133,000	506,000	0	0	0		133,000		0	
Q2 2022	60,000	0	0	0	0	0	60,000		0		0 0	0	60,000	506,000	0	0
Q3 2022	60,000	246,000	0	0	0	0	306,000	500,000	0		0		306,000	300,000	0	l ŭ
Q4 2022	7,000	0	0	0	0	0	7,000		0		0		7,000		0	
Total	4,812,230	3,793,000	487,000	437,270	8,000	6,000	9,543	3,500	14,55°	1,000	3,639	,230	5,904	,270	10,91	1,770

*Note: Inert C&D materials generated from Q3 of 2015 to Q3 of 2016 would be temporarily stored in stockpiles, which would then be reused for land formation from Q3 of 2016 onwards.



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(Attention:

Dr. Anne Kerr

Fax no.: 2827 1823

19 November 2013

Dear Sirs.

Expansion of Hong Kong International Airport into a Three Runway System -**Environmental Impact Assessment Study**

Technical Note on Cut and Fill Materials

I refer to your above referenced letter dated 12.11.2013 and have no further comment on the revised Technical Note from fill management point of view.

It is noted that a detailed C&DMMP will be submitted at later stage when more information is available.

Yours faithfully,

for Chief Engineer/Fill Management

Civil Engineering and Development Department