Business Continuity Manual

Business Continuity Plan: H3

Tsunami Plan

		Signature	Revision	Effective Date
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A. Introduction

1. Tsunami is a series of water waves, caused by an undersea earthquake, that can quickly inundate low-lying coastal regions.

2. Tsunami can be caused by submarine earthquakes or earthquakes at coastal shorelines, submarine landslides, submarine volcanoes, exploding island-type volcanoes, large scale landslides near the coast, etc.

3. The three points below are extracted from the "Contingency Plan for Natural Disasters" (File ref. SB FR/1-90/4), issued by Security Bureau in October 2019:
   a. The chance of Hong Kong being affected by a significant tsunami (i.e. one with a tsunami height of 0.5 metre or higher) is very small.
   b. Since automatic tide gauges were installed in Hong Kong in the early 1950s, only seven measurable tsunamis were recorded, all not significant.
   c. This is notably due to the sheltering effect of the land masses of Taiwan and the Philippines against tsunamis originated in the Pacific.

4. However, tsunamis have been known to cause immense damages and great loss of lives and properties to low lying coastal regions e.g. the tsunami of Bandar Aceh of 2004, and the tsunami of Japan's Northeastern Coast of 2011.

5. In order to ensure an integrated and coordinated approach to planning for a tsunami response, the following tsunami plan can be used by Hong Kong International Airport (HKIA) stakeholders and business partners to devise their own company-specific tsunami business continuity plans compatible with others within the HKIA community.

B. Alerting

1.0 HKO-Initiated Tsunami Warnings & Bulletins

1. The Hong Kong Observatory (HKO) tsunamis warnings and information bulletins will be sent by fax to the IAC-ACC, IAC-TOD, FRTMO, IAC-LD and AEC.

2. HKO will issue a tsunami warning for the public if a significant tsunami (i.e. a tsunami with a height of 0.5 metre or more above the normal tide level) is expected to reach Hong Kong within 3 hours. The following information will be given in a Tsunami Warning:
   a. Time of occurrence, location and magnitude of the earthquake that generates the tsunami.
   b. The estimated time of arrival of the tsunami at Hong Kong.
   c. The estimated tsunami heights in Hong Kong.
   d. An advice for members for the public to take precautions.
   *e. Normal tides of the day in Hong Kong.
   *f. Tsunami heights recorded around the Pacific, the South China Sea or Hong Kong.
   g. Precautionary announcements.

Items marked with an asterisk are optional depending on availability of information and relevance for a particular event.

3. HKO Precautionary Announcements to Accompany a Tsunami Warning:
   a. Stay away from shores, beaches and low-lying coastal areas. If you are there, move inland or to higher grounds. The upper floors of high, multi-storey, reinforced concrete building can provide safe refuge if there is no time to quickly move inland or to higher grounds.
   b. Do not engage in water sports.
   c. Vessels should stay away from the shore or shallow waters. If vessels remain moored in typhoon shelters, their moorings should be doubled and all personnel should leave the vessels and head for higher grounds.
   d. Please observe these precautions until the Hong Kong Observatory cancels the tsunami warning.
   e. Please stay tuned to the radio or television for further information.

4. The following information will be given in a Tsunami Information Bulletin:
   a. Time of occurrence, location and magnitude of the earthquake that generates the tsunami.
   b. A statement to the effect that a tsunami has been or might be generated, and its estimated time of arrival at Hong Kong. If the tsunami height at Hong Kong is expected to be below 0.5 metre, this will be mentioned.
   *c. Normal tides of the day in Hong Kong.
   *d. Tsunami heights recorded around the Pacific, the South China Sea or Hong Kong.

   Items marked with an asterisk [*] are optional depending on availability of information and relevance for a particular event.

5. The above information is obtained from Annex D of the “Contingency Plan for Natural Disasters” (File ref. SB FR/1-90/4), issued by Security Bureau in October 2019 and is also reproduced in EPM Volume 3, Part 12, “Weather Warnings”.

6. HKO Airport Meteorological Office (AMO) will also issue Aerodrome Tsunami Warning in accordance to Appendix 6, Section 5.1.3 of ICAO Annex 3. The IAC-ACC, IAC-TOD, IAC-LD and FRTMO would be informed by fax.

2.0 Airport Authority Alerting

1. The following are excerpted from the EPM Volume 3, Part 12, Section 42.

2. Once alerted by HKO, IAC-ACC will alert the Airport Duty Manager (ADM).
   a. IAC-ACC will send the tsunami warning message to the Airport Fire Contingent (AFC) and all ramp operators by e-fax.
   b. Cancellation of tsunami warnings will be relayed as per the above process.

3. Once alerted by HKO, IAC-TOD will alert the Airport Duty Manager (ADM).

a. IAC-TOD will also inform IAC-LD.
b. IAC-TOD will send the tsunami warning message to all airlines, ground handling agents and AVSECO by e-fax.
c. IAC-LD will send the tsunami warning message to all landside contractors, cross-boundary ferry handling agent; Bonded bus handling agent and marine cargo operator by e-fax.
d. Cancellation of tsunami warnings will be relayed as per the above process.

3.0 Terminal Buildings Indoor PA Announcements

1. IAC-TOD to make appropriate indoor PA announcements in accordance with information as received from the HKO Tsunami Precautionary Announcements.

2. Duty and other AA staff including the Service Ambassadors are to assist the general public to take necessary precautionary actions.

C. Command, Control, Coordination (C^3)

1. If HKO tsunami warnings indicate the tsunami may affect HKIA operations, the ADM may activate the Airport Emergency Center (AEC) to manage the airport's C^3 function.

2. If necessary, the ADM may relocate the AEC to another safer location away from the tsunami waves.

3. The relocated AEC location will be relayed to all representatives along with the AEC activation message.

4. Companies called upon to send representatives to the AEC are to do so as quickly as possible in order to ensure airport-wide coordination takes place as soon as possible.

D. Tsunami Response

1. Similar to storm surges caused by approaching tropical cyclones, significant tsunamis may bring about inundation of low-lying coastal areas. Because of historical concern about storm surges, Hong Kong is already well prepared against tsunamis. Coastal designs of built-up areas in Hong Kong and general land use have catered for storm surges. This offers protection against tsunamis of considerable height (more than two times the highest tsunami recorded in Hong Kong since the early 1950s).

2. For tsunami waves that are less than 2.5m, existing flooding and severe weather precautions may apply.

3. Upon receipt of HKO tsunami warnings that are projected to be less than 2.5m in height, all are to action their flooding and severe weather contingency procedures.

E. Extreme Tsunami Response

1.0 General

1. There are little indications in the near future that tsunamis that may affect the Airport Island would exceed 2.5m above normal tide level.

2. However, as an example, the tsunami waves triggered by earthquake in Japan in 2011 were ten to twenty meters high in some coastal areas in Japan.

3. As such, upon receipt of HKO tsunami warning of wave heights that may inundate the Airport Island in part or in whole, one or more of the following precautions may be actioned.

4. Time will be a critical factor in carrying out precautions against these extreme events. For instance, tsunami waves generated by seismic events in the Manila Trench will take less than 3 hours to reach Hong Kong.

5. As a planning guideline, any precautionary actions to be carried out should leave at least one hour for the involved personnel to reach higher grounds / relatively safer / taller buildings after carrying out their precautionary actions.

6. Responses to tsunami may be very different from other types of disasters:
   a. All personnel must evacuate to higher grounds / safer areas as soon as possible because the lead-in warning time may be less than 3 hours. Essential personnel will have to start recovery operations after the waters from the tsunami waves recede.
   b. No one should be left behind in unsafe areas.
   c. There need to be coordination between affected companies and their designated essential recovery personnel to come back to the airport at a safe time.
   d. Since there is a likelihood that phone lines and mobile phone networks may not work, arrangements should be made with RTHK/etc. for radio broadcasts to essential workers to let them know when / where / how to report for duty.
   e. In addition, the ground transportation network on HKIA may be severely affected and as such, alternate means of transporting essential teams back to the airport may need to be considered in order to expedite airport recovery operations.

7. If deemed appropriate, essential recovery teams may be pre-positioned at the upper floors of relatively large and stable buildings (e.g. floors higher than projected wave heights like Level 6 and 7 of buildings like Terminal 1).

8. It may very well be that damages cannot be avoided from the impact of the tsunami, therefore, the emphasis in precautionary actions are to :
   a. Save lives.
   b. Minimize damages that can be caused by the waves and subsequent flood waters.
   c. Promote recovery operations once the flood water recedes.

2.0 AEC Command, Control & Coordination and IAC Fallback

1. The AEC is located at runway level or below and as such, is susceptible to flooding if projected tsunami waves are greater than the height of the CLK Island seawalls.

2. An alternate AEC may need to be mobilized if the AEC is unserviceable.

3. Alternate AEC locations may include the following possible sites :
   a. Training Centre at 5Z539 Room B
   b. HKIA Tower Meeting Room 3A
   c. SSBC will coordinate with ITD to ensure basic communication equipment are available at the alternate AEC.

4. The alternate AEC location will be broadcasted to relevant parties so their representatives can report for coordination duties

5. IAC – TOD, IAC-LD and FRTMO will be relocated to the designated fallback location (e.g. Multi-Function room at HKIAT2); whilst IAC – ACC will be repositioned to the backup ACC located at AOC office of 2nd level of MOMB2 when instructed by the ADM.

3.0 Inbound Flights

1. If projected tsunami waves are greater than the height of the CLK Island seawalls, then take-off and landing operations may not be possible once the waves reach HKIA.

2. If situation warrants, CAD-ATMD in consultations with AA may divert all inbound flights to unaffected airports.

3. Diversions will be in effect until after further consultations between HKO, AA and CAD.

4.0 Outbound Flights

1. If situation warrants, all on-ground aircraft with available cockpit crew are to be immediately sent off to appropriate unaffected airports.

2. If aircraft need to be refueled, they should be fueled with sufficient fuel to reach primary and alternate unaffected airports.

3. Priority of outbound flights will be based upon who is first to be pushed back from the parking stand.

4. Empty flights may be pushed back if insufficient time to load all passengers; in addition, flights should not be delayed because of catering or other non-essential services.

5. It is important that as many on-ground aircraft should be flown off as time and situation permits;
   a. Aircraft left on the apron may be highly susceptible to damages from the tsunami waves;

b. The aircraft themselves, if loosened from their apron tie-downs, may cause additional damages to other tied-down aircraft and installations as the waves carry them away from their parking stands:
c. Damaged aircraft will increase the amount of debris and increase the clean-up time thus affecting HKIA recovery operations.

5.0 SkyPier Terminal

1. If situation warrants, SkyPier Terminal is to be evacuated.

2. All flooding and severe weather contingency procedures to be carried out.

3. Special flooding precautions need to be applied to the APM as it is highly vulnerable to flooding.

4. All upstream ports are to be advised of SkyPier Terminal's closure until further notice.

5. All Air-To-Sea/Bridge and Sea/Bridge-To-Air passengers must be evacuated.

6. All personnel must also be evacuated; nobody should be left at SkyPier Terminal once all passengers are gone.

6.0 BAC

1. If situation warrants, BAC aircraft should be flown off as soon as possible.

2. Inbound flights should be diverted to unaffected airports.

3. If circumstances allows, aircraft unable to be flown off need to arrange refueling to increase ballast in order to prevent as much as possible the aircraft from being carried away by the tsunami waves.

4. Hangar doors should be closed.

5. Ground equipment should be secured to prevent them being carried away by the tsunami waves and becoming debris that may damage other installations.

6. Apron equipment or systems that cannot be moved need to be prepared as per flooding contingency procedures with the aim of minimizing water damages.

7. If feasible, ground equipment should be driven to higher, safer areas (e.g. upper stories of AAT, Hactl, Car Park 4, etc.).

8. Removing these ground equipment will save them for the recovery operations.

7.0 Passengers & Airport Workers

1. AA Corporate Affairs Department (CAF) works with HKO and the Government Information Services Department (ISD) to inform the public not to come to the airport until further notice.

2. TOD and LD to coordinate with the Police on how best to quickly evacuate all passengers from CLK Island to higher and safer areas.

3. Transportation arrangements must be made to evacuate the last of the essential personnel that are carrying out flooding and severe weather contingency plans.

4. No one should be left behind in vulnerable areas.

5. If deemed appropriate, essential recovery teams may be pre-positioned at the upper floors of relatively large and stable buildings (e.g. floors higher than projected wave heights like Level 6 and 7 of buildings like Terminal 1) in order to provide on-site essential support.

8.0 Apron Preparations

1. On-ground aircraft unable to be flown off must be tie-downed as per severe weather procedures; tie-down lines should be doubled to prevent as much as possible the aircraft from being carried away by the tsunami waves.

2. Hangar doors should be closed.

3. Ground equipment should be secured to prevent them being carried away by the tsunami waves and becoming debris that may damage other installations.

4. Apron equipment or systems that cannot be moved need to be prepared as per flooding contingency procedures with the aim of minimizing water damages.

5. If feasible, ground equipment should be driven to higher, safer areas (e.g. upper levels of AAT, Hactl, Car Park 4, etc.).

6. Removing these ground equipment will save them for the recovery operations.

7. Essential recovery personnel should be identified and communication protocol established so that they can be contacted at appropriate time to come back to the airport to start recovery operations.

8. If deemed appropriate, essential recovery teams may be pre-positioned at the upper floors of relatively large and stable buildings (e.g. floors higher than projected wave heights like Level 6 and 7 of buildings like Terminal 1) in order to provide on-site essential support.

9.0 Buildings Preparations

1. All buildings should be prepared for flooding as per flooding and severe weather contingency procedures.

2. Back-up generators and their fuel supplies should be made flood resistant as much as possible.

3. Comms Rooms and other telecommunication/PABX rooms located in lower floors or basements should be made flood resistant as much as possible.

4. This also applies to entrances and exits to the Automated People Mover (APM) and the Baggage Hall.

5. All personnel should be evacuated as soon as possible.

6. If deemed appropriate, essential personnel may stay behind and should relocate to the higher floors; as a general rule of thumb, relocate no less than 3 to 4 floors above ground level/sea level and higher than projected wave heights.

7. Refer to attached appendices for various building heights including those of the passenger terminal buildings.

F. Appendices

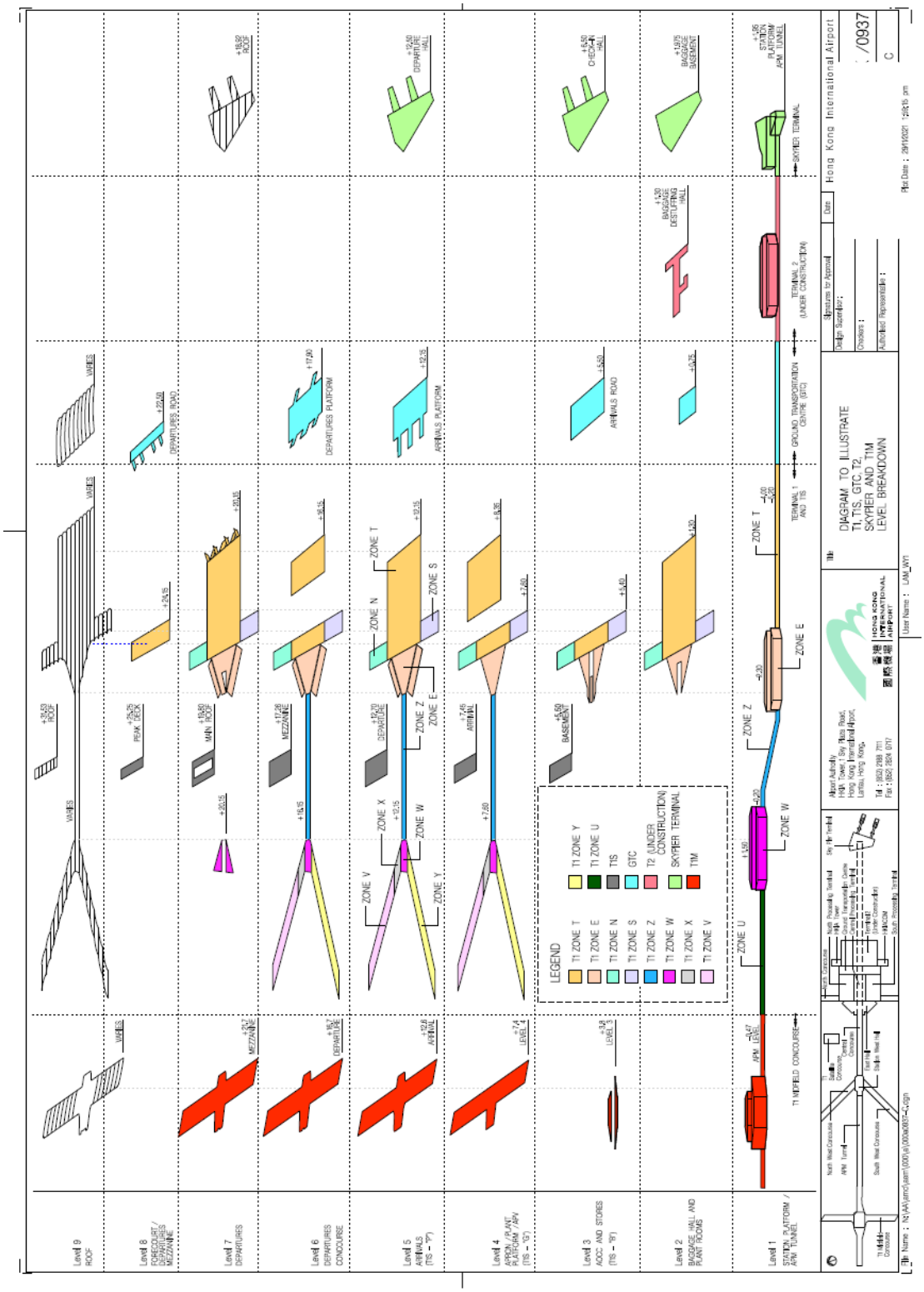
1.0 Building Heights Above Sea Level

Building Schedule of AOD/Government Sites as at 16 Jun 2004			
			Building Height
Lot No.	Land Use	Name of Building (Per 9 Oct 03 Submission)	Main Roof Level (MPD)
L002	AOD	Switching Station Q	11.85
L003	AOD	Generator Building GL7	13.3
L004	AOD	Oil Separator and Pumping Station No. 4	U/G
L005	AOD	Sewage Pump Station 8	U/G
L006	AOD	Gate House No. 5	13.9
L007	AOD	Switching Station N	11.45
L008	AOD	Airfield Ground Maintenance Building	17.15
L009	AOD	Western Sea Rescue Station	16.38
L010	AOD	Aircraft Recovery Equipment Storage	17.15
L011	Gov't	Localizer Equipment Room (Northern Runway - West)	11.92
L012	AOD	Hold Baggage Screen Level 5 Bag Store	10.88
L101	AOD	Emergency Generator Building M + GL2	13.7
L102	AOD	AGL Vault 'A'	11.8
L103	Gov't	Government Flying Services	22.5
L105	AOD	Civil Works Depot	11
L106	AOD	Sewage Pump Station 10	U/G
L107	AOD	Substation D and Switching Station D	11.65
L108	AOD	Generator Building GL6	13.8
L109	Gov't	Localizer Equipment Room (Southern Runway - West)	12.53
L110	AOD	Seawater Pump House 5	13.45
L111	AOD	Gate House No. 4	9.8
L112	AOD	Sewage Pump Station 7	U/G
L113	AOD	Switching Station L	11.25
L114	Gov't	Southern Rescue and Fire Fighting Station	25.4
L115	AOD	Western Tunnel Plant Room No. 6	12.3
L116	AOD	Oil Separator and Pumping Station No. 5	U/G
L117	AOD	Switching Station Y1	11.75
L118	AOD	Southern Sea Rescue Ramp	8.51
L203	Gov't	Joint Movements Unit	13.25
L205	Gov't	Airmail Centre	26.2
L206	AOD	Gate House No. 3	13.5
L207	AOD	AGL Vault 'B'	11
L208	AOD	Emergency Generator Building V + GL1	12.9
L209	AOD	Communications Equipment Building 1	10.05
L210	AOD	Generator Building GL4	12.9
L211	AOD	Switching Station I	11.45
L212	AOD	Eastern Tunnel Plant RM2	11.2
L213	AOD	Eastern Tunnel Pump House 2	U/G
L214	AOD	Oil Separator and Pumping Station No. 3	U/G
L215	AOD	Switching Station Y2	10.95
L216	Gov't	Customs Check Point (GateHouse 3)	10.05
L218	AOD	Security Screen Point 2	10.05
L301	AOD	CLP Primary Substation "B"	21.2
L305	AOD	Sewage Pump Station 6	U/G
L306	AOD	Gas Governor Kiosk 1	9.55
L307	AOD	Switching Station S	12.05
L308	AOD	Generator Building GL10	13.7
L309	Gov't	Landside Fire Station	25
L310	AOD	Sewage Pump Station 1	U/G

Lot No.	Land Use	Name of Building (Per 9 Oct 03 Submission)	Main Roof Level (MPD)
L315	Gov't	Customs Check Point (Catering Gate)	13.19
L405	Gov't	Airport Police Building	45.64
L408	AOD	Waste Water Treatment Plant	16.56
L409	AOD	Generator Building GL8	13.2
L410	AOD	Switching Station R	11.75
L413	AOD	Vehicle Towing Compound	13.04
L414	AOD	Security Screen Point 1	10.5
L415	AOD	Catering Gatehouse	10.5
L601	MTR	MTRC Substation	22.25
L602	MTR	AEL Cleaning Platform	13.52
L603	Gov't	Eastern Sea Rescue Station	15
L604	AOD	CLP Primary Substation "A"	17.9
L605	AOD	Switching Station T	11.65
L606	AOD	Generator Building GL11	13.7
L701	AOD	Terminal 1	41
L702	AOD	Ground Transportation Centre	26.06
L704	AOD	North Multi-Storey Car Park	19.75
L705	AOD	Gate House No. 1	14.4
L706	AOD	Battery Charging Unit 1	14.82
L707	AOD	Tricharator A	14.72
L708	AOD	Oil Separator and Pumping Station No. 2	U/G
L709	AOD	Airport Authority Building	22.4
L710	AOD	Generator Building GH1	21.5
L711	AOD	Substation H and Switching Station H	11.75
L712	AOD	Generator Building GL5	13.8
L713	AOD	Seawater Pump House 1	13.75
L714	AOD	Switching Substation J1	12.6
L715	AOD	Switching Substation J2	13
L716	AOD	Refuse Compactor D2	11.415
L717	AOD	Switching Substation W	12.8
L718	Gov't	Northern Rescue and Fire Fighting Station	23.08
L719	AOD	Sewage Pump Station 5	U/G
L720	AOD	Airfield Operations Control Centre	13.7
L721	Gov't	Air Traffic Control Center and Air Traffic Control Tower	86.5
L722	AOD	Sewage Pump Station 4	U/G
L723	Gov't	Meteorological Enclosure	8
L724	AOD	Eastern Tunnel Pump House 1	U/G
L725	AOD	Eastern Tunnel Plant Room 1 (Including Switching Station X & Generator Building GL3)	12.7
L726	AOD	Tricharator B	14.62
L727	AOD	Battery Charging Unit 2	14.64
L728	AOD	Switching Substation K1	13.1
L729	AOD	Switching Substation K2	13.15
L730	AOD	Oil Separator and Pumping Station No. 1	U/G
L731	AOD	Gate House No. 2	13.5
L732	AOD	Gas Governor Kiosk 2	9.15
L733	AOD	Battery Charging Unit 3	14.57
L734	Gov't	Localizer Equipment Room (Southern Runway - East)	12.94
L735	AOD	Substation ex-EX	11.985
L736	AOD	Sewage Pump Station 2	U/G
L737	Gov't	Customs Check Point (Gatehouse 2)	10.5
L738	AOD	Sewage Pump Station 12	U/G
L740	Gov't	Localizer Equipment Room (Northern Runway - East)	12.88
aui	AOD	North Ground Level Car Park	8.85
L742	AOD	South Ground Level Car Park	9.01

Lot No.	Land Use	Name of Building (Per 9 Oct 03 Submission)	Main Roof Level (MPD)
L743	Gov't	PRM Tower	61.2
L747	AOD	Communications Equipment Building 2	11.4
L750	AOD	Bus Regulator's Office	8.65
L751	Gov't	Customs Check Point (Gatehouse 1)	10.5
L752	AOD	Ferry Terminal Passenger Waiting Area	n/a
L754	AOD	Security Screen Point 3	10.5
L755	AOD	Attendant's Office (Tour Coach Station)	8.7
L756	AOD	Attendant's Office (Travel Industry Staging Area)	8.7
L757	AOD	Attendant's Office (Taxi Staging Area)	8.7
L758	Gov't	Northern Sea Rescue Platform	8.53
L759	Gov't	Transformer Room for ATC Backup Complex	12.81
L760	Gov't	Glide Path Building (Northern Runway - West)	U/G
L761	Gov't	Glide Path Building (Northern Runway - East)	U/G
L762	Gov't	Glide Path Building (Southern Runway - West)	U/G
L763	Gov't	Glide Path Building (Southern Runway - East)	U/G
L764	Gov't	CAD West Antenna Farm	12.58
L765	Gov't	CAD East Antenna Farm	12.25
L833	AOD	None	13.215
	Highlight means amendment and update since Concept Plan Rev G dated 24/7/00		
	Highlight means new developments since Concept Plan Rev G dated 24/7/00		
U/G	means underground		

2.0 Passenger Terminal Buildings Heights Above Sea Level



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