Hong Kong Virtual Area Control Centre (HKVACC)
Virtual Air Traffic Simulation Network (VATSIM)

Doc No.: HKVACC-SOP002-R1   Date Issued: 22 JUNE 2016
Subject: Macau International Airport (VMMC) Standard Operating Procedure

STANDARD OPERATING PROCEDURE (SOP)
DOCUMENT NUMBER: HKVACC-SOP002-R1
DATE ISSUED: 22 JUNE 2016
REVISION: 1

SUBJECT: Macau International Airport (VMMC) Standard Operating Procedure

EFFECTIVE DATE: 25 JUNE 2016 0001z

SCOPE: Outlines standard techniques for online ATC service at Macau International Airport (VMMC) on VATSIM

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1. PURPOSE

1.1 This Standard Operating Procedure (SOP) sets forth the procedures for all controllers providing aerodrome air traffic control service at Macau International Airport (VMMC) to improve communication, techniques, and to distinguish procedures that are specific to the online environment.

2. ROLES AND RESPONSIBILITIES

2.1 The Office of Primary Responsibility (OPR) for this SOP is the team under the supervision of Manager (Standards and Publications). This SOP shall be maintained, revised, updated or cancelled by the Manager (Standards and Publications). Any suggestions for modification / amendment to this SOP should be sent to the Manager (Standards and Publications) for review.

3. DISTRIBUTION

3.1 This SOP is intended for controllers staffing aerodrome ATC positions at Macau International Airport (VMMC) and other controllers who interface with aerodrome controllers at VMMC.

4. BACKGROUND

4.1 Over time, controllers have found that having aircraft arrive and depart via pre-approved runways provides for a more orderly traffic flow and reduces the need for communication among controllers at VMMC. Due to operational differences between this online environment on VATSIM and that in the real world, it is also necessary to defines procedures that are specific to the online environment.

5. REQUIREMENTS

5.1 FREQUENCIES

5.1.1   The following frequencies shall be used at all times for aerodrome control positions at Macau International Airport. Frequencies other than listed may not be used. *(Refer to Macau AIP AD2.18)*

POSITION	TEXT CALL SIGN	VOICE CALL SIGN	FREQUENCY
Macau Ground	VMMC_GND	"Macau Ground"	121.720
Macau Tower	VMMC_TWR	"Macau Tower"	118.000

5.1.2   During organized events or when the airport experiences a large volume of departure traffic, the secondary GND frequency may be used for Clearance Delivery.

POSITION	TEXT CALL SIGN	VOICE CALL SIGN	FREQUENCY
Macau Ground (Delivery)*	VMMC_DEL	"Macau Ground"	121.970

use only during major events or high departure traffic volume

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5.1.3   When Macau Tower, or a radar control position (APP/DEP/CTR) covering Macau Tower positions, is online, the controller may elect to set up voice Automatic Terminal Information Service (ATIS) at VMMC airport. The follow frequency shall be used:

POSITION	TEXT CALL SIGN	VOICE CALL SIGN	FREQUENCY
Macau Information	VMMC_ATIS	N/A	126.400

6   RUNWAY-IN-USE
6.1 PREFERENTIAL RUNWAY SYSTEM (DIRECTION OF OPERATIONS)
6.1.1   **Runway 34** will be nominated as the runway in use whenever the **tailwind component**, include gust values, is 10kt or less when the runway is dry, or 5kt or less when the runway is not dry.

6.2 Controllers shall determine runway-in-use based on wind and METAR information.

6.3 **IFR aircraft landing on RWY34 shall by default be assigned <u>ILS approach</u>, while IFR aircraft landing on RWY16 shall by default be assigned <u>LOC/DME approach</u>.** Other instrument approach procedures (IAP) or visual approach may be used with ATC approval.

6.4 See Section 7 of this SOP document for noise abatement procedures.

7   NOISE ABATEMENT PROCEDURES
7.1 As Per Macau AIP AD2.21, Noise Abatement Procedures are in place for Macau International Airport (VMMC). However, only Section 1 of AD2.21 is observed on VATSIM.

7.2 Section 1.1.1 of Macau AIP AD2.21:
> *"Take-off on runway 34 at any time*
> *Climb offset 15° (right) to 400 ft (120 m), then turn RIGHT. Aircraft are NOT TO OVERSHOOT Jiuzhou DVOR (ZAO) R230° which defines the northern limit for flights taking off runway 34 due to NOISE ABATEMENT for Zhuhai City."*

7.3 Section 1.2.1 of Macau AIP AD2.21:
> *"Landing on runway 16 at any time*
> *Maintain inbound track 215° (true north) on the localizer course. Aircraft are NOT TO DEVIATE FROM Jiuzhou DVOR (ZAO) R230° which defines the northern limit for flights landing runway 16 due to NOISE ABATEMENT for Zhuhai City"*

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8   MACAU GROUND (VMMC_GND)

8.1 AREA OF RESPONSIBILITY

8.1.1   Macau Ground (VMMC_GND) owns all ground movement areas of the airport, including all taxiways and _inactive or closed_ runways. Ground control does not own any active runway, and may not taxi aircraft across an active runway without prior approval from the controller responsible for the Macau Tower position.

8.2 FLIGHT PLAN INSPECTION

8.2.1   Macau Ground shall examine each field of the flight plan submitted by the pilot and ensure that the **route and altitude** is sound and appropriate prior to issuing clearance. If an incorrect route or altitude is filed, the delivery controller shall remind the pilot and provide a correct alternative. If the pilot accepts the alternative, the GND controller shall amend the flight plan accordingly. In the case when an amendment to a submitted flight plan is necessary, no Pre-departure clearance (PDC) shall be issued (Refer to SOP007 for details in PDC).

8.2.2   DEL controller may use Appendix A of this document for SID route reference and Appendix B for squawk code reference.

8.2.3   Ground controller should also check for the **runway-in-use** (this is determined by TWR and announced on ATIS) and runway closure. If TWR is not online, Ground controller can & shall only recommend pilots to depart from a specific runway under consideration of **Section 6A** (-> current tail wind component, METAR and TAF). However, pilots have the final say whenever TWR is not online.

8.2.4   Normally, it is the **responsibility of the controller to issue SID to departing IFR aircraft**. In such situation, the route in the flight plan submitted by the pilot will begin with the transition route (e.g. V2, V3, V4 etc.) or initial waypoint. Clearance delivery controllers shall add the cleared SID into pilot's flight plan after enroute clearance being given. It is not necessary to add departure runway to the route when a SID is used as all RNAV SID are specific to the departure runway. **Ensure that airfields are not included in the route.**
(for example: **SOUSA2V V13 LELIM** if cleared SOUSA2V departure via RWY 34)

8.2.5   IFR departing aircraft unable to follow a SID may be cleared for "**radar vectors departure**" subject to the approval of the terminal airspace controller (i.e. APP/DEP). If this is the case, "RDVR" shall be added to the flight plan to indicate that the aircraft needs radar vectors for departure.
(for example: **RDVR/34 SOUSA.** if cleared radar vectors departure to SOUSA via RWY 34)

8.2.6   IFR departing aircraft following SID will climb via SID. For radar vectors departure, the ground controller shall consult with Hong Kong Approach and/or Zhuhai Apporach for an initial climb altitude. To reflect this altitude, delivery controller shall **set the temporary altitude** of IFR departing aircraft prior to issuing clearance on their radar client. (F8 command on the

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keyboard)

8.2.7   If the aircraft does not enter Zhuhai Approach airspace after departure, to check the cruising altitude of the flight plan, the delivery controller shall first identify the departure route under which the aircraft will fly within Hong Kong FIR. Generally, delivery controller shall assign an altitude according to the ODD-EVEN rule with reference to the altitude assignment within **Appendix A**. The ODD-EVEN rule within a RVSM airspace, to simply put it, assigns altitude of flight according to the magnetic track of the aircraft.

SFC to 41000 ft (FL410)	
Magnetic Track	**Altitude (Feet)**
0^0-179^0	Odd (100, 300,…, 39000, 41000)
180^0-359^0	Even (200, 400,…, 38000, 40000)

41000 ft (FL410) and above	
Magnetic Track	**Altitude (Feet)**
0^0-179^0	FL410, FL450, FL490 etc.
180^0-359^0	FL430, FL470 etc.

8.2.8   Assignment of cruising altitude for aircraft entering Zhuhai airspace after departure and into Guangzhou FIR shall base upon the metric RVSM system in China. Controllers may refer to the VATPRC division website for the Chinese RVSM Flight Level Allocation Scheme (http://vatprc.net/index.php/en-chinese-rvsm).

8.2.9   Ground controller shall check if the voice flag is set remark section and add or correct in pilots' flight plans:

>   */v* for voice
>   */r* for receive-voice
>   */t* for text-only

8.2.10. **VMMC_GND does not issue clearance to VFR departing aircraft.** VFR departing aircraft can contact Macau Ground directly for taxi clearance.

8.2.11. In the real world, an IFR flight plan contains a variety of information. However, some of this information may not necessary pertain to the work of virtual ATC on VATSIM. For VRC users, all fields within the flight plan window, except for alternative airfield, are considered essential. For Euroscope users, certain fields in the flight plan window are considered optional for the purpose of issuing IFR clearance. These fields are highlighted in yellow in Figure 8.1.

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Figure 8.1: A sample Euroscope flight plan window. The fields highlighted in yellow are considered optional for issuing clearance.

8.3 IFR CLEARANCE FORMAT

8.3.1 The format of the IFR clearance issued by VMMC_GND shall follow the rules set forth by ICAO Doc 4444 Section 6.3.2.3.

8.3.2 As climb altitudes are included in the SIDs, it is not necessary to include the initial climb in the clearance if the aircraft is cleared via a SID (see ICAO Doc 4444 6.3.2.3.d).

8.3.3 When radar vectors departure is used, the Ground controller shall specify "**radar vectors departure**" and the assigned initial climb altitude (normally 5000 feet, check with DEP controller) in the IFR clearance.

8.3.4 It is mandatory that Macau Ground ensures pilots have listened to the **ATIS** frequency. If pilots do not mention the latest or a wrong ATIS letter, Macau Ground shall ask pilots to (re-)check the ATIS. If ATIS is not available, e.g. when TWR is not online, Macau Ground shall state the latest QNH and recommended departure runway, for example:

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"*CPA401, cleared to Taipei, flight plan route. CONGA Two Tango departure. Squawk 3521.* ***Information Alpha***"

8.4 PHRASEOLOGY

G: **CLEARED / PROCEED** *TO* (clearance limit) **FLIGHT PLAN ROUTE** (or description of route)**. (**Details of route to be followed / instructions) *CLIMB (level)* ^RUNWAY XXX^ **SQUAWK** (four figures) *(instructions)*

Example 1: Cathay 401, cleared to destination, flight plan route. CONGA 2 Tango departure. Squawk 3521.

Example 2: Cathay 401, cleared to Taipei, flight plan route. Radar vectors departure, runway 16. Initial climb 5000 feet. Squawk 3521.

General information:

(1) The parts of the phraseology printed bold shall be used.

(2) Parts of the phraseology marked by asterisks (*) shall be used additionally, as far as necessary.

(3) Parts of the phraseology divided by diagonals (/) shall be used alternatively, as far as necessary.
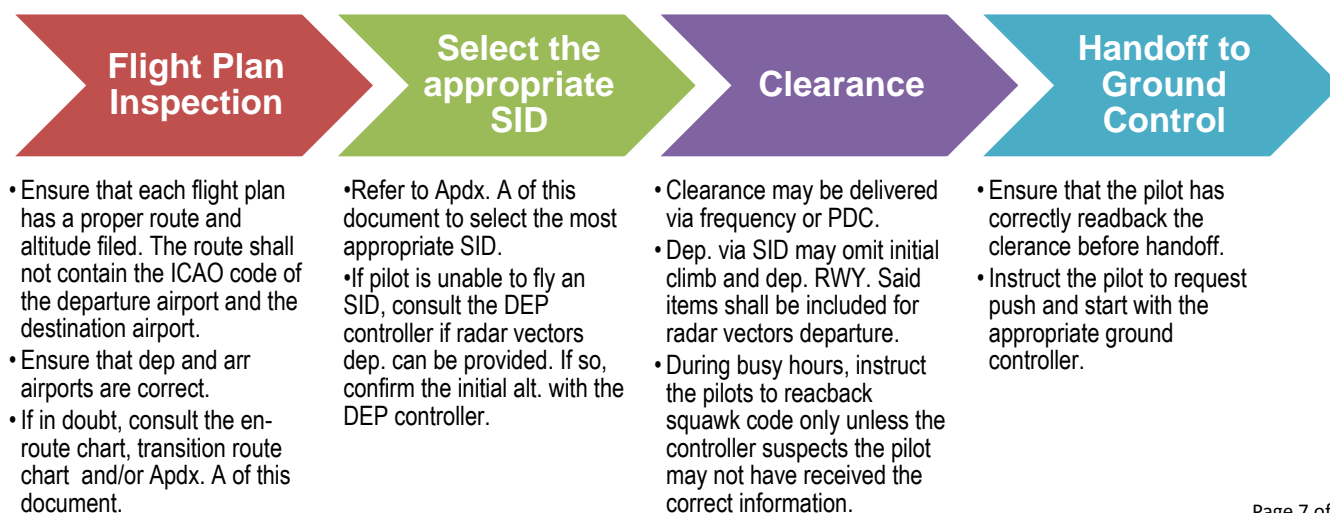
(4) Parts of the phraseology marked by ^ (i.e. departure runway) is optional when an aircraft is cleared via a SID

(5) Parts of the phraseology marked by brackets shall be completed by the resp. statements.

8.5. PRE-DEPARTURE CLEARANCE

8.5.1. In lieu of issuing clearance on Delivery frequency in the conventional manner, clearance delivery controller now has the option of issuing pre-departure clearance (PDC) via private text message. This reduces the communication needed over the frequency and can speed up the clearance delivery process. Clearance delivery controller shall refer to **SOP007** document for detailed procedures of issuing PDC.

Summary of Work Procedures of DEL Controllers

Flight Plan Inspection	Select the appropriate SID	Clearance	Handoff to Ground Control
• Ensure that each flight plan has a proper route and altitude filed. The route shall not contain the ICAO code of the departure airport and the destination airport. • Ensure that dep and arr airports are correct. • If in doubt, consult the en-route chart, transition route chart and/or Apdx. A of this document.	•Refer to Apdx. A of this document to select the most appropriate SID. •If pilot is unable to fly an SID, consult the DEP controller if radar vectors dep. can be provided. If so, confirm the initial alt. with the DEP controller.	• Clearance may be delivered via frequency or PDC. • Dep. via SID may omit initial climb and dep. RWY. Said items shall be included for radar vectors departure. • During busy hours, instruct the pilots to reacback squawk code only unless the controller suspects the pilot may not have received the correct information.	• Ensure that the pilot has correctly readback the clerance before handoff. • Instruct the pilot to request push and start with the appropriate ground controller.

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8.6 PREPARATION FOR TAXI

8.6.1   Ground controller shall ensure that the **current weather condition meets VFR requirement** before issuing taxi clearance for VFR aircraft, as per Macau AIP Section 7.2.5:

- Ground visibility more than 5000 meters
- Ceiling (BKN and OVC clouds) not lower than 1500 feet AGL

8.6.2   As per Macau AIP Section 7.3.4.1, Special VFR flights (SVFR) may be cleared at night under the following conditions (excerpts from Macau AIP Section 7.3.4.1):

- *"Traffic density is such that flights will not delay public transport aircraft.", and;*
- *"Weather observations show a visibility of at least 9 km and a cloud ceiling of not less than 1800 feet", and;*
- *"The scale of equipment carried by the aircraft is adequate for flying at night", and;*
- *"The flight is contained in Macau ATZ", or;*
- *"The flight has been initiated and authorised by adjacent ATS unit, or has been accepted by an adjacent ATZ unit."*

8.6.3   Ground control should issue taxi clearance to the appropriate departure runway-in-use as determined by TWR and announced on ATIS. If TWR is not available, the controller responsible for Macau Tower position shall determine the departure runway in use based on weather condition. If Macau Tower ATC service is not available, the ground controller shall determine the runway-in-use following the method Section 6A of this SOP document.

8.6.4   GND controllers shall note that the original Gate B9 and B11 will be replaced by General Aviation (GA) stands G01 to G15 according to AIP Supplement 01/16 dated 17 March 2016. **No aircraft shall be instructed to park at original locations of Gate B9 and Gate B11 until the new GA stands G01 to G15 are in use.**
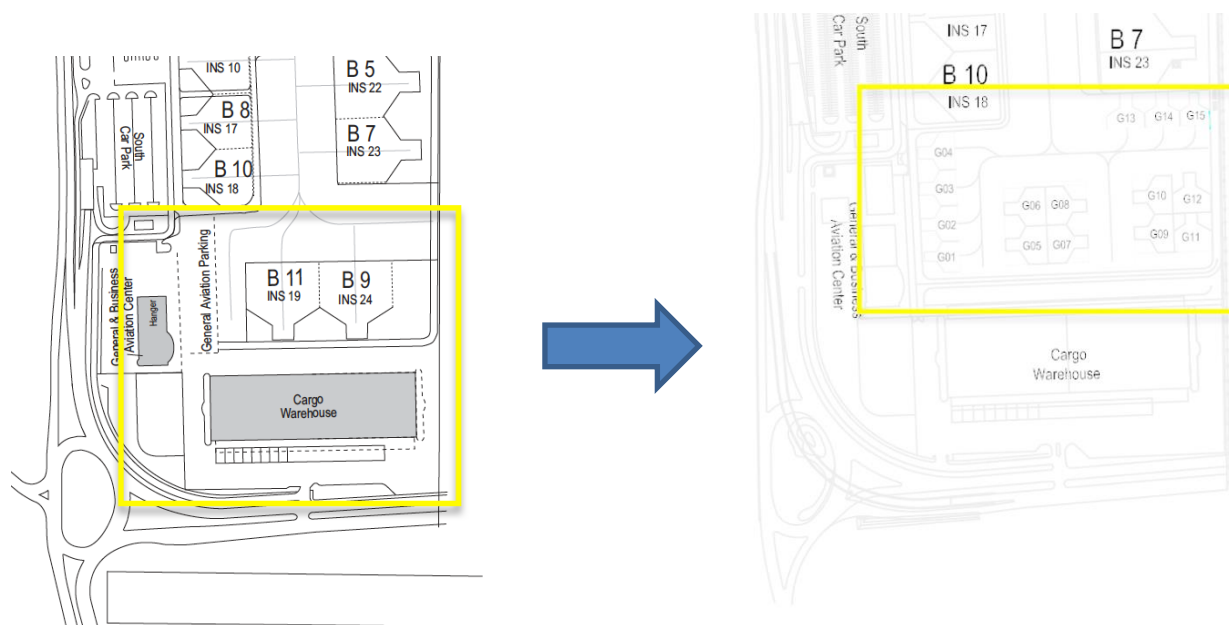

Figure 8.2: Gates B9 and B11 become Stands G01 to G15, according to AIP Supplement 01/16.
(Source: AIP Macau AD2-VMMC-53 and SUP 01/16)

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8.6.5   **COLOUR-CODED PUSH BACK PROCEDURES:** There are three colour codes for push back at VMMC: Blue, Green and Pink. The following table describes these three colour codes and their respective procedures.

COLOUR-CODED PUSH BACK PROCEDURES	
(Source: AIP Macau SUP 01/16)	
COLOUR CODE	**DESCRIPTION OF PROCEDURE**
BLUE (ALL except B7 & B10)	Aircraft pushback facing South or North depending on the Runway-in-use. If necessary, special instruction will be issued by Control Tower. Startup can be commenced after the engines cross the white taxi line protection.
GREEN (B7 and B10 only)	Pushback of aircraft on B7 or B10 in normal situation shall be done by pushing the aircraft tail towards GAP, and then towed forward until breakaway point 1 for aircraft with wingspan less than 36m (narrow body) and breakaway point 2 for aircraft with wingspan more than 36m (wide body). Breakaway point 2 also applies for situation that aircraft on B7 or B10 with APU problem, and requires starting up engine on stand while No aircraft is parked on G05 to G08. Except that the startup on stand due to APU problem, other startup can only be commenced when the pushback finishes at breakaway point.
PINK (B7 and B10 only)	The pink procedure requires pushing the aircraft tail towards North until either the beginning of Taxiway C1 for RWY16 departure or taxiway A for RWY34 departure. Except that the startup on stand due to APU problem, other startup can only be commenced when the pushback finishes. The procedure applies for pushback of aircraft with APU problem, which requires to start up engine on stand B7 or B10 while aircraft is parked on G05 to G08.

Due to limitations on various flight simulators, it is not practical to expect all aircraft to be able to perform push back colour PINK. **Hence, ground controllers should use the BLUE (all gates except B7 & B10) or GREEN (B7 & B10 only) colour-coded procedures when issuing push back and start up clearance.** Illustrative diagrams can be found in Appendix C of this SOP document. As in the real world, **when assigning the BLUE colour coded push back, the colour code may be omitted in communication**. Although memorization is not required, ground controller shall also be familiar with the parking/gate number arrangement according to the aerodrome charts.

8.6.6.   The ground controller shall provide the current QNH to the pilot when giving taxi clearance to the runway, unless it has been confirmed that the pilot has received the latest ATIS information. If the ATIS information has changed between the time the aircraft received its departure clearance and the time the aircraft is issued push back clearance, the ground controller shall advise the pilot that new ATIS information is available.

8.6.7.   For arrival traffic, **the ground controller shall ask the pilot if a specific parking or gate is requested.** If the pilot has no parking or gate preference, the ground controller shall assign

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a gate or parking based on the nature of the flight. (e.g. passenger aircraft should go to the gate, cargo aircraft should go to the cargo stand, GA aircraft should use GA stands)

8.7. PUSH BACK AND START UP

8.7.1. Prior to issuing push back and start up clearance, ground controller shall ensure that no other aircraft is in the immediate vicinity of that aircraft, and that such aircraft may not interfere with other aircraft taxiing on the taxiway after pushing back. **When a high volume of traffic is present at the aerodrome or within the airspace, it might be necessary for the ground controller to hold push back and start up activities for a specific amount of time to avoid over-crowding the manoeuvring area, subject to the coordination with other controllers on duty.** If holding is required, the ground controller shall use the following phraseology to instruct the aircraft to hold at the gate or parking.
(Reference Document: ICAO Doc 9432 4th Edition, Section 4.3)

Phraseology:

G: *(Callsign)* **STANDBY. EXPECT _____ MINUTE(S) DELAY DUE _____.**

Example 1: BHHN, STANDBY. EXPECT ONE MINUTE DELAY DUE BOEING 777 TAXIING BEHIND.

*   Example 2: BHHN, STANDBY. EXPECT THREE MINUTE DELAY DUE AIRBUS 330 ON YOUR RIGHT PUSHING BACK.*
G: *(Callsign)* **STANDBY. EXPECT PUSH BACK AND START UP AT __(TIME)__ DUE _____.**

*   Example 3: OASIS 101, STANDBY. EXPECT PUSH BACK AND START UP AT 1530 ZULU DUE FLOW CONTROL IN TERMINAL AIRSPACE.*

8.7.2. The following phraseology shall be used for push back and start up clearance:

Phraseology:

G: *(Callsign)* **START UP AND PUSH BACK APPROVED.** *(if other than Blue:)***PUSH BACK COLOUR GREEN/PINK**.
Example 1: CATHAY 401, START UP AND PUSH BACK APPROVED.

8.7.3. In case pilots are unfamiliar with the push back colour system, the ground controller may remind the pilot of the direction of pushback.

8.8 TAXI CLEARANCE

(Reference Document: ICAO Doc 9432 4th Edition, Section 4.4)

8.8.1 When issuing taxi clearance to aircraft, the ground controller shall consider any potential conflict that may occur. When needed, the controller shall instruct the aircraft to hold short certain taxiway(s).

8.8.2 When needed, aircraft may be instructed to follow other aircraft and/or give way to other aircraft.

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8.8.3   Ground controller shall ensure that the transponder of all aircraft taxiing on active taxiways is on **squawk normal** (i.e. Mode Charlie)

Phraseology:
G: *(Callsign)* **TAXI VIA TAXIWAY** *(taxiway sequence)* **TO** *(Destination). (Additional Information)*

*Example 1: BHHN, TAXI VIA TAXIWAY A, C1, C2 TO HOLDING POINT C3 RUNWAY 34. *QNH ONE-ZERO-ONE-SEVEN* (* only add QNH if it changes or if ATIS has not been set up yet)*

Example 2: BHHN, TAXI VIA TAXIWAY A, C1, C2 TO HOLDING POINT C3 RUNWAY 34. FOLLOW COMPANY BOEING TRIPLE SEVEN COMING FROM YOUR RIGHT.

Phraseology:
G: *(Callsign)* **TAXI VIA TAXIWAY** *(taxiway sequence)* **TO** *(Destination).* **BEHIND** *(Aircraft Type) (Direction)*

Example: BHHN, TAXI VIA TAXIWAY A, C1, C2 TO HOLDING POINT C3 RUNWAY 34 BEHIND AIRBUS A320 COMING FROM YOUR LEFT.

G: *(Callsign)* **TAXI VIA TAXIWAY** *(taxiway sequence)* **TO** *(Destination).* **GIVE WAY TO** *(Aircraft Type) (Direction).*

Example: BHHN, TAXI VIA TAXIWAY A, C1, C2 TO HOLDING POINT C3 RUNWAY 34 GIVE WAY TO AIRBUS A320 PASSING LEFT TO RIGHT.

G: *(Callsign)* **HOLD SHORT** *(taxiway/runway).*
Example 1: BHHN, HOLD SHORT TAXIWAY A.
Example 2: BHHN, HOLD SHORT RUNWAY 16.

8.9 HANDOFF TO TOWER

8.9.1   Ground controller may handoff aircraft taxiing to active runways for departure as they approach the designated holding point. It is not necessary for the ground controller to wait until the aircraft reaching the designated holding point to perform the handoff. During high volume of departure traffic, ground controllers shall coordinate with tower controllers for a specific handoff point (e.g. after passing holding point E for RWY 34 departure) to improve the control of flow. This also allows VFR/SVFR departure traffic to receive VFR clearance from TWR and be instructed to hold at a holding point in high traffic volume.

8.10 FROM THE RUNWAY

8.10.1   Once an aircraft has landed, or if a departure aircraft has aborted takeoff, the TWR controller shall instruct such aircraft to:

(a). Taxi past the holding position marking and then hold position on the taxiway

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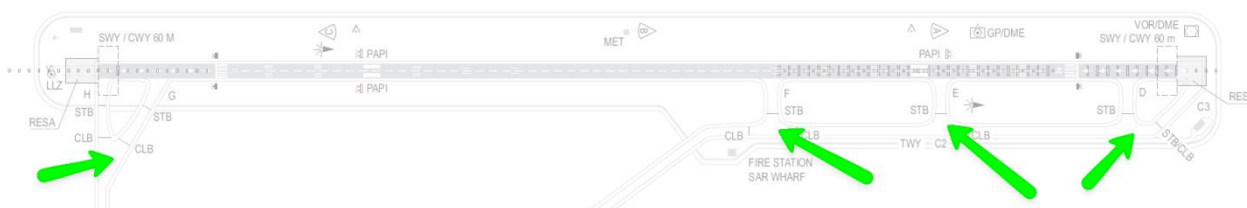## (b). Contact the appropriate ground controller according to Ground control sectors

Figure 8.3: The TWR controller shall instruct arrival aircraft to stop at the indicated locations and contact the GND controller. (Source: AIP Macau, AD2-VMMC-52)

8.10.2 Once such aircraft has contacted the Ground controller, the controller shall instruct the aircraft the aircraft to taxi to the destination (e.g. gate, cargo ramp, BAC or a runway-in-use for aircraft aborted takeoff).

8.11 RADAR TRACKING

8.11.1 Macau Ground shall not use radar tracking (F3 and F4 functions on the keyboard at all times)

Summary of Work Procedures of GND Controllers

Initial Inspection	Push back and start up	Taxi Clearance	Handoff to Tower Control
• Ensure that the departure aircraft has received the latest ATIS. If not, advise the current QNH. • For arrival aircraft, understand if the shortest taxi route will potentially interfere with other traffic	• (applies to DEP aircraft) • Check whether the aircraft may cause conflict with other aircraft on taxiway or adjacent aircraft that are also ready for push back. • Referring to the push back colour charts, select the most appropriate push back direction. (BLUE for all gates except for B7 & B10; GREEN for B7 & B10) • If gate hold is needed, advise delay time or est. push back time.	• Instruct the aircraft to taxi via the shortest route, if possible • After taxi clerance is given, constantly check each moving aircraft for potential conflict on the ground. If needed, instruct the aircraft to hold.	• Departure aircraft can be instructed to contact TWR prior to reaching the speciied holding point. • VFR/SVFR traffic will then receive VFR clerance from TWR and holding instructions (if needed).

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9 MACAU TOWER (VMMC_TWR)

9.1 AIRSPACE

9.1.1   Macau Tower is responsible for the Category C airspace within Aerodrome Traffic Zone (ATZ) (SFC to 3000 feet AMSL), per Macau AIP AD 2.17. The following except from Macau AIP AD 2.17 defines the airspace for VMMC ATZ:

"The Macau ATZ is a regulated airspace, extending in a circle of 5 NM radius from the aerodrome reference point except to the west where the boundary is a straight line parallel to the runway at a distance of 3 NM. There is a 5NM wide stub, out to 10NM on the approach to runway 34 and a 2 NM wide stub out to 6.27 NM (Jiuzhou DVOR) on the 215° (true bearing) inbound track to the runway 16 LLZ."

9.1.2   Macau Tower may provide radar control service to VFR flights within ATZ.

Figure 9.1: Macau ATZ Airspace (Source: Macau AIP AD 2-VMMC-58)

9.2 SPECIAL INSTRUCTIONS FOR VFR AND SVFR TRAFFIC

9.2.1   VFR and SVFR departing aircraft shall file a valid flight plan with a valid route prior to requesting for taxi clearance to the active runway. If an aircraft enters the Hong Kong CTR zones after departure from the Macau ATZ, a valid route shall contain all CTR zones and entry/exit routes through the aircraft will fly after departure. A detailed discussion of this can be found in the SOP006 document. The only exception to providing a valid route is when an aircraft remains in circuit within the ATZ. For VFR traffic, Macau Tower shall ensure that the current weather meets VFR minima prior to issuing clearance.

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9.2.2   Macau Tower shall be familiar with the **Macau AIP ENR 1.2 and AD 2-20 Section 7 "*Regulations for Local Flights in Macau Aerodrome Traffic Zone*"** prior to controlling traffic in ATZ.

9.2.3. Macau Tower shall **clear VFR and SVFR departing aircraft into the ATZ and assign a SSR transponder code** prior to granting takeoff clearance. For example, *"cleared VFR in ATZ at or below 3000 feet, squawk 3521."* Controllers shall be aware of that this is **separate from the takeoff clearance**. It has been observed to be a common mistake made by TWR controllers in the past.

9.2.4   For aircraft entering the ATZ from CTR zones, the TWR controller shall provide essential information about runways-in-use and current local air pressure on initial call.

Phraseology:

G: **ENTER CONTROL ZONE,** *SPECIAL VFR* **VIA** (route) *(altitude)* **RUNWAY** (designator) **QNH** (figures) *(instructions)*

Example: BHHN, enter ATZ (Aerodrome Traffic Zone), altitude 3000 feet or below, runway 34, QNH 1016.

Note: A clearance to enter control zone (ATZ) is no authorisation to join traffic circuit. If no clearance to join traffic circuit was issued the holding pattern has to be entered.

9.2.5   Since arrival VFR pilots don't need to check the ATIS, TWR must provide essential information about runways-in-use and current local air pressure on initial call.

9.2.6   VFR pilots are self-responsible for being separated visually from all traffic. Since GA aircraft may not have radar, TWR controller must ensure that weather minima are fulfilled and give traffic information about arriving and departing aircraft.

9.2.7   VFR aircraft remaining in traffic circuit shall fly right circuit if RWY34 is in use or right circuit if RWY16 is in use. This is to avoid deviation into the Zhuhai Approach airspace.

9.2.8   For information regarding visual approach and visual landing into VMMC, refer to Macau AIP AD2-VMMC-73 and AD2-VMMC-74.

9.2.9   Macau Tower shall also be responsible for traffic into and out of the Macau Heliport. The heliport is restricted to VFR use only. Refer to Macau AIP AD3 for details and procedures.

9.2.10 Helicopter flights between Macau ATZ and airfields/helipads in Hong Kong shall following the standard helicopter routes specified in Macau AIP ENR 3.4.

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9.2.11 VFR/SVFR departing **helicopter flights may be instructed to takeoff from its parking stand** at VMMC on VATSIM.

Phraseology:

G: *UNKNOWN* **TRAFFIC** (direction, distance and other information)

G: *UNKNOWN* **TRAFFIC** (figure) **O'CLOCK** bearing by clock reference and

distance) **MILES** (direction   of flight) (information)

G: (traffic) (significant point)

– SLOW / FAST MOVING

– CLOSING

– OPPOSITE / SAME DIRECTION

– OVERTAKING

– CROSSING LEFT TO RIGHT / RIGHT TO LEFT

G: If known:

– (type of aircraft)

– (level) / (relative level) (figures) * NOT CONFIRMED*

– CLIMBING / DESCENDING

Example:

- BHHN, landing Cathay-Pacific B777, 10 o'clock position, on 5 NM final RWY 07L.

- CPA401, VFR traffic, Cessna 152, 10 o'clock position, indicated altitude 1000 feet, on opposite direction.

9.3. DEPARTING TRAFFIC

    9.3.1. Once an aircraft is handed off from the Ground controller and is approaching the specified holding point, depending on the traffic situation, the TWR controller may issue one of the following instruction to the aircraft:

Instruction	Situation
Hold shot of runway	When there is activity on the runway or if the aircraft would cause conflict by entering the runway
Line up and wait	When entering the runway will not cause any conflict but the runway is not clear of preceding arrival aircraft or the separation between the aircraft in question and the preceding departure aircraft is not enough
Takeoff Clearance	When the runway is clear of activity and the spacing between the aircraft in question and the preceding aircraft is sufficient (VFR/SVFR traffic: VFR/SVFR clearance precedes the takeoff clearance)

    9.3.2. Prior to issuing takeoff clearance, except for aircraft remaining in ATZ, TWR controller shall obtain a release for each aircraft that will enter the terminal airspace after takeoff. Alternatively, the TWR controller may obtain a blanket release for all aircraft entering the terminal airspace after takeoff, however, this practice is discouraged during high-volume traffic. Macau Tower shall coordinate with the controller providing APP/DEP service prior the releasing departure aircraft into the terminal airspace. Such release shall be performed prior

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to takeoff and can be communicated via TeamSpeak or private message on the radar client. Conversely, controller providing APP service shall coordinate with the TWR controller and communicate with the TWR controller prior to the aircraft contacting tower.

9.3.3. For IFR departing aircraft requiring **radar vectors**, TWR controller shall provide a **heading along with the takeoff clearance**. For example, *"surface wind 100 degrees 9 knots, runway 16, cleared for takeoff. After departure, fly runway heading."*

9.3.4. VFR/SVFR clearance shall be given to VFR/SVFR departure aircraft PRIOR to the landing clearance. Controllers shall refer to SOP006 document for details.

9.3.5. If the departure aircraft has to abort takeoff, the TWR controller shall instruct the aircraft twice. After the instruction, the TWR controller shall confirm that the aircraft has acknowledged the cancel takeoff instruction. This is a common occurrence on VATSIM when aircraft randomly connects to the network while on an active runway. Once the condition permits, if the aircraft needs to return to the end of the runway for takeoff, the TWR controller shall instruct the aircraft to hold short of the closest taxiway parallel to the active runway and hand off the aircraft to the GND controller.

Cancelling takeoff clearance:

Phraseology:

(Takeoff roll commenced) T: (Callsign) **STOP IMMEDIATELY.** (Callsign) **STOP IMMEDIATELY. ACKNOWLEDGE.**

(Takeoff roll not commenced) T: (Callsign) **HOLD POSITION, CANCEL TAKE OFF. I SAY AGAIN CANCEL TAKE OFF DUE** (reason).

Example 1:

VHHH_S_TWR: Oasis 100, hold position, cancel take off. I say again cancel take off due aircraft connected online on runway.

9.3.6. Once a departure aircraft is airborne, the TWR controller hand off the aircraft to the DEP controller.

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9.4. ARRIVAL TRAFFIC

    9.4.2. Once an IFR arrival aircraft is handed off from the APP controller to the TWR controller, the TWR controller may issue one of the following instructions:

Instruction	Situation
Continue approach	When there is activity on the runway or if the preceding arrival aircraft has not vacated the same runway
Landing clearance	When the runway is clear of activity

    9.4.3. When a landing clearance cannot be granted, the TWR controller shall advise the traffic information to such aircraft, particularly the other aircraft that is preventing the landing clearance being issued.

    9.4.4. **MISS APPROACH:** A miss approach can be initiated by either the pilot or the controller. On VATSIM, a pilot may call for go-around at *Decision Height (DH)* or *Decision Altitude (DA)* primarily due to weather or unforeseen obstruction to the runway (Refer to Section 8.6.9 of the HKVACC Training Manual TM-GEN-001 for a detailed discussion). Only when necessary, a controller may ask the aircraft to go-around when there is unforeseen obstruction to the runway or the runway is not clear of activity when the aircraft is at or below DH. The latter should be rare and all controllers shall practice safe and sound separation to prevent that from happening. **Once an aircraft has started the go around, the controller cannot cancel the go around clearance.**

Go around (requested by the pilot):

    Phraeology:

    P: **GOING AROUND.** *(Callsign)*

    T: *(Callsign)* **ROGER.** *(instruction if applicable).*

    Example 1:

        OHK100: Going around, Oasis 100.

        VMMC_TWR: Oasis 100, roger. Follow published miss approach procedure (if unsure aircraft will follow published missed approach) OR *Oasis 100, roger. Flying runway heading. Climb to 5000 feet.* (if a specific instruction is given by the APP/DEP controller)

Go around (requested by the controller):

    Phraeology:

    T: *(Callsign)* **GO AROUND.** *(instruction, if requested by APP/DEP to deviate from published miss approach)* *(Reason, if communication permits)*

    T: *(Callsign)* **GOING AROUND.**

    Example 2:

        VMMC_TWR: Oasis 100, go around. OR *Oasis 100, go around. Flying runway heading. Climb to 5000 feet. Aircraft entered runway without permission (*if a specific instruction is given by the APP/DEP controller)

        OHK100: Going around, Oasis 100.

    9.4.5. Aircraft is assumed to follow the published missed approach procedures when a go around is necessary. TWR controller shall advise landing aircraft on miss approach to follow the

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published miss approach procedures if unsure. This is especially important during major events online.

9.4.6. As IFR aircraft has priority over VFR/SVFR aircraft, TWR controller shall give priority to IFR arrival aircraft when there is VFR/SVFR in the ATZ or in circuit. When necessary, the TWR controller shall instruct the VFR/SVFR traffic to extend downwind in the circuit or hold at one of the designated holding points in the VFR charts.

9.4.7. Once an aircraft has landed, the TWR controller shall instruct the aircraft to holding short of the nearest taxiway parallel to the runway-in-use and to contact the appropriate GND controller.

9.5. COORDINATION WITH ZHUHAI APPROACH

9.5.1 IFR aircraft departing to Zhuhai Approach airspace from Macau ATZ shall contact Zhuhai Approach when airborne after takeoff. For a list of SIDs entering Zhuhai airspace after departure from VMMC airport, refer to Appendix A of this SOP.

9.5.2 Tower shall refer to ENR 1.5 Section 3 for a list of Transfer of Control Points (TCP) and their respective altitudes between Macau ATZ and Zhuhai airspace.

Flight Procedures	Transfer of control				
	Transferring ATCU	Accepting ATCU	Point/Position	Altitude	
RWY 34 Arrival	Zhuhai	Hong Kong	ROMEO	6000 ft	
	Zhuhai	Hong Kong	'MCU' VOR	7000 ft	For traffic from the direction of 'NLG' VOR
	Hong Kong	Macao	As soon as aircraft established on 'MCN' ILS	Appropriate profile altitude	
RWY 34 Departure or Missed Approach	Macao	Zhuhai	Initial right turn after DEP/MAP	900 m or below	
	Zhuhai	Hong Kong	'LKC' VOR	6 000 ft	Reach 6 000 ft by 'LKC' VOR
RWY 16 Arrival	Hong Kong	Zhuhai	INDUS	2 700 m	For traffic from Hong Kong FIR to Macao via Zhuhai airspace.
	Zhuhai	Macao	As soon as aircraft established on 'MCS' LLZ	3 000 ft or below	For all arrivals
RWY 16 Departure	Macao	Hong Kong	As soon as practicable after departure and before enter Hong Kong FIR, climbing to assigned SID altitude	3 000 ft or below	For SIDs transiting HK FIR via PAPA, HK ATC shall not climb aircraft above 4000 ft until PAPA, unless otherwise co-ordinated and agreed with Zhuhai Approach.
	Hong Kong	Zhuhai	Common FIR boundary between Hong Kong and Zhuhai	1 800 m or below	Climbing to 1800 m for aircraft on SHL/ NLG SIDs, climbing to 1500 m for aircraft on BIGRO SID, unless otherwise co-ordinated and agreed with Zhuhai Approach.
RWY 16 Missed Approach	Macao	Hong Kong	Crossing 'MCU' VOR climbing to 4 000 ft	3 000 ft or below	
	Zhuhai	Hong Kong	Crossing 'MCU' VOR climbing to 4 000 ft	4 000 ft or below	For missed approach traffic under control of Zhuhai APP
	Hong Kong	Zhuhai	INDUS	1 800 m	

AMDT 12   Civil Aviation Authority – Macao, China

AIP MACAO 24 JUN 2004   3. Transfer of Control Points   ENR 1.5-2

Figure 9.2: Transfer of Control Points for VMMC Airport (Source: Macau AIP ENR1.5-2)

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9.5.3   The coordination for VMMC airport between Hong Kong FIR and Guangzhou FIR shall be discussed in details in the Letter of Agreement (Document number: LOAZGZU-VHHK) between the two FIRs, created and maintained by Hong Kong VACC and VATPRC division.

9.6 RADAR TRACKING

9.6.1   VMMC_TWR shall not use radar tracking (F3 and F4 functions on the keyboard) for IFR aircraft. However, the TWR controller shall use radar tracking for VFR aircraft flying within ATZ when providing radar service.

10 DEVIATION FROM THE AIP OF MACAU SAR

10.1 While it is the goal of VATSIM to simulate real-world navigation environment, there are certain circumstances where strictly following real-world regulations may not fit the context or needs of the VATSIM online environment. In the interest of the VATSIM community, certain exemptions are granted to deviate from the AIP of Macau or real-world operations.

10.2 ~~PUSHBACK PROCEDURE~~

~~10.2.11   In the view that many pilots flying to and from VMMC airport may not be familiar with the real-word pushback colour system outlined in Macau AIP AD 2.20 Section 8, AD 2.20 Section 8 is not adopted on VATSIM. In lieu of the colour system, ground controllers are to provide pushback direction for departing aircraft. For example, *"pushback approved. Face east."*, or *"pushback approved. Tail north".*~~   **(Refer to Section 8.10 and Appendix C for push back procedures)**

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APPENDIX A: REFERENCE GUIDE FOR VMMC SID ROUTES

Departure to Guangzhou FIR (Zhuhai Approach provides terminal ATC):

END POINT	RWY34	RWY16	TO AIRWAY(S)
SHL	SHL5D*	SHL9D*	A461 (North), G471 (East), W22 (North)
	SHL6D	SHL1D	
	SHL7D[1]	SHL2D[1]	
MIPAG	MIPAG5D*	MIPAG9D*	W21 (NW to CEN or SE to GLN)
	MIPAG6D	MIPAG1D	
	MIPAG7D[1]	MIPAG2D[1]	
NLG	NLG5D*	NLG9D*	V19 (West)
	NLG6D	NLG1D	
	NLG7D[1]	NLG2D[1]	
BIGRO	BIGRO4D*	BIGRO9D*	G221, R200 (West)
	BIGRO8D	BIGRO1D	
	BIGRO7D[1]	BIGRO2D[1]	

*(SID marked with * indicates preferred SID route)*

[1]*Indicates a RNAV (GNSS) SID route. Aircraft must meet ICAO RNP1 standard or equivalent*

Departure to Hong Kong FIR (Hong Kong Approach provides terminal ATC):

END POINT	RWY34	RWY16	TRANSITION.EXIT POINT	ALT AVAILABLE
ALLEY	ALLEY2T*[1]	ALLEY2P*[1]	V10.SIKOU	*A202:S0660(ZJHK), S0720(ZJHK), S0840(ZJSY), S1040, S1160, S1200* *R339: S0600(ZGZJ), S0720 (ZGNN), S0780(ZGNN), S0980, S1040, S1100, S1160, S1200*
	ALLEY2U[1]			
	ALLEY1V**		V31.IDOSI	*A1: F280, F300, F340, F380, F400, F430*
	ALLEY1W		V32.EPDOS	*L642: F280,F310,F320,F350,F360,F390,F400*
CONGA	CONGA2T*[1]	CONGA2P*[1]		
	CONGA3U[1]		V3.ENVAR	*M750: F270 or above at all times; No F290 2300-1159UTC* *G86: F290, F330, F370, F390, F410*
	CONGA1V**			
	CONGA2W			
GRUPA	GRUPA2T*[1]	GRUPA2P*[1]	V4.NOMAN	*A461 & M50.: F290, F330, F370, F410*
	GRUPA3U[1]			
	GRUPA1V**		V5.SABNO	*A583: F290, F330, F370, F410*
	GRUPA2W			
SOUSA	SOUSA3T*[1]	SOUSA2P*[1]	V1.DOTMI	*Landing ZGOW: S0450* *To ZSAM & ZSQZ: S0690,S0750* *To ZSFZ & ZSWY: S0690, S0750, S0810, F290* *From VHHK FIR: F290,F330,F350,F390*
	SOUSA3U[1]			
	SOUSA2V**		V13.LELIM	*Landing ZSPD: F330* *Landing ZSQD, ZSYT, ZYTL: F330, F350*
	SOUSA2W			

*(SID marked with * indicates preferred SID route, SID marked with ** indicates preferred SID route for non-RNAV aircraft)*

[1]*Indicates a RNAV (GNSS) SID route. Aircraft must meet ICAO RNP1 standard or equivalent*

Red colour indicates an update in this release of the document.

(Reference document: Macau SAR AIP AD2, Hong Kong AIP ENR 1.8 and People's Republic of China AIP ENR 6)

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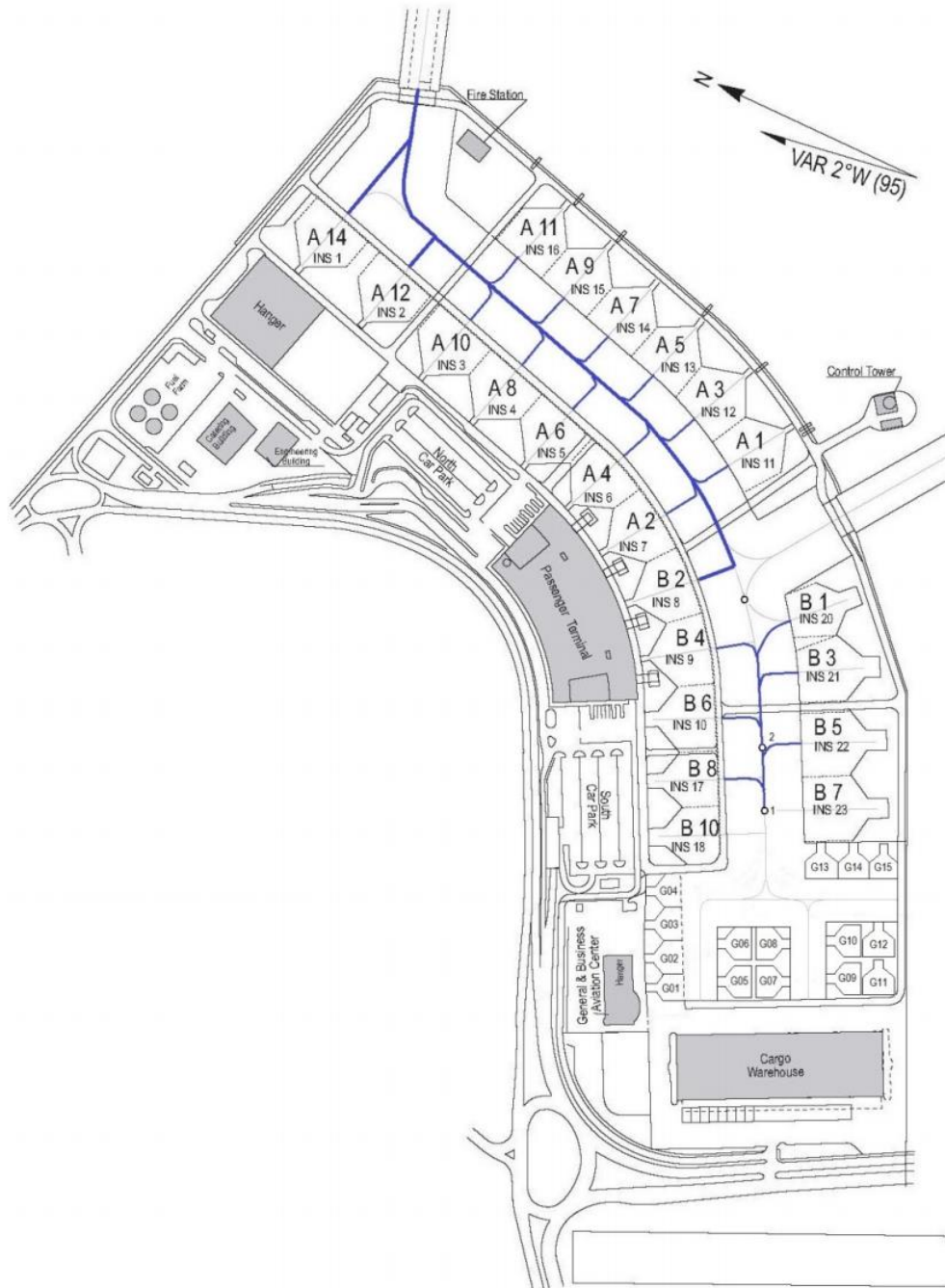**APPENDIX B: TRANSPONDER SQUAWK CODE ASSIGNMENT FOR MACAU AIRPORT (VMMC)**

1. **Aircraft Departing Macau International Airport (VMMC)**

SSR Codes	Airport	Status
3521-3537	VMMC	IFR and VFR departure

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APPENDIX C: COLOUR-CODED PUSH BACK FOR MACAU AIRPORT (VMMC)

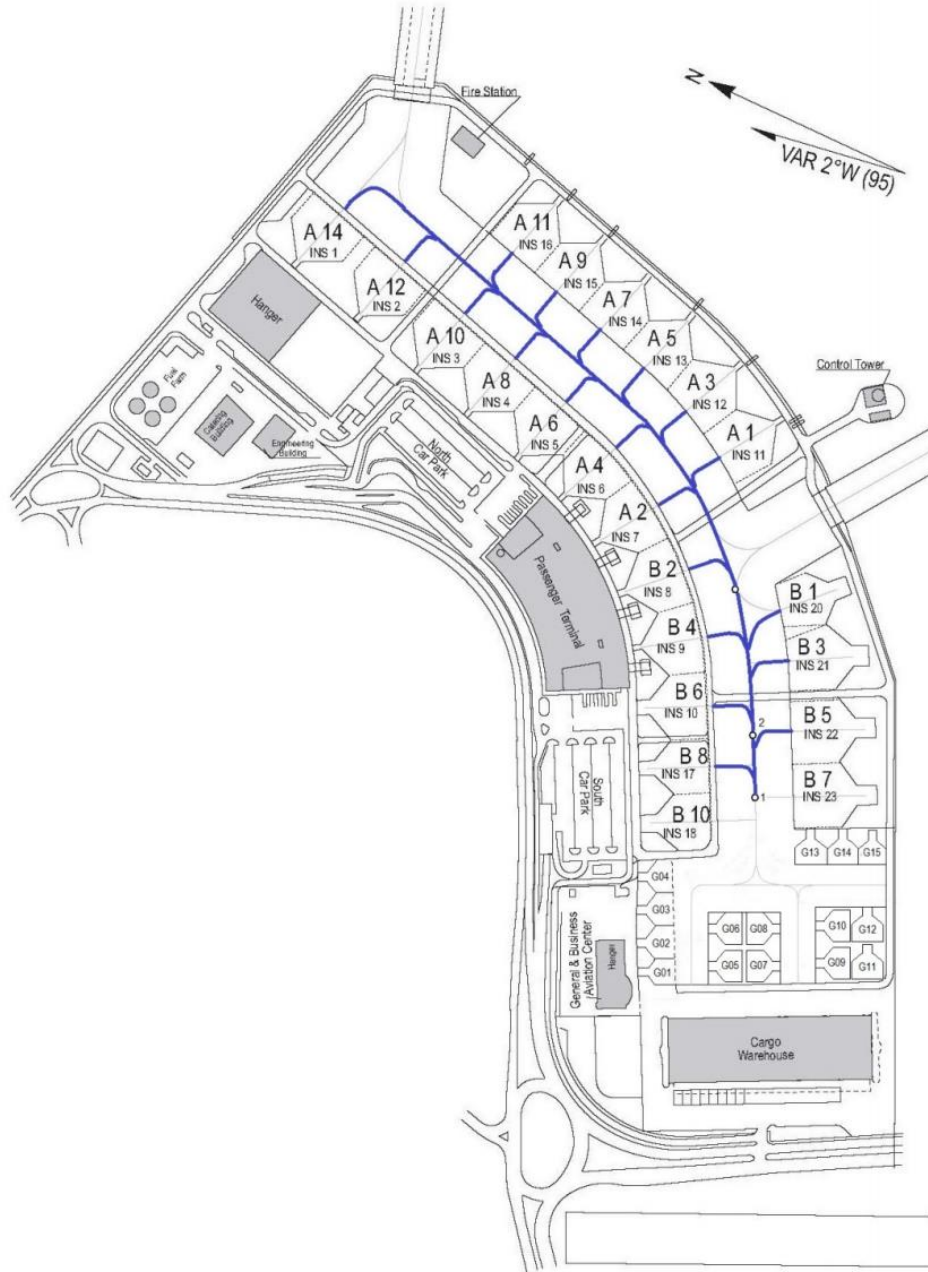C.1: PUSH BACK COLOUR BLUE ALL GATES EXCEPT B7 AND B10, RWY 34)

(Source: AIP Macau SUP 01/16)

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APPENDIX C: COLOUR-CODED PUSH BACK FOR MACAU AIRPORT (VMMC) *(CONTINUED)*

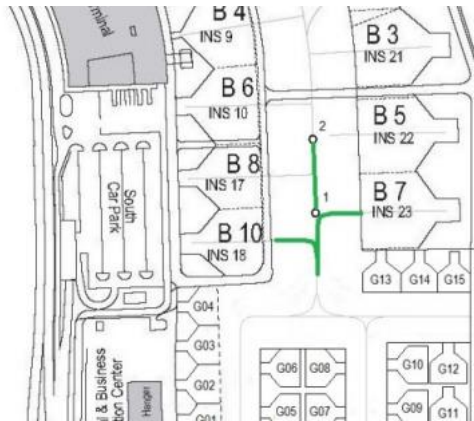### C.2: PUSH BACK COLOUR BLUE (ALL GATES EXCEPT B7 AND B10, RWY 16)
(Source: AIP Macau SUP 01/16)

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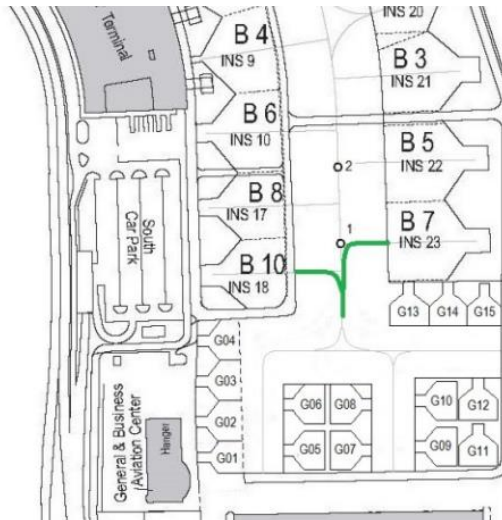
C.3: PUSH BACK COLOUR GREEN (B7 AND B10, WINGSPAN > 36M)
(Source: AIP Macau SUP 01/16)

C.4: PUSH BACK COLOUR GREEN (B7 AND B10, WINGSPAN < 36M)
(Source: AIP Macau SUP 01/16)

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RECORD OF REVISION

DATE	REV.	REVISION CONTENT	APPROVAL
		1. **Rewrite Section 8** 2. **Delete Section 9.2** 3. **Update Appendix A** 4. **Added Appendix C**	**A Tang**