STANDARD OPERATING PROCEDURE (SOP)
DOCUMENT NUMBER: HKVACC-SOP002-R6
DATE ISSUED: 07 DEC 2024
REVISION: 6

SUBJECT: Macau International Airport (VMMC) Standard Operating Procedures

EFFECTIVE DATE: 07 DEC 2024

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

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 the Facilities Director This SOP shall be maintained, revised, updated or cancelled by the Facilities Director. Any suggestions for modification / amendment to this SOP should be sent to the Facilities Director 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"	121.725
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"	121.975

**use only during major events or high departure traffic volume*

5.1.3. When any position covering Macau aerodrome, is online, the controller may elect to set up voice Automatic Terminal Information Service (ATIS) for Macau. The following frequency shall be used:

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

5.2. TRANSITION LEVEL

5.2.1. In the interests of consistency, on VATSIM the Transition Level for Macau International Airport (VMMC) shall be the same as the Transition Level for Hong Kong International Airport (VHHH). This means that the Transition Level is FL110 when the local QNH is 980 hPa or above, or FL120 or higher (by ATC) when the local QNH is 979 hPa or below.

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 RWY 34 shall by default be assigned ILS Z approach, while IFR aircraft landing on RWY 16 shall by default be assigned LOC Z approach.** 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 **AD 2.21**, Noise Abatement Procedures are in place for Macau International Airport (VMMC). However, only Section 1 of **AD 2.21** is observed on VATSIM.

7.2. Section 1.1.1 of Macau AIP **AD 2.21**:

"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 **AD 2.21**:

"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"

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 Ground 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. Ground controllers should also check for the **runway-in-use** (this is determined by Tower and announced on ATIS) and runway closure. If Tower is not online, the Ground controller may & 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 Tower is not online.

8.2.3. Normally, it is the **responsibility of the controller to issue SID to departing IFR aircraft**. Controllers shall assign RNAV SIDs by default. In such situation, the route in the flight plan submitted by the pilot will begin with the transition route (e.g. V621, V631, V641 etc.) or initial waypoint. The Delivery controller shall prepend the cleared SID into the aircraft's flight plan after the enroute clearance has been given. The departure runway shall also be included to allow EuroScope to display the SID routing correctly. **Ensure that airfields are not included in the route.**
(for example: CONGA4T/34 CONGA... if cleared CONGA4T departure)

8.2.4. 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 NUDPI.** if cleared radar vectors departure to NUDPI via RWY 34)

8.2.5. IFR departing aircraft following a SID will climb via SID to initial altitude:

- Runway 34 to LUKBU (NUDPI, CONGA, ALLEY, GRUPA): 6000ft
- Runway 34 to Guangzhou (SHL, NLG, MIPAG, BIGRO): 1200m
- Runway 16 to LUKBU (NUDPI, CONGA, ALLEY, GRUPA): 4000ft
- Runway 16 to BIGRO: 1500m
- Runway 16 to Guangzhou except BIGRO (SHL, NLG, MIPAG): 1800m

8.2.6. Controllers shall note that the NLG SIDs are for departures to ZGSZ only. Refer to the Hong Kong vACC – VATPRC Letter of Agreement for more details.

8.2.7. For radar vectors departure, the ground controller shall consult with Hong Kong Departure and/or Zhuhai Approach for an initial climb altitude. To reflect this altitude, delivery controller shall **set the temporary altitude** of IFR departing aircraft prior to issuing clearance. When Zhuhai Approach is offline and RWY 34 is in use, aircraft shall be cleared on a heading of 040 and an initial climb altitude with respect to Section 8.2.5, where the altitude shall base upon where the SID would normally end (e.g. 1200m for Guangzhou departures). If the aircraft is not departing into Zhuhai airspace, the Tower controller shall directly hand the aircraft off to the controller covering Hong Kong Departure after departure.

8.2.8. If the aircraft re-enters Hong Kong airspace after departure, the Delivery controller shall first identify the departure route under which the aircraft will fly within Hong Kong FIR. Generally, with the exception of aircraft departing towards PRC airspace (using Chinese RVSM metric altitudes, except for Sanya Oceanic FIR), the Delivery controller shall assign an altitude according to the ODD-EVEN rule with reference to the altitudes available within the Letters of Agreement with each neighbouring FIR. These altitudes may also be found within the Hong Kong vACC Cue Card. The ODD-EVEN rule within a RVSM airspace, simply put, assigns altitude of flight according to the magnetic track of the aircraft.

8.2.9. Assignment of cruising altitude for aircraft not re-entering Hong Kong 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 (vatprc.net/rvsm) or the Hong Kong vACC Cue Card.

8.2.10. Ground controller shall check if the voice flag is set in the remarks section and add or correct it if required:

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

8.2.11. **VMMC_GND does not issue clearance to VFR departing aircraft.** VFR departing aircraft can contact Macau Ground directly for taxi clearance. Macau Ground shall also issue a VFR squawk code to the aircraft.

8.2.12. Controllers shall refer to the Hong Kong vACC Cue Card for a list of available SIDs. Should the automatic squawk code assignment function provided by the TopSky plugin fail, then controllers may also refer to the Cue Card for a list of available squawks.

8.2.13. In the real world, an IFR flight plan contains a variety of information. However, some of this information may not necessarily pertain to the work of virtual ATC on VATSIM. 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.

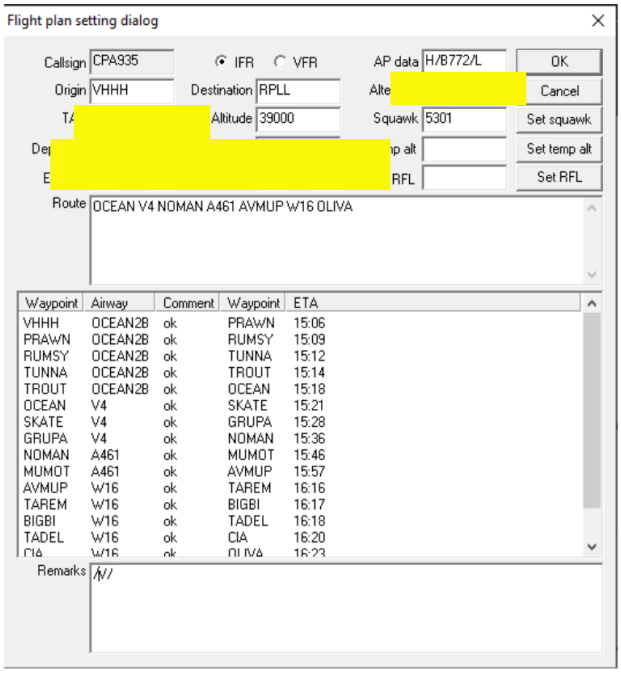


Figure 8.1: A sample EuroScope flight plan window. The fields highlighted in yellow are considered optional for issuing clearance.

8.2.14. Controllers may refer to SOP001-ANNEX-1 for detailed examples on flight plan inspection.

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 the initial climb altitude for each SID is different, Macau Ground shall include the initial climb altitude in the IFR clearance.

8.3.3. As per real world practice, the QNH for Macau shall be provided with the IFR clearance if Runway 16 is in use. If Runway 34 is in use, then the QNH for Zhuhai shall be provided with the IFR clearance. Controllers may utilise the QNH for Shenzhen (ZGSZ) as the QNH for Zhuhai.

8.3.4. When radar vectors departure is used, the Ground controller shall specify "**radar vectors departure**", **the departure runway** and the assigned **initial climb altitude** in the IFR clearance.

8.3.5. 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, the Delivery controller shall state the latest QNH instead.

8.4. PHRASEOLOGY

Phraseology:
G: (Callsign), **CLEARED TO** ____, **FLIGHT PLANNED ROUTE,** ____ **DEPARTURE. INITIAL ALTITUDE** ___ **FEET/METRES, ZHUHAI/MACAU QNH** ____ (depending on runway), **SQUAWK** ____. **INFORMATION** ____.

Example 1: AIR MACAU 139, CLEARED TO TAIPEI TAOYUAN, FLIGHT PLANNED ROUTE, CONGA3T DEPARTURE, INITIAL ALTITUDE 6000 FEET, ZHUHAI QNH 1005, SQUAWK 3301. INFORMATION A CURRENT.

Example 2: AIR MACAU 139, CLEARED TO TAIPEI TAOYUAN, FLIGHT PLANNED ROUTE, RADAR VECTORS DEPARTURE. RUNWAY 16, INITIAL ALTITUDE 4000 FEET, MACAU QNH 1005, SQUAWK 3301. INFORMATION A CURRENT.

8.5. PRE-DEPARTURE CLEARANCE

8.5.1. In lieu of issuing clearance on Delivery frequency in the conventional manner, the 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 on issuing PDCs.

8.6. PREPARATION FOR TAXI

8.6.1 The Ground controller shall ensure that the **current weather conditions meet Visual Meteorological Conditions (VMC)** 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 The Ground controller should issue taxi clearance to the appropriate departure runway-in-use as determined by Tower and announced on ATIS. If Tower 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 described in Section 6.1.

8.6.4 **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)	
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 A** 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.

8.6.5. For GA stands **G01 – G15**, the pushback / tow breakaway procedure shall be followed for departing aircraft.

Stands **G01 – G06** are assigned breakaway point **X**, located on the taxiway centreline behind stand **G03**.

Stands **G07 – G10** are assigned breakaway point **Y**, located on the taxiway centreline ahead of stand **G10**.

Stands **G11 – G15** are assigned breakaway point **Z**, located on the taxiway centreline behind stand **G13**.

Controllers shall note that simultaneous pushback / tow operations are not allowed on **Y** and **Z**. Engine start-up on stand is also not allowed, however exceptions can be made for stands **G06, G08, G10** and **G13** subject to the traffic situation.

When assigning the pushback / tow procedure, the aircraft shall be given the breakaway point in communication.

Owing to the fact that not all simulators support push and tow operations, if an aircraft reports that they are unable to follow this procedure, controllers may issue a standard pushback clearance with just the departure runway. For example:

Phraseology:
Example:
BHLC, PUSH AND START APPROVED, RUNWAY 34.

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 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 the GA stands) Alternatively, controllers may assign the parking stand generated by the Ground Radar Plugin.

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. Ground controllers shall also ensure that the aircraft is squawking the correct transponder code with Mode C before issuing push back clearance. **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.

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.

(Reference Document: ICAO Doc 9432 4th Edition, Section 4.3)

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

Phraseology:
G: (Callsign) **PUSHBACK AND START APPROVED. RUNWAY ___.** (if other than Blue) **FOLLOW GREEN/PINK PROCEDURE.**

Example 1: CATHAY 401, PUSHBACK AND START APPROVED, RUNWAY 34, FOLLOW GREEN PROCEDURE.

8.7.3. In case pilots are unfamiliar with the push back colour system, the ground controller may refer the pilot to the diagrams mentioned above, which are on the Macau AIP website. These diagrams are also available on the Hong Kong vACC website. Alternatively, the ground controller may remind the pilot of the direction of pushback **after** the push back colour is advised.

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.

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
(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).

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."

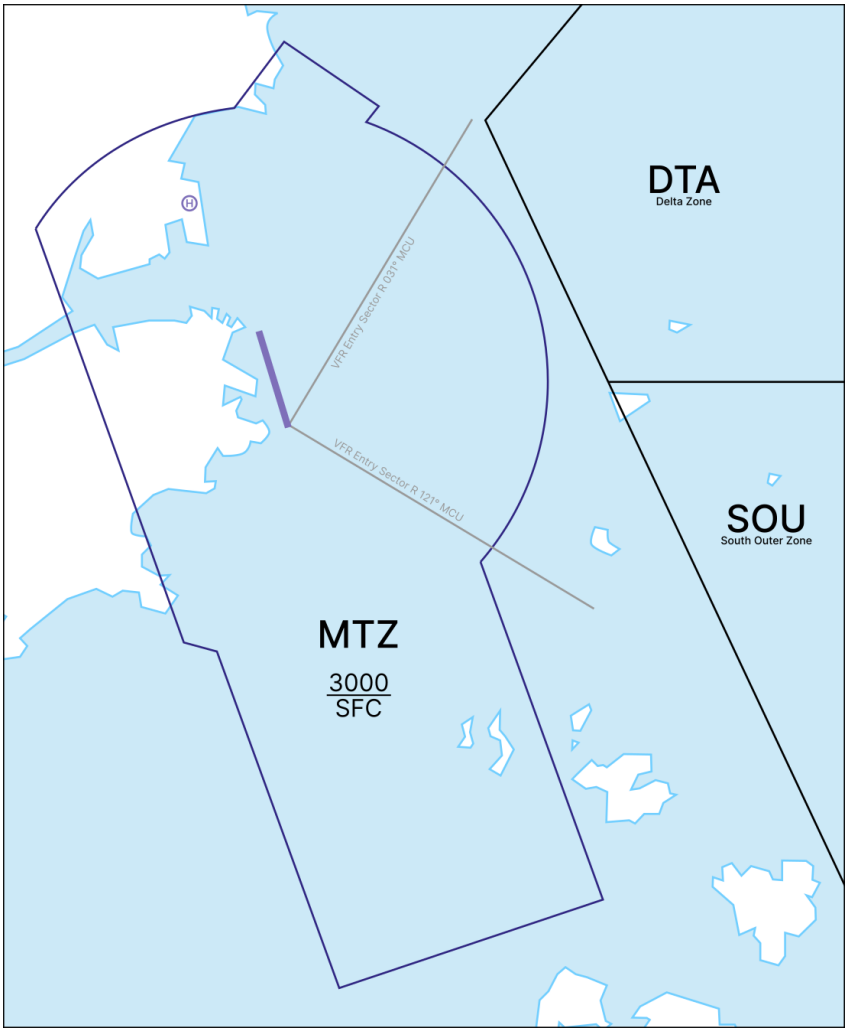


Figure 9.1: Macau ATZ Airspace

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. A SSR transponder code shall be assigned with the clearance.

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. When there is a controller responsible for Hong Kong Zone Control, Macau Tower shall coordinate with Zone Control regarding the clearance limit of a VFR / SVFR aircraft intending to enter the Hong Kong CTR. Normally, **VFR and SVFR aircraft** are cleared to **a specific VRP / zone within Hong Kong CTR**. Controllers should note that the clearance limit shall **not** be one of the following, unless otherwise coordinated with the respective unit:

- Other controlled ATZs
- Anywhere outside the Hong Kong CTR
- UCARA
- Repeated VRPs (as filed in the flight plan)

In all four cases above, the clearance limit shall be the VRP / zone just before the aforementioned "point". In cases where the pilot requests to hold/stay at a certain VRP / zone for an extended period of time, then the clearance limit shall be that specific VRP / zone. In all cases, a new VFR clearance will need to be issued when the pilot is ready to proceed further. For VRPs that are not directly accessible via a straight-out departure, additional instructions to join the traffic circuit and the VRP at which the aircraft can expect to leave the ATZ shall be given.

Phraseology:
T: (Callsign), **CLEARED TO** (Zone / VRP within CTR), **STANDARD ALTITUDE RESTRICTIONS**, (After Departure Instructions), (QNH).

Example:
BHLC, CLEARED TO HARBOUR, STANDARD ALTITUDE RESTRICTIONS, QNH 1013.

Controllers shall instruct aircraft to follow standard altitude restrictions on entry/exit routes as per AIP AD 2.19.3.1. It is not necessary to instruct aircraft to maintain VFR at or below a certain altitude once the aforementioned instruction has been given.

For example, assume an aircraft has filed a flight plan with the route:
MTZ HZMB DTA SSK ATZ

Note that HZMB is a non-standard abbreviation for the Hong Kong – Zhuhai – Macau Bridge.

The clearance shall then be:

Phraseology:
Example:
BHLC, CLEARED TO SHAM SHEK, STANDARD ALTITUDE RESTRICTIONS, QNH 1013.

9.2.4. If Hong Kong Zone Control is offline or for VFR / SVFR aircraft **not** intending to enter the Hong Kong CTR, Macau Tower shall **issue a clearance to the Macau ATZ Boundary to VFR / SVFR aircraft leaving the ATZ**. For example:

Phraseology:
T: (Callsign), **CLEARED TO THE MACAU ATZ BOUNDARY** (Altitude), (QNH).

Example:
BHLC, CLEARED TO THE MACAU ATZ BOUNDARY, MAINTAIN VFR AT OR BELOW 3000FT. QNH 1013.

Controllers shall be aware of that this is **separate from the takeoff clearance**. In the case of Hong Kong Zone Control being offline, the traffic shall be instructed to monitor UNICOM 122.800 MHz upon reaching the ATZ boundary.

9.2.5. Fixed wing VFR and SVFR traffic remaining within the circuit in the ATZ shall be given a clearance in the following format:

Phraseology:
T: (Callsign), (Circuit Joining Instruction), (QNH).

Example:
BHLC, AFTER DEPARTURE JOIN RIGHT HAND CIRCUIT RUNWAY 34. QNH 1013.

9.2.4. Aircraft entering the ATZ from other CTR zones shall be given runways-in-use on initial contact. A clearance to perform a manoeuvre inside the ATZ / clearance limit within the ATZ implies a clearance into the ATZ (e.g. joining a leg of the circuit or clearing aircraft directly to Macau). See example below:

Phraseology:
T: (Callsign), (Runways-in-use), (QNH), (Additional Instructions).

Example:
BHLC, RUNWAY 34 IN USE, QNH 1013, JOIN RIGHT HAND CIRCUIT RUNWAY 34.

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

9.2.6. VFR and SVFR aircraft remaining in the circuit shall fly a left-hand circuit if RWY 16 is in use or right-hand circuit if RWY 34 is in use. This is to avoid deviation into the Zhuhai Approach airspace.

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

9.3. MACAU ATZ HELICOPTER PROCEDURES

9.3.1. Macau Tower is responsible for traffic in and out of the Macau Heliport (VMMH). This heliport is located above the Macau Outer Harbour Ferry Terminal. It is an uncontrolled heliport and is restricted to VFR use only. As such, no takeoff or landing clearances shall be issued. Aircraft may only be instructed to report on ground / airborne. This does not preclude Macau Tower from issuing VFR / SVFR clearances as this is separate to a takeoff / landing clearance.

9.3.2. Helicopter flights between Macau Heliport and Shun Tak Heliport shall follow the standard helicopter routes specified in Macau AIP **ENR 3.4**. These are also available in SOP006.

9.3.3. Clearances for these standard helicopter routes shall be issued in accordance with Section 9.2.3, in addition to the route to be followed. For example:

Phraseology:
T: (Callsign), **CLEARED TO SKY SHUTTLE HELIPORT VIA** (Route), **STANDARD ALTITUDE RESTRICTIONS,** (QNH), (Squawk).

Example:
EAST ASIA 138, CLEARED TO SKY SHUTTLE HELIPORT VIA ROUTE B1, STANDARD ALTITUDE RESTRICTIONS, SQUAWK 5201.

When Zone Control is offline, then clearances shall be issued as per Section 9.2.4.

9.3.4. As there is no weather information available online for Macau Heliport, controllers may use the weather information at Macau International Airport (VMMC) for reference.

9.3.5. Controllers are reminded of the need to consider the effect of helicopters landing / departing from Macau Heliport against the traffic flow at Macau International Airport. Where necessary, controllers may hold or delay helicopters to give priority to traffic at Macau International Airport.

9.3.6. Controllers shall note the use of the following phraseology for holding helicopters:

Phraseology:
T: (Callsign), **HOLD VISUALLY** (Position).

Example:
BHLC, HOLD VISUALLY ABEAM RUNWAY 34 THRESHOLD.

9.3.7. VFR/SVFR departing **helicopter flights may be instructed to liftoff from its parking stand** at Macau International Airport on VATSIM. VFR / SVFR clearances for these helicopters are the same as the helicopters departing Macau Heliport.

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 34.
- 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 Tower controller may issue one of the following instructions to the aircraft:

Instruction	Situation
Hold short of runway	When there is activity on the runway or if the aircraft would cause a 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 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. When RWY 34 is in use at Macau, Macau Tower shall obtain a release from Zhuhai Approach (if online) for departing IFR aircraft prior to issuing takeoff clearance. Once this release has been obtained, only then is Macau Tower allowed to issue takeoff clearance to an aircraft.

9.3.3. For IFR departing aircraft requiring **radar vectors**, the Tower controller shall provide a **heading and the initial climb altitude along with the takeoff clearance**. For example:

Phraseology:
T: (Callsign), **AFTER DEPARTURE FLY** (Heading), **CLIMB TO** (Altitude), **SURFACE WINDS** (Wind Direction) **DEGREES** (Wind Speed) **KNOTS, RUNWAY** (Runway), **CLEARED FOR TAKEOFF.**
Example 1: AIR MACAU 139, AFTER DEPARTURE FLY RUNWAY HEADING, CLIMB TO 4000FT, SURFACE WINDS 100 DEGREES 9 KNOTS, RUNWAY 16, CLEARED FOR TAKEOFF..

9.3.4. IFR departing aircraft on different SIDs shall be sequenced alternatively where possible. For example, assume that there are 3 departing aircraft. Two of them are flying the CONGA departure, whilst the third aircraft is flying the GRUPA departure. The first aircraft to depart would then be one of the aircraft on the CONGA departure, followed by the aircraft on the GRUPA departure, and finally the other aircraft on the CONGA departure.

9.3.5. IFR departing aircraft shall be separated with respect to the following Distance-based Wake Turbulence Separation Minima:

Distance-based Wake Turbulence Separation Minima					
		Follower			
		SUPER	HEAVY	MEDIUM	LIGHT
Leader	SUPER	-	**5 NM**	**7 NM**	**8 NM**
	HEAVY	-	**4 NM**	**5 NM**	**6 NM**
	MEDIUM	-	-	-	**5 NM**
- Indicates Wake Turbulence Separation is not applicable					

Figure 10.4: Distance-based Wake Turbulence Separation Minima Table

9.3.6. In cases where wake turbulence separation is not applicable (e.g. aircraft of wake turbulence category SUPER following an aircraft of wake turbulence category HEAVY) then the minimum spacing between these aircraft shall be 4 NM / 90 seconds.

9.3.7. If the departure aircraft has to abort takeoff, the Tower controller shall instruct the aircraft twice. After the instruction, the Tower 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 conditions permit, if the aircraft needs to return to the end of the runway for takeoff, the Tower controller shall instruct the aircraft to hold short of the closest taxiway parallel to the active runway and hand off the aircraft to the Ground controller.

Cancelling takeoff clearance:
Phraseology:
(Takeoff roll commenced) TWR: (Callsign) **STOP IMMEDIATELY.** (Callsign) **STOP IMMEDIATELY. ACKNOWLEDGE.**
(Takeoff roll not commenced) TWR: (Callsign) **HOLD POSITION, CANCEL TAKE OFF. I SAY AGAIN CANCEL TAKE OFF DUE** (reason).

Example 1:
VMMC_TWR: Oasis 100, hold position, cancel take off. I say again cancel take off due aircraft connected online on runway.

9.3.8. Once a departure aircraft is airborne, the Tower controller hand off the aircraft to the Departure controller.

9.4. ARRIVAL TRAFFIC

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

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

9.4.3. Tower controllers shall not adjust the speed of IFR arrival aircraft without the prior approval of the Approach controller. If speed adjustment is necessary, or if there is not enough spacing between arriving aircraft, then the Tower controller shall coordinate with the controller covering Macau Approach Radar (Runway 34 arrivals) or Zhuhai Approach (Runway 16 arrivals) for such adjustments.

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

9.4.5. When Runway 16 is in use, landing clearances shall include the Macau QNH as aircraft will be on the Zhuhai QNH upon handoff from Zhuhai Approach. See the example below:

Phraseology:
TWR: (Callsign) **SURFACE WINDS ___ DEGREES ___ KNOTS, QNH ____, RUNWAY 16, CLEARED TO LAND.**

Example:
VMMC_TWR: Air Macau 865, surface winds 170 degrees 5 knots, QNH 1005, runway 16, cleared to land.

9.4.6. **MISSED APPROACH**: A missed 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, the Tower controller may instruct 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 practise 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**.

9.4.7. Aircraft is assumed to follow the published missed approach procedures when a go around is necessary. The Tower controller shall advise landing aircraft on miss approach to follow the published miss approach procedures if unsure. This is especially important during major events online.

Go around (requested by the pilot):
Phraseology:
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):
Phraseology:
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.

9.4.8. As IFR aircraft have priority over VFR/SVFR aircraft, the Tower 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, take up orbits or hold at a specific position.

9.4.9. Once an aircraft has landed, the Tower controller shall instruct the aircraft to holding short of the nearest taxiway parallel to the runway-in-use and to contact the Ground controller.

9.5. COORDINATION WITH ZHUHAI APPROACH

9.5.1. IFR aircraft departing from Runway 34 shall contact Zhuhai Approach when airborne after takeoff, except in the case where Zhuhai Approach is offline and the aircraft is departing via radar vectors departure, in which case the aircraft shall contact the controller covering Hong Kong Departure after departure.

9.5.2. Tower shall refer to the table on the next page for a list of Transfer of Control Points (TCP) and their respective altitudes between Macau ATZ and Zhuhai airspace.

9.5.3. The coordination for Macau International Airport between Hong Kong FIR and Guangzhou FIR shall be discussed in details in the Letter of Agreement (Document number: HKVACC-LOA-VATPRC-R0) between the two FIRs, created and maintained by Hong Kong vACC and VATPRC Division.

Flight Procedures	Transfer of Control				Remarks
	Transferring ATCU	Accepting ATCU	Point / Position	Altitude	
RWY 34 Arrival	Zhuhai	Hong Kong	ROMEO	6000ft	
	Zhuhai	Hong Kong	MCU VOR	7000ft	For traffic from the direction of NLG VOR
	Hong Kong	Macau	As soon as aircraft has established on MCN ILS	Appropriate profile altitude	
RWY 34 Departure or Missed Approach	Macau	Zhuhai	Initial right turn after DEP / MAP	1200m or below	
	Zhuhai	Hong Kong	LUKBU	6000ft	Reach 6000ft by LUKBU
RWY 16 Arrival	Hong Kong	Zhuhai	INDUS	2700m	For traffic from Hong Kong FIR to Macau via Zhuhai airspace
	Zhuhai	Macau	As soon as aircraft has established on MCS LOC	3000ft or below	For all arrivals
RWY 16 Departure	Macau	Hong Kong	As soon as practicable after departure and before entering Hong Kong FIR, climbing to assigned SID altitude	3000ft or below	For SIDs transiting VHHK via PAPA
	Hong Kong	Zhuhai	Common FIR boundary between Hong Kong and Zhuhai	1800m or below	Climbing to 1500m for aircraft on BIGRO SIDs, climbing to 1800m for aircraft on other Guangzhou SIDs
RWY 16 Missed Approach	Macau	Hong Kong	Crossing MCU VOR climbing to 4000ft	3000ft or below	
	Zhuhai	Hong Kong	Crossing MCU VOR climbing to 4000ft	4000ft or below	For missed approach traffic under control of Zhuhai Approach
	Hong Kong	Zhuhai	INDUS	1800m	

Figure 9.2: Transfer of Control Points for Macau International Airport

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 Tower controller **shall use radar tracking for VFR aircraft flying within the ATZ.**

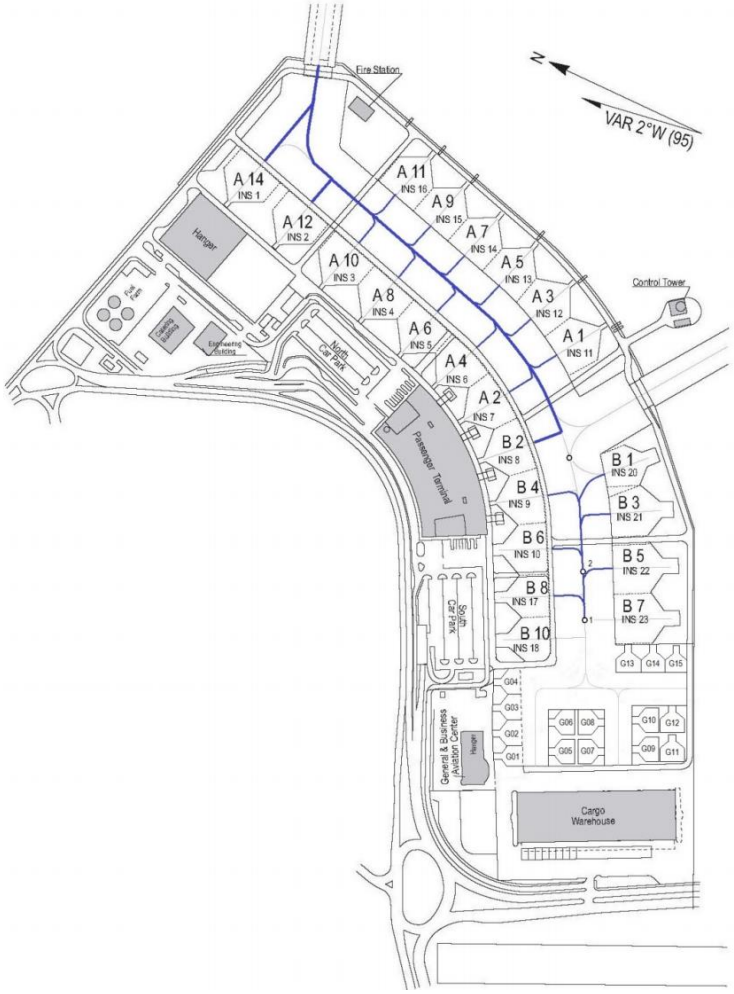
10 DEVIATION FROM THE AIP OF MACAU SAR

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.

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

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

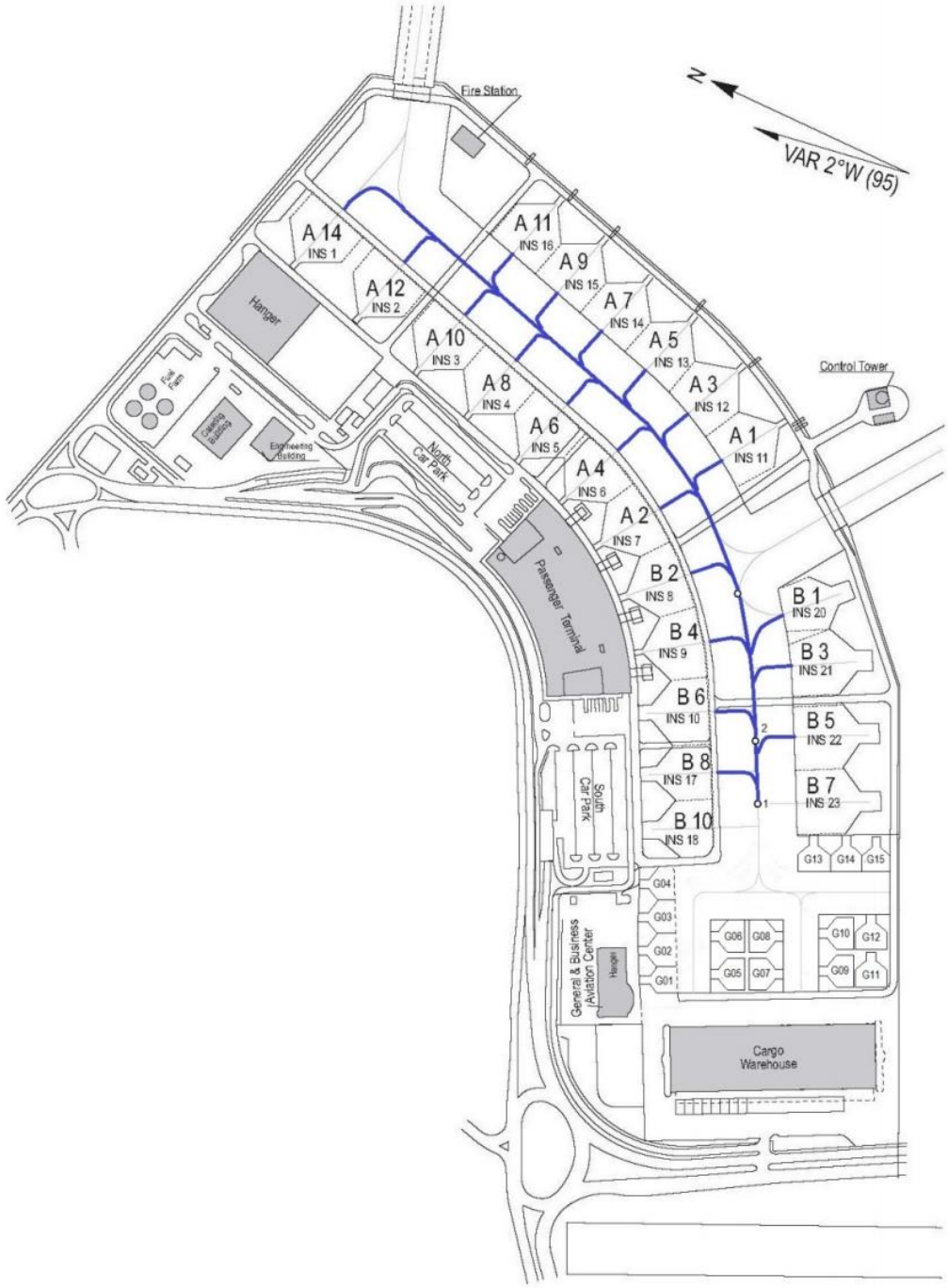
(Source: AIP Macau SUP 01/16)



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

A.2: PUSH BACK COLOUR BLUE (ALL GATES EXCEPT B7 AND B10, RWY 16)

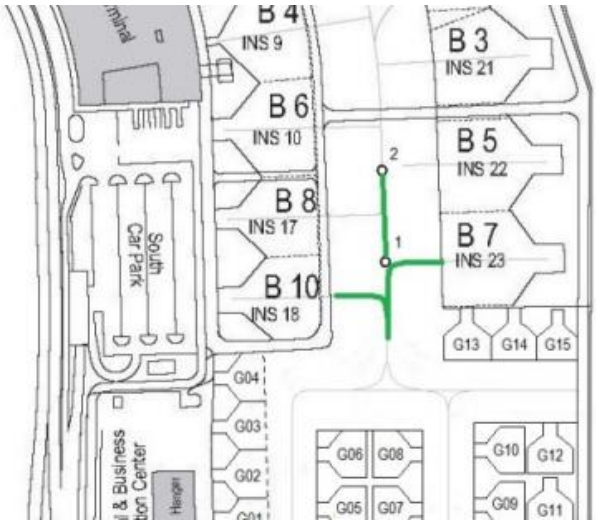
(Source: AIP Macau SUP 01/16)



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

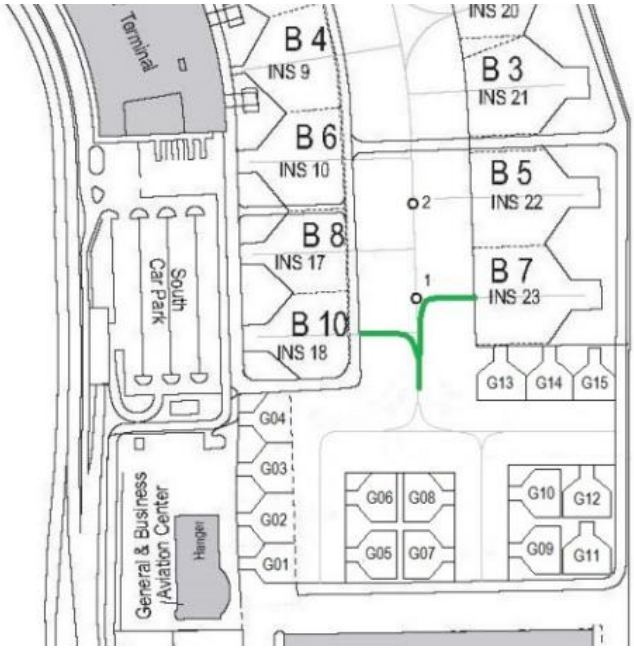
A.3: PUSH BACK COLOUR GREEN (B7 AND B10, WINGSPAN > 36M)

(Source: AIP Macau SUP 01/16)



A.4: PUSH BACK COLOUR GREEN (B7 AND B10, WINGSPAN < 36M)

(Source: AIP Macau SUP 01/16)



RECORD OF REVISION

DATE	REV.	REVISION CONTENT	APPROVAL
19 JUN 2016	1	Rewrote Section 8 Deleted Section 9.2 Updated Appendix A Added Appendix C	A. TANG
14 JUN 2020	2	Updated section 5.1.3 Updated section 8.3.3 Updated section 8.3.4 Updated Appendix A	J. CHENG
01 MAR 2024	3	Added Section 5.2 (Transition Level) Updated Section 6.3 (Default Approach) Updated Section 8.2 (Flight Plan Inspection) Updated Section 8.3 & 8.4 (IFR Clearance Format & Phraseology) Added Section 8.6.5 (GA Stands Breakaway Procedure) Updated Section 8.7 (Push and Start) Updated Section 9.2 (ATZ VFR Procedures) Added Section 9.3 (ATZ Helicopter Procedures) Updated Section 9.3 & 9.4 (Departing and Arriving Traffic) Updated Table in Section 9.5 (Replace LKC with LUKBU) Updated Section 9.6 (Radar Tracking)	T. SIU
09 JUN 2024	4	Updated Section 8.2.7 Updated Section 8.3.2 Updated Section 9.5.1	T. SIU
05 OCT 2024	5	Updated IFR Clearance Phraseology Updated Pushback Phraseology Added note about runway 16 arrivals needing the Macau QNH	T. SIU
07 DEC 2024	6	Updated waypoint names with their 3RS counterparts Updated some VFR procedures	T. SIU