



AIRSIDE WORKS PROCEDURE MANUAL

FOR CHANGI AIRPORT

Compiled by

Standards and Health Unit
Engineering & Development Cluster

Version 32/2024

15 June 2024

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PROCEDURE

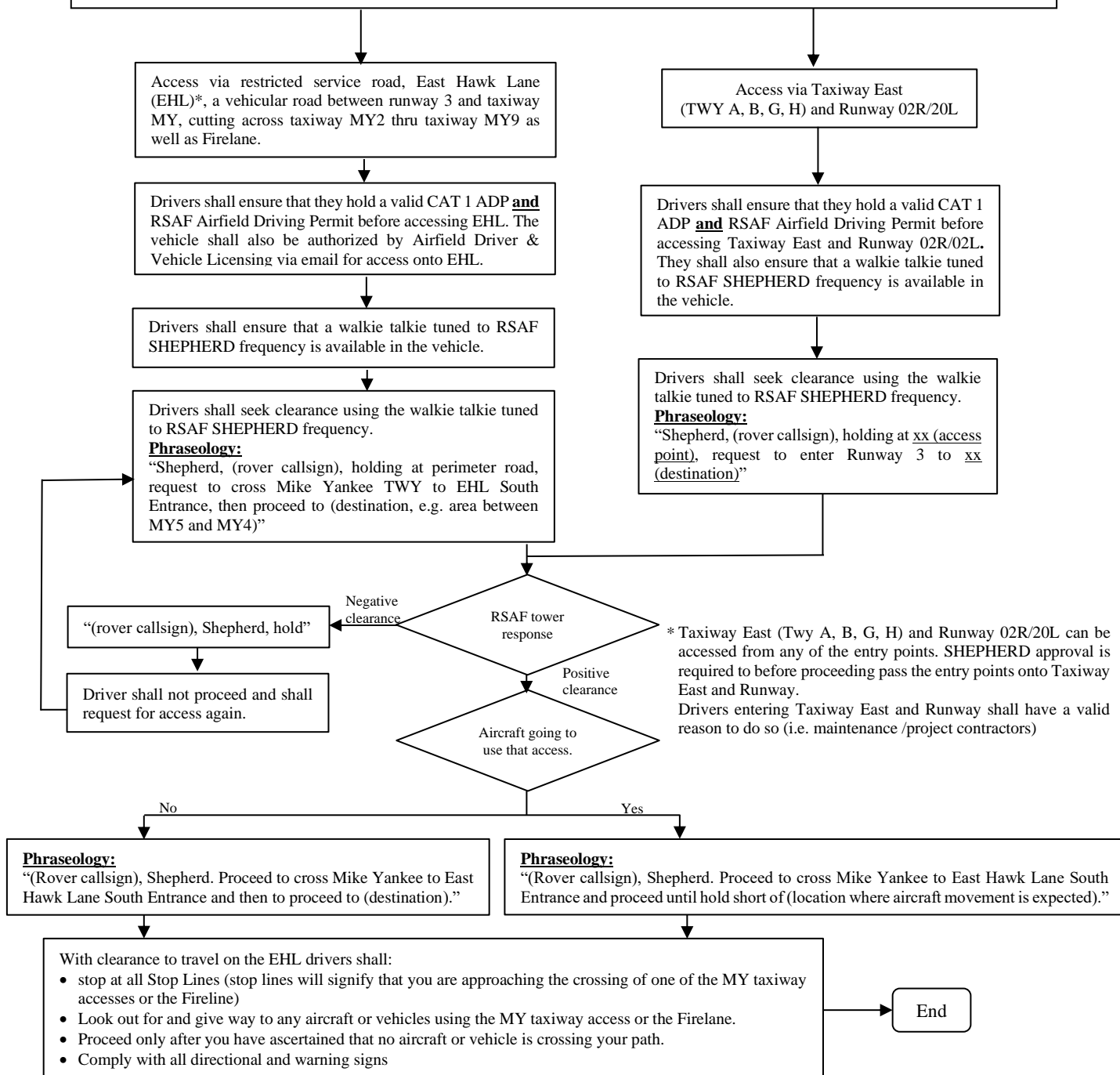
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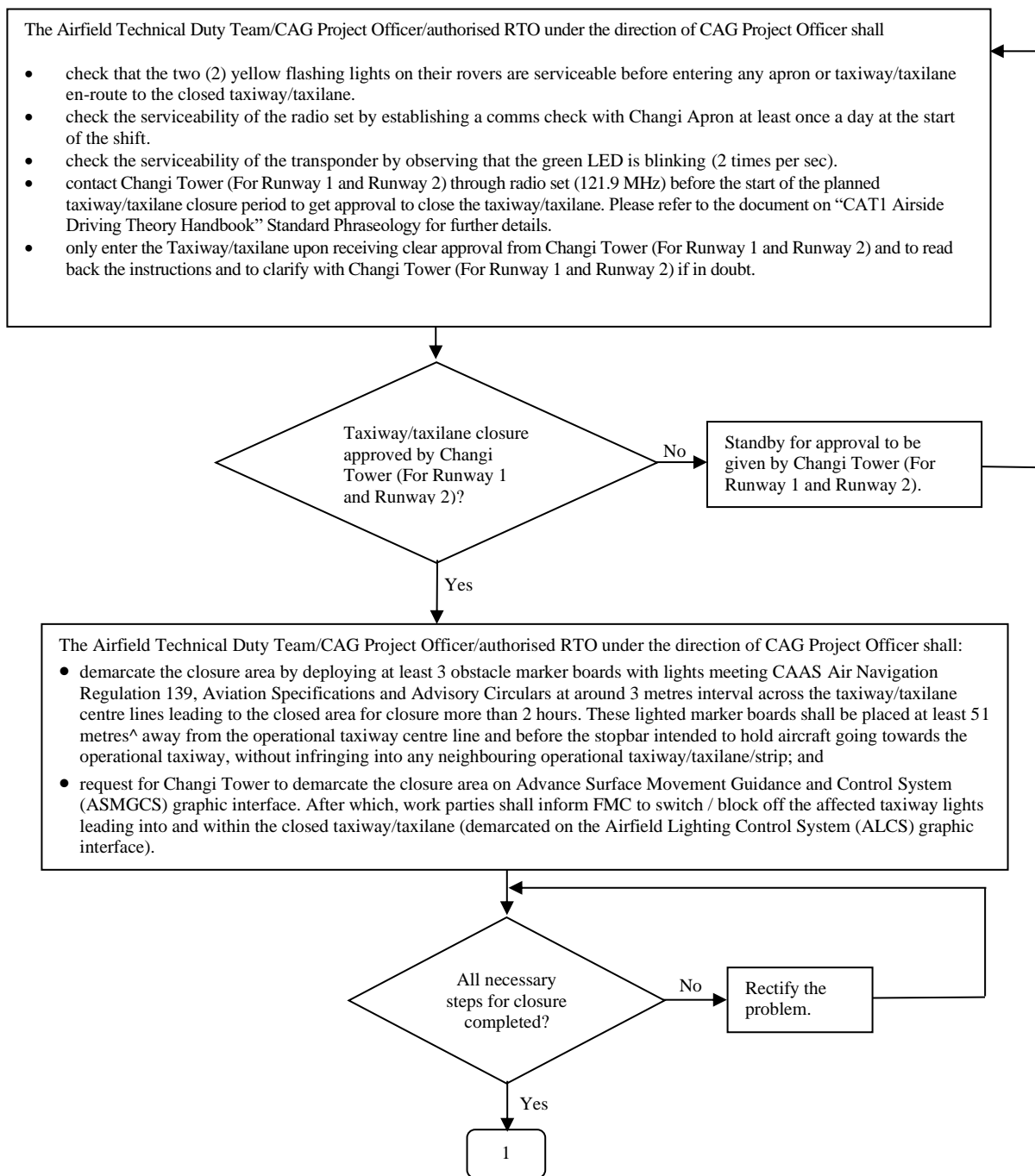
PROCEDURE 1: PROCEDURE FOR DRIVERS ACCESSING VICINITY OF RUNWAY 3

The CAT 1 / CAT 1(R) drivers accessing runway 3 vicinity shall:

- check that the two (2) yellow flashing lights on their rovers are serviceable before entering the runway 3 vicinity.
- check the serviceability of the radio set by establishing a comms check with Changi Apron at least once a day at the start of the shift.
- check the serviceability of the transponder by observing that the green LED is blinking (2 times per sec).
- contact Changi Tower (For Runway 1 and Runway 2)/Changi East Tower (For Runway 3) through radio set on the frequency listed in Airside Works Procedure Manual Procedure 1, before the planned runway access. Please refer to the document on “CAT1 Airside Driving Theory Handbook” Standard Phraseology for further details.
- shall ensure that RT set had been tuned and RT set shall be clearly labelled to indicate Ground Frequency and Runway Frequency.
- only enter the runway upon receiving clear approval from Changi Tower (For Runway 1 and Runway 2)/Changi East Tower (For Runway 3) and the stop bar lights are not illuminated. If in doubt, read back the instructions or clarify with Changi Tower (For Runway 1 and Runway 2).



PROCEDURE 2: CLOSING OF TAXIWAY/TAXILANE FOR THREE (3) DAYS OR LESS



[^] The minimum clearance from taxiway may be less than 51 metres based on the separation distances stated in paragraph 1.2 of Section C of CAG AOS requirements.

1

All work parties shall commence maintenance/project works.

- escort not more than 2 other vehicles (including heavy machineries and premix trucks) to the closed taxiway/taxilane after getting clearance from Changi Tower (For Runway 1 and Runway 2), where needed;
- ensure that the active taxiways/taxilanes used by the construction vehicles en-route to the closed taxiways/taxilanes are kept clean at all times;
- ensure no movement of heavy machineries, premix trucks and vehicles between 2 parked aircraft.
- carry out inspection of the lights mounted on the obstacle marker boards at the end of the workday before sunset or before sunset for work timing after 1900 hrs and record the status in an appropriate checklist. Where lights are found to be blown or unserviceable, they shall be replaced immediately.

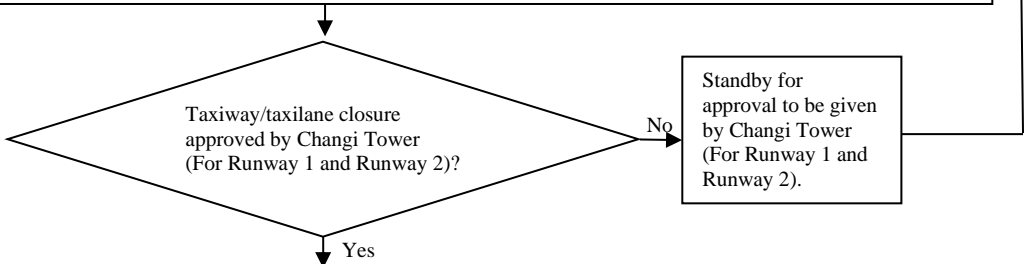
The Airfield Technical Duty Team/CAG Project Officer/authorised RTO under the direction of CAG Project Officer are required to liaise closely with all contractors working within the taxiway/taxilane to monitor their access and progress of work. The team shall also be on radio alert and respond to Changi Tower (For Runway 1 and Runway 2)'s instructions throughout the taxiway/taxilane closure (e.g. for emergency opening of the taxiway/taxilane). At no time shall unmanned machinery be parked on the taxiway/taxilane.

END

PROCEDURE 3: CLOSING OF TAXIWAY/TAXILANE FOR MORE THAN THREE (3) DAYS

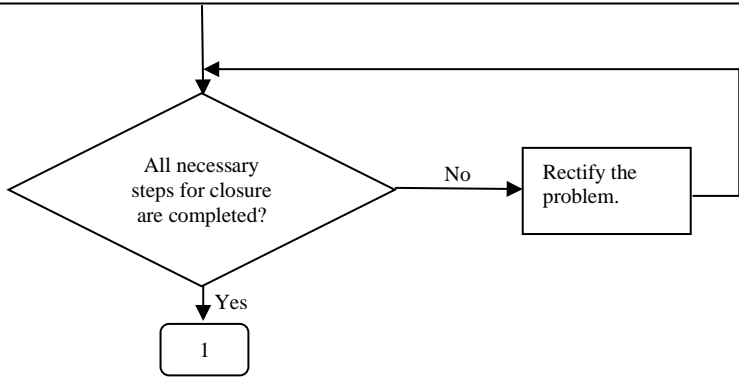
The Airfield Technical Duty Team/CAG Project Officer/authorised RTO under the direction of CAG Project Officer shall

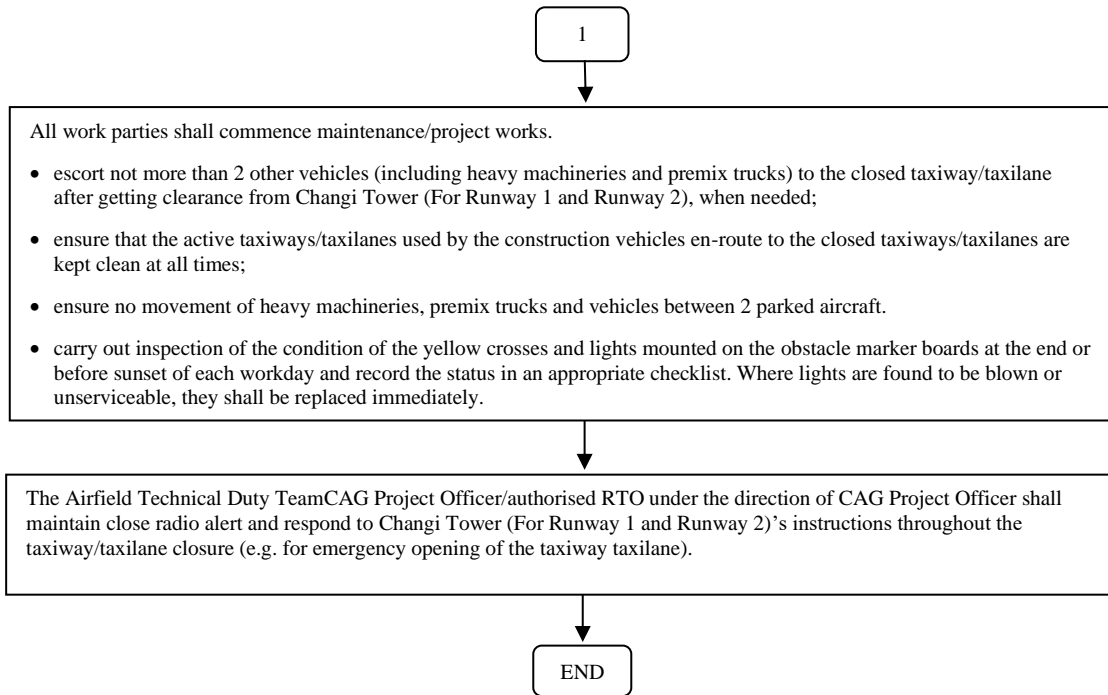
- check that the two (2) yellow flashing lights on their rovers are serviceable before entering any apron or taxiway/taxilane en-route to the closed taxiway/taxilane.
- check the serviceability of the radio set by establishing a comms check with Changi Apron at least once a day at the start of the shift.
- check the serviceability of the transponder by observing that the green LED is blinking (2 times per sec).
- contact Changi Tower (For Runway 1 and Runway 2) through radio set (121.9 MHz) before the start of the planned taxiway/taxilane closure period to get approval to close the taxiway/taxilane. Please refer to the document on “CAT1 Airside Driving Theory Handbook” Standard Phraseology for further details.
- only enter the Taxiway/taxilane upon receiving clear approval from Changi Tower (For Runway 1 and Runway 2) and to read back the instructions and to clarify with Changi Tower (For Runway 1 and Runway 2) if in doubt.



The Airfield Technical Duty Team/CAG Project Officer/authorised RTO under the direction of CAG Project Officer shall:

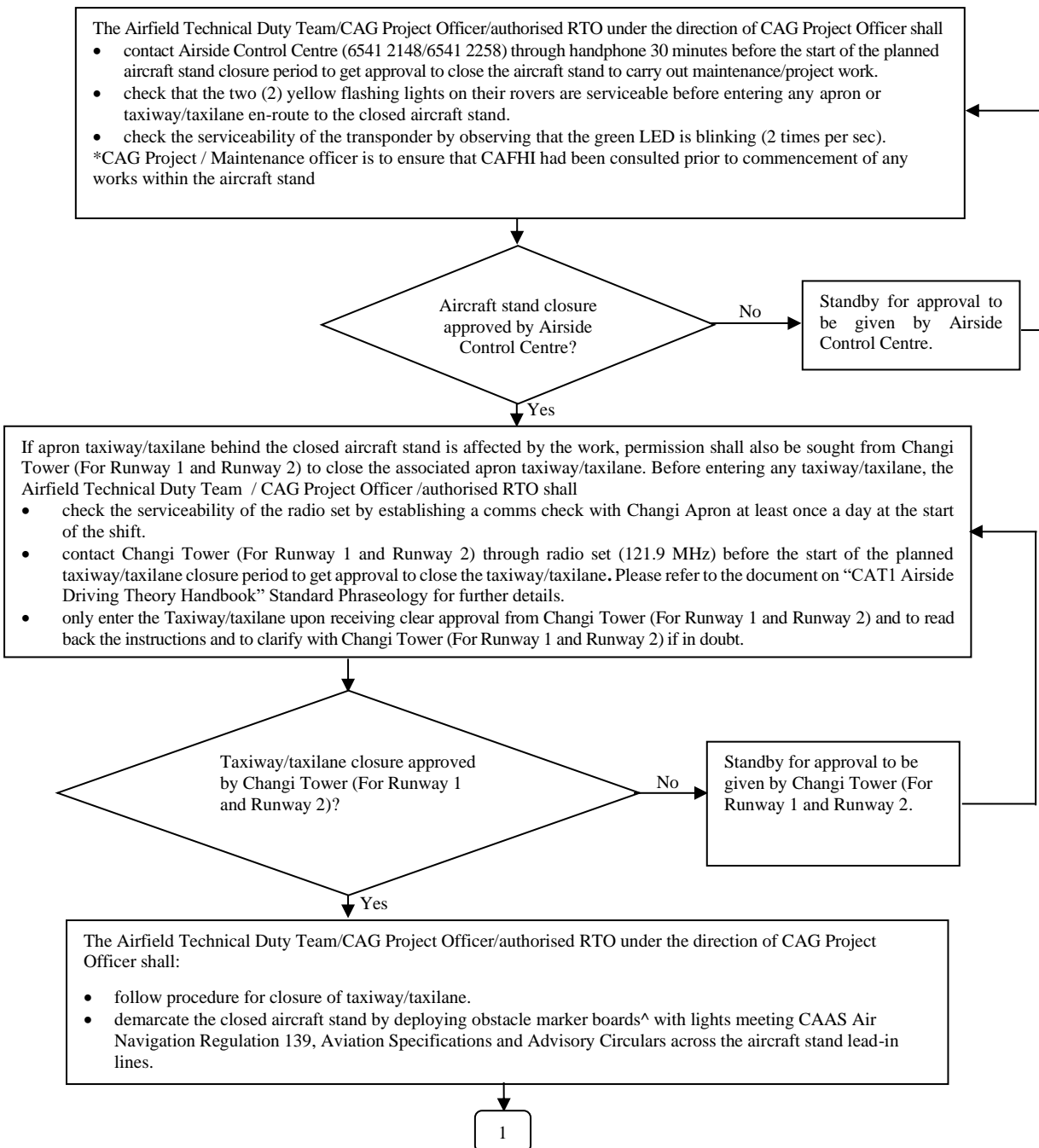
- request FMC or Changi Tower (For Runway 1 and Runway 2) to switch off the taxiway lights leading into and within the closed taxiway/taxilane;
- ensure that a yellow cross meeting CAAS Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars is placed at the beginning and end of the closed/unfinished taxiway/taxilane. The yellow cross shall either be painted on the taxiway/taxilane pavement or made of reflective material which is properly pasted onto the taxiway/taxilane pavement to prevent it being blown away;
- ensure that obstacle marker boards with lights meeting CAAS Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars attached are placed at 3 metres interval across the entry to the closed/unfinished taxiway/taxilane and weighted down. These lighted marker boards shall be placed at least 51 metres^ away from the operational taxiway centre line and before the stopbar intended to hold aircraft going towards the operational taxiway, without infringing into any neighbouring operational taxiway/taxilane/strip. The obstacle marker boards shall be placed after the yellow crosses on the side of the closed/unfinished taxiway/taxilane. The lights shall consist of a 50-50 mix of types that can be runs on two different powerful sources (e.g. conventional electrical, generator, solar or battery operated);
- ensure that taxiway side strip markings are painted across the entrance to the closed/unfinished taxiway/taxilane;
- lead in lines should be blacken for closure more than 3 days, but less than 3 months;
- guidance sign should be masked for closure more than 3 days;
- for prolonged closure > 3 months, taxiway and/or aircraft stand markings shall be grinded off;
- ensure that blue retro-reflective markers are installed at 60 metres interval or lesser as directed by CAG across the entrance to the closed/unfinished taxiway/taxilane;
- ensure that all taxiway/taxilane centre line and edge light circuits leading into and within the closed taxiway/taxilane are isolated and FMC and CAG Officer-in-charge of Airfield Lighting Control System (ALCS) are kept informed of the isolated circuits through an official memo;
- request for Changi Tower to demarcate the closure area on Advance Surface Movement Guidance and Control System (ASMGCS) graphic interface. After which, work parties shall inform FMC to switch / block off the affected taxiway lights leading into and within the closed taxiway/taxilane (demarcated on the Airfield Lighting Control System (ALCS) graphic interface).

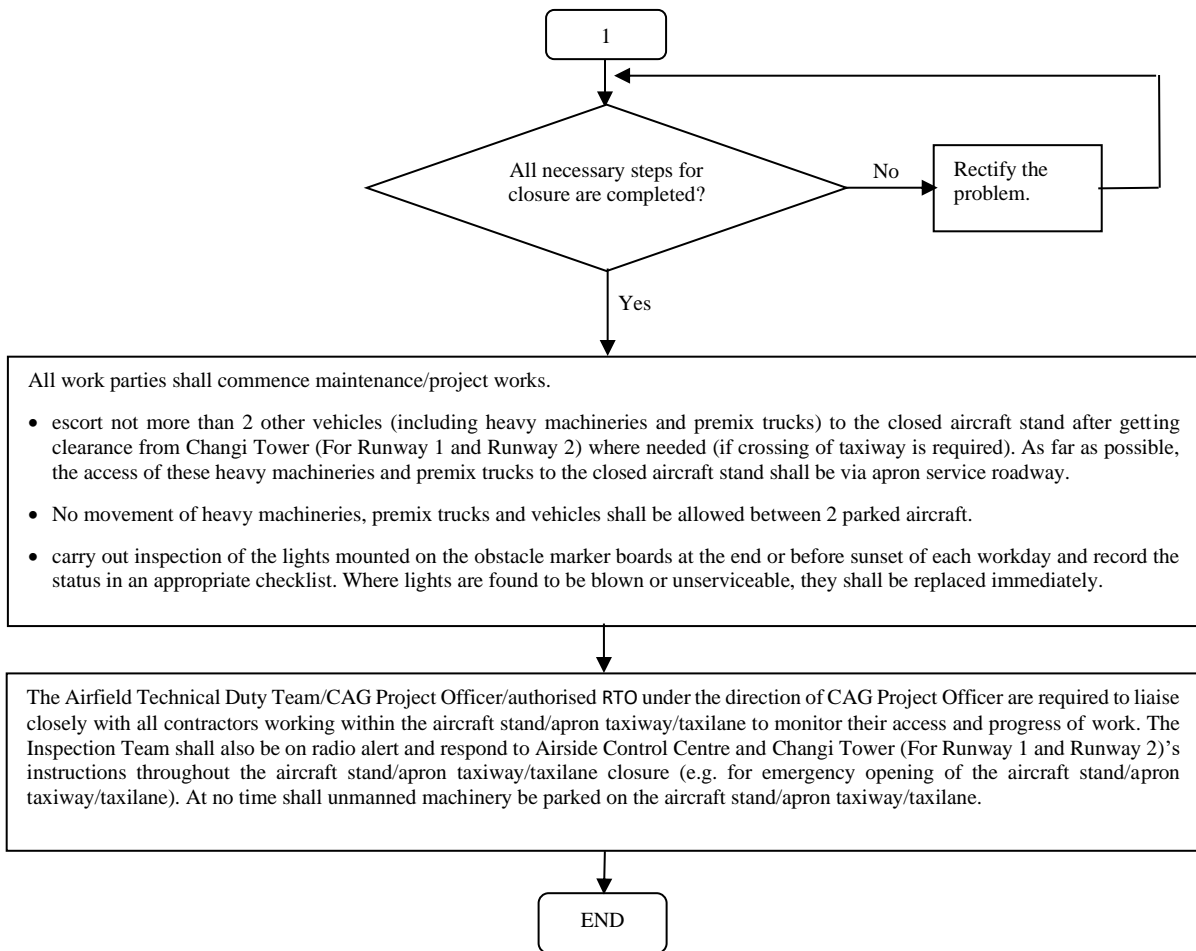




^ The minimum clearance from taxiway may be less than 51 metres based on the separation distances stated in paragraph 1.2 of Section C of CAG AOS requirements.

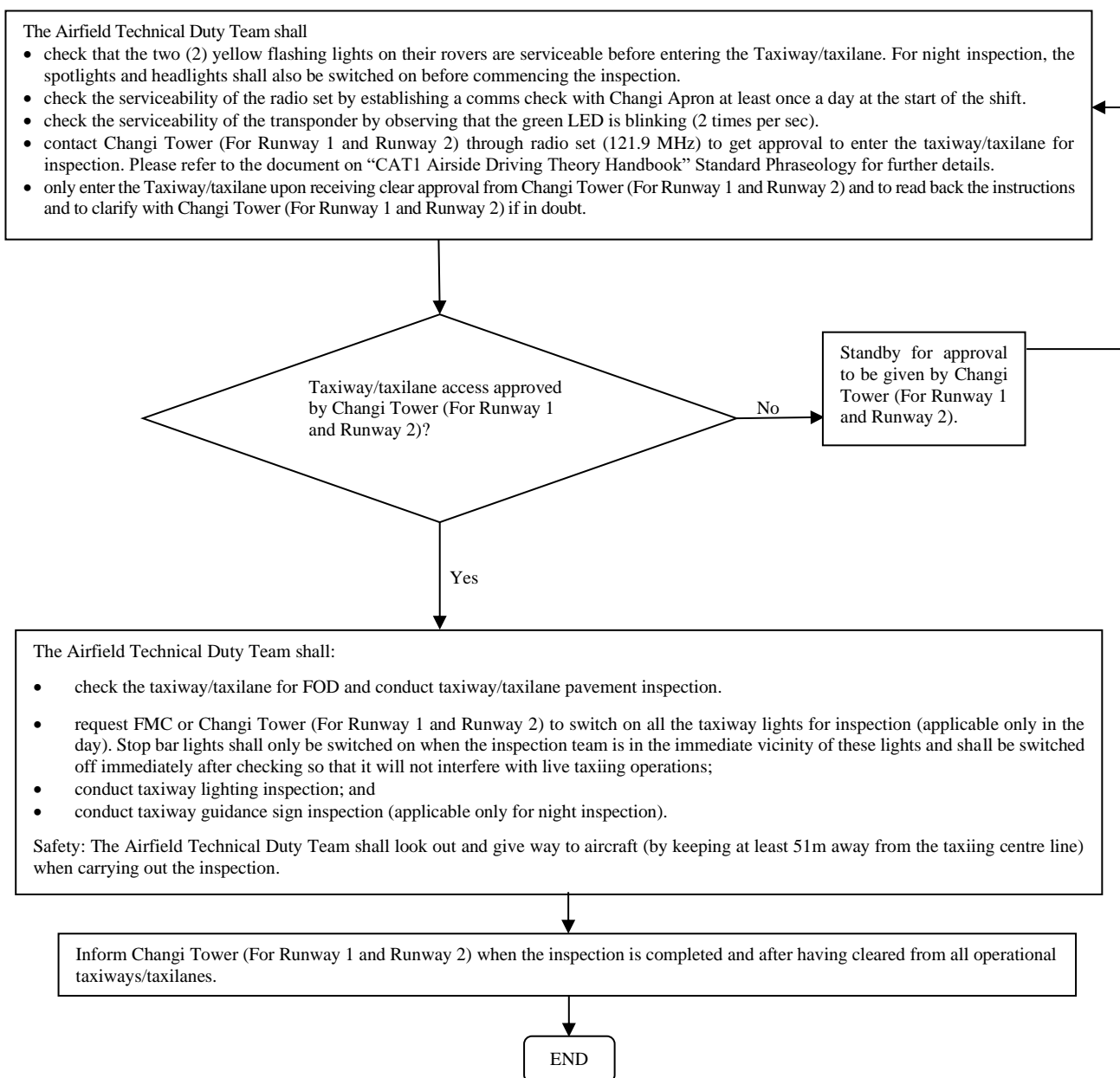
PROCEDURE 4: CLOSING OF AIRCRAFT STAND TO CARRY OUT APRON PAVEMENT MAINTENANCE/PROJECT WORK





^ Aircraft stand closure for 3 days or less, a single marker board with red obstacle lights on each end shall be placed at the aircraft stand centre line during works to denote stand closed for works (e.g. maintenance works).

PROCEDURE 5: CONDUCTING TAXIWAY/TAXILANE GENERAL MAINTENANCE CHECK



Additional Note:

- (a) All blown taxiway guidance sign tubes shall be replaced immediately when spotted.
- (b) All FOD, fuel/hydraulic spillage, unserviceable obstacle lights, pavement/markings defects, obstructions infringing the taxiway strip shall be recorded in the Taxiway Daily Inspection Report.

PROCEDURE 6: CONDUCTING AIRCRAFT STAND GENERAL MAINTENANCE CHECK

The Airfield Technical Duty Team shall:

- check that the two (2) yellow flashing lights on their rovers are serviceable before entering any aircraft stand.
- check the serviceability of the transponder by observing that the green LED is blinking. (2 times per sec)
- check the serviceability of the radio set by establishing a comms check with Changi Apron if access to aircraft stand via taxiway/taxilane is needed
- contact Changi Tower (For Runway 1 and Runway 2) through radio set (121.9 MHz) to seek approval if access to aircraft stand via taxiway/taxilane is needed. Please refer to the document on “CAT1 Airside Driving Theory Handbook” Standard Phraseology for further details.
- only enter the taxiway/taxilane upon receiving clear approval from Changi Tower (For Runway 1 and Runway 2) and to read back the instructions and to clarify with Changi Tower (For Runway 1 and Runway 2) if in doubt.
- check the aircraft stand for FOD; and
- conduct rigid pavement inspection, including the condition of non roc drain gratings.

Safety: 1) The Airfield Technical Duty Team shall always look out and give way to aircraft taxiing and pushing back when carrying out the inspection.
2) The Airfield Technical Duty Team shall not travel in between two aircrafts all times.
3) Wherever possible, the inspection team shall avoid the use of secondary road.

END

PROCEDURE 7: EMERGENCY OPENING OF TAXIWAY/TAXILANE CLOSURE

Changi Tower (For Runway 1 and Runway 2) contacts the Airfield Lead / Airfield Technical Duty Team/CAG Project Officer /authorised RTO under the direction of CAG Project Officer to request for emergency opening of the closed taxiway/taxilane.

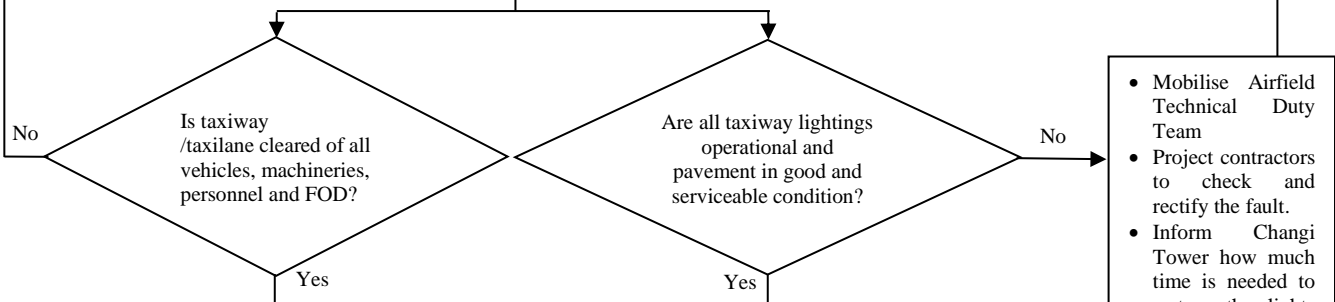
The Airfield Technical Duty Team/CAG Project Officer /authorised RTO under the direction of CAG Project Officer shall immediately inform all parties on the taxiway/taxilane to prepare the taxiway/taxilane for emergency opening within the time stipulated below as informed by Changi Tower. If the taxiway/taxilane cannot be re-opened within the stipulated period, the Airfield Technical Duty Team shall inform Changi Tower in advance and the CAG Team Leader in-charge of aircraft pavement and AFL.

Closure time	Evacuation time
Less than or Equal to 30 minutes (i.e. time-limited works)	5 minutes
More than 30 minutes	30 minutes

The Airfield Technical Duty Team /CAG Project Officer/authorised RTO under the direction of CAG Project Officer shall:

- check that all openings on pavement and trenches are covered up;
- check that all the work parties and vehicles which have entered the taxiway/taxilane are cleared from the site; and assemble at designated holding area
- check that all loose excavation on turf areas within the runway/taxiway strip is properly compacted;
- check that all the closed taxiway/taxilane markings obstacle marker boards and lights, are removed from the site;
- conduct a thorough FOD, pavement and taxiway/taxilane lightings inspection to ensure that the taxiway/taxilane is safe for operations.
- account for manpower strength of all parties.

All work parties' supervisors shall wait at the holding area until clearance is given by the Airfield Technical Duty Team.

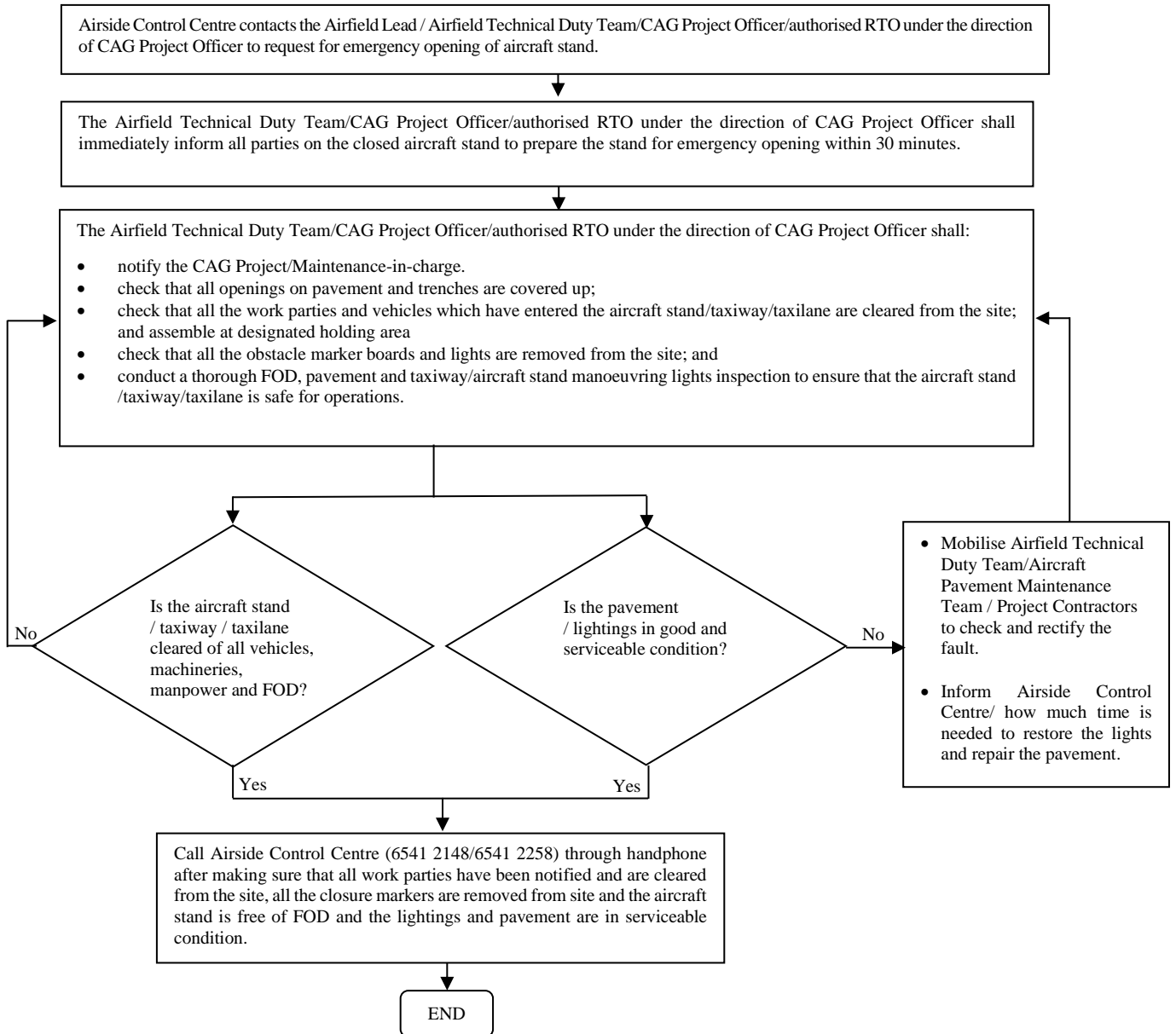


- Mobilise Airfield Technical Duty Team
- Project contractors to check and rectify the fault.
- Inform Changi Tower how much time is needed to restore the lights and repair the pavement.
- Inform FMC to contact CAG Officer-in-charge.

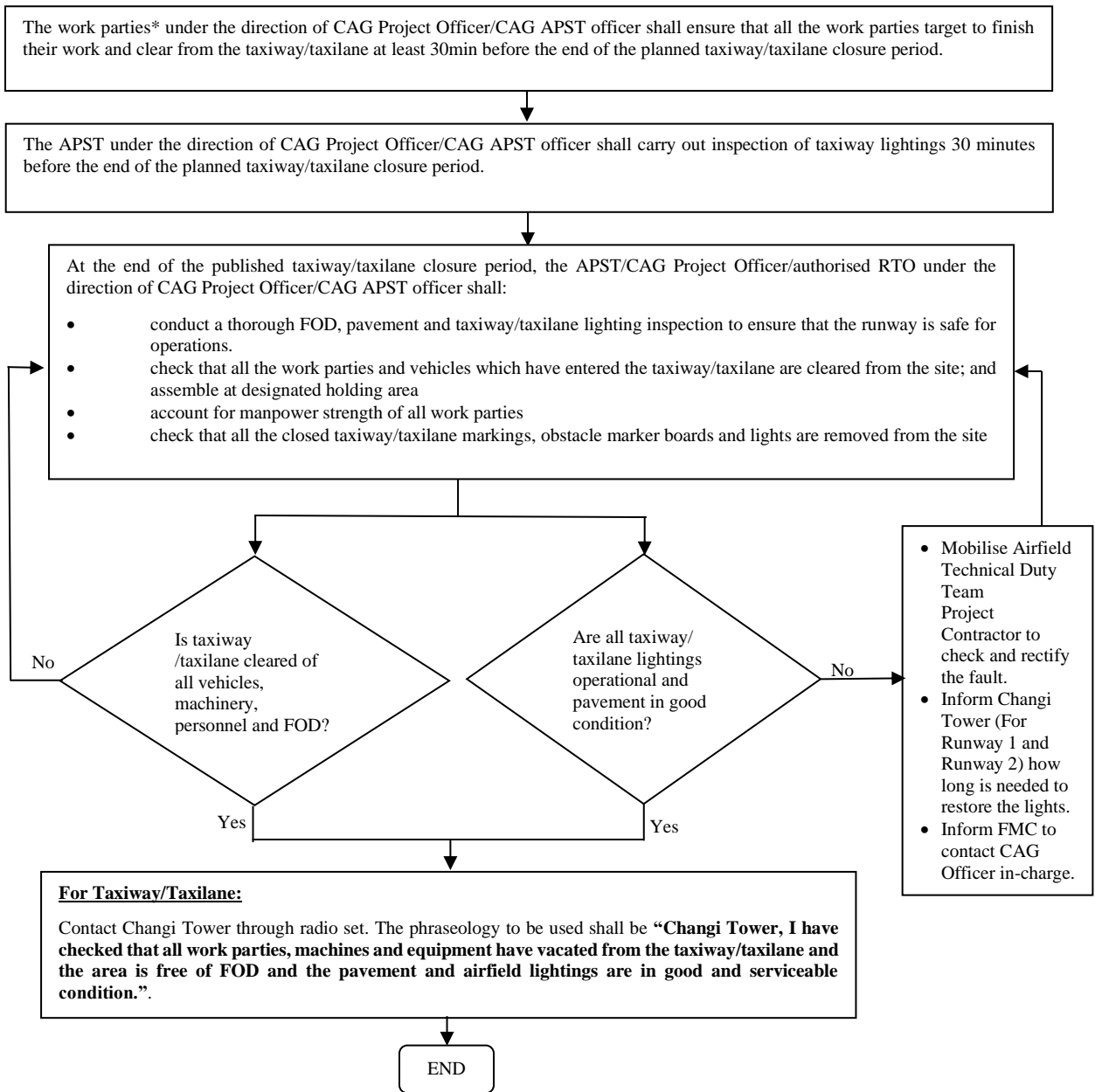
For Taxiway/Taxilane:
 Contact Changi Tower (121.9MHz) through radio set. The phraseology to be used shall be **“Changi Tower, I have checked that all work parties, machines and equipment have vacated from the taxiway/taxilane and the area is free of FOD and the pavement and airfield lightings are in good and serviceable condition.”**

END

PROCEDURE 8: EMERGENCY OPENING OF AIRCRAFT STAND CLOSURE

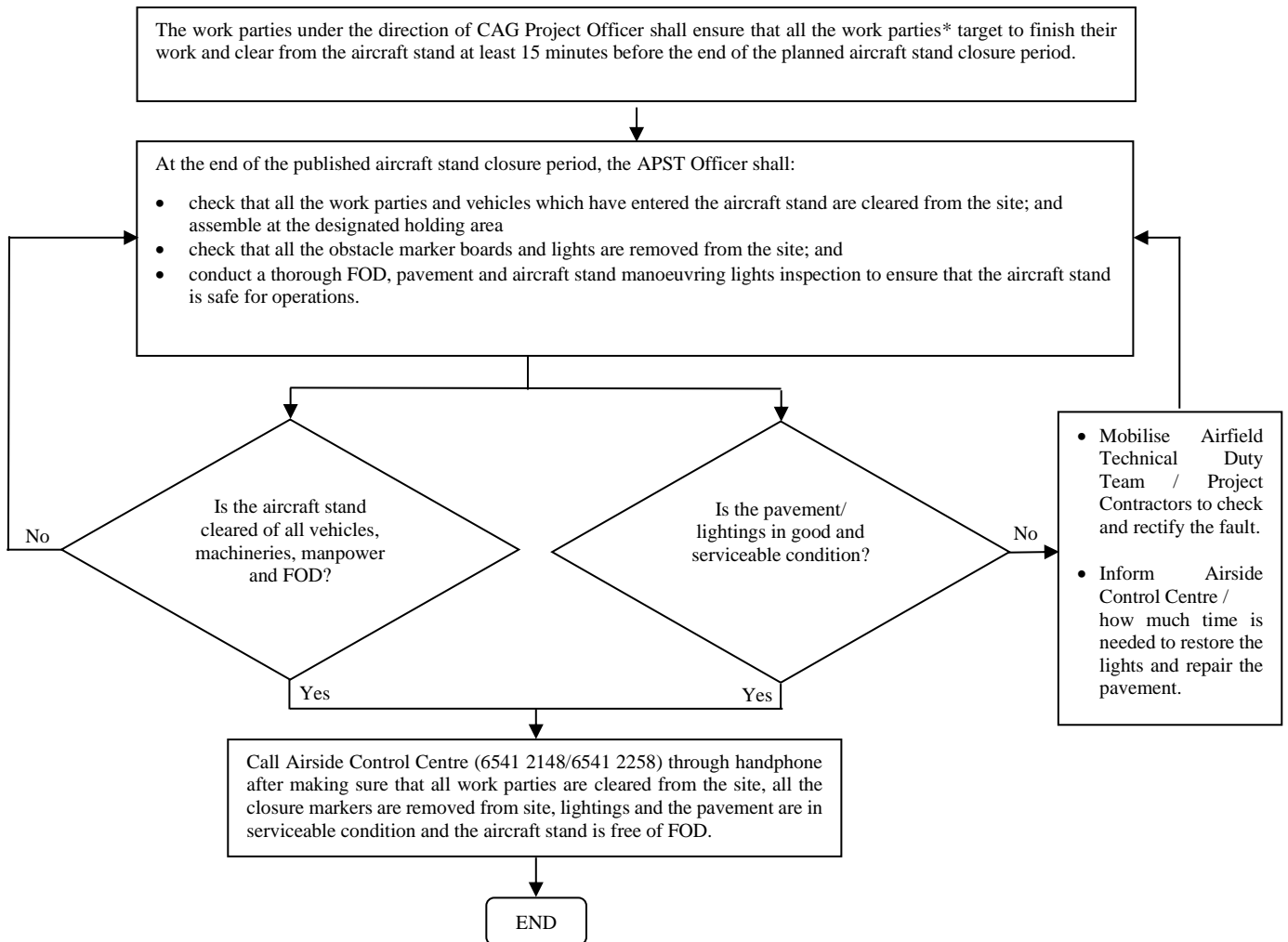


PROCEDURE 9: NORMAL OPENING OF TAXIWAY/TAXILANE CLOSURE



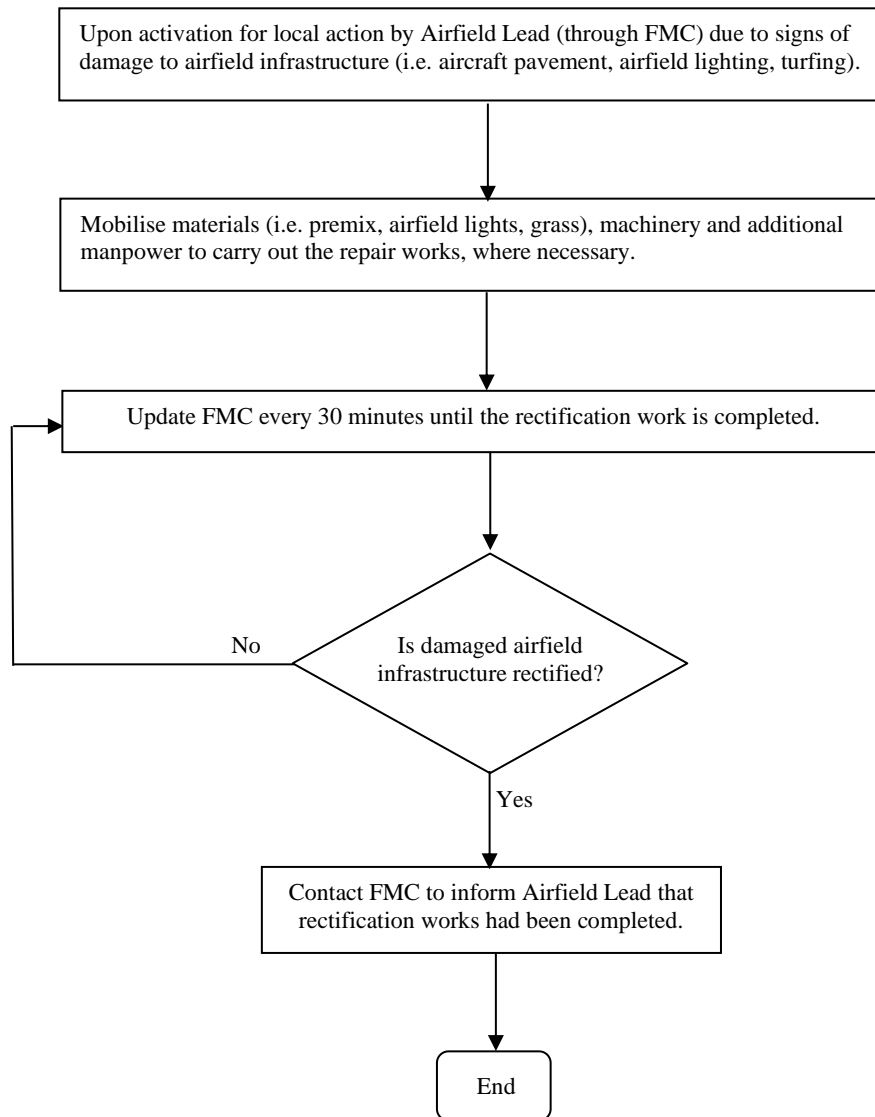
* Work parties includes, but are not limited to CAG staff, authorized RTO and/or safety personnel and other resident site staff engaged to represent CAG.

PROCEDURE 10: NORMAL OPENING OF AIRCRAFT STAND CLOSURE

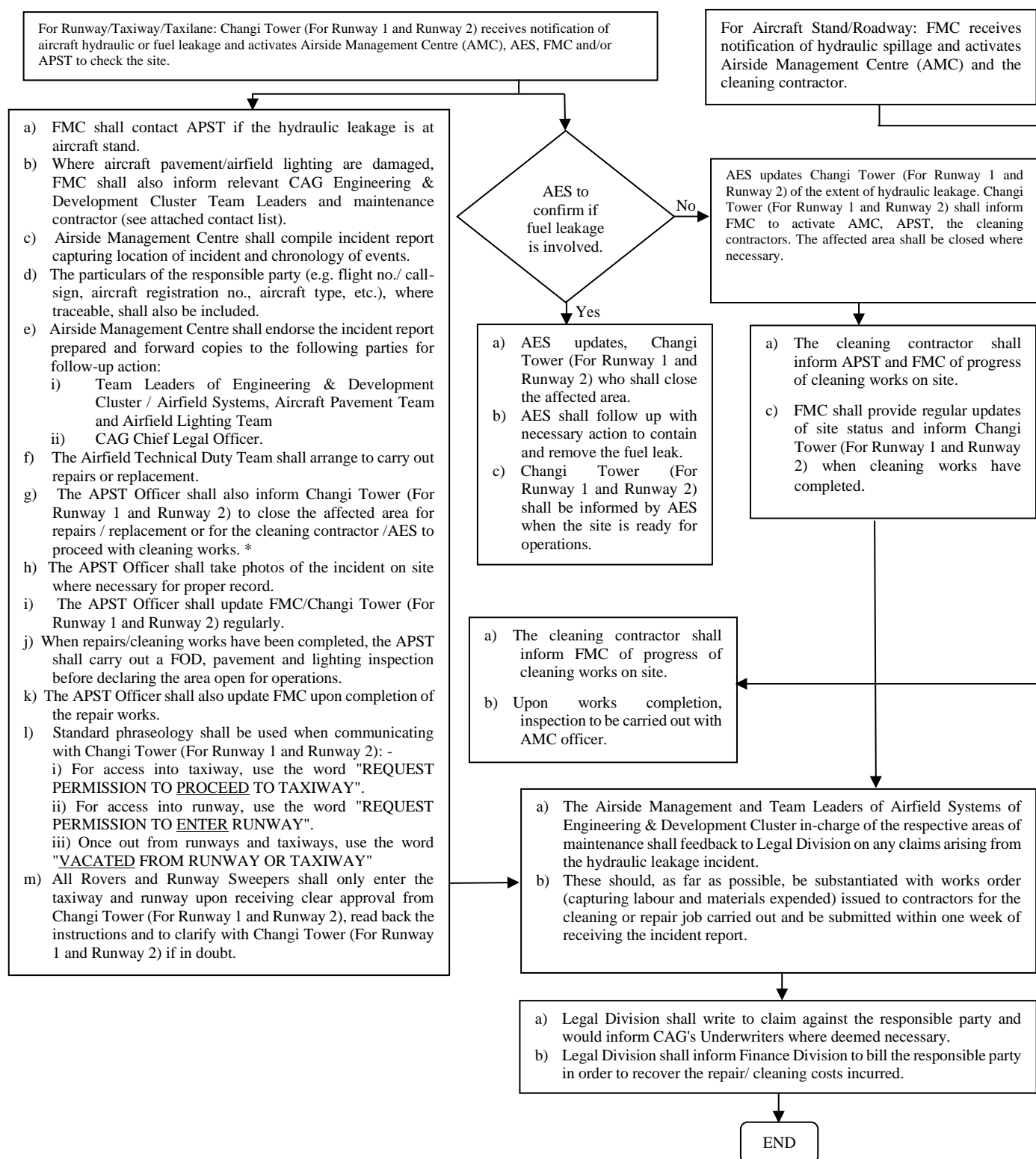


* Work parties includes, but are not limited to CAG staff, authorized RTO and/or safety personnel and other resident site staff engaged to represent CAG.

PROCEDURE 11: MOBILISATION OF WORK PARTIES UPON LOCAL ACTION ACTIVATION



PROCEDURE 12: RESPONSE TO LEAKAGE INCIDENT ON RUNWAY/TAXIWAY/TAXILANE/AIRCRAFT STAND / ROADWAY



- * For temporary closure purposes, the APST Officer shall carry a minimum of 4 sets of heavy-duty, rubber type cones, chequered flags and red fixed lights to demarcate the closed area.

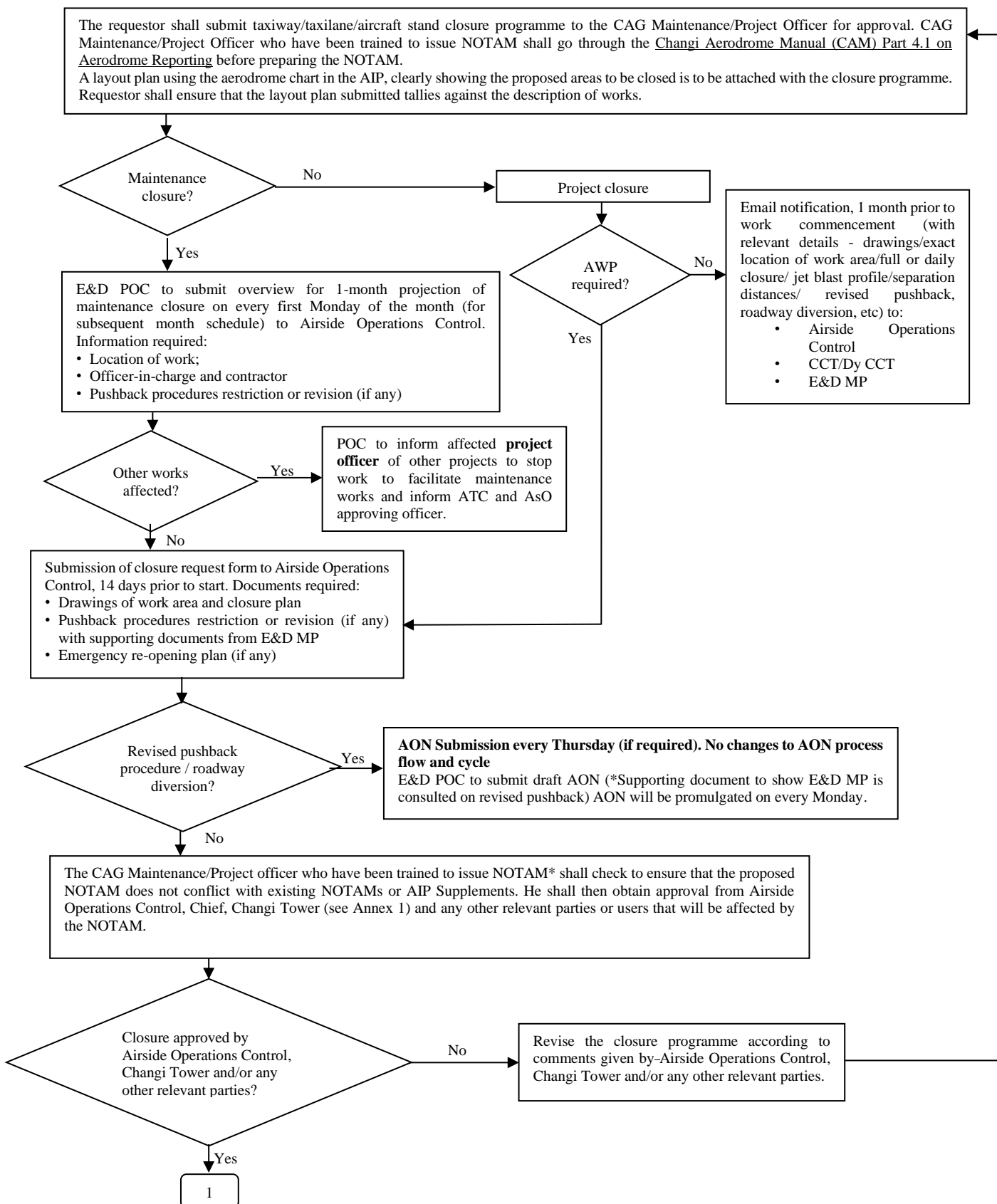
Additional Note: If there is hydraulic fluid leakage on the runway, friction test is required to be carried out.

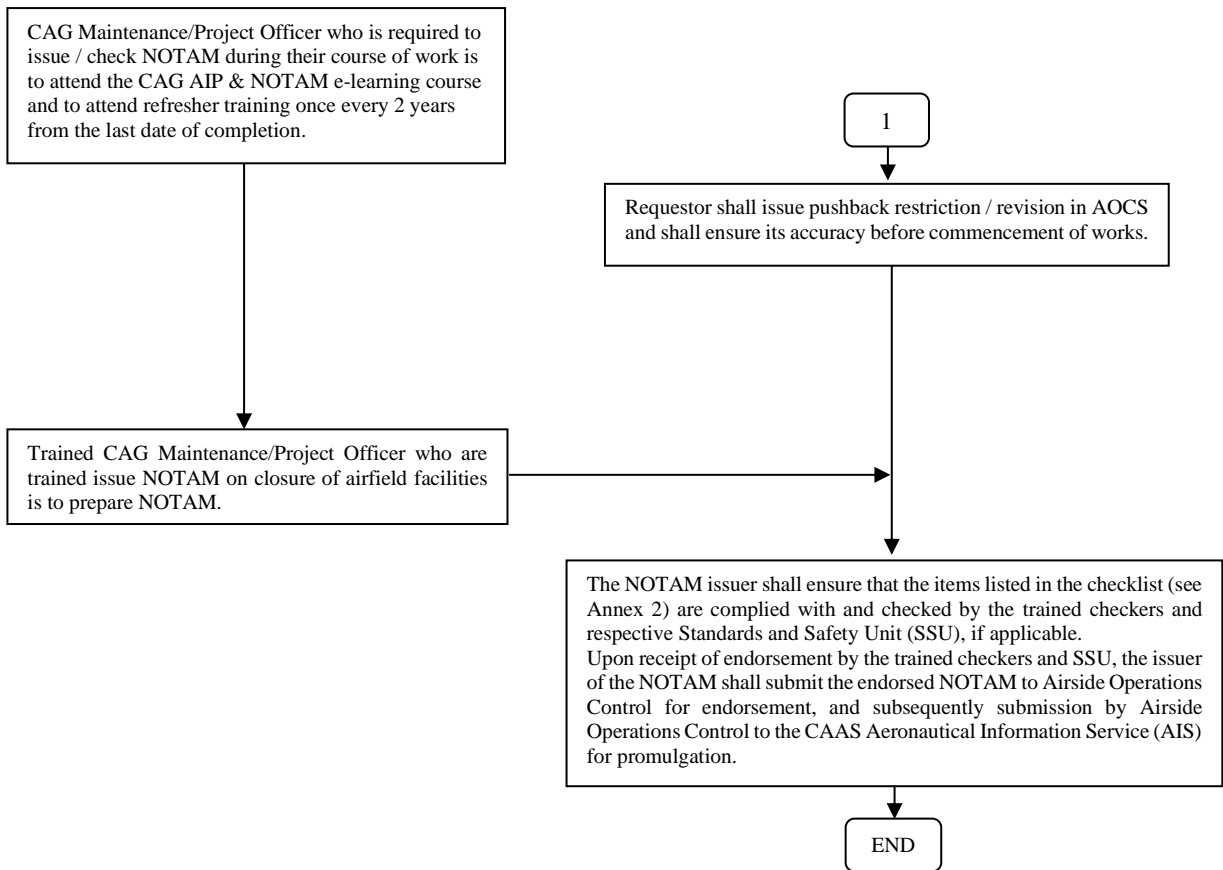
Depending on the extent of the leakage, the APST Officer shall make an assessment on the risk to re-open the runway without first conducting a friction test. An example of risk which can be mitigated without first conducting a friction test is when a spillage is localized in area and has been thoroughly cleaned up. If in doubt, the APST officer should still take the safer approach to determine the need to conduct a friction test before re-opening of the runway. For aircraft accident a friction test shall be carried out. If after conducting the friction test and the result shows that the friction level along any 100m section is measured to be 0.34 or less at test speed of 95km/h or to be at 0.50 or less at test speed of 65km/h, the APST officer shall notify the Airfield Lead and inform the Team Leader of CAG E&D Airfield Systems, Aircraft Pavement Team to take immediate action to arrange for the removal of rubber deposits.

LIST OF CONTACT PERSONS FOR AIRCRAFT HYDRAULIC LEAKAGE INCIDENT ON RUNWAY/TAXIWAY/TAXILANE/AIRCRAFT STAND

Changi Tower		
1	Duty Tower Watch Manager	Tel: 6541 2416/2417
Airport Emergency Service (AES)		
2	Station 1 Watch Tower	Tel: 6541 2526
3	Station 2 Watch Tower	Tel: 6541 2544
4	Station 3	Tel: 6541 2531
FMC		
5	Duty Supervisor	Tel: 6541 2424
Airside Operations Control		
6	Airside Control Centre (ACC)	Tel: 8533 4558 / 6541 2151
7	Airside Management Centre (AMC)	Tel: 6541 2273 / 2275
CAG Engineering & Development Cluster		
8	Team Leader, Airfield Systems, Aircraft Pavement Team	HP: 8191 9223
9	Team Leader, Airfield Lighting Team	HP: 9457 7373
Primech A&P Pte Ltd		
10	Contractor's Manager	HP: 8784 1517
11	Contractor's Duty Phone	HP: 9735 0216

PROCEDURE 13: APPLYING TAXIWAY/TAXILANE/ AIRCRAFT STAND CLOSURE TO CARRY OUT MAINTENANCE/PROJECT WORK





Additional Notes:

- (a) Approval from Changi Tower is not required for closure of aircraft stand (i.e. provided that no runway/taxiway/taxilane is required).
- (b) Application for stand closure is via online gate closure portal **at least 10 working days** before the proposed date of closure. Submission not fulfilling the required lead time requirement via the portal will be evaluated on a case-by-case basis.

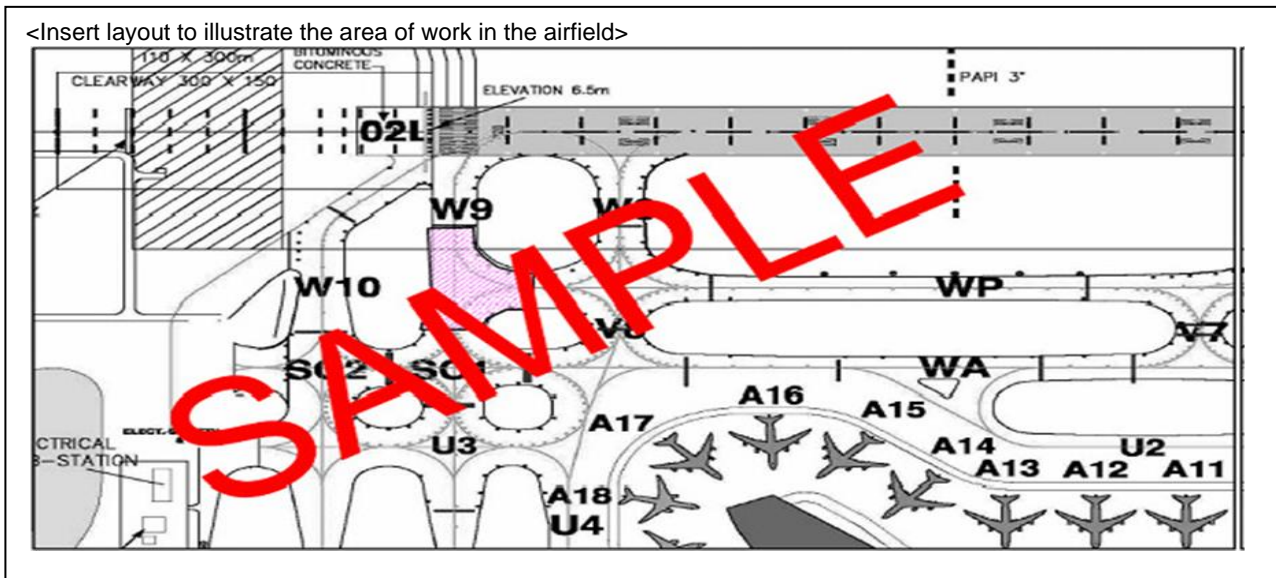
Annex 1

Twy Closure Approval No: _____

CLOSURE PROGRAMME

<Insert title of project/ work scope>

<Insert layout to illustrate the area of work in the airfield>



For clarification, please call handphone:
 CAG (Project officer): _____ Contractor: _____ / Rover _____

LEGEND	CLOSURE LOCATION	DATE	TIME (L/T)	REMARKS (FULL/DAILY)
Requested By:		Supported By:		Approved By:
(Company)		CAG Engineering & Relevant Group		(Runway & Taxiway/Taxilane Only)
				Chief Changi Tower(WEST)
				SVP, Airside Operations Control
(Name)		(Name)		(Name)
(Signature & Date)		(Signature & Date)		(Signature & Date)

Colour code

- : Taxiway/taxilane closure
- : Work area
- : Stand Closure - (no aircraft parking)
- : Stand restriction - (for layover only/no movements/no engine run)
- : Advisory Note - aircraft pushback restrictions

NOTE: The description of work under closure location and the inserted layout (use AIP Aerodrome chart) must tally, and NOTAM accordingly

File Reference: _____

CHECKLIST FOR NOTAM / AIP SUPPLEMENT / AIP AMENDMENT / AERONAUTICAL INFORMATION CIRCULAR PROMULGATION**Project Title:** _____**Requesting Section:** _____ **Work Location:** _____

Before Promulgation		
S/No	Item	Please Circle / Respond
1	Have you checked whether the aeronautical data and information of the draft NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular impacts safety and efficiency of the airside's operations (eg. runway closure, longer taxiing route, pushback restriction/revision, obstacles, etc.)?	Yes / No / N.A.
2	Have mitigation measures for the impact on safety of operations in the airside, arising from the NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular, been reviewed and fully endorsed in the form of a risk assessment?	Yes / No / N.A.
3	Have you ensured that the necessary safety provisions (e.g. visual aids, closure markings / markers, obstacle lights, etc.) will be in place on site to support the NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular?	Yes / No / N.A.
4	Have you consulted Changi Tower / Airside Operations Control / relevant AIP Subject Owner(s) on the proposed changes / activities before drafting the NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular?	Yes / No / N.A.
5	Have you checked that the aeronautical data and information of the draft NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular in association with the proposed changes / activities is correct and not in conflict with any of the existing NOTAMs / AIP Supplements / AIP Amendments / Aeronautical Information Circulars?	Yes / No
6	Have you checked that the phrasing of the aeronautical data and information of the draft NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular is accurate and complete?	Yes / No
7	Have you ensured that all areas affected by the changes are visually indicated on existing chart(s) for traceability?	Yes / No
8	Have you confirmed that the aeronautical charts comply with the requirements stated in Annex 4 Aeronautical charts?	Yes / No
Name/ Designation of officer assigned to check the site when the NOTAM / AIP Supplement / AIP Amendment is effected		
Contact Number		

Issuer of NOTAM/AIP Supplement/AIP Amendment:**Checker of NOTAM/AIP Supplement/AIP Amendment:**_____
Name / Designation_____
Signature / Date_____
Name / Designation_____
Signature / Date**Checked by SSU:**_____
Name / Designation_____
Signature / Date

After Promulgation		
1	Have you checked that the promulgated NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular is correct?	Yes
2	Have you provided the NOTAM / AIP Supplement / AIP Amendment / Aeronautical Information Circular reference number and attached it with this Checklist as a supporting document?	Yes Ref No: _____
If your answer to any of the above items is "No", please give the reason(s) below: -		

Issuer of NOTAM/AIP Supplement/AIP Amendment:

Checker of NOTAM/AIP Supplement/AIP Amendment:

Name / Designation

Signature / Date

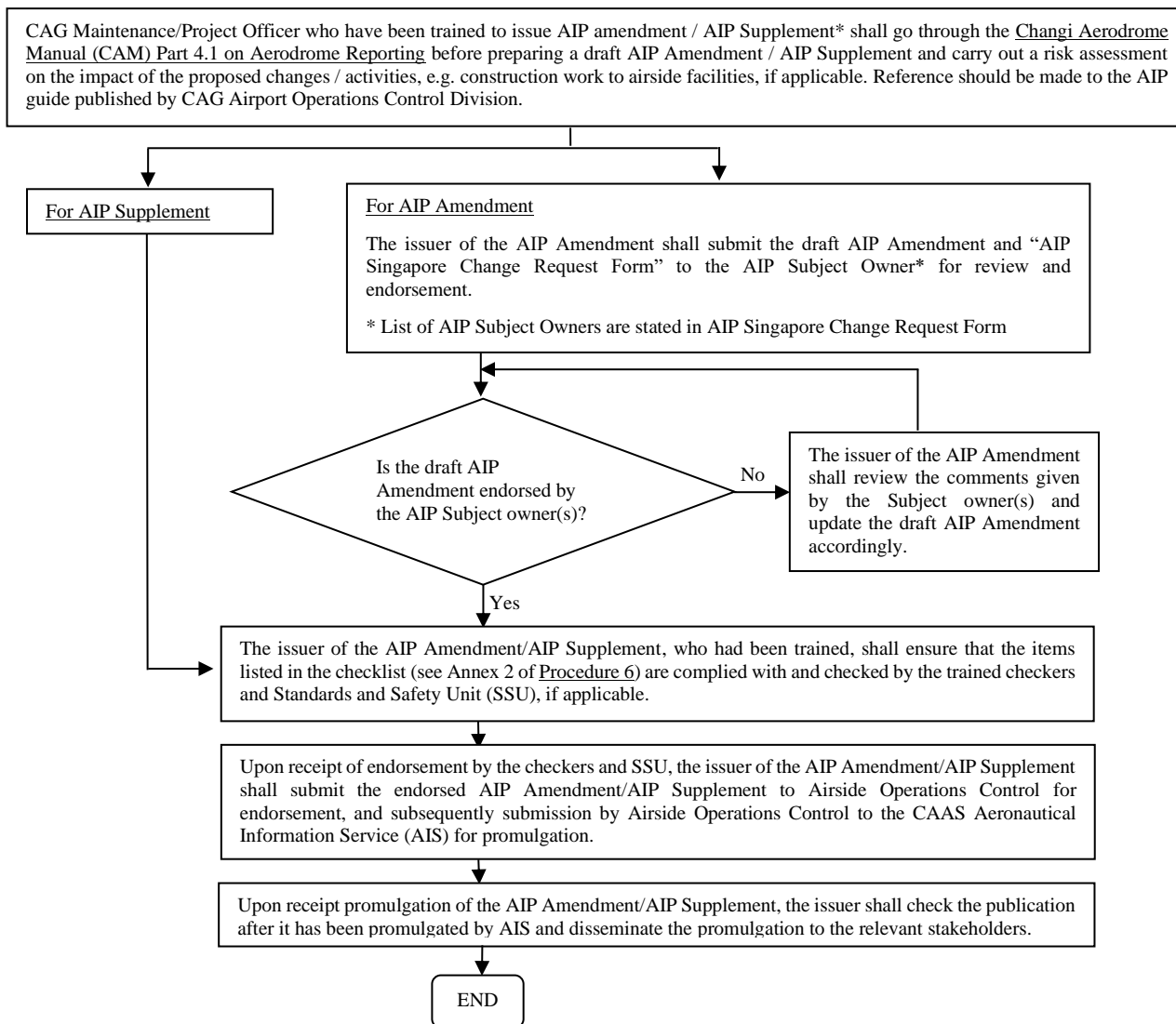
Name / Designation

Signature / Date

Note:

1. For content of NOTAM which takes effect less than 1 day, the issuer of NOTAM shall inform Airfield Technical Duty Team (Changi) / Aircraft Pavement & Airfield Lighting Inspection Teams (Seletar) via phone and fax immediately after the NOTAM is promulgated.
2. Only those officers have been trained can issue NOTAM.
3. The checker of NOTAM/AIP Supplement/AIP Amendment shall be officers who have undergone training.
4. The checker of the NOTAM/AIP Supplement/AIP Amendment cannot be the issuer of the same NOTAM/AIP Supplement/AIP Amendment.
5. NOTAM / AIP Supplement / AIP Amendment Promulgation Form must be attached to this checklist.
6. NOTAM / AIP Supplement / AIP Amendment Promulgation Form shall be checked by the respective SSU before submission.
7. Project officers shall consult Airside Operations Control, prepare AIP and all the necessary supporting documents, and submit to Airside Operations Control within the publication timeline as stipulated in Changi Aerodrome Manual. Airside Operations Control shall be responsible for the final submission to CAAS, AIS.
8. For NOTAM promulgation only – Maintenance works carried out by Team Leaders of E&D Airfield Systems, Pavement section and AFL section need not be endorsed by SSU. However, the issuer has to complete the checklist before sending the NOTAM to CAAS AIS and ASIT (Changi) / Aircraft Pavement & Airfield Lighting Inspection Teams (Seletar).

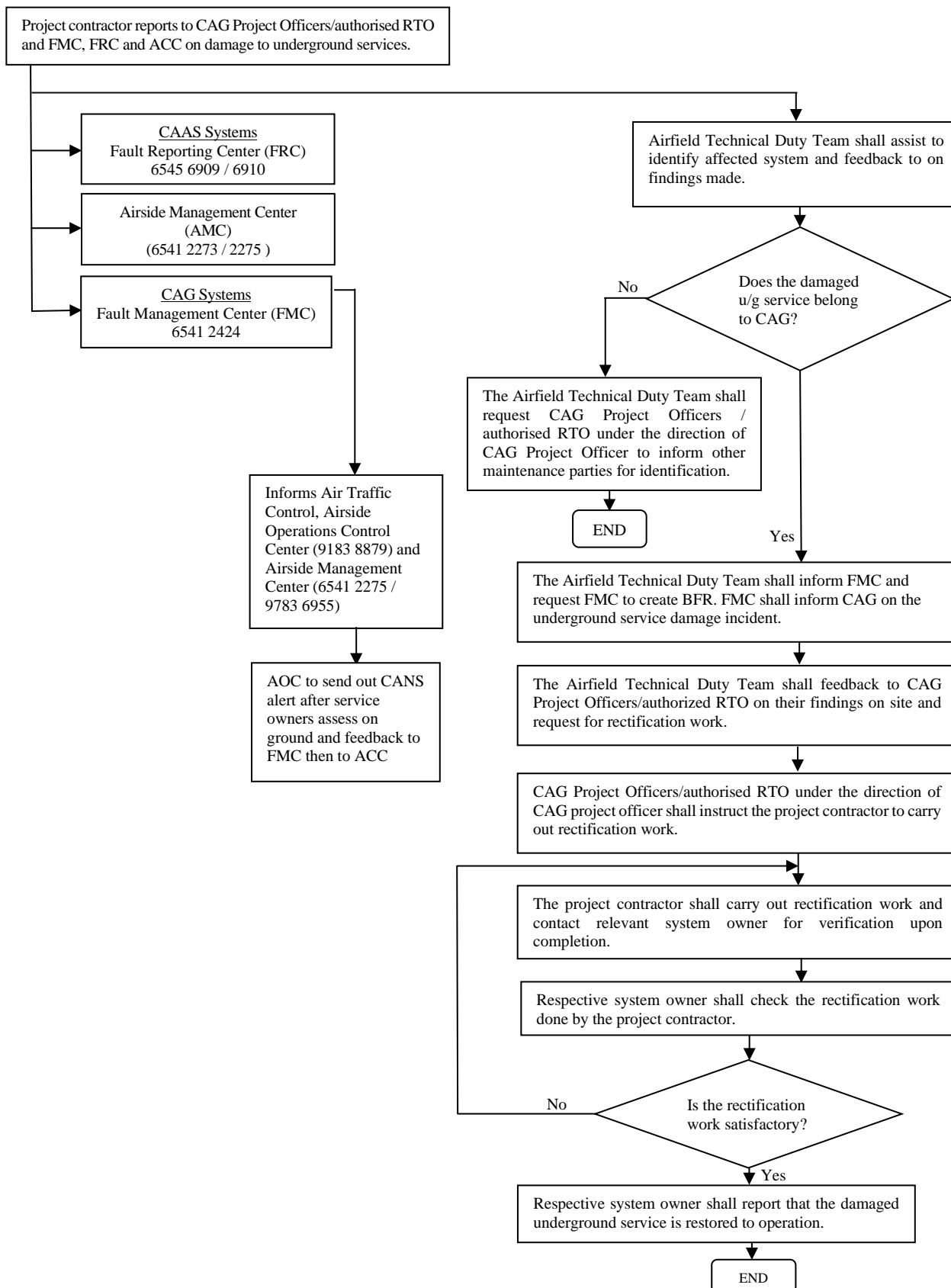
PROCEDURE 14: PREPARING AND DISSEMINATING AIP AMENDMENT/AIP SUPPLEMENT



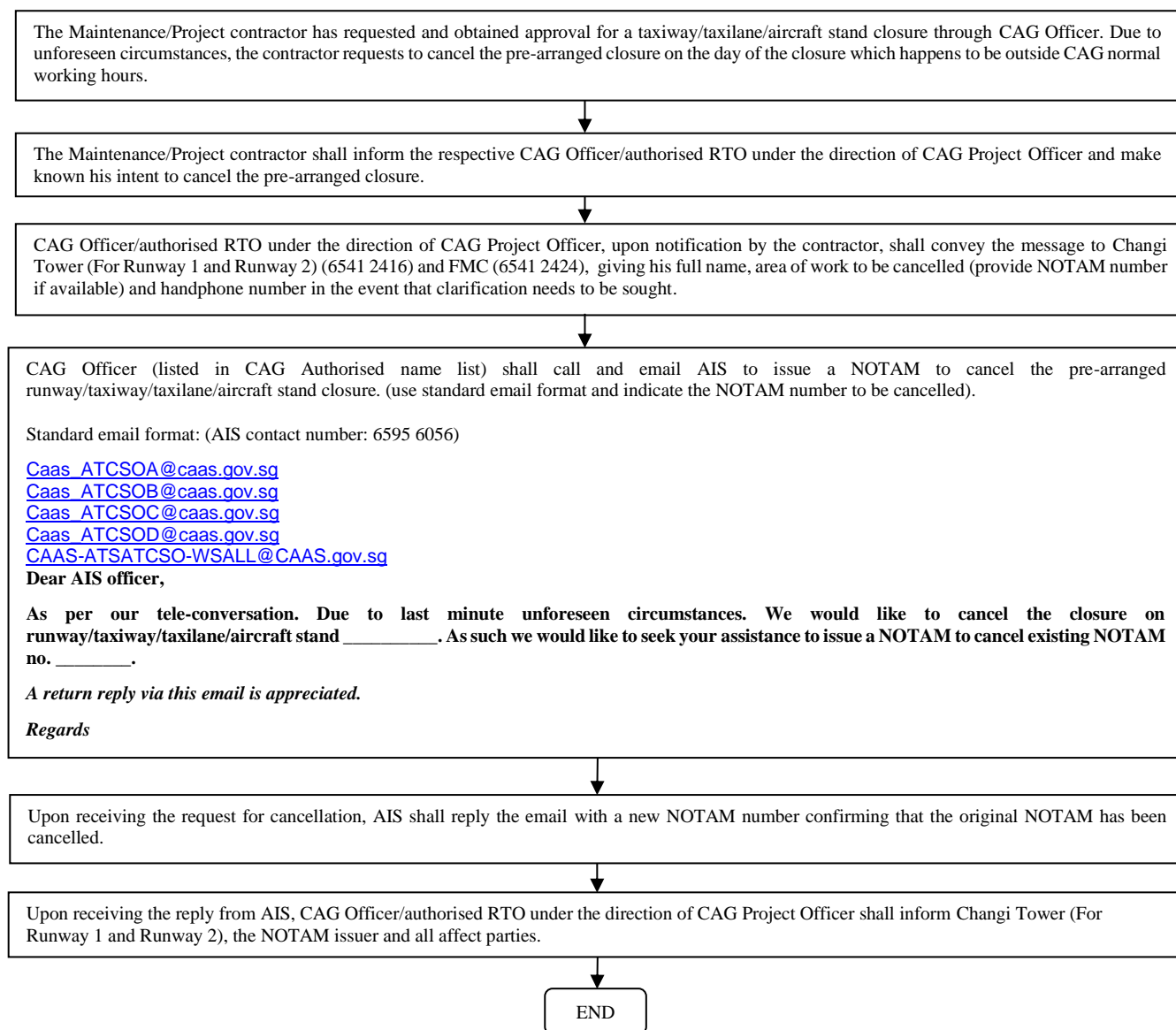
Additional Note:

- For newly constructed / rehabilitated aircraft parking stands, early confirmation on the data by the licensed surveyor through email would be established prior to submission of endorsed as-built drawings.
- Project / maintenance officer shall ensure that updates in the AIP and aerodrome manuals are made whenever there are changes to the infrastructure.
- For permanent changes to the information contained in the AIP, or completion of new airfield infrastructure (e.g. new taxiway / new aircraft stand etc.), CAG Maintenance/Project Officer shall inform Master Planning (Airfield Capacity Planning team) to update the changes in the Changi Aerodrome Manual (CAM) and in AIP Singapore accordingly.
- For AIP/AIP supplement promulgation, the form shall only be signed off if a proper safety assessment has been carried out where applicable.
- For permanent changes that are put up using NOTAMs, an additional "AIP Singapore Change Request Form" is needed to submit to AIS for AIP amendment.
- For permanent changes that are put up using AIP Supplement, an additional "AIP Singapore Change Request Form" is needed to submit to AIS for AIP amendment.
- For amendment on WSSS AD2.24 Aerodrome Chart AD-2-WSSS-ADC-2, in parallel with the submission to CAAS AIS, the issuer of the AIP amendment shall extend a copy to AES (for their update of the crash map).

PROCEDURE 15: RESPONSE BY PROJECT CONTRACTOR TO UNDERGROUND SERVICE DAMAGE BY PROJECT CONTRACTOR DURING EXCAVATION WORK



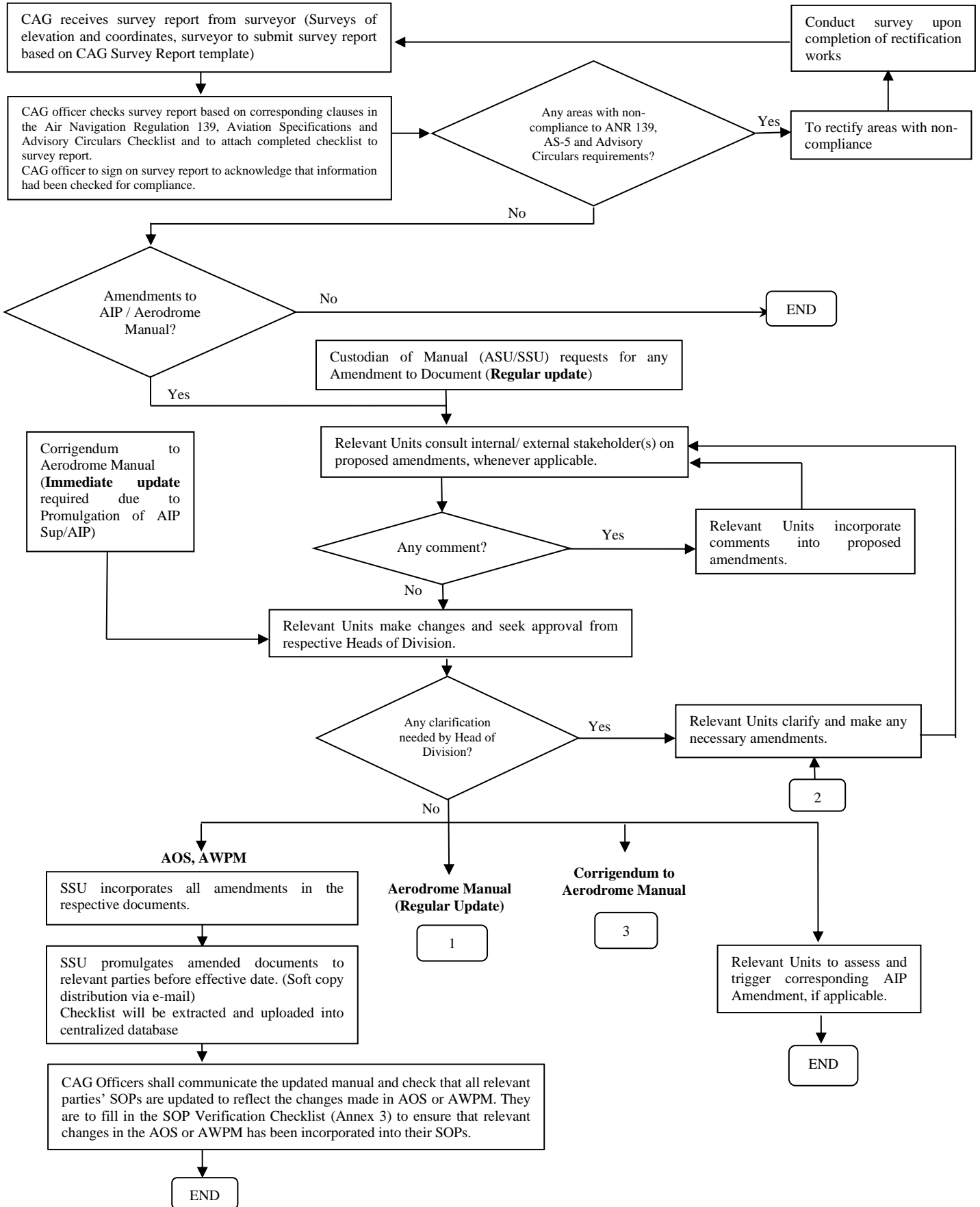
PROCEDURE 16: PROCEDURE FOR CANCELLING TAXIWAY/TAXILANE/AIRCRAFT STAND CLOSURE OUTSIDE CAG NORMAL WORKING HOURS

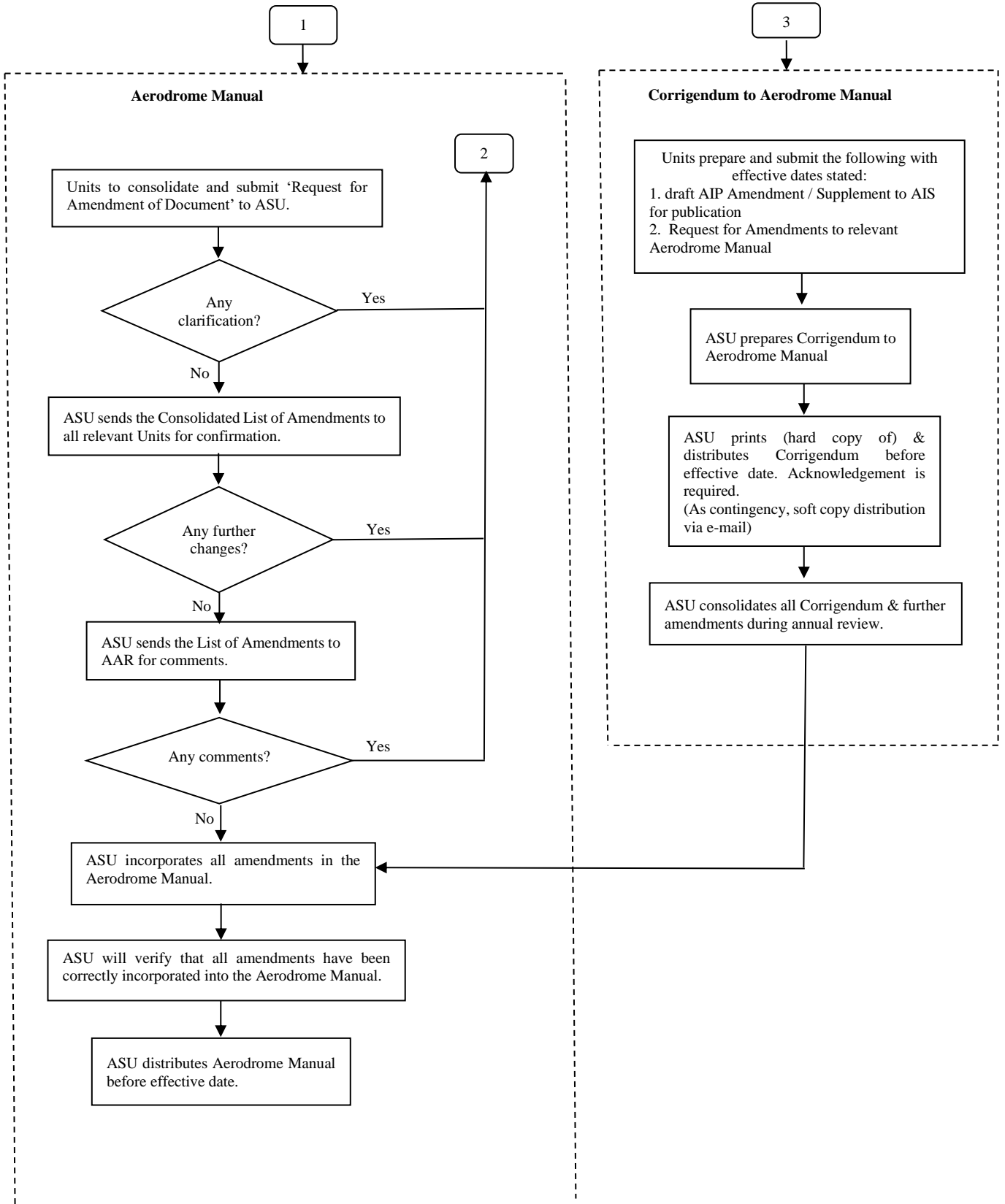


Note:

- 1) If the Original NOTAM contains several other dates and which will be cancelled together with the runway/taxiway/taxilane/aircraft stand to be closed, then the issuer of the NOTAM shall re-issue a new NOTAM for the rest of the remaining dates.
- 2) There is no requirement to cancel the NOTAM if the CAG Officer/authorised RTO so decides to re-open the runway/taxiway/taxilane/aircraft stand earlier after it has been closed according to the approved timing.

PROCEDURE 17: PROCESS FLOW ON UPDATING OF AERODROME MANUAL, AIRPORT OPERATIONAL AND SAFETY(AOS), AIRSIDE WORKS PROCEDURE MANUAL (AWPM)





Annex 3

SOP Verification Checklist



The purpose of this checklist is to ensure that work parties had implemented the latest requirements, where relevant, as stipulated in CAG’s procedures such as the Airport Operational and Safety Requirement Manual (AOS) or Airside Works Procedure Manual (AWPM) as and when a new revision to the manual or SOP is promulgated.

CAG project / maintenance officer shall attach excerpts of the affected SOP from work parties for documentation of such changes made.

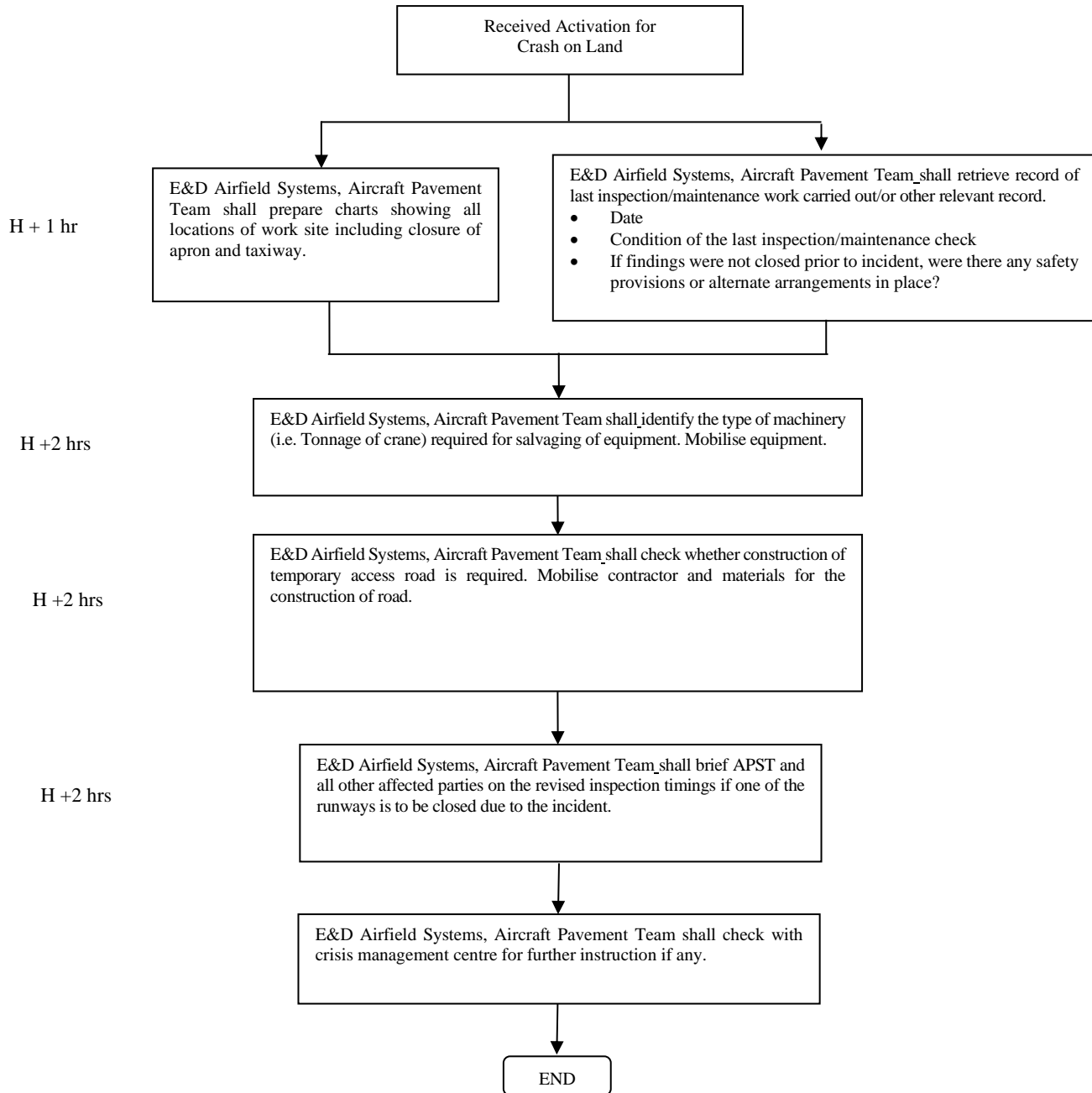
CAG Manual : AOS / AWPM*
 Revision : _____
 Manual Revision Date : _____

* Delete where applicable

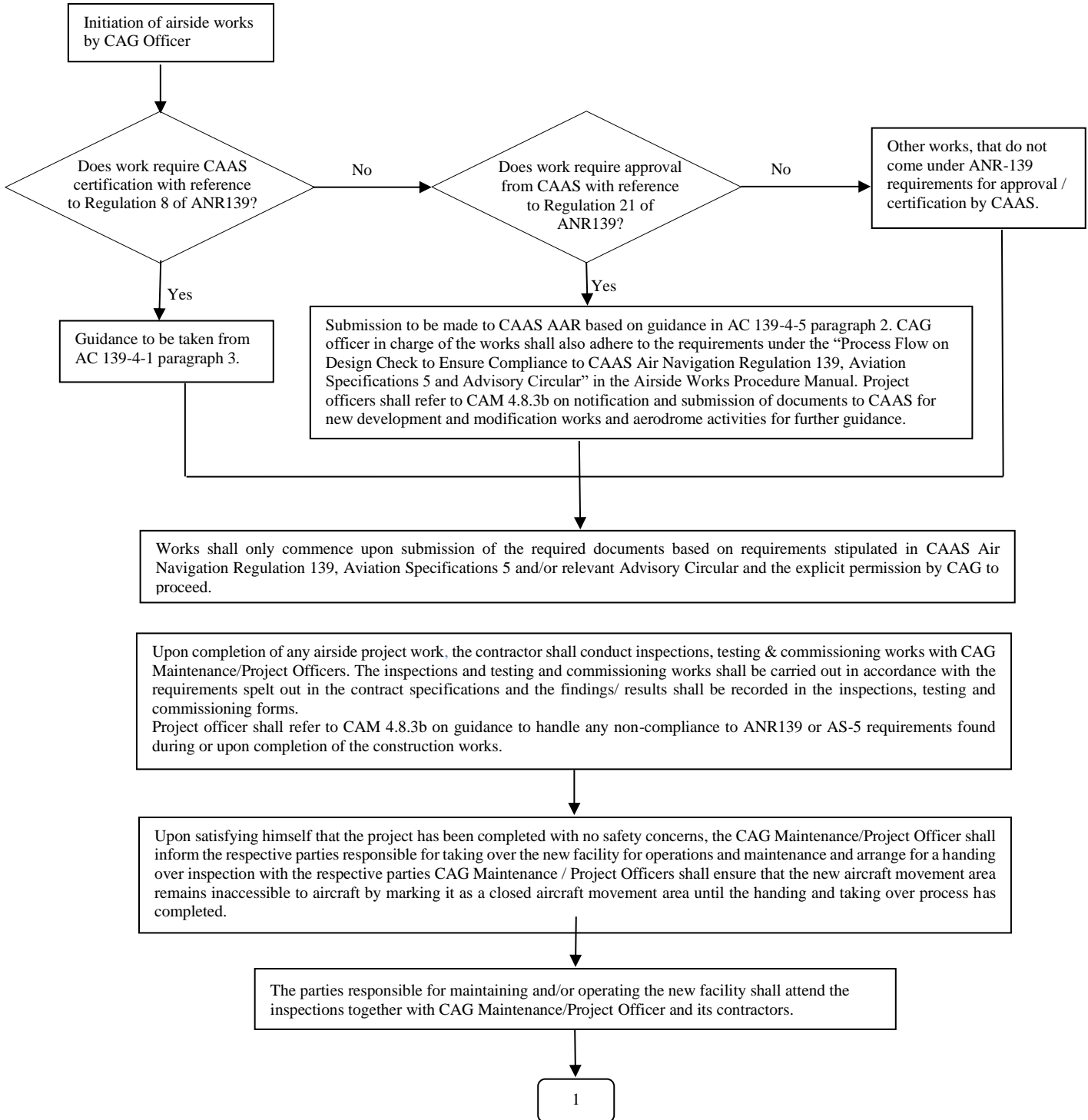
Reference number in list of amendment form	Clause reference in CAG Manual	Not Implemented	Not Applicable	Implemented	Remarks (Reason for not implementing / implemented with reference to work parties' SOP and to include work parties' SOP clause reference number)

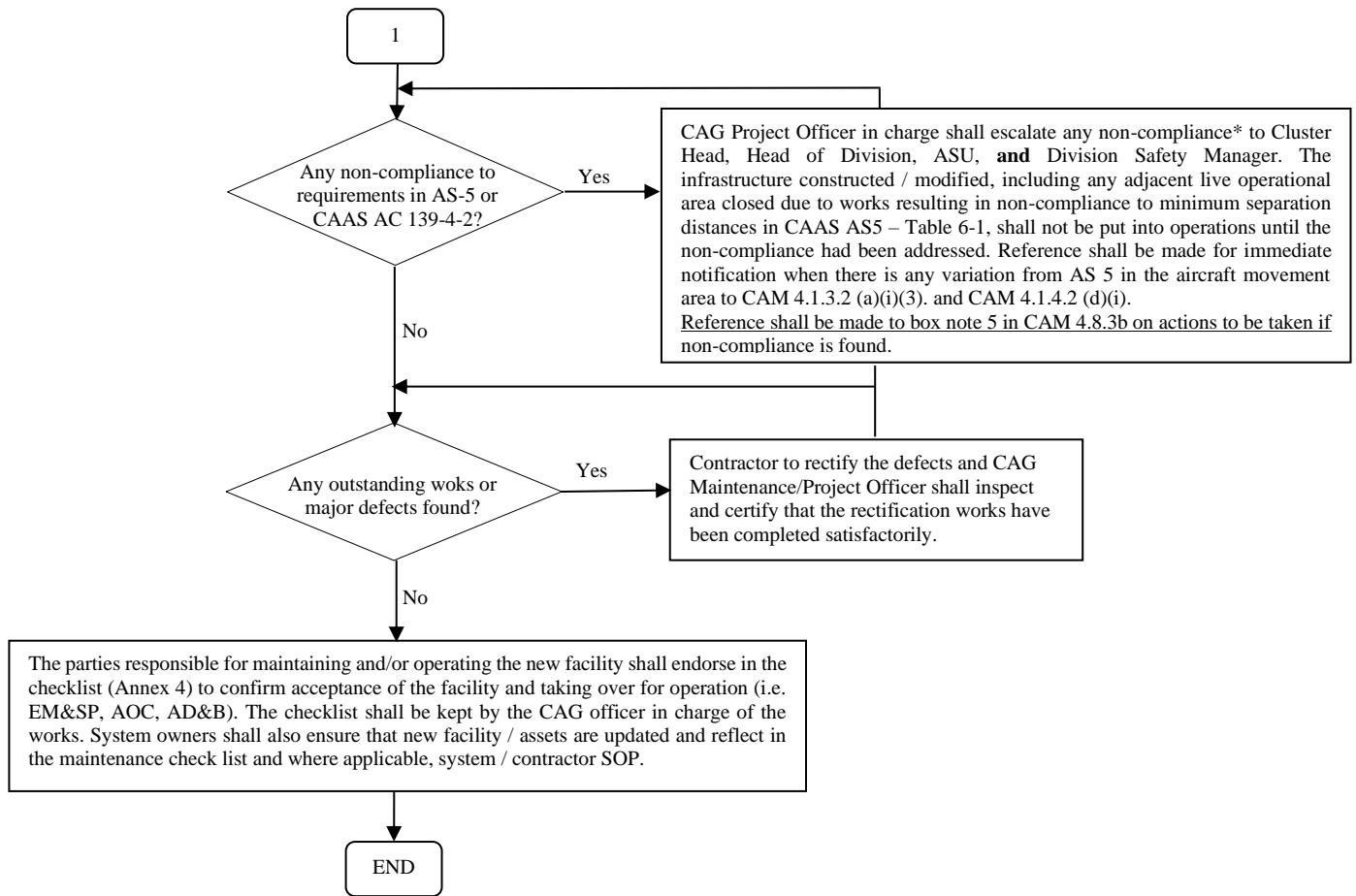
Check by (CAG) : _____
 Date : _____
 Scope of Work : _____

PROCEDURE 18: RESPONSE TO CRASH ON LAND WITHIN CHANGI AIRPORT WITHIN AES TURN-OUT AREA (RUNWAY 1 or 2)



PROCEDURE 19: PROCESS FLOW ON COMMISSIONING AND HANDING OVER UPON COMPLETION OF PROJECT AT MOVEMENT AREA





*Any non-compliances to ANR-139, AS-5 and CAAS AC139-4-2 found during the system owners’ checks are to be rectified by the project team prior to handover and operationalisation.

Annex 4

Checklist for Commissioning of Airside Infrastructure and Works



Project Title: _____

	* Runway / Taxiway	:	_____
	Aircraft Parking Stand	:	_____
	Other Works	:	_____

No	Facility / Equipment	Compliance / Functionality Checked	Check Status	Checked By	Signed / Date	Maint Checklist Updated?	Remarks / Comments Addressed
1	<u>Civil Works</u>						
1.1	Runway / Taxiway pavement constructed in accordance to design and specifications. *To attach PCN / PCR (from 28 Nov 2024) report during HOTO.		*Acceptable / To Rectify / NA			*Yes / No	
1.2	Runway / Taxiway ground markings painted in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
1.3	Parking Stand pavement constructed in accordance to design and specifications. *To attach PCN / PCR (from 28 Nov 2024) report during HOTO.		*Acceptable / To Rectify / NA			*Yes / No	
1.4	Aircraft stand ground markings, including stop-line painted in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
1.5	Primary and Secondary Roadway constructed in accordance to design and specifications.		*Acceptable / To Rectify / NA			*Yes / No	
1.6	Roadway ground markings dimension painted in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
1.7	Jet blast deflector are constructed according to design and specifications, meeting minimum separation distance from nearest edge of any above-ground structure of jet blast deflector structure to taxiway / runway centerline in compliance to AS-5 Table 6-1 requirements.		*Acceptable / To Rectify / NA			*Yes / No	
1.8	Drains are constructed in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
1.9	Turfing are provided in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	

No	Facility / Equipment	Compliance / Functionality Checked	Check Status	Checked By	Signed / Date	Maint Checklist Updated?	Remarks / Comments Addressed
1.10	Any objects that are required to be frangible are constructed to ICAO frangibility requirements. * To attach proof of frangibility / test results.		*Acceptable / To Rectify / NA			*Yes / No	
1.11	Any objects regarded as aerodrome obstacles, i.e. object within minimum separation distance to taxiway / runway centerline to AS-5 Table 6-1 requirements; object penetrating airport height controls; object hazardous to air navigation are marked/painted red-white in accordance to AS-5 specifications.		*Acceptable / To Rectify / NA			*Yes / No	
1.12	Any objects regarded as aerodrome obstacles, i.e. object within minimum separation distance to taxiway / runway centerline to AS-5 Table 6-1 requirements; object penetrating airport height controls; object hazardous to air navigation are installed with red obstacle light(s) in accordance to AS-5 specifications.		*Acceptable / To Rectify / NA			*Yes / No	
2	<u>PLB / ADGS</u>						
2.1	Fixed gangway serviceability and condition check		*Acceptable / To Rectify / NA			*Yes / No	
2.2	PLB serviceability and condition check		*Acceptable / To Rectify / NA			*Yes / No	
2.3	PLB security doors and condition check		*Acceptable / To Rectify / NA			*Yes / No	
2.4	PLB red obstacle lights provided in accordance to AS-5 specifications		*Acceptable / To Rectify / NA			*Yes / No	
2.5	PLB safety zone ground markings dimension in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
2.6	ADGS display & control panel in working condition and passed respective serviceability test		*Acceptable / To Rectify / NA			*Yes / No	
2.7	INS sign constructed in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
2.8	Bay indicator sign constructed in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
2.9	Gate Operating System (GOS) updated		*Acceptable / To Rectify / NA			*Yes / No	
3	<u>ANCILLARY BUILDING SERVICES AND M&E SYSTEMS</u>						
3.1	Apron Floodlight & luminance checked in accordance to AS-5 specifications. To attached lux level reading report.		*Acceptable / To Rectify / NA			*Yes / No	
3.2	Apron floodlight OG box + plinth installed in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
3.3	Lightning protection shelter provided in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	

No	Facility / Equipment	Compliance / Functionality Checked	Check Status	Checked By	Signed / Date	Maint Checklist Updated?	Remarks / Comments Addressed
3.4	Earth receptacle provided in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
3.5	OBS lights for jet blast fence provided in accordance to AS-5 specifications		*Acceptable / To Rectify / NA			*Yes / No	
4	<u>AFL system / ALCS</u>						
4.1	Runway / Taxiway centerline and edge lights are installed in accordance to design and specifications, in compliance with AS-5 requirements *To attached specifications of installation.		*Acceptable / To Rectify / NA			*Yes / No	
4.2	Airfield mandatory and information signs constructed in accordance to specifications in terms of dimension and luminance. In compliance with AS-5 requirements		*Acceptable / To Rectify / NA			*Yes / No	
4.3	Airfield Lighting Control System (ALCS) updated with new / removed section of the AFL upon completion of works		*Acceptable / To Rectify / NA			*Yes / No	
4.4	Aircraft Stand Manoeuvring Guidance Light System provided in accordance to design and specifications		*Acceptable / To Rectify / NA			*Yes / No	
4.5	Guidance signs are designed and constructed in compliance with AS-5 specifications		*Acceptable / To Rectify / NA			*Yes / No	
5	<u>CCTV</u>						
5.1	Camera Coverage of Aircraft Parking Stand/Runway/Taxiway has been checked and verified with relevant stakeholders		*Acceptable / To Rectify / NA			*Yes / No	
6	<u>Fuel hydrant system</u>						
6.1	Underground fuel hydrant pit location had been identified and marked		*Acceptable / To Rectify / NA			*Yes / No	
6.2	Dimension of markings for hydrant pits in accordance to specifications		*Acceptable / To Rectify / NA			*Yes / No	
6.3	Height of protrusion of fuel pit above pavement level		*Acceptable / To Rectify / NA			*Yes / No	
6.4	CAFHI infrastructure has been commissioned in line with relevant JIG Standards. CAFHI to send CAG confirmation by the project consultant that the relevant commissioning tests have been conducted and are satisfactory		*Acceptable / To Rectify / NA			*Yes / No	
6.5	CAFHI Hansa test bay closure matrix and test plans has been updated. CAFHI to send CAG: <ul style="list-style-type: none"> Updated Hansa test bay closure matrix Confirmation that Hansa test plans and parameters has been recalibrated and updated. 		*Acceptable / To Rectify / NA			*Yes / No	

No	Facility / Equipment	Compliance / Functionality Checked	Check Status	Checked By	Signed / Date	Maint Checklist Updated?	Remarks / Comments Addressed
8	<u>Documentation</u>						
8.1	Issuance of NOTAM		*Acceptable / To Rectify / NA			*Yes / No	
8.2	Issuance of AON		*Acceptable / To Rectify / NA			*Yes / No	
8.3	Submission of AIP publication (AIP Supp, AIP amdt) Project officer to ensure that information submitted is aligned with updates to the aerodrome manual. * To attached relevant endorsed drawings from registered surveyor for information to be updated in the AIP publication.		*Acceptable / To Rectify / NA			*Yes / No	
8.4	Update to Aerodrome Manual (CAM / SAM) Project officer to ensure that information submitted is aligned with updates to the AIP / AIP Supp.		*Acceptable / To Rectify / NA			*Yes / No	
8.5	CAAS Forms A, B, D for proposed changes to aerodrome infrastructure.		*Acceptable / To Rectify / NA			*Yes / No	
8.6	Annex 5 to Procedure 20 of Airside Works Procedure Manual - Declaration on compliance to C AAS ANR 139, Aviation Specifications and Advisory Circulars for airfield design at Changi and Seletar Airports		*Acceptable / To Rectify / NA			*Yes / No	
9	<u>Others</u>						
9.1	Operational item has been updated (pushback procedure in AOCs)		*Acceptable / To Rectify / NA			*Yes / No	
9.2	Operational item has been provided (fire extinguisher at parking stand)		*Acceptable / To Rectify / NA			*Yes / No	
9.3	Operational item has been provided (FOD bin)		*Acceptable / To Rectify / NA			*Yes / No	
9.4	Others (to specify: _____)		*Acceptable / To Rectify / NA			*Yes / No	

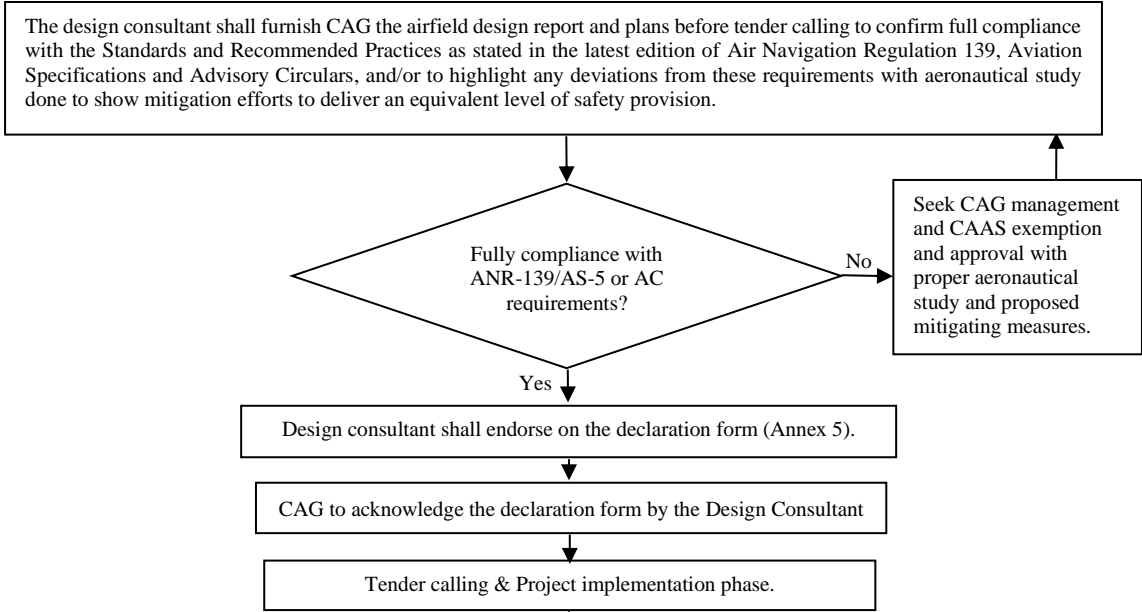
***Note:**

- System owners' checks as part of the handover of infrastructure shall be conducted prior to any AAR inspection.
- All items checked should be compliant to Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars and critical dimension (i.e. Marking font size, safety distances, e.t.c) shall be recorded.
- As-built drawings to be attached once available and uploaded into internal drawing management system (i.e. Newforma for E&D), after handing-over.

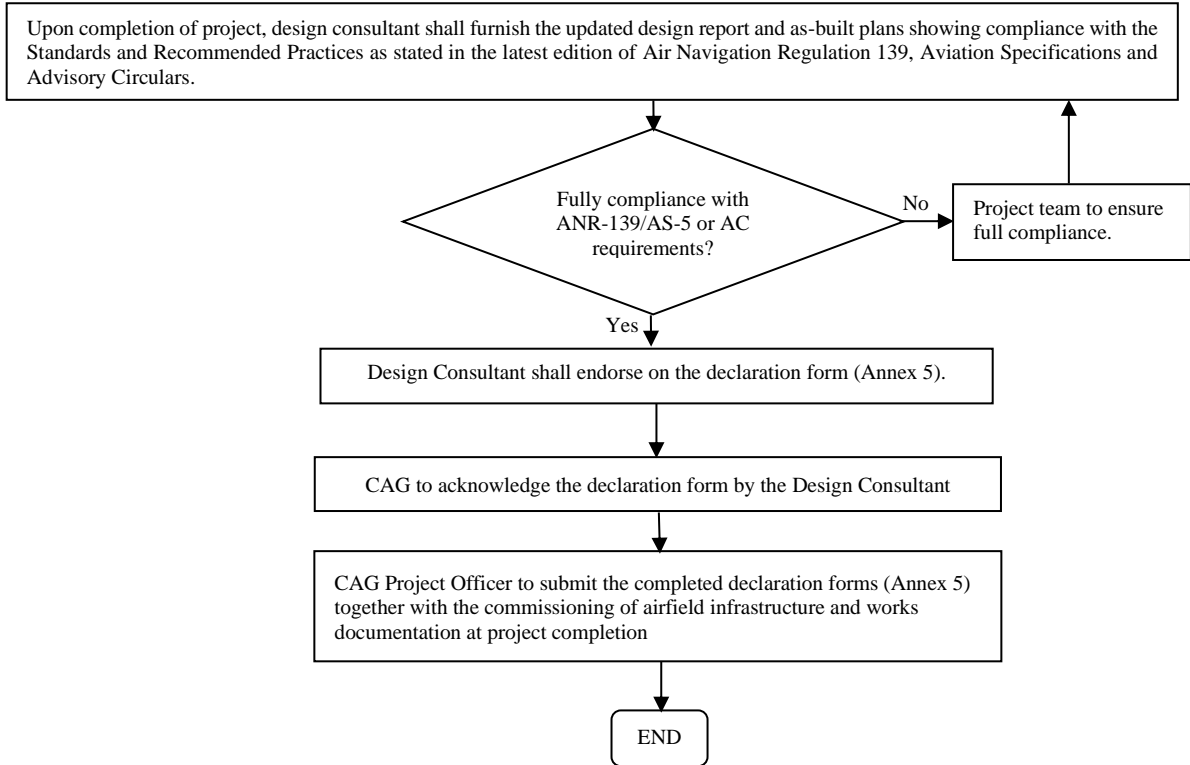
Infrastructure Type: *Runway/ Taxiway / Taxilane / Aircraft Parking Stand / Others: (_____)					
Hand Over (E&D / CE PDCO)		Taking Over (E&D Maintenance)		Witness By	
Section	: _____	Division	: _____	Company	: _____
Name	: _____	Name	: _____	Name	: _____
Designation	: _____	Designation	: _____	Designation	: _____
Signature	: _____	Signature	: _____	Signature	: _____
Date / Time	: _____	Date / Time	: _____	Date / Time	: _____
Infrastructure Type: *Runway/ Taxiway / Taxilane / Aircraft Parking Stand / Others: (_____)					
Hand Over (E&D / CE PDCO)		Taking Over (Operations)		Witness By	
Section	: _____	Division	: _____	Company	: _____
Name	: _____	Name	: _____	Name	: _____
Designation	: _____	Designation	: _____	Designation	: _____
Signature	: _____	Signature	: _____	Signature	: _____
Date / Time	: _____	Date / Time	: _____	Date / Time	: _____

PROCEDURE 20: PROCESS FLOW ON DESIGN CHECK TO ENSURE COMPLIANCE TO CAAS AIR NAVIGATION REGULATION 139, AVIATION SPECIFICATIONS AND ADVISORY CIRCULARS

(A) Before Tender Calling Stage



(B) Project Completion Stage



DECLARATION ON COMPLIANCE TO CAAS AIR NAVIGATION REGULATION 139, AVIATION SPECIFICATIONS AND ADVISORY CIRCULARS FOR AIRFIELD DESIGN AT CHANGI AND SELETAR AIRPORTS

(A) INFORMATION ON PROPOSED DEVELOPMENT/PROJECT

Proposed Development / Project :
Location :

(B) DECLARATION BY DESIGN CONSULTANT QUALIFIED PERSON

The design consultant Qualified Person (QP) hereby declares that:

For the proposed airfield related development:

- The submitted design report and plan(s) (Tender / As-Built)* comply fully with the Standards and Recommended Practices as stated in the latest edition of the Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars (version: ____) published by the Civil Aviation Authority of Singapore (CAAS), unless otherwise stated below;
- The complete list of non-compliances are:

Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars Clause	Details of Non-Compliance	Remarks

Note: to submit on a separate page if necessary

This is to certify that the design report and plan(s) submitted have been checked to ensure that the submitted design report and plan(s) (Tender / As-Built)* comply fully with the Standards and Recommended Practices as stated in the latest edition of the Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars (version: _____) published by the Civil Aviation Authority of Singapore (CAAS). The relevant chapter(s) checked are:

Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars Chapter / Clauses	Yes	No	N.A	Remarks
Physical Characteristics				
Obstacle Restriction and Removal				
Visual Aids for Navigation				
Visual Aids for Denoting Obstacles				
Visual Aids for Denoting Restricted Use Areas				
Electrical Systems				
Aerodrome Operational Services, Equipment and Installations				
Others (please specify: _____)				

Note: to submit on a separate page if necessary

Additional aeronautical studies done to provide equivalent level of safety for any non-compliances.

The following aeronautical studies reports for the non-compliances identified are attached:

Nos	Air Navigation Regulation 139, Aviation Specifications and Advisory Circulars Clause	Report Reference No.

DECLARED BY (DESIGN CONSULTANT)

Name: _____ Designation: _____

Signature: _____ Date: _____

DECLARATION FORM ACKNOWLEDGED BY (CAG PROJECT OFFICER)

Name: _____ Designation: _____

Signature: _____ Date: _____

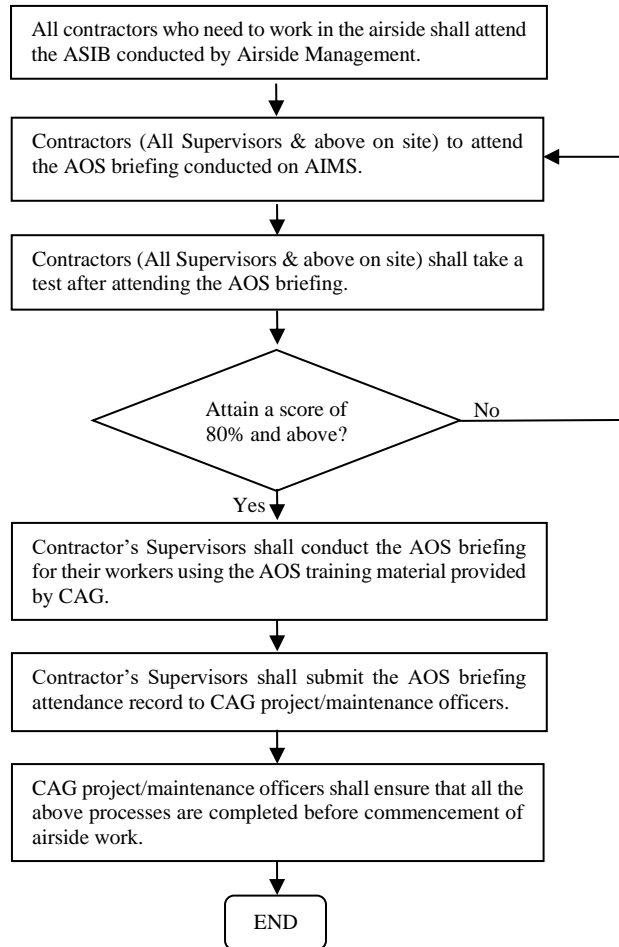
DECLARATION FORM ACKNOWLEDGED BY (*CAG MASTER PLANNING (for CHANGI WEST / T1-T4); or * CAG CHANGI EAST DESIGN (for CHANGI EAST / T5))

Name: _____ Designation: _____

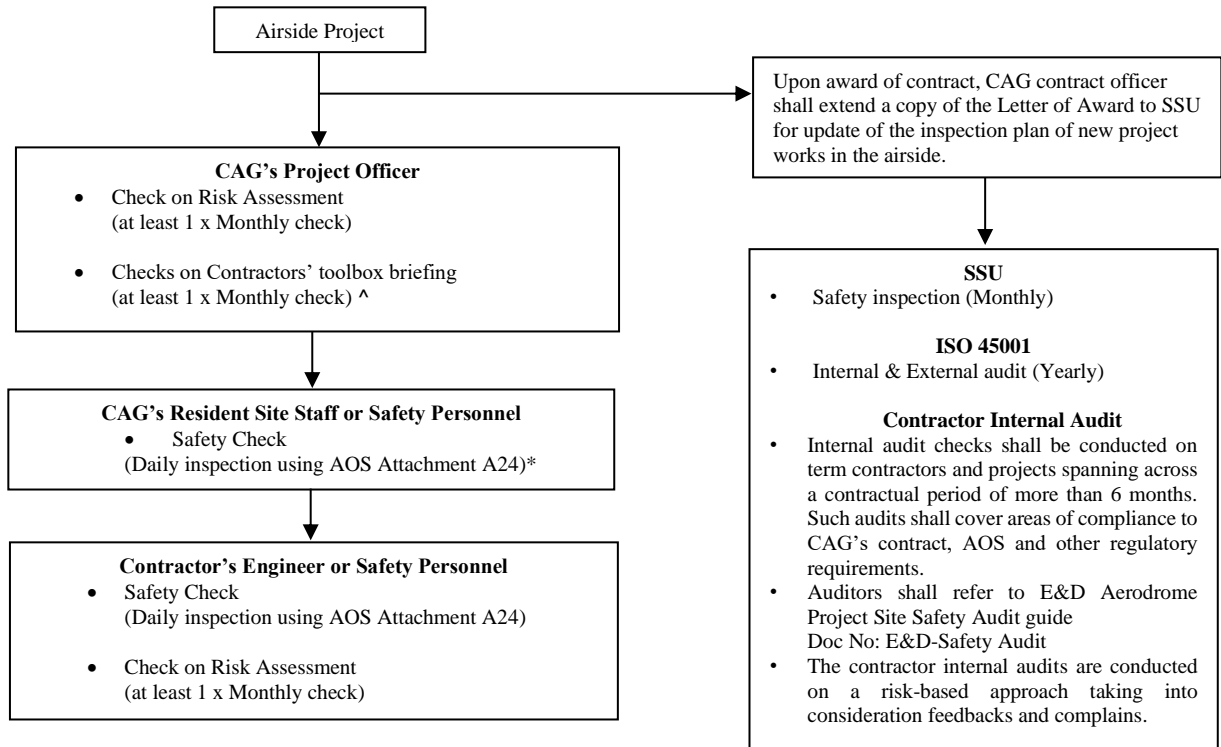
Signature: _____ Date: _____

* Delete where applicable

**PROCEDURE 21: SAFETY BRIEFING WORKFLOW FOR
AIRSIDE SAFETY INDUCTION BRIEFING (ASIB) &
AIRPORT OPERATIONAL SAFETY REQUIREMENTS (AOS)
BRIEFING**



PROCEDURE 22: SAFETY INSPECTION FRAMEWORK **(DEVELOPMENT / PROJECT)**



* On days that the site supervisory personnel are not at work due to public holidays or weekends, the contractor shall assign a person holding a supervisory post or minimally a safety coordinator, to conduct the checks on behalf of the site supervisory personnel. Information of person who has conducted the check on public holidays or weekends shall be indicated on the daily inspection checklist.

To ensure the quality of the checks, photographs of critical check items such as closure markers and markings, obstacle lights and chequered flags shall be taken and forwarded to the site supervisory personnel for verification. Site supervisory personnel shall then attach the photographs and endorse on the checklist on the next working day.

^

CAG's Project Officer are advised to utilize a copy of the approved risk assessment form to conduct the checks. Mitigation measures checked shall be indicated on the RA with date that it was inspected. Project Officers are also advised to indicate explicitly the checks done or when any mitigation measure has been completed. Where practicable based on progress and scope of work, project officers shall complete checks for every single line item on the RA within a period of 1 year, except for work activities which have not commence. This is to ensure that every line item is checked within a reasonable timeframe. The team lead for the project, shall also conduct checks on the completeness of the RA checks by the project officer once every quarter. CAG's Project Officer can exercise their own discretion when conducting such checks if the records are kept in a manner that provides traceability and ensure completeness of check.

CAG's appointed site representative is to conduct checks on contractor's toolbox briefing at least once a week, signing off on the attendance record only when they are physically present for the briefing session and had verified the accuracy of contents briefed against what is recorded.