AIRSIDE WORKS PROCEDURE MANUAL

FOR CHANGI AIRPORT

Compiled by

Standards and Health Unit
Engineering & Development Cluster

Version 30/2024

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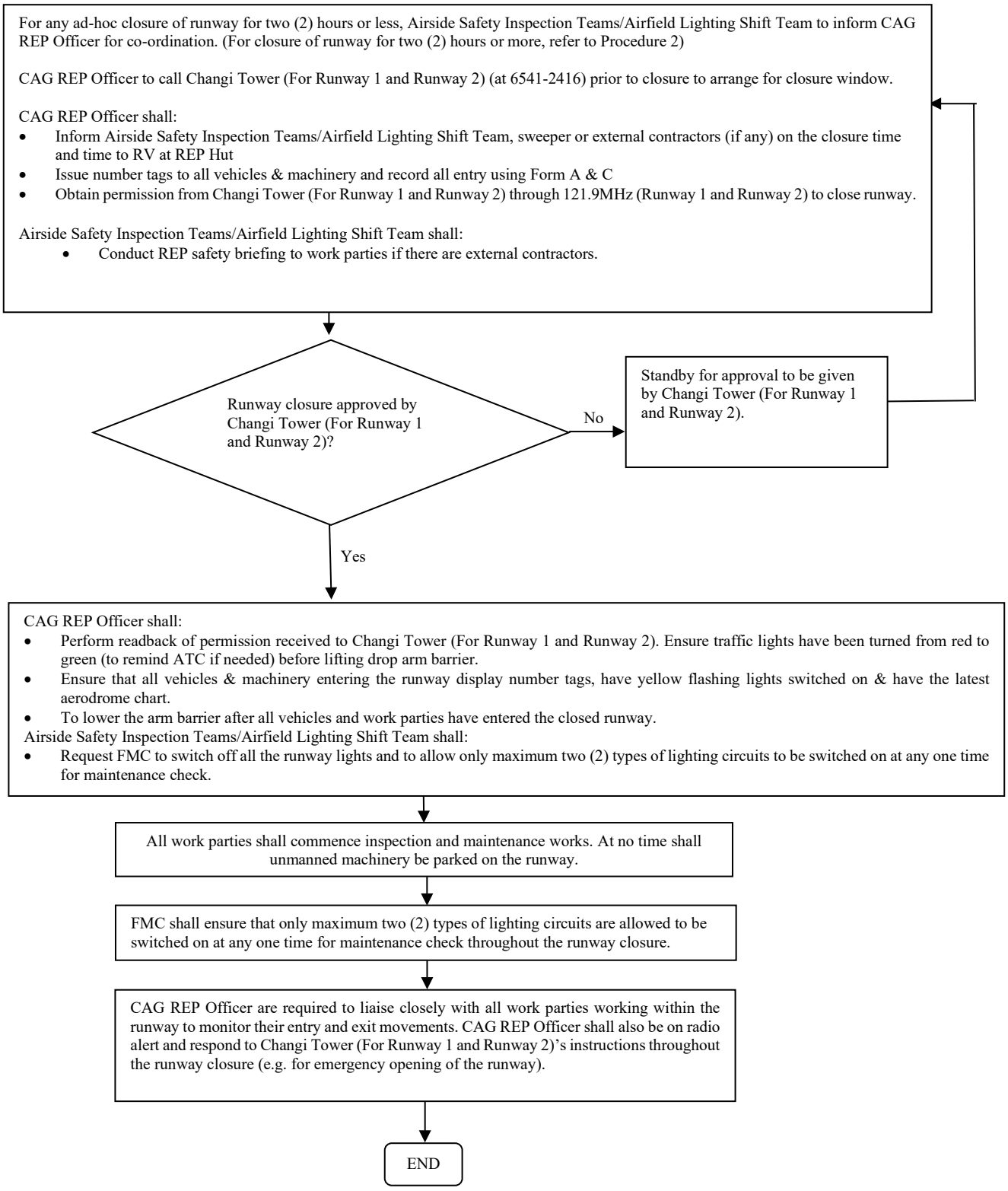
PROCEDURE

PROCEDURE 1: CLOSURE OF RUNWAY FOR TWO (2) HOURS OR LESS TO CARRY OUT WORK



Additional Note:

(a) CAG REP Officer, Airside Safety Inspection Teams/Airfield Lighting Shift Team shall:
- Check the two (2) yellow flashing lights on their rovers are serviceable before the start of runway closure.
- 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).
- Refer to "CAT1 Airside Driving Theory Handbook" for further details.

(b) In the event that Changi Tower (For Runway 1 and Runway 2) needs to re-open the closed runway, CAG REP Officer shall ensure that all personnel, vehicles and machinery, etc. are evacuated from the runway within the time specified below upon notification by Changi Tower (For Runway 1 and Runway 2). All workers need to sign out and vehicle/machinery tags need to be accounted for. If the runway cannot be re-opened within the stipulated period, CAG REP Officer shall inform Changi Tower (For Runway 1 and Runway 2) in advance. Airside Safety Inspection Teams/Airfield Lighting Shift Team shall inform FMC who will in turn inform the CAG Team Leader in-charge of aircraft pavement and AFL. REP Officer shall jointly with ASIT/ASLT carry out the FINAL inspection to ensure all workers, vehicles, machines and equipment have vacated the runway.

Closure time	**Estimated lead time for evacuation**
Less than or equal to 30 minutes (i.e. time-limited works)	5 minutes
More than 30 minutes	30 minutes

(c) Ad-hoc closure refers to closures which are not part of the scheduled daily inspections that are reflected in the AIP/AIP Sup.

PROCEDURE 2: CLOSING OF RUNWAY FOR MORE THAN TWO (2) HOURS TO CARRY OUT WORK

Before the start of the planned runway closure period, the Airside Safety Inspection Teams (ASITs)/Airfield Lighting Shift Team shall contact Changi Tower (For Runway 1 and Runway 2) through radio set (121.9 MHz) to get approval to carry out inspection of the other runway, i.e. runway not intended to be closed for more than 2 hours. This is to ensure that the other runway is in fully serviceable condition before the planned runway closure of more than 2 hours is carried out. Please also refer to Procedure 7 when inspecting the other runway.

Is the other runway in good condition?

No

ASIT shall request Changi Tower (For Runway 1 and Runway 2)'s permission to mobilise necessary resources to rectify the defect found on the other runway before continuing with the original planned runway closure. ASIT shall inform CAG REP officer (on standby at REP post) should there be any delay to scheduled runway closure.

Yes

CAG REP Officer shall:

- Inform Airside Safety Inspection Teams/Airfield Lighting Shift Team, sweeper or external contractors (if any) on the closure time and time to RV at REP Hut
- Issue number tags to all vehicles & machinery and record all entry using Form A & C
- Update movement chart on the work areas and contact numbers of work supervisors;
- Obtain permission from Changi Tower (For Runway 1 and Runway 2) through 121.9MHz (Runway 1 and 2) to close runway.

Airside Safety Inspection Teams/Airfield Lighting Shift Team shall:

- Conduct REP safety briefing to work parties if there are external contractors.
- Brief on any special activity or event that will be taking place on the closed runway during the closure, e.g. aircraft crossing.

Runway closure approved by Changi Tower (For Runway 1 and Runway 2)?

No

Standby for approval to be given by Changi Tower (For Runway 1 and Runway 2).

Yes

Runway Closure

CAG RE Officer & REP Support Officer shall:

- Perform readback of permission received to Changi Tower (For Runway 1 and Runway 2). Ensure traffic lights have been turned from red to green (to remind ATC if needed) before lifting drop arm barrier
- Complete relevant checklist(s) for runway closure, in accordance to CAG Airside Operations Control's SOP;
- Ensure that all vehicles & machinery entering the runway display number tags, have latest aerodrome chart and yellow flashing lights switched on.
- Record the time at which vehicles/machinery enter the runway;
- Check that the number of workers entering with each vehicle tallies with the records;
- Regulate the vehicular movement into the runway and ensuring that escort vehicle not escorting more than 2 vehicles;
- Lower the drop arm barrier after the last vehicle had entered the runway.

Airside Safety Inspection Teams/Airfield Lighting Shift Team shall:

- Request FMC to switch off all the runway lights and to allow only maximum two (2) types of lighting circuits to be switched on at any one time for maintenance check.

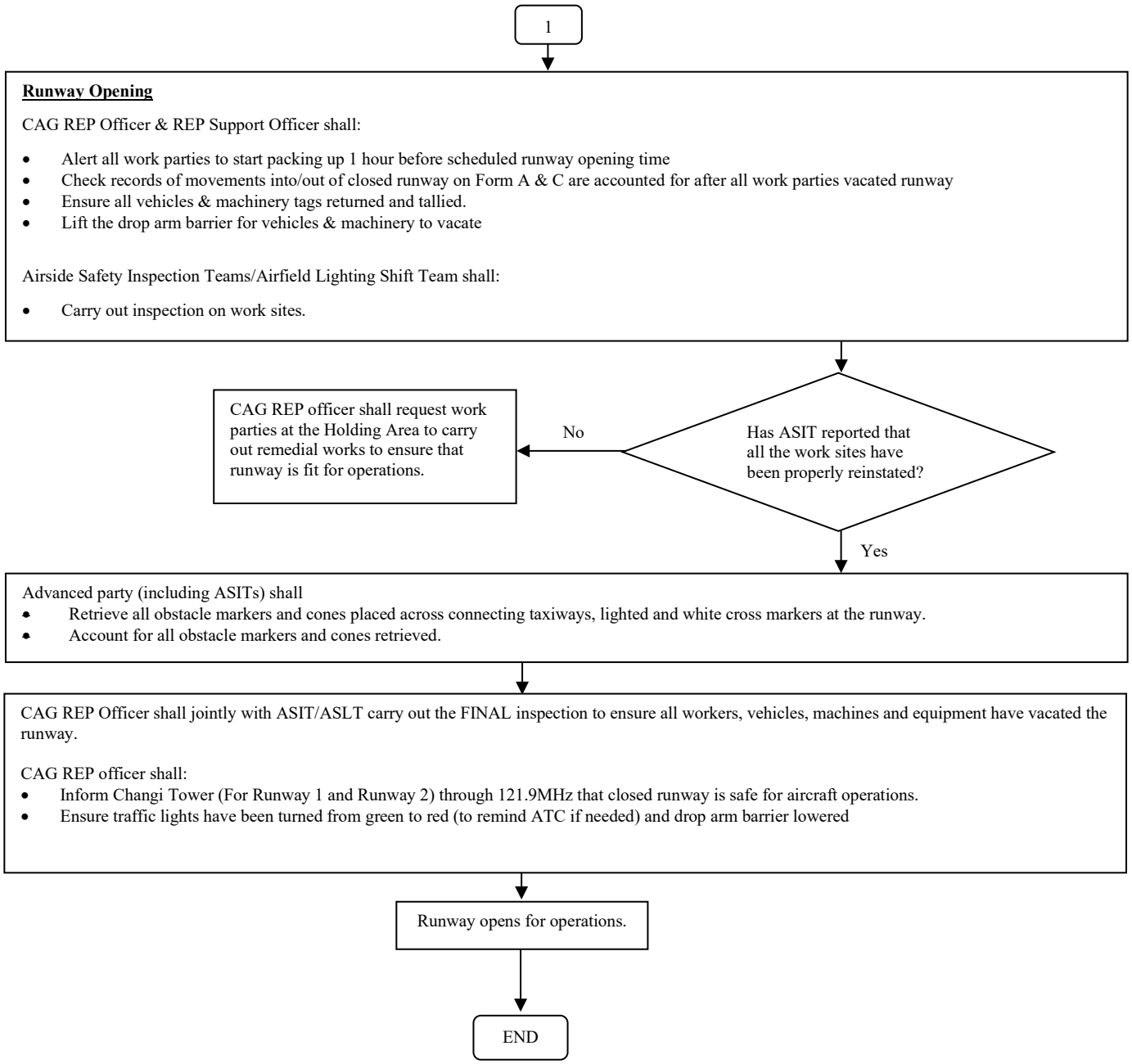
Advanced party (including ASITs), Airfield Lighting Shift Team and all work parties shall enter the runway through REP:

(i) Advance Party would proceed to set up the following closure markers as per Annex 1 and inform CAG REP Officer when closure markers are properly deployed:

- Lighted and white cross markers at each end of the runway and properly weighted down;
- Lighted obstacle marker boards across taxiways as shown in Annex 1; and
- Reflective cones across all other taxiways connecting to closed runway.

(ii) All work parties shall enter the REP to their designated work site.

1


1
Runway Opening
CAG REP Officer & REP Support Officer shall:
• Alert all work parties to start packing up 1 hour before scheduled runway opening time
• Check records of movements into/out of closed runway on Form A & C are accounted for after all work parties vacated runway
• Ensure all vehicles & machinery tags returned and tallied.
• Lift the drop arm barrier for vehicles & machinery to vacate
Airside Safety Inspection Teams/Airfield Lighting Shift Team shall:
• Carry out inspection on work sites.
Has ASIT reported that all the work sites have been properly reinstated?
No
CAG REP officer shall request work parties at the Holding Area to carry out remedial works to ensure that runway is fit for operations.
Yes
Advanced party (including ASITs) shall
• Retrieve all obstacle markers and cones placed across connecting taxiways, lighted and white cross markers at the runway.
• Account for all obstacle markers and cones retrieved.
CAG REP Officer shall jointly with ASIT/ASLT carry out the FINAL inspection to ensure all workers, vehicles, machines and equipment have vacated the runway.
CAG REP officer shall:
• Inform Changi Tower (For Runway 1 and Runway 2) through 121.9MHz that closed runway is safe for aircraft operations.
• Ensure traffic lights have been turned from green to red (to remind ATC if needed) and drop arm barrier lowered
Runway opens for operations.
END

Additional Notes:

(a) Where runway closure period is more than three (3) days or where a section of the runway is closed for more than 3 days, closed runway markings (white cross complying with CAAS Air Navigation Regulation 139, Aerodrome Specifications and Advisory Circulars) shall be placed at not more than 300 m intervals along the runway or closed runway section.

(b) In the event that Changi Tower (For Runway 1 and Runway 2) needs to reopen the closed runway, the CAG REP Officer, Airside Safety Inspection Teams(ASIT)/Airfield Lighting Shift Team(ALST) shall ensure that all personnel, vehicles and machinery, etc. be evacuated from the runway within 30 minutes upon notification by Changi Tower (For Runway 1 and Runway 2).

(c) NOTAM shall be issued for cancellation of the inspection and maintenance closures of the other runway when one runway is closed for maintenance or project works for more than 2 hours or where there are conflicts in closure timings resulting in closing of both runways at the same time.

(d) All forms need to be filled in and submitted to CAG REP officer before being allowed to enter runway. These forms can be obtained from CAG REP officer.

(e) All personnel involved in the runway maintenance closure shall refer to any risk assessments conducted and/or proposals for any interim deviation from this procedure.

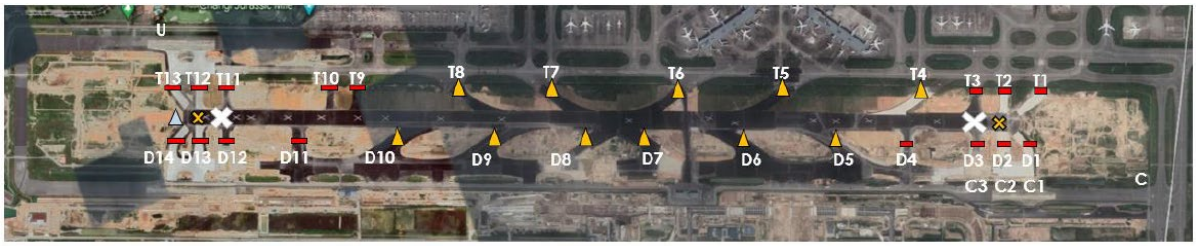
Annex 1

CLOSING OF RUNWAY 1 FOR MORE THAN TWO (2) HOURS TO CARRY OUT MAINTENANCE WORK

Inventory	Qty
Marker boards	5
Lighted cross	2
White cross markers *(+ weights)*	2 (+48)

Cones	Total: 47
x6 each: W3, W4, W5, W6 & W7	30
x5 each: M4, M5 & SASCO Crossing	15
x2 each: REP access road	2

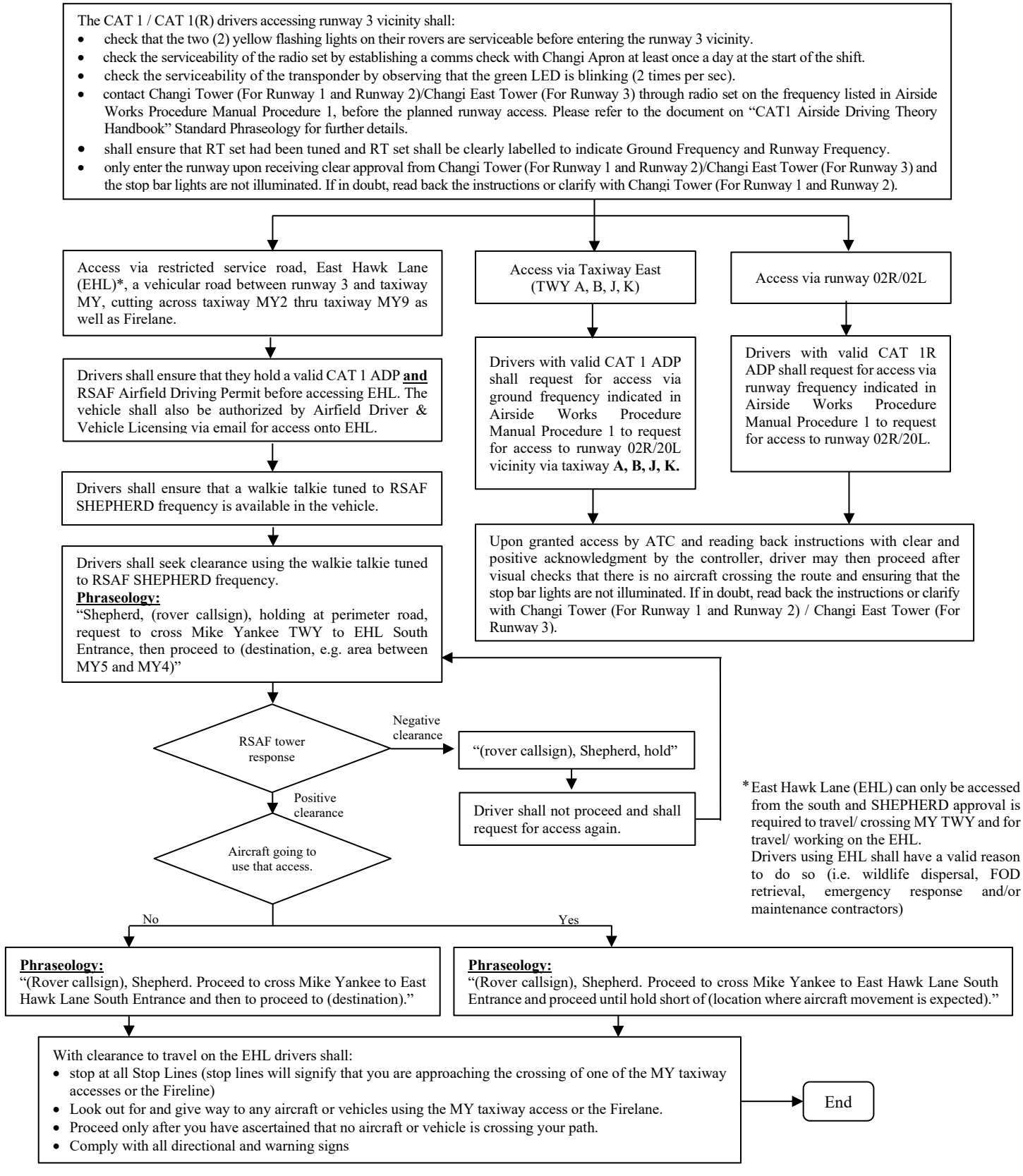
CLOSING OF RUNWAY 2 FOR MORE THAN TWO (2) HOURS TO CARRY OUT MAINTENANCE WORK*



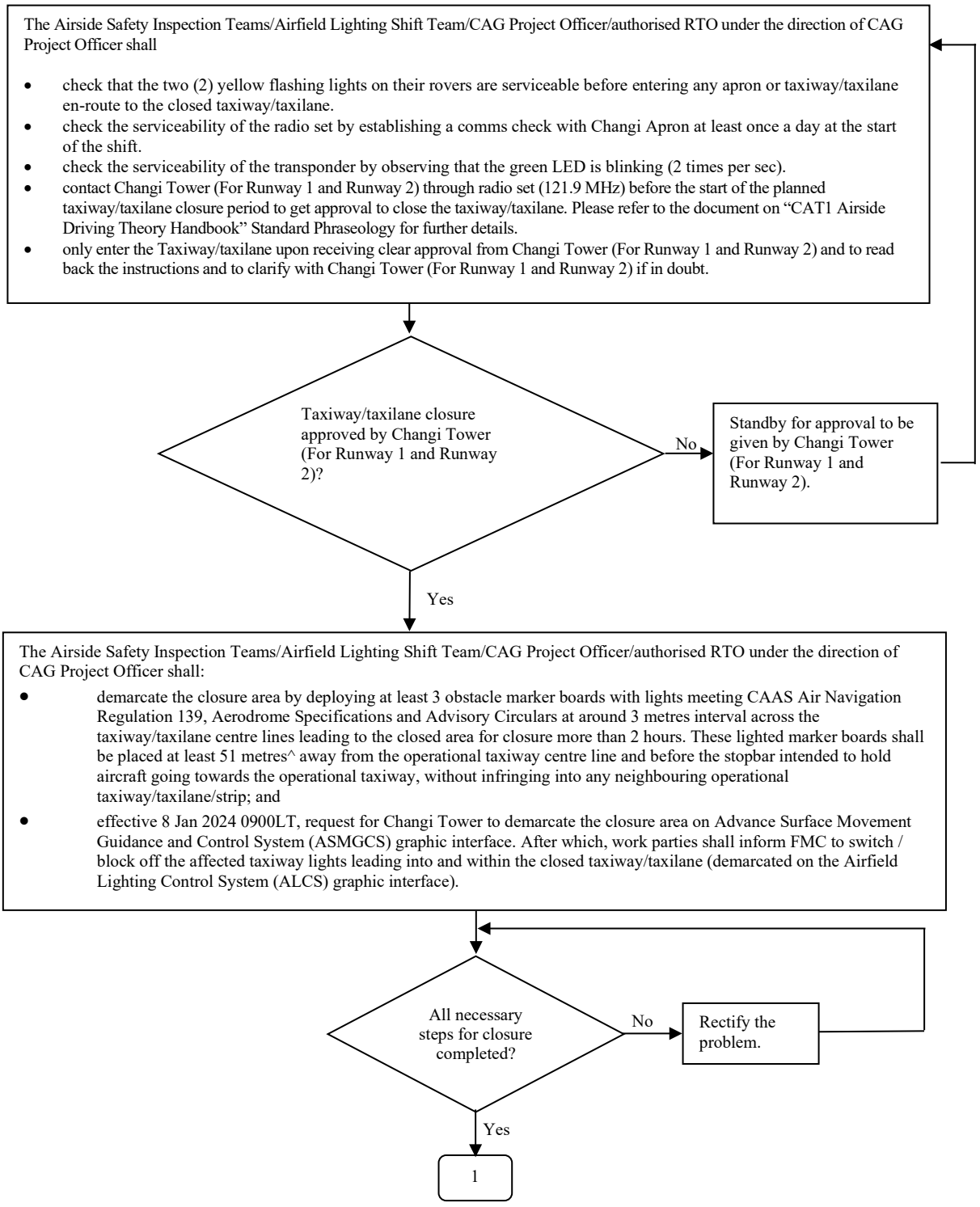
Legend	Qty
Marker boards	16 sets
Lighted cross	2
White cross markers *(+ weights)*	2 (+48)

Legend	Qty
Cones	Total: 68
6 each	66
2 each @ REP access road	2

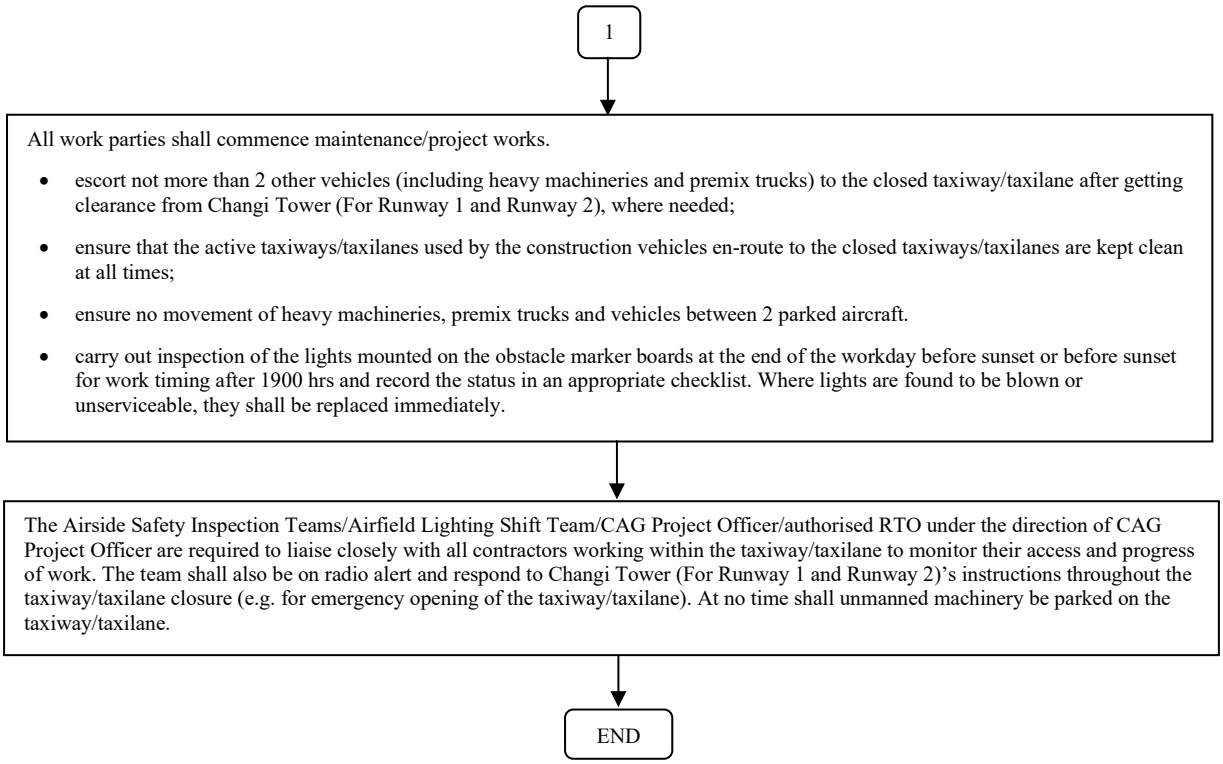
PROCEDURE 3: PROCEDURE FOR DRIVERS ACCESSING VICINITY OF RUNWAY 3



PROCEDURE 4: 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.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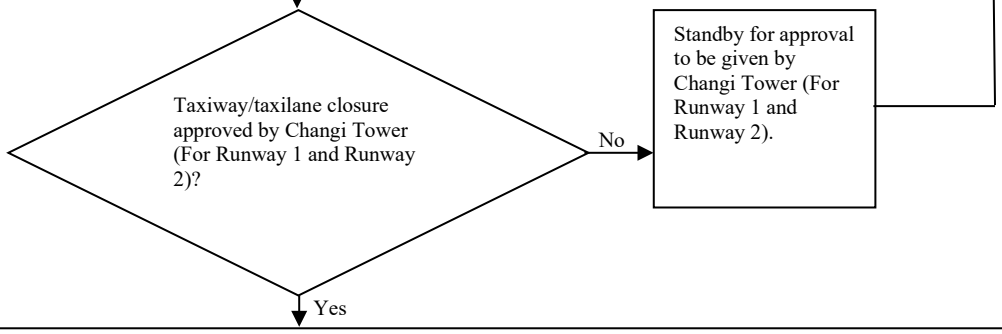
All work parties shall commence maintenance/project works.
• escort not more than 2 other vehicles (including heavy machineries and premix trucks) to the closed taxiway/taxilane after getting clearance from Changi Tower (For Runway 1 and Runway 2), where needed;
• ensure that the active taxiways/taxilanes 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 Airside Safety Inspection Teams/Airfield Lighting Shift 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 5: CLOSING OF TAXIWAY/TAXILANE FOR MORE THAN THREE (3) DAYS

The Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Project Officer/authorised RTO under the direction of CAG Project Officer shall

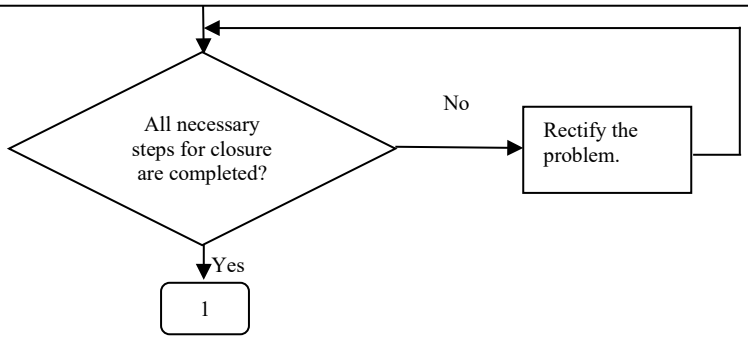
- check that the two (2) yellow flashing lights on their rovers are serviceable before entering any apron or taxiway/taxilane en-route to the closed taxiway/taxilane.
- check the serviceability of the radio set by establishing a comms check with Changi Apron at least once a day at the start of the shift.
- 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.

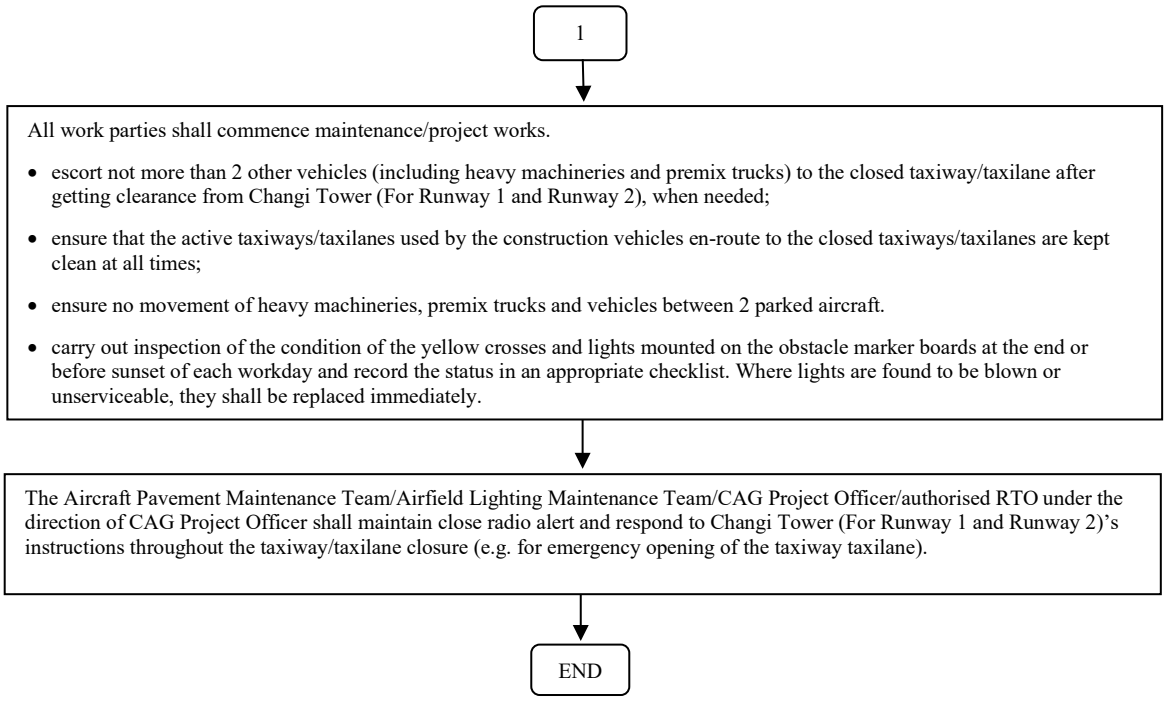


The Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Project Officer/authorised RTO under the direction of CAG Project Officer shall:

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;

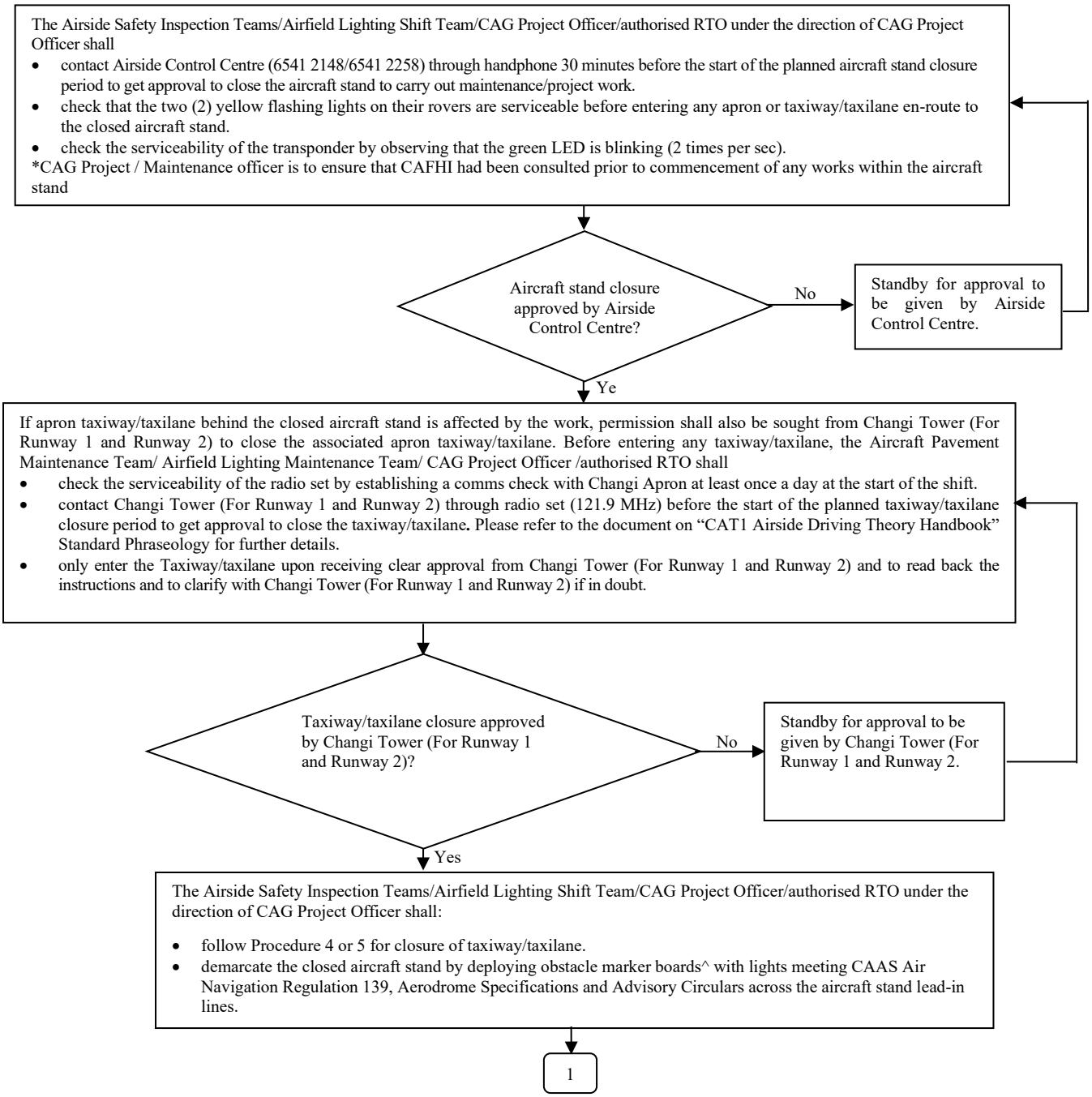
- ensure that a yellow cross meeting CAAS Air Navigation Regulation 139, Aerodrome Specifications and Advisory Circulars is placed at the beginning and end of the closed/unfinished taxiway/taxilane. The yellow cross shall either be painted on the taxiway/taxilane pavement or made of reflective material 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, Aerodrome 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;
- effective 8 Jan 2024 0900LT, 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).

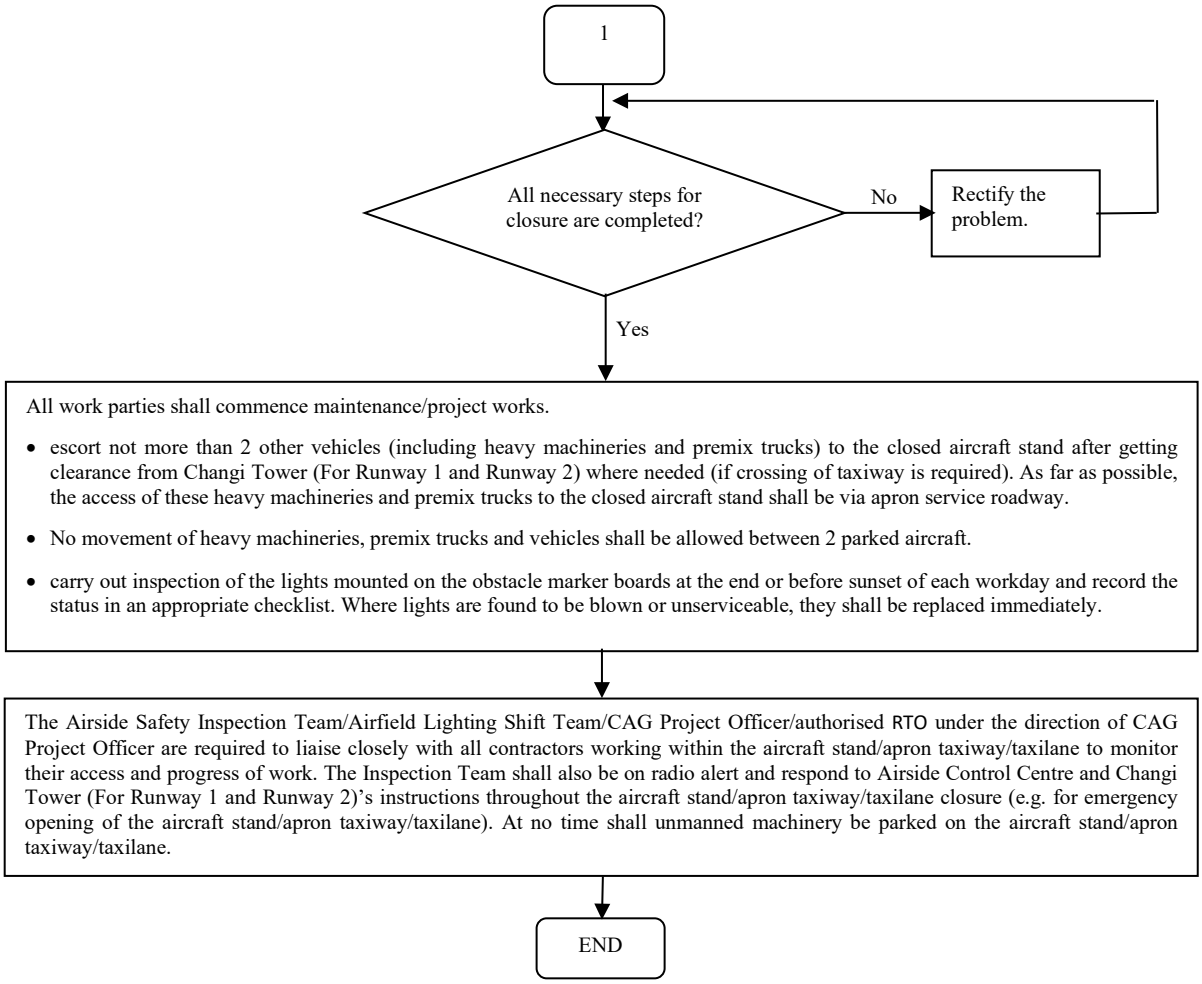




^ The minimum clearance from taxiway may be less than 51 metres based on the separation distances stated in paragraph 1.2 of Section C of CAG AOS requirements.

PROCEDURE 6: 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 7: CONDUCTING RUNWAY SCHEDULED INSPECTIONS

Scheduled Runway Inspection

For 30- & 60-min

Refer to Procedure 1 "CLOSURE OF RUNWAY FOR TWO (2) HOURS OR LESS TO CARRY OUT WORK"

During Runway Inspection
Duties of Rover 34 & 35:

- Rover 34 shall inspect FOD & Pavement defects from entry point by driving along either eastern or western side of Runway till the other end of Runway. It then returns back on the other side of Runway to conduct similar check till it reaches the entry point (making one complete circle inspection).
- Rover 34 shall inspect FOD & Pavement defects for all Runway Entry Taxiways & Rapid Exit Taxiways
- Rover 35 shall request FMC to switch off all the runway lights (including the Runway Entry Taxiway & Rapid Exit Taxiway lights) and to allow only maximum two (2) types of lighting circuits to be switched on at any one time for maintenance checks.

Upon completion of inspection:

- For 30- and 60-min inspection, all rovers shall vacate the runway from the REP.

Refer to Procedure 1 "CLOSURE OF RUNWAY FOR TWO (2) HOURS OR LESS TO CARRY

For 5- & 10-min durations

Rover 34 as the lead Rover shall contact and check with Changi Tower (For Runway 1 and Runway 2) the estimated time for scheduled runway inspection. Rover 34 shall relay the message to Rover 35 unless changes made to the call-signs of these rovers were informed otherwise to ATC and Airside Operations Control. At the given estimated time, Rovers 34 and 35* shall proceed to the designated Runway Holding Position which is normally on the opposite side of the prevailing landing direction (unless otherwise instructed by ATC).
*OJT staff are not allowed to replace qualified staff for these inspections.

At Runway Holding Position (RHP), the Airside Safety Inspection Teams ASIT (Rover 34) /Airfield Lighting Shift Team ALST (Rover 35) shall:

i. Identify callsign to ATC & report current position to ATC via 121.9 MHz (for Runway 1), describe intended location and purpose. **(Refer to Annex 2)**
   - ❖ While preparing to enter runway, ensure position allow vehicle to face aircraft landing/take-off direction
   - ❖ At RHP, drivers must stop before the solid double yellow lines and wait for permission from ATC to enter the runway.

ii. Obtain instruction from ATC to monitor appropriate runway frequency.

iii. Tune to 'Singapore Tower' frequency to listen out ONLY. Wait for Singapore Tower to initiate contact.

Has Changi Tower (For Runway 1 and Runway 2) given the approval to enter the Runway?

No

Yes

ATC upon giving clearance, shall simultaneously turn off the red stopbar lights.
Rover 34 & Rover 35 to perform readback of permission received. **(Refer to Annex 2)** Ensure positive clearance received from ATC, red stopbar lights have been turned off & no landing aircraft seen before entering the runway.

- ❖ **NEVER CROSS ILLUMINATED RED STOPBAR LIGHTS** - Even if permission has been given to enter. If the Red Stopbar Lights are still illuminated, inform ATC and request for the lights to be turned off before proceeding.
- ❖ Red stop bar lights are unidirectional (i.e. you will see the row of red lights as you approach the runway. When you vacate the runway, you will not see these row of red lights).

During Runway Inspection
Duties of Rover 34 & 35:

- Rover 34 shall inspect FOD & Pavement defects from the entry point by driving along along the centre line of Runway before vacating the closed Runway.
- Rover 34 shall carry out one round of inspection of Runway Entry Taxiways & Rapid Exit Taxiway for FOD and pavement over defect during the 5- & 10-mins inspection.)
- Rover 35 shall request Changi Tower (For Runway 1 and Runway 2) to switch on all the runway lights and inspect all airfield lightings (circuit level) by driving along the center of Runway from one end of the runway to the other.
- Rover 35 shall carry out one round of inspection of airfield lights at all Runway Entry Taxiways & Rapid Exit Taxiways during the 5- & 10-mins inspection

Upon completion of inspection:

- For 5- & 10-mins inspection, Rovers 34 and 35 shall vacate Runway & they shall individually inform Changi Tower (For Runway 1 and Runway 2) that they have already vacated the Runway.[1]
- Once confirmed that all rovers have vacated the runway, Rover 34 (or the Lead Rover) shall then inform Changi Tower (For Runway 1 and Runway 2) that inspection has completed, and he has vacated the Runway.[1]

END

ANNEX 2:

RT script for vehicles entering via runway holding position (RHP) for runway inspection:

ENTERING RUNWAY FOR RUNWAY INSPECTION		
Frequency		**RT Script**
121.9 MHz (CHANGI TOWER (FOR RUNWAY 1 AND RUNWAY 2) GROUND UTILITY FREQUENCY)	**ROVER**	CHANGI TOWER (FOR RUNWAY 1 AND RUNWAY 2), **<ROVER CALLSIGN>**
	ATC	***<ROVER CALLSIGN>,*** *CHANGI TOWER (FOR RUNWAY 1 AND RUNWAY 2) (FOR RUNWAY 3)*
	ROVER	CHANGI TOWER (FOR RUNWAY 1 AND RUNWAY 2), **<ROVER CALLSIGN>**AT **<RUNWAY HOLDING POINT>**, STANDING BY FOR RUNWAY **<DESIGNATOR>** INSPECTION
	ATC	***<ROVER CALLSIGN>,*** *MONITOR SINGAPORE TOWER ON* ***<RUNWAY FREQUENCY>***
	ROVER	CHANGI TOWER (FOR RUNWAY 1 AND RUNWAY 2), **<ROVER CALLSIGN>**, MONITOR SINGAPORE TOWER ON **<RUNWAY FREQUENCY>**
118.6 MHz (RUNWAY 1) **118.25MHz** (RUNWAY 2)	**ENTERING RUNWAY**	
	ATC	***<ROVER CALLSIGN>,*** *SINGAPORE TOWER* *ENTER RUNWAY* ***<DESIGNATOR>*** *via* ***<RUNWAY HOLDING POINT>***
	ROVER	**<ROVER CALLSIGN>**, ENTER RUNWAY **<DESIGNATOR>** via **<RUNWAY HOLDING POINT>** [In vehicle: - Driver & buddy eyeball red stop bar turned off. Buddy verbalise to driver "**Red stop bar turned off**" - Driver to cross check & verbalise "**Red stop bar turned off**"]
	VACATING RUNWAY	
	ROVER	SINGAPORE TOWER, **<ROVER CALLSIGN>**
	ATC	***<ROVER CALLSIGN>****, SINGAPORE*
	ROVER	SINGAPORE TOWER, **<ROVER CALLSIGN>**, VACATED RUNWAY **<DESIGNATOR>** via **<*RUNWAY HOLDING POINT>** **Rover to inform ATC which RET was taken to exit from the runway.*
	ATC	***<ROVER CALLSIGN>****, ROGER*

Additional Note:

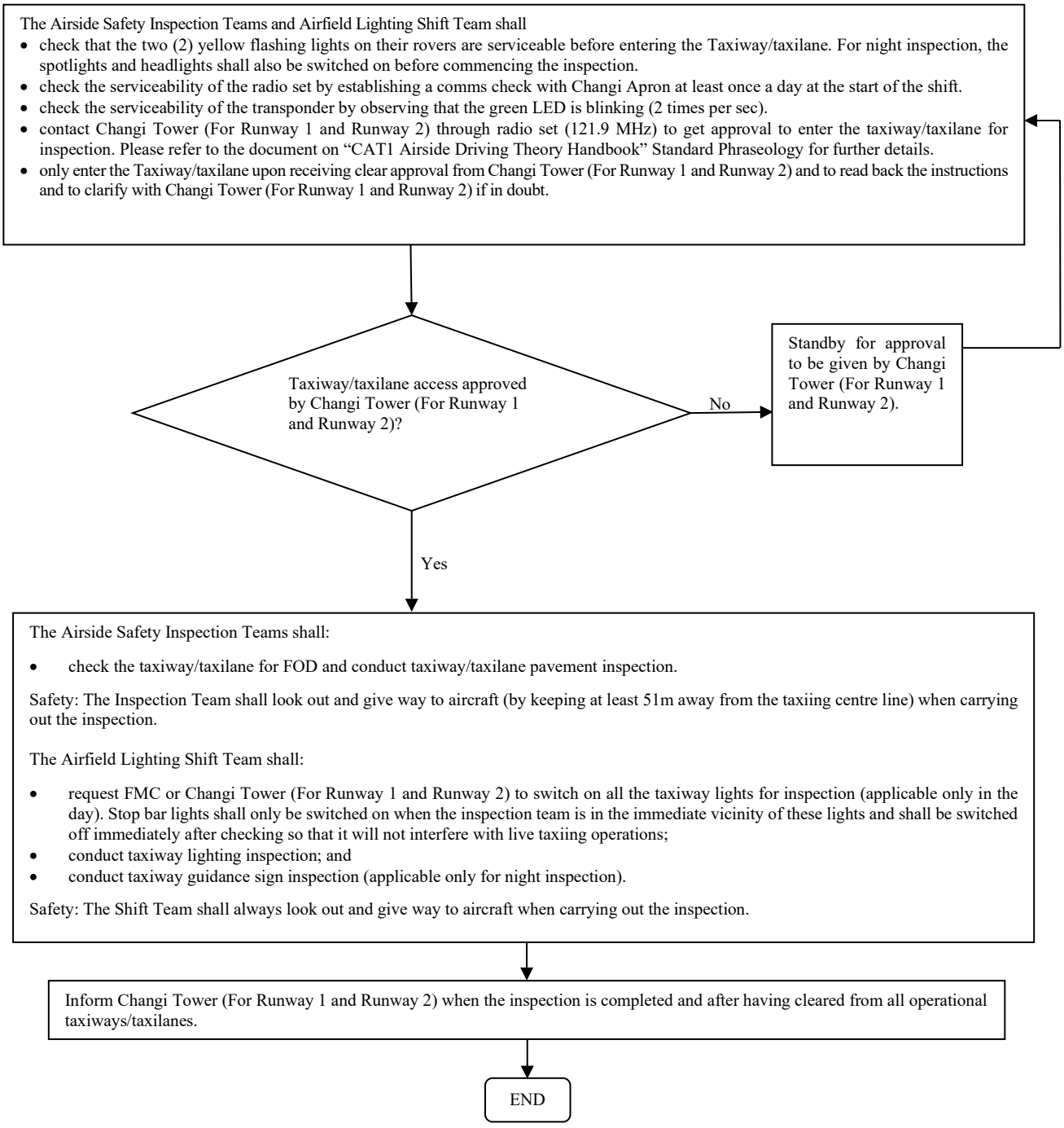
1. All rovers entering maneuvering shall:
   - check that the two (2) yellow flashing lights on their rovers are serviceable before entering the runway. For night inspection, the spotlights and headlights shall also be switched on before commencing the inspection.
   - check the serviceability of the 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 on the frequency listed in Airside Works Procedure Manual Procedure 1, individually before the scheduled runway inspection timeslot to get approval to enter the runway for inspection. Please refer to the document on "CAT1 Airside Driving Theory Handbook" Standard Phraseology for further details.
   - only enter the Runway upon receiving clear approval from Changi Tower (For Runway 1 and Runway 2) 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).

2. Rover 34 shall:
   (a) keep records of FOD, pavement defect(s) and any abnormalities found, all rovers entering the runway including details such as rover call signs, nature and location of work, person-in-charge, handphone number, manpower strength, estimated time of completion of work etc; runway closing and opening times for inspection; weather condition, surface condition and landing direction in the Runway Daily Inspection Report.
   (b) arrange with pavement repair team to repair any pothole(s) found during runway inspection.
   (c) activate CAG Airside Operations Control's through FMC for carrying out friction test if fuel or hydraulic leakage is detected on the runway.

- Depending on the extent of the leakage, the ASIT 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 an area and has been thoroughly cleaned up. If in doubt, the ASIT shall still take the safer approach to activate CAG Airside Operations Control to conduct a friction test before re-opening 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 ASIT shall notify the Airside Duty Manager and inform Team Leader of E&D Airfield Systems, Pavement Section to take immediate action to arrange for the removal of rubber deposits.

3. Rover 34 shall report any FOD or pavement defect(s) found, and record in the Runway Daily Inspection Report.
4. Rover 35 shall record unserviceable airfield lightings and arrange to replace those unserviceable lightings during the maintenance closure.
5. Inform CAG of any rovers who have requested to enter the runway without giving notification to Rover 34 in advance.
6. For the 5- and 10-mins inspections, apart from Rovers 34 and 35, no other rovers/vehicles are allowed to enter the runway.
7. For the 30- and 60-mins inspection, all vehicles entering closed runway shall inform CAG REP Officer of the works that they intend to carry out and the location of the work.
8. Please refer to AIP Singapore / AIP Sup, WSSS Section AD 2.12 and/or NOTAMs for details on the runway inspection timing.
9. ATC shall be consulted for interim arrangements that may deviate from the AIP, AIP Sup and NOTAMs or this procedure.

PROCEDURE 8: CONDUCTING TAXIWAY/TAXILANE DAILY INSPECTION AND GENERAL MAINTENANCE CHECK



Additional Note:

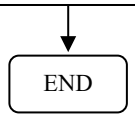
(a) All blown taxiway guidance sign tubes shall be replaced immediately when spotted.
(b) All FOD, fuel/hydraulic spillage, unserviceable obstacle lights, pavement/marking defects, obstructions infringing the taxiway strip shall be recorded in the Taxiway Daily Inspection Report.

PROCEDURE 9: CONDUCTING AIRCRAFT STAND DAILY INSPECTION AND GENERAL MAINTENANCE CHECK

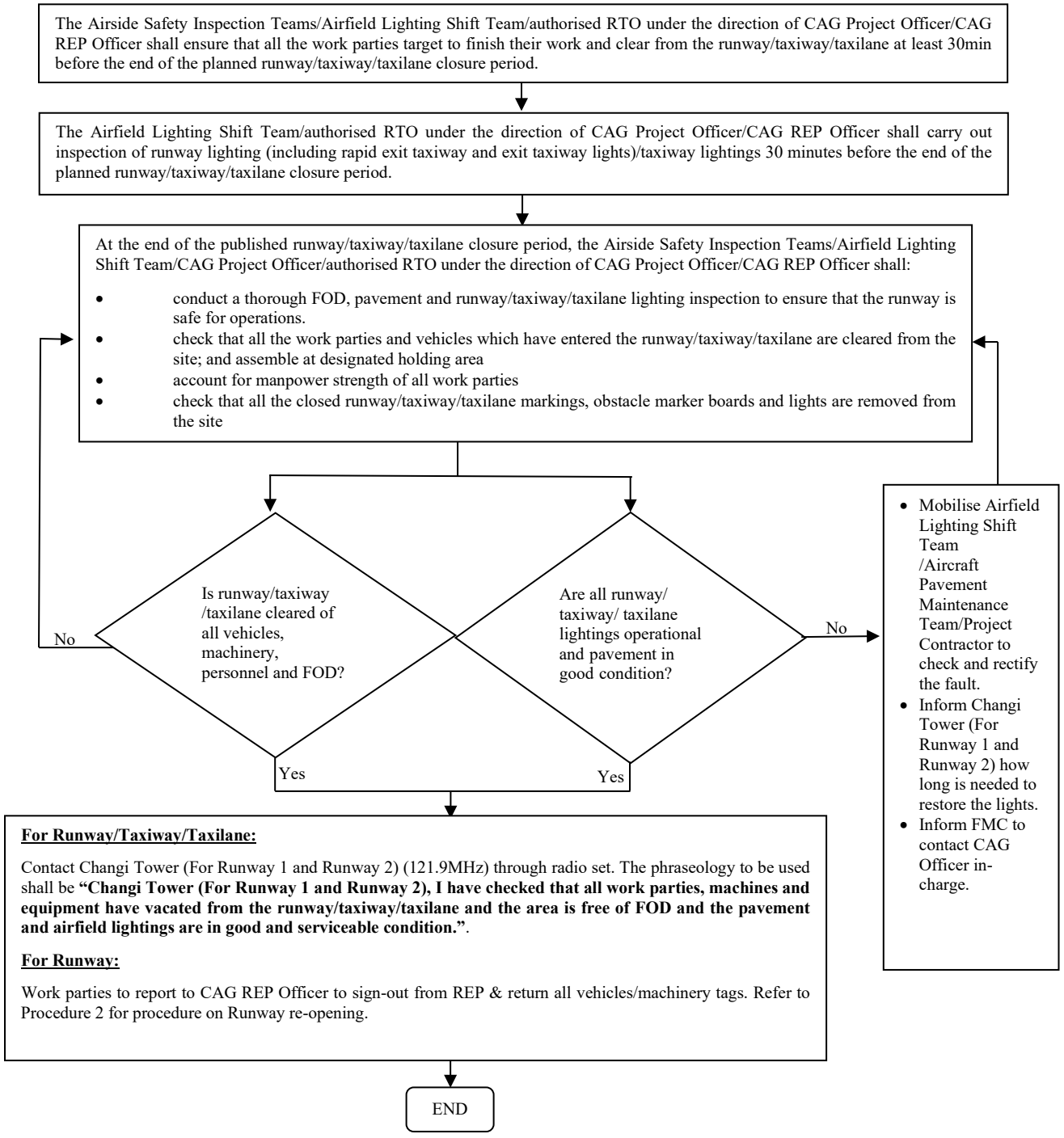
The Airside Safety Inspection Teams shall:

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



PROCEDURE 10: NORMAL OPENING OF RUNWAY/TAXIWAY/TAXILANE CLOSURE



PROCEDURE 11: EMERGENCY OPENING OF RUNWAY/TAXIWAY/TAXILANE CLOSURE

Changi Tower (For Runway 1 and Runway 2) contacts the CAG REP Officer, the Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Project Officer /authorised RTO under the direction of CAG Project Officer to request for emergency opening of the closed runway/taxiway/taxilane.

The CAG REP Officer, Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Project Officer /authorised RTO under the direction of CAG Project Officer shall immediately inform all parties on the runway/taxiway/taxilane to prepare the runway/taxiway/taxilane for emergency opening within the time stipulated below as informed by Changi Tower (For Runway 1 and Runway 2). If the runway/taxiway/taxilane cannot be re-opened within the stipulated period, the Airside Safety Inspection Teams/Airfield Lighting Shift Team shall inform Changi Tower (For Runway 1 and Runway 2, CAG REP Officer 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 Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Project Officer/authorised RTO under the direction of CAG Project Officer/CAG REP Officer shall:

- notify CAG REP Officer (for runway only).
- check that all openings on pavement and trenches are covered up;
- check that all the work parties and vehicles which have entered the runway/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 runway/taxiway/taxilane markings obstacle marker boards and lights, are removed from the site;
- conduct a thorough FOD, pavement and runway/taxiway/taxilane lightings inspection to ensure that the runway/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 Airside Safety Inspection Teams which are applicable for runway closure.

Is runway/taxiway /taxilane cleared of all vehicles, machineries, personnel and FOD?

No

Yes

Are all runway/taxiway lightings operational and pavement in good and serviceable condition?

No

- Mobilise Airfield Lighting Shift Team/Aircraft Pavement Maintenance Team/Project contractors to check and rectify the fault.
- Inform Changi Tower (For RWY 1 and 2) how much time is needed to restore the lights and repair the pavement.
- Inform FMC to contact CAG Officer-in-charge.

Yes

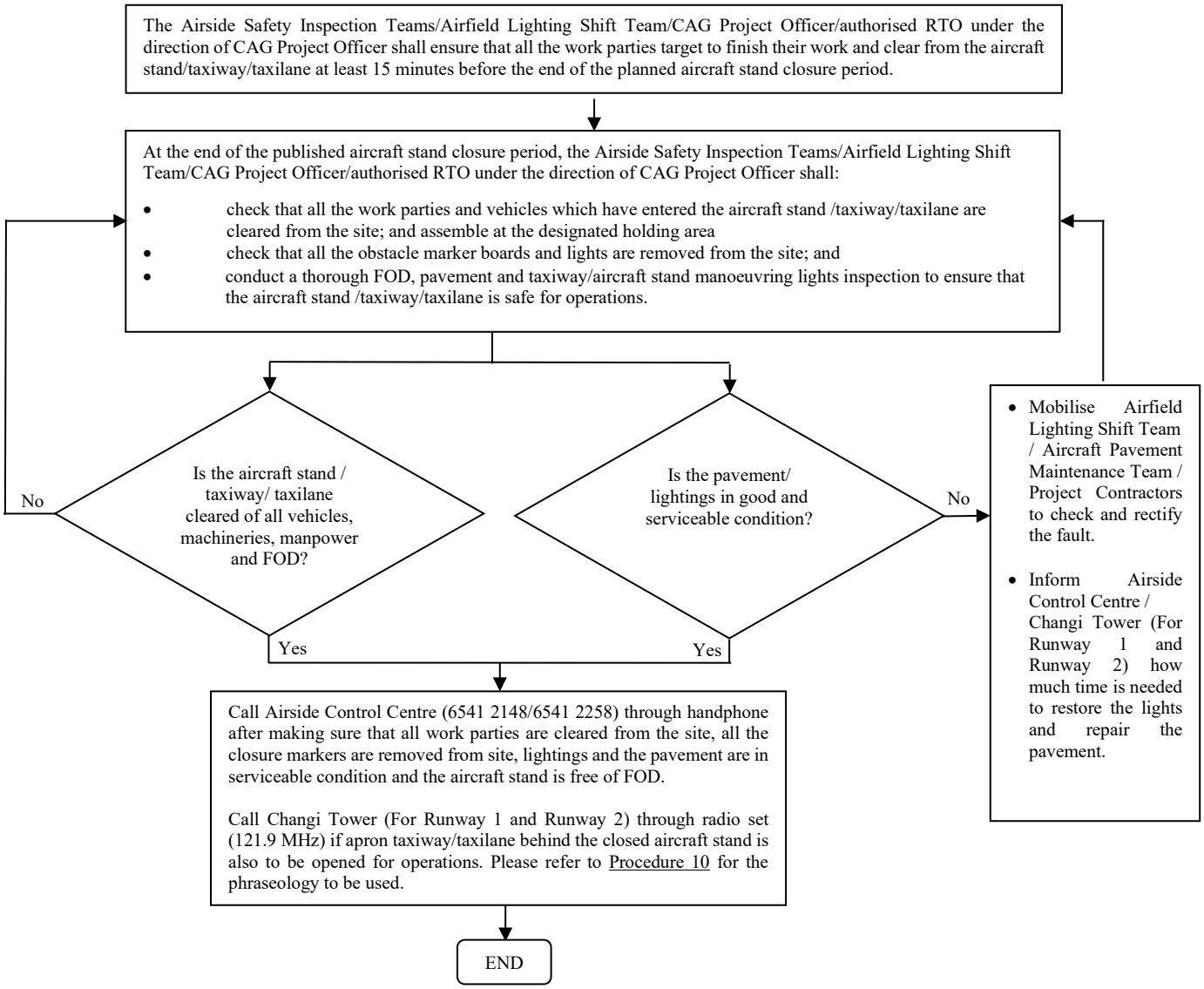
For Runway/Taxiway/Taxilane:
Contact Changi Tower (For Runway 1 and Runway 2) (121.9MHz) through radio set. The phraseology to be used shall be **"Changi Tower (For Runway 1 and Runway 2), I have checked that all work parties, machines and equipment have vacated from the runway/taxiway/taxilane and the area is free of FOD and the pavement and airfield lightings are in good and serviceable condition."**.

For Runway:
Work parties to report to CAG REP Officer to sign-out from REP & return all vehicles/machinery tags. Refer to Procedure 2 for procedure on Runway re-opening.

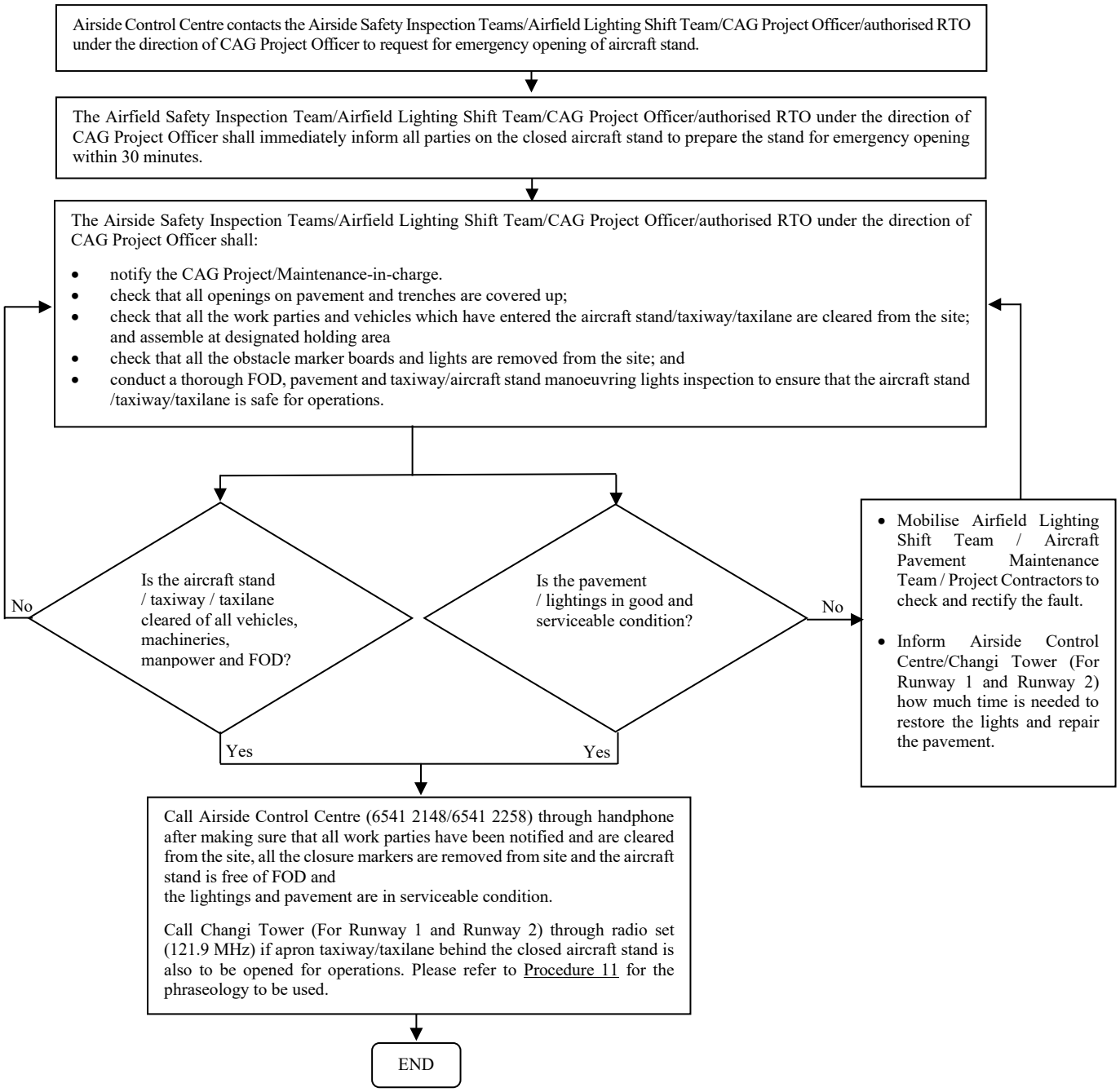
END

Additional Note:
Unless approved by Changi Tower (For Runway 1 and Runway 2), all communications between the Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Project Officer/authorised RTO under the direction of CAG Project Officer/CAG REP Officer and all work parties shall continue to be via handphones. To facilitate the opening of runway within the specified evacuation time, CAG REP Officer may seek the approval from Changi Tower (For Runway 1 and Runway 2) to use radio set (121.9 MHz) in addition to using handphones for communications. This procedure shall be read in tandem with Airside Operations Control SOP for emergency opening of runway.

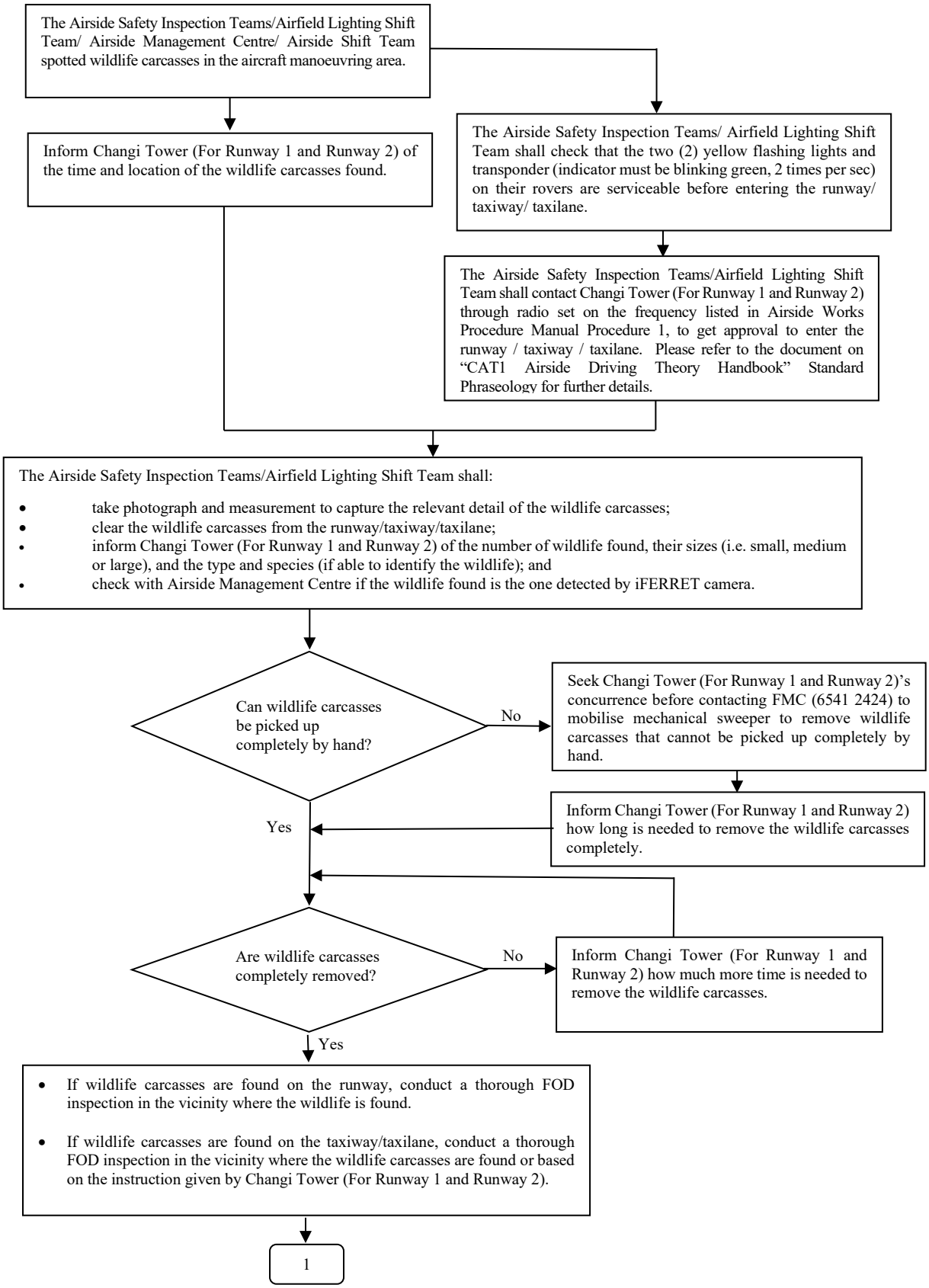
PROCEDURE 12: NORMAL OPENING OF AIRCRAFT STAND CLOSURE

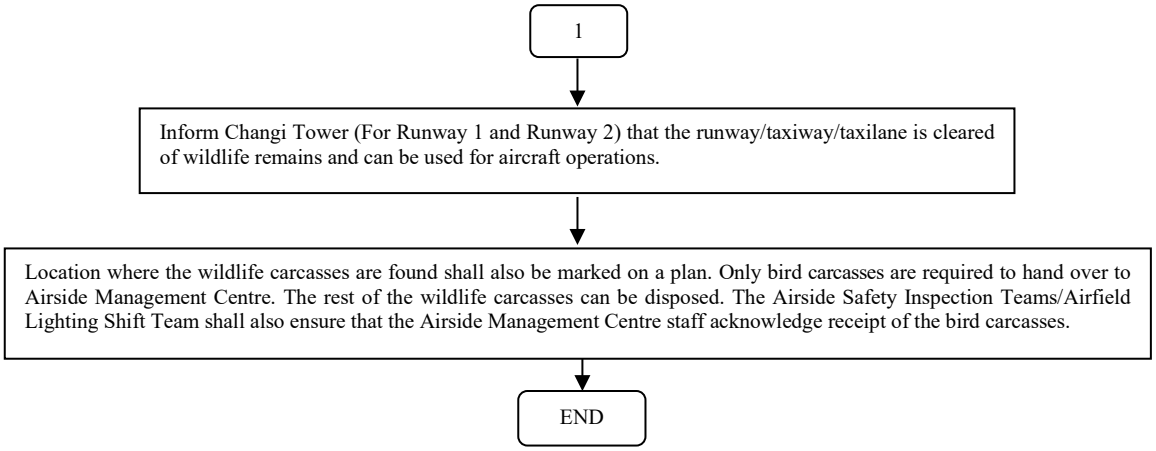


PROCEDURE 13: EMERGENCY OPENING OF AIRCRAFT STAND CLOSURE



PROCEDURE 14: RESPONSE TO WILDLIFE STRIKE REPORT AND WILDLIFE CARCASS FOD FOUND IN THE AIRCRAFT MANOEUVRING AREA





Additional Note:

(a) All Personnel shall also be equipped with proper tools/PPE in handling and storing carcasses.

(b) The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall stop and look in both directions to make sure that there is no approaching aircraft in flight when at the junction of a taxiway/roadway leading to a runway. If need to, the vehicle shall be positioned at an angle that allows maximum visibility of both ends.

(c) The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall park the vehicle facing the landing end of the runway when picking up wildlife carcasses.

PROCEDURE 15: RESPONSE TO HANDLE FOD FOUND IN THE AIRCRAFT MANOEUVRING AREA

The Airside Safety Inspection Teams/Airfield Lighting Shift Team (ASIT/ALST) spotted FOD in the aircraft movement area.

Changi Tower (For Runway 1 and Runway 2) / Airside Management Centre (AMC) / Fault Management Centre (FMC) requests Airside Safety Inspection Teams/Airfield Lighting Shift Team (ASIT/ALST) / / AMC Duty Officers (ADO) to pick up FOD.

Where is the FOD sighted?

TAXIWAY/TAXILANE

ASIT/ALST shall contact Changi Tower (For Runway 1 and Runway 2) through 121.9MHz (Runway 1 and Runway 2) to get approval to enter the taxiway/taxilane to pick up the FOD. Please refer to the document on "CAT1 Airside Driving Theory Handbook" Standard Phraseology for further details. ASIT/ALST shall only enter the /taxiway/taxilane upon receiving clear approval from Changi Tower (For Runway 1 and Runway 2) and to read back the instruction and to clarify with Changi Tower (For Runway 1 and Runway 2) if in doubt.

RUNWAY

ASIT/ALST/ADOs shall contact Changi Tower (For Runway 1 and Runway 2) through 121.9MHz (Runway 1 and Runway 2) to get approval to proceed to the designated Runway Holding Position which is normally on the opposite side of the prevailing landing direction (unless otherwise instructed by ATC).

At Runway Holding Position (RHP), ASIT/ALST/ADOs shall:

i. Identify callsign to ATC & report current position to ATC via 121.9 MHz (for Changi Tower (For Runway 1 and Runway 2)), describe intended location and purpose
   - ❖ While preparing to enter runway, ensure position allow vehicle to face aircraft landing/take-off direction
   - ❖ At RHP, drivers must stop before the solid double yellow lines and wait for permission from ATC to enter the runway.

ii. Obtain instruction from ATC to monitor appropriate runway frequency.

iii. Tune to 'Singapore Tower' frequency to listen out ONLY. Wait for Singapore Tower to initiate contact.

iv. ATC shall give clearance and simultaneously turn off the red stopbar lights.

v. Perform readback of permission received. Ensure positive clearance received from ATC and red stopbar lights have been turned off before entering the runway.
   - ❖ **NEVER CROSS ILLUMINATED RED STOPBAR LIGHTS** - Even if permission has been given to enter. If the Red Stopbar Lights are still illuminated, inform ATC and request for the lights to be turned off before proceeding.
   - ❖ Red stop bar
   - ❖
   - ❖ lights are unidirectional (i.e. you will see the row of red lights as you approach the runway. When you vacate the runway, you will not see these row of red lights).

If needed, briefly describe to Changi Tower (For Runway 1 and Runway 2) the details of the FOD and inform how long is needed to remove the FOD.

Can FOD be picked up completely by hand?

No

Seek Singapore Tower's (for Runway) and Changi Tower (For Runway 1 and Runway 2)'s (for Taxiway/taxilane) concurrence before contacting FMC (6541 2424) to mobilise the mechanical sweeper to remove the FOD that cannot be picked up completely by hand (e.g. cut grass, tyre debris, oil spillage, etc.). AMC shall be informed should there be any spillages.

Yes

The ASIT/ALST/ ADO shall coordinate the sweeping / flushing of runway / taxiway / taxilane and inform Changi Tower (For Runway 1 and Runway 2) how long is needed to remove the FOD.

FOD completely removed?

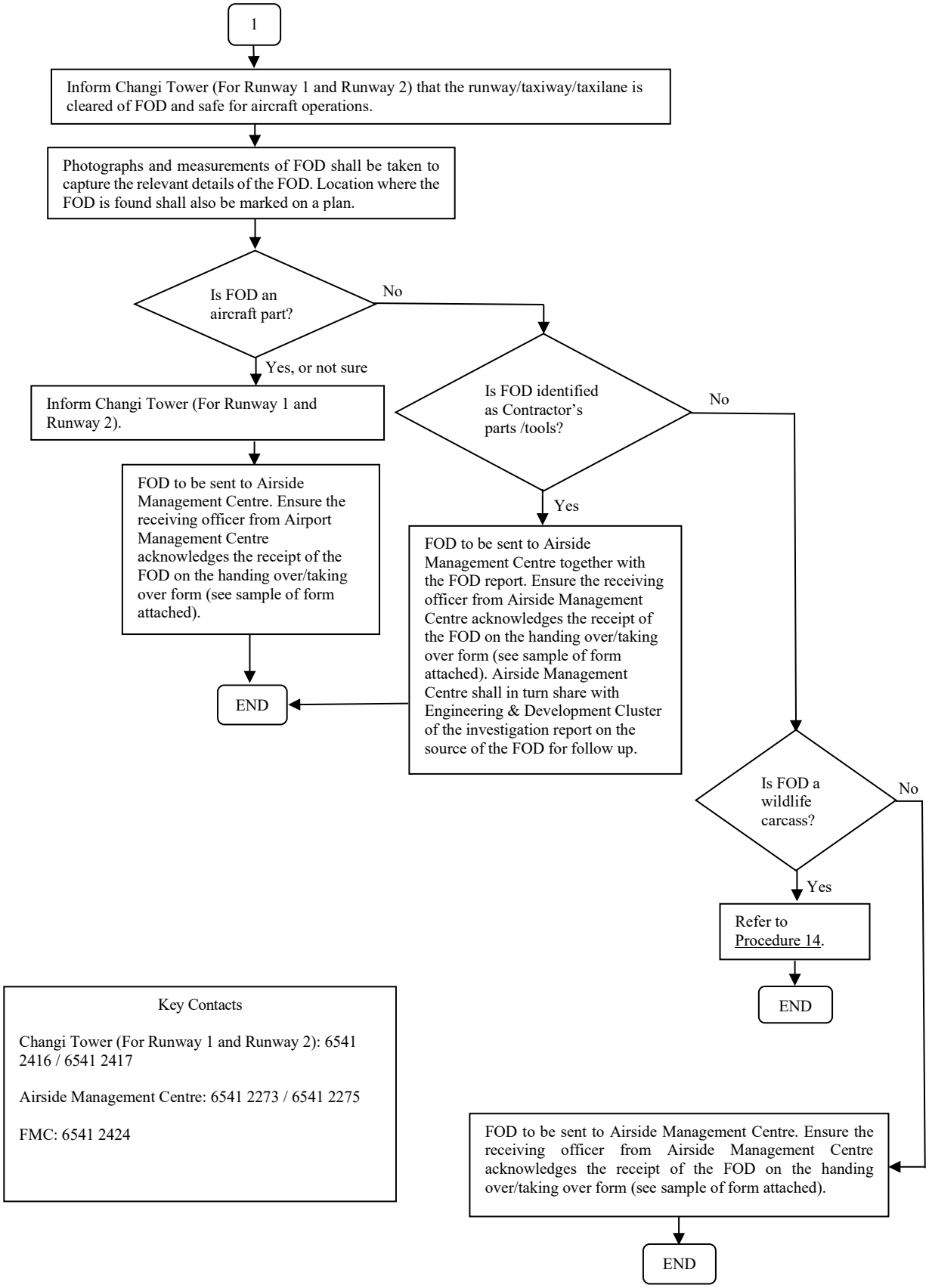
No

Inform Changi Tower (For Runway 1 and Runway 2) how much more time is needed to remove the FOD.

Yes

Conduct a thorough FOD and pavement inspection in the vicinity where the FOD is found or based on the instruction given by Singapore Tower/ Changi Tower (For Runway 1 and Runway 2).

1


1
Inform Changi Tower (For Runway 1 and Runway 2) that the runway/taxiway/taxilane is cleared of FOD and safe for aircraft operations.
Photographs and measurements of FOD shall be taken to capture the relevant details of the FOD. Location where the FOD is found shall also be marked on a plan.
Is FOD an aircraft part?
No
Yes, or not sure
Inform Changi Tower (For Runway 1 and Runway 2).
FOD to be sent to Airside Management Centre. Ensure the receiving officer from Airport Management Centre acknowledges the receipt of the FOD on the handing over/taking over form (see sample of form attached).
END
Is FOD identified as Contractor's parts /tools?
No
Yes
FOD to be sent to Airside Management Centre together with the FOD report. Ensure the receiving officer from Airside Management Centre acknowledges the receipt of the FOD on the handing over/taking over form (see sample of form attached). Airside Management Centre shall in turn share with Engineering & Development Cluster of the investigation report on the source of the FOD for follow up.
Is FOD a wildlife carcass?
No
Yes
Refer to Procedure 14.
END
Key Contacts
Changi Tower (For Runway 1 and Runway 2): 6541 2416 / 6541 2417
Airside Management Centre: 6541 2273 / 6541 2275
FMC: 6541 2424
FOD to be sent to Airside Management Centre. Ensure the receiving officer from Airside Management Centre acknowledges the receipt of the FOD on the handing over/taking over form (see sample of form attached).
END

Additional Note:

(a) The ASIT / ALST / ADO shall stop and look in both directions to make sure that there is no approaching aircraft in flight when at the junction of a taxiway/roadway leading to a runway. If need to, the vehicle shall be positioned at an angle that allows maximum visibility of both ends."

(b) The ASIT / ALST / ADO shall park the vehicle facing the landing end of the runway when picking up FOD.

(c) All rovers entering maneuvering area shall:

- check that the two (2) yellow flashing lights on their rovers are serviceable before entering the runway. For night inspection, the spotlights and headlights shall also be switched on before commencing the inspection.
- 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 on the frequency listed in Airside Works Procedure Manual Procedure 1, individually before the scheduled runway inspection timeslot to get approval to enter the runway for inspection. Please refer to the document on "CAT1 Airside Driving Theory Handbook" Standard Phraseology for further details.
- only enter the Runway upon receiving clear approval from Changi Tower (For Runway 1 and Runway 2) 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).

HANDING OVER / TAKING OVER FORM

S/No.	Description

I certify that the above items have been received by me.

_____
Name

_____
Designation

_____
Organisation

_____
Signature

I witness that the above items have been handed over to the recipient.

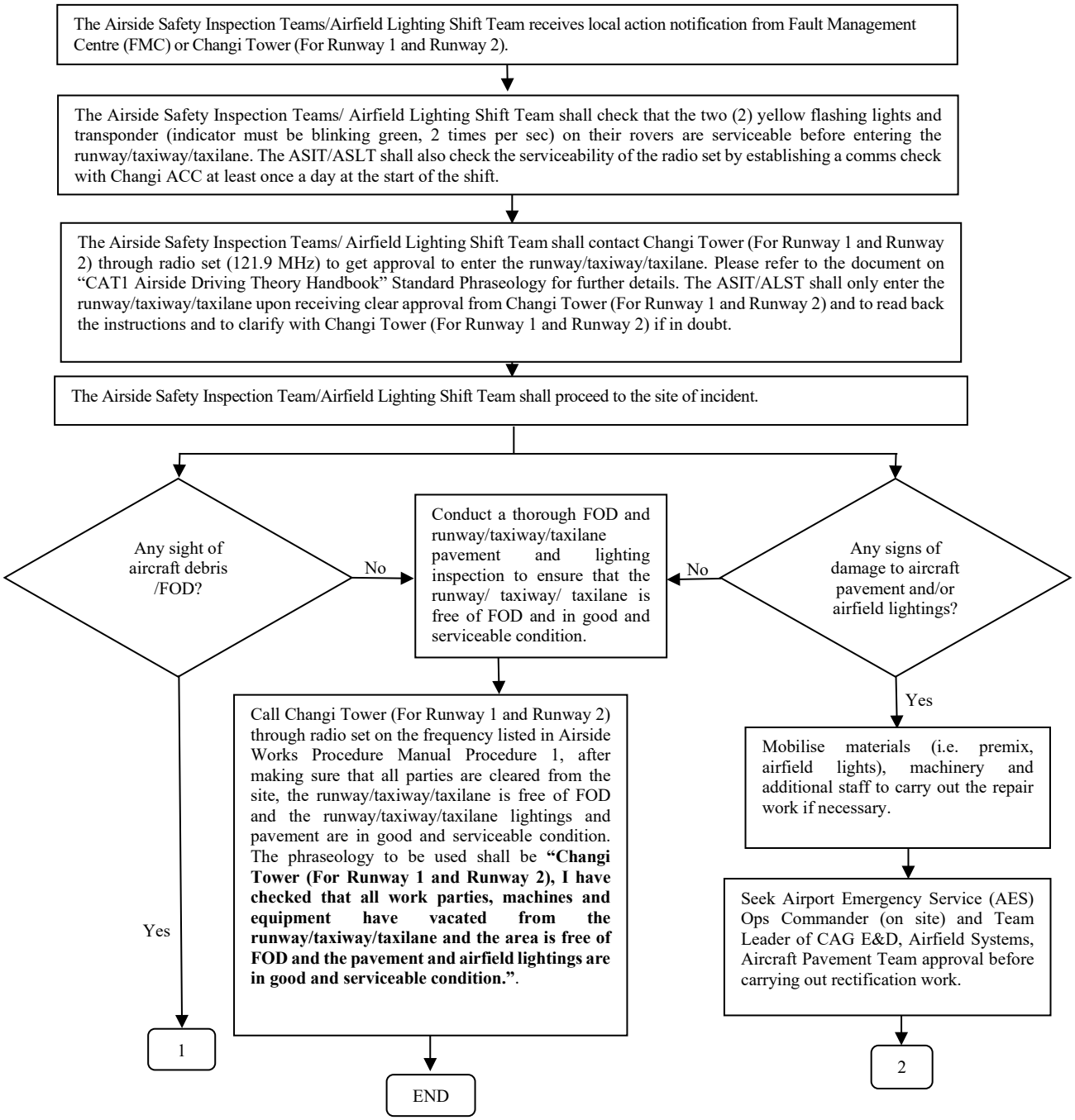
_____
Name

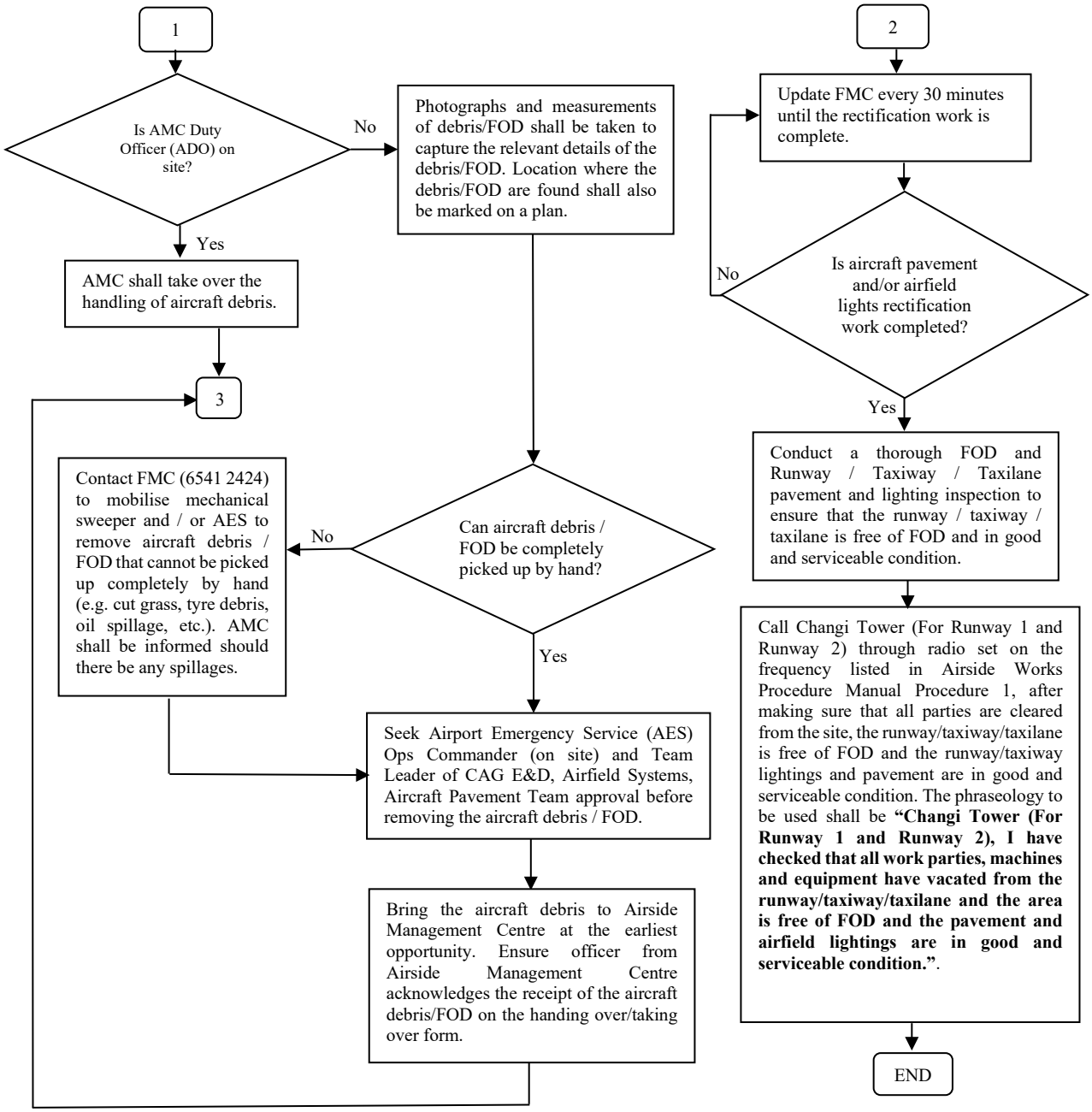
_____
Designation

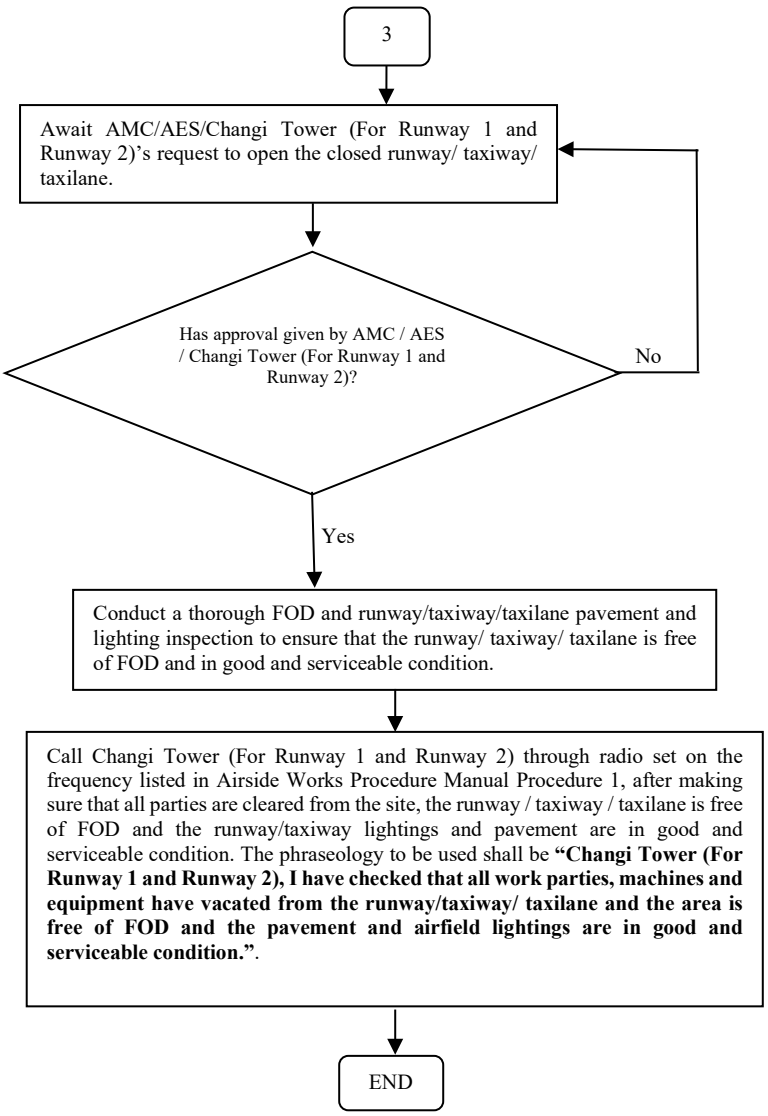
_____
Organisation

_____
Signature

PROCEDURE 16: RESPONSE TO LOCAL ACTION




1
Is AMC Duty Officer (ADO) on site?
No
Photographs and measurements of debris/FOD shall be taken to capture the relevant details of the debris/FOD. Location where the debris/FOD are found shall also be marked on a plan.
Yes
AMC shall take over the handling of aircraft debris.
3
Contact FMC (6541 2424) to mobilise mechanical sweeper and / or AES to remove aircraft debris / FOD that cannot be picked up completely by hand (e.g. cut grass, tyre debris, oil spillage, etc.). AMC shall be informed should there be any spillages.
No
Can aircraft debris / FOD be completely picked up by hand?
Yes
Seek Airport Emergency Service (AES) Ops Commander (on site) and Team Leader of CAG E&D, Airfield Systems, Aircraft Pavement Team approval before removing the aircraft debris / FOD.
Bring the aircraft debris to Airside Management Centre at the earliest opportunity. Ensure officer from Airside Management Centre acknowledges the receipt of the aircraft debris/FOD on the handing over/taking over form.
2
Update FMC every 30 minutes until the rectification work is complete.
No
Is aircraft pavement and/or airfield lights rectification work completed?
Yes
Conduct a thorough FOD and Runway / Taxiway / Taxilane pavement and lighting inspection to ensure that the runway / taxiway / taxilane is free of FOD and in good and serviceable condition.
Call Changi Tower (For Runway 1 and Runway 2) through radio set on the frequency listed in Airside Works Procedure Manual Procedure 1, after making sure that all parties are cleared from the site, the runway/taxiway/taxilane is free of FOD and the runway/taxiway lightings and pavement are in good and serviceable condition. The phraseology to be used shall be **"Changi Tower (For Runway 1 and Runway 2), I have checked that all work parties, machines and equipment have vacated from the runway/taxiway/taxilane and the area is free of FOD and the pavement and airfield lightings are in good and serviceable condition."**.
END



Additional Note:

The Airside Safety Inspection Teams shall activate the CAG Airside Operations Control to conduct friction test under the following scenarios:
i) Aircraft veered off /overshot the runway,
ii) Fuel or hydraulic leakage is detected on the runway,
iii) Aircraft skidding on the runway.

Depending on the extent of the leakage, the ASIT 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 an area and has been thoroughly cleaned up. If in doubt, the ASIT shall still take the safer approach to activate CAG Airside Operations Control to conduct a friction test before re-opening of the runway. For aircraft accident a friction 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 ASIT shall notify the Airside Duty Manager 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.

PROCEDURE 17: RESPONSE TO CATEGORY II ILS OPERATION

The Airside Safety Inspection Teams/Airfield Lighting Shift Team receives CAT II ILS operation notification from Fault Management Centre (FMC) or Changi Tower (For Runway 1 and Runway 2).

↓

The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall check that the two (2) yellow flashing lights and transponder (indicator must be blinking green, 2 times per sec) on their rovers are serviceable before entering the runway/taxiway/taxilane.

↓

The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall contact Changi Tower (For Runway 1 and Runway 2) through radio set on the frequency listed in Airside Works Procedure Manual Procedure 1, to check which is the landing runway and get approval to enter that runway to carry out the inspection first, followed by the take-off runway. Please refer to the document on "CAT1 Airside Driving Theory Handbook" Standard Phraseology for further details. The ASIT/ALST shall only enter the runway upon receiving clear approval from Changi Tower (For Runway 1 and Runway 2) 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).

↓

The Airside Safety Inspection Teams and/or Airfield Lighting Shift Team shall proceed to check the pavement, approach and runway lights for the landing runway first before carrying out the same for the take-off runway. The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall be given 20 to 30 minutes to complete inspection on one runway. The pavement and lighting inspections for all runways shall be completed within 1 hour upon FMC/Changi Tower (For Runway 1 and Runway 2) notification. The following approach and runway lights shall be checked for its serviceability and the status recorded in the Airfield Lighting Inspection Checklist:

- approach lights;
- threshold lights;
- touchdown zone lights;
- runway centre line lights;
- runway end lights;
- runway edge lights; and
- Precision Approach Path Indicator (PAPI) lights.

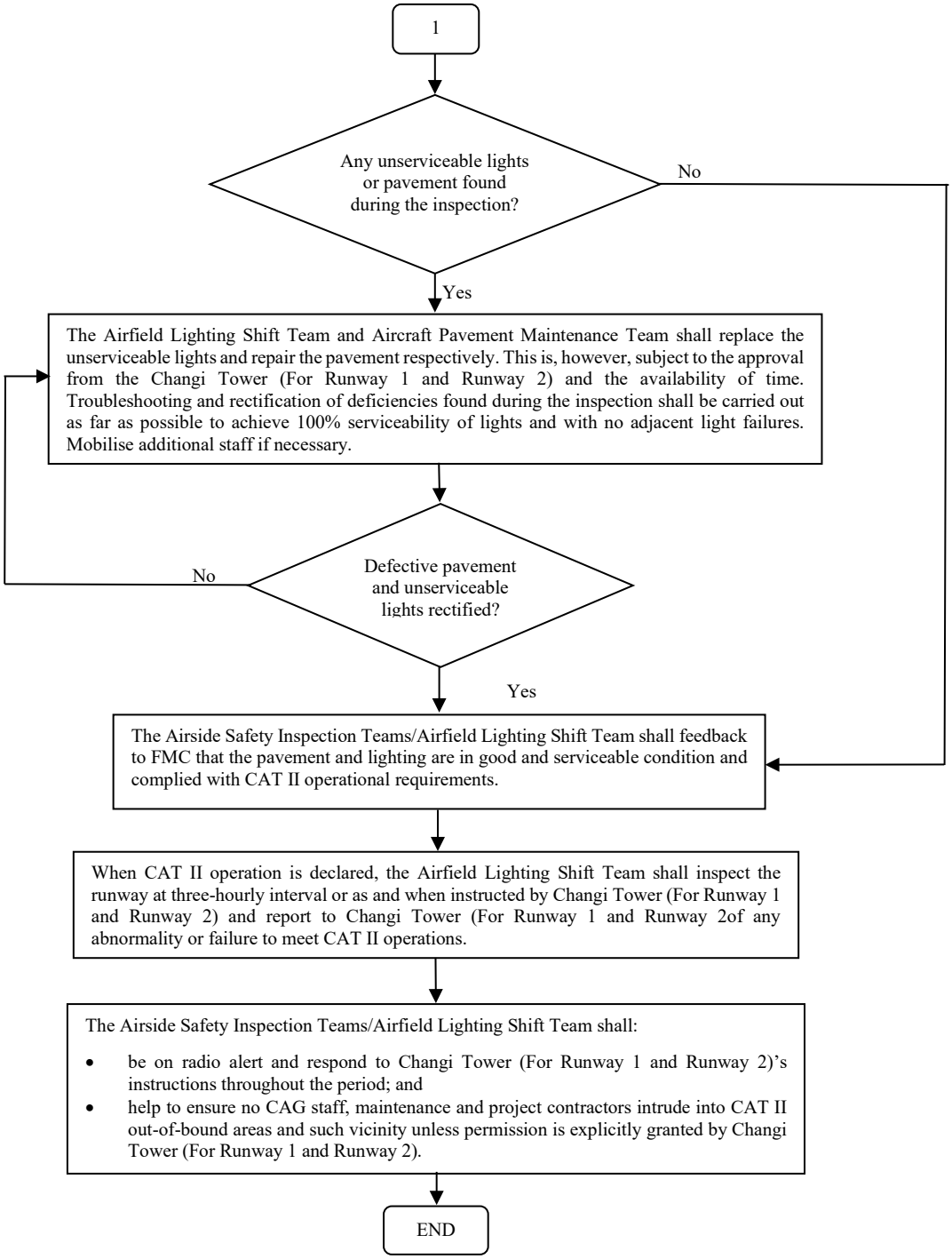
Following which, the Airside Safety Inspection Teams and/or Airfield Lighting Shift Team shall check for the serviceability of all the standby generator sets by asking Changi Tower (For Runway 1 and Runway 2) Watch Manager to switch on from Changi Tower (For Runway 1 and Runway 2).

↓

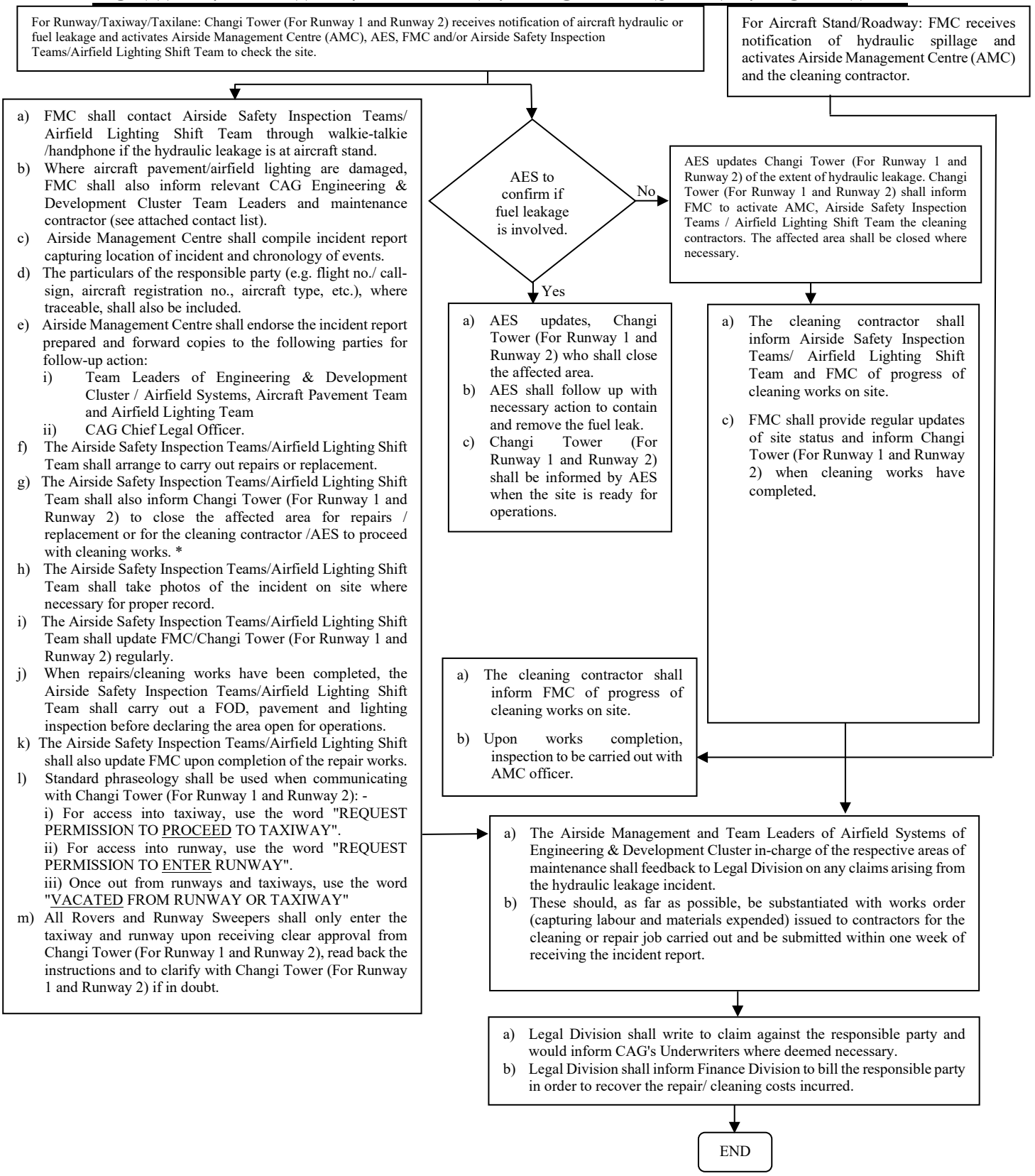
The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall feedback to FMC on the condition of pavement, the standby generator sets, and the number of unserviceable lights based on the list above.

↓

1


1
Any unserviceable lights or pavement found during the inspection?
No
Yes
The Airfield Lighting Shift Team and Aircraft Pavement Maintenance Team shall replace the unserviceable lights and repair the pavement respectively. This is, however, subject to the approval from the Changi Tower (For Runway 1 and Runway 2) and the availability of time. Troubleshooting and rectification of deficiencies found during the inspection shall be carried out as far as possible to achieve 100% serviceability of lights and with no adjacent light failures. Mobilise additional staff if necessary.
Defective pavement and unserviceable lights rectified?
No
Yes
The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall feedback to FMC that the pavement and lighting are in good and serviceable condition and complied with CAT II operational requirements.
When CAT II operation is declared, the Airfield Lighting Shift Team shall inspect the runway at three-hourly interval or as and when instructed by Changi Tower (For Runway 1 and Runway 2) and report to Changi Tower (For Runway 1 and Runway 2of any abnormality or failure to meet CAT II operations.
The Airside Safety Inspection Teams/Airfield Lighting Shift Team shall:
be on radio alert and respond to Changi Tower (For Runway 1 and Runway 2)'s instructions throughout the period; and
help to ensure no CAG staff, maintenance and project contractors intrude into CAT II out-of-bound areas and such vicinity unless permission is explicitly granted by Changi Tower (For Runway 1 and Runway 2).
END

PROCEDURE 18: RESPONSE TO LEAKAGE INCIDENT ON RUNWAY/TAXIWAY/TAXILANE/AIRCRAFT STAND / ROADWAY



* For temporary closure purposes, the Airside Safety Inspection Teams/Airfield Lighting Shift Team shall carry a minimum of 4 sets of heavy-duty, rubber type cones, chequered flags and red fixed lights to demarcate the closed area.

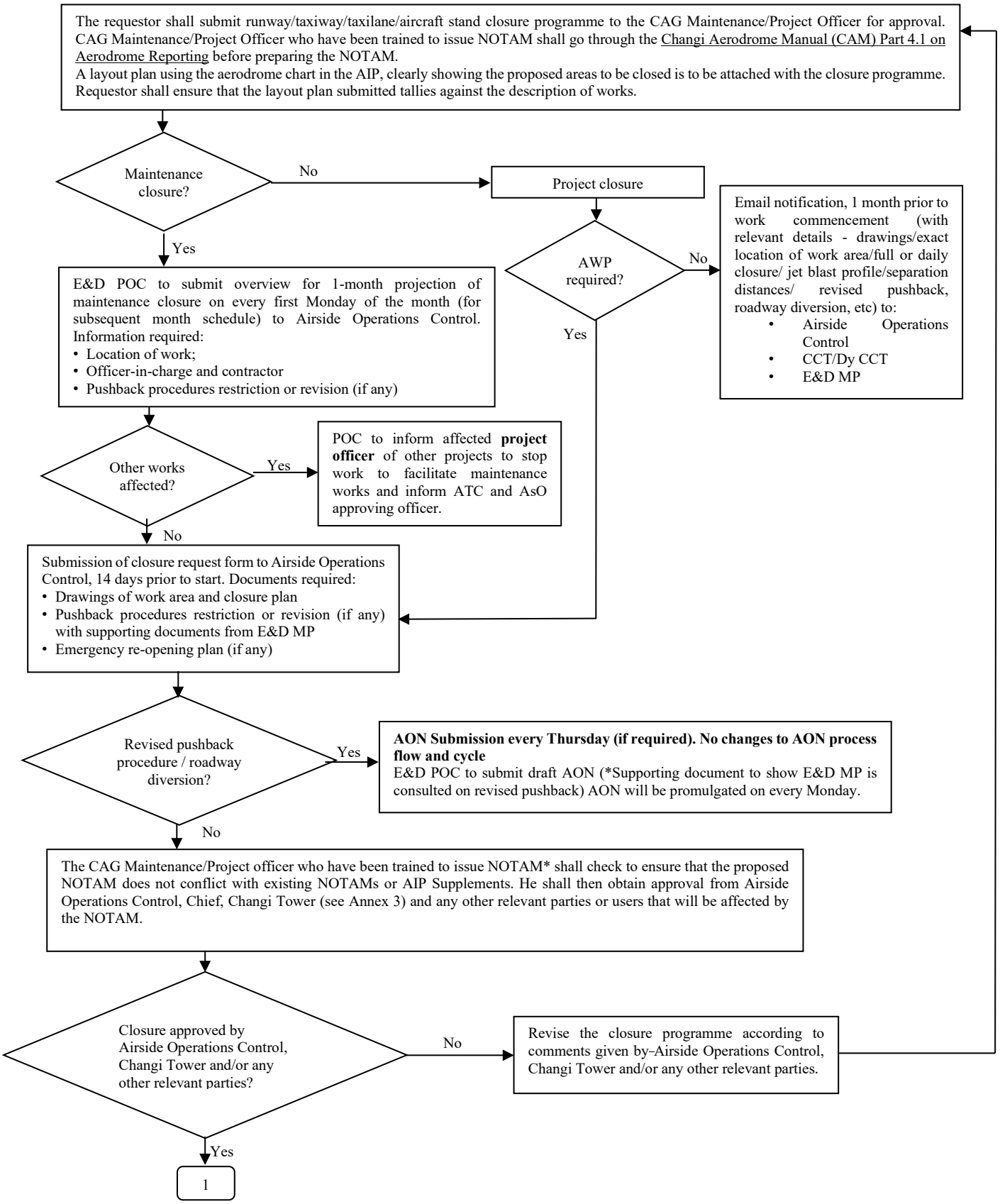
Additional Note: If there is hydraulic fluid leakage on the runway, friction test is required to be carried out.

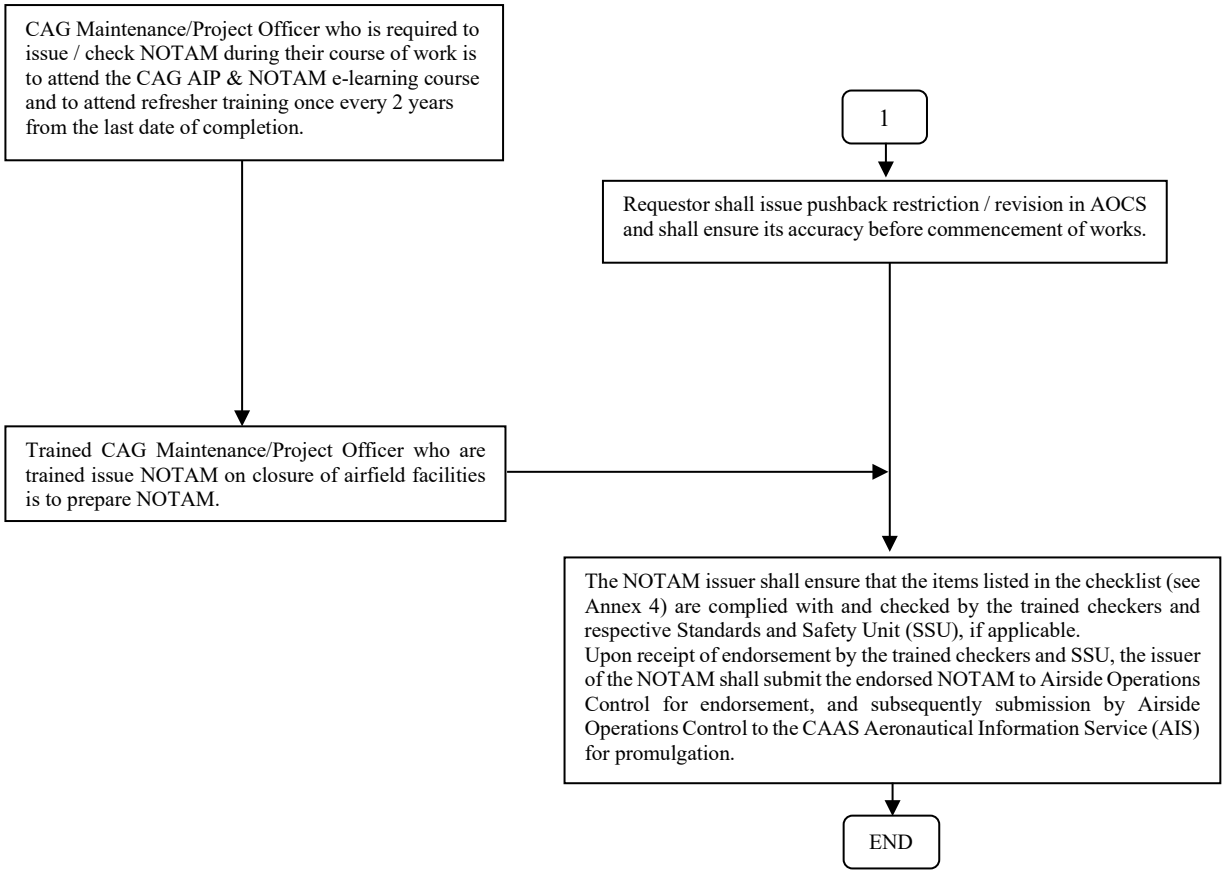
Depending on the extent of the leakage, the ASIT shall make an assessment on the risk to re-open the runway without first conducting a friction test. An example of risk which can be mitigated without first conducting a friction test is when a spillage is localized in area and has been thoroughly cleaned up. If in doubt, the ASIT should still take the safer approach to activate CAG Airside Operations Control to site 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 ASIT shall notify the Airside Duty Manager 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 19: APPLYING RUNWAY/TAXIWAY/TAXILANE/ AIRCRAFT STAND CLOSURE TO CARRY OUT MAINTENANCE/PROJECT WORK





Additional Notes:

(a) Approval from Changi Tower (For Runway 1 and Runway 2) 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.

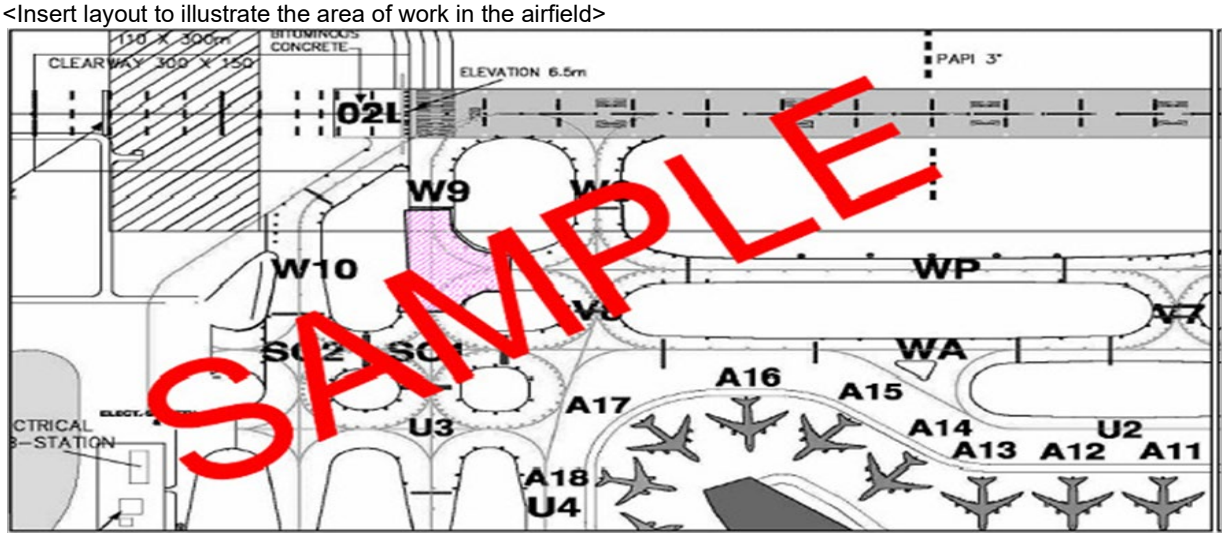
Annex 3

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: (Runway & Taxiway/Taxilane Only)	
(Company)	CAG Engineering & Relevant Group	Chief Changi Tower(WEST)	SVP, Airside Operations Control
(Name)	(Name)	(Name)	(Name)
(Signature & Date)	(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

Annex 4

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
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 Airside Safety Inspection 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 20: APPLYING EMERGENCY RUNWAY/TAXIWAY/TAXILANE CLOSURE TO CARRY OUT REPAIR WORK

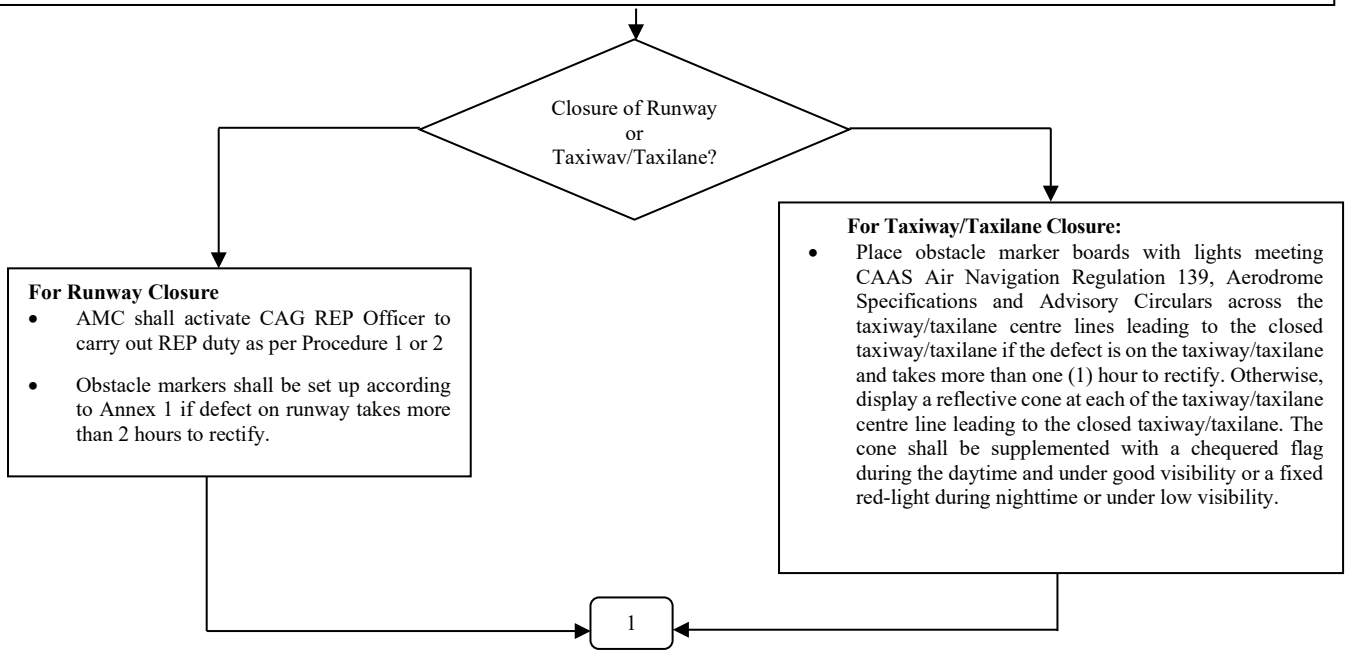
The Airside Safety Inspection Teams (ASIT) /Airfield Lighting Shift Team (ALST)/CAG Officer/authorised RTO under the direction of CAG Project Officer spotted a defect on the runway/taxiway/taxilane during their inspection, which could pose a danger to aircraft operations.

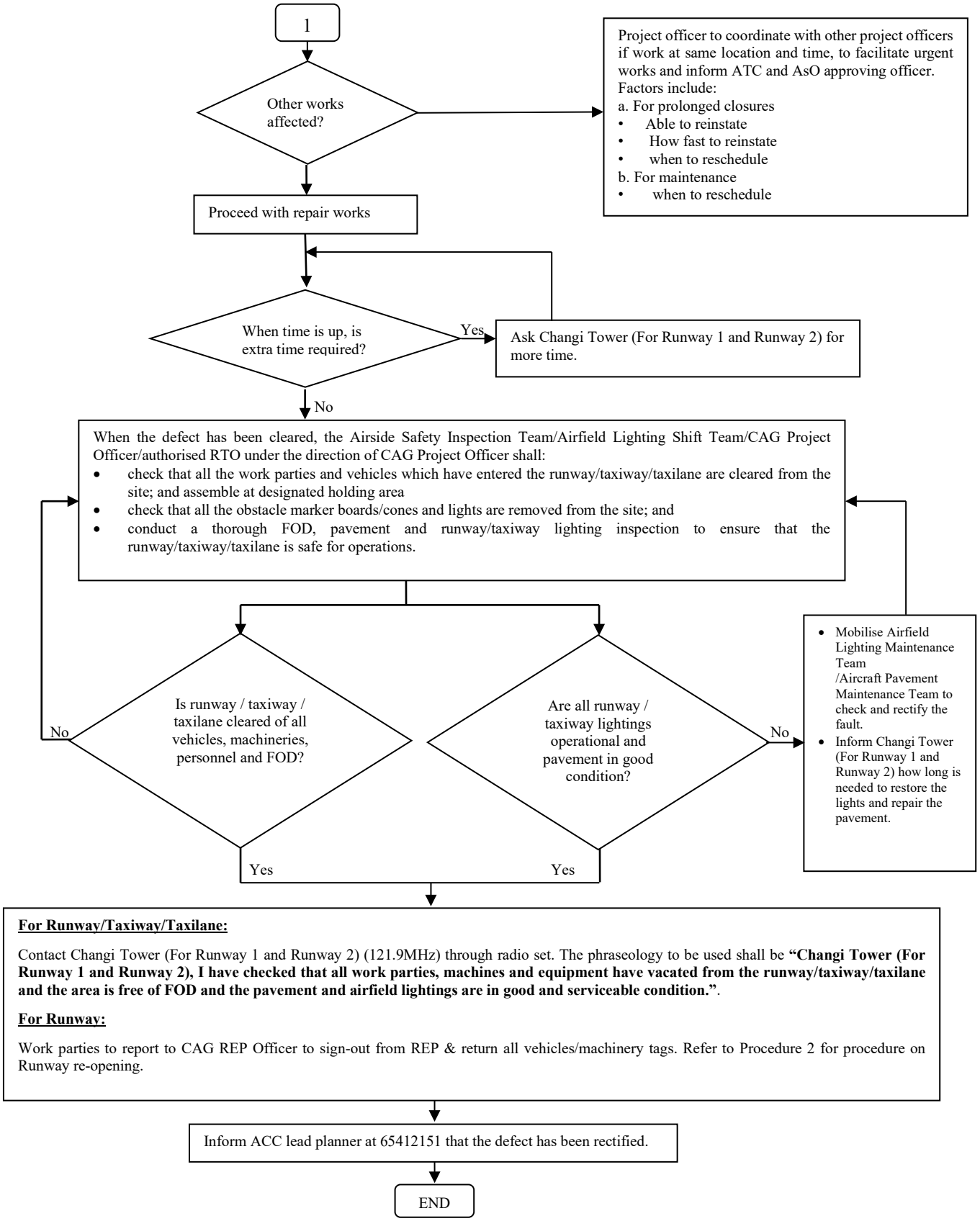
The following defects are defects which warrant immediate closure of runway/taxiway/taxilane. This list shall serve as a guide to the Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Officer/authorised RTO under the direction of CAG Project Officer but shall not be taken as exhaustive. For defects which are not listed below, the Airside Safety Inspection Teams/Airfield Lighting Shift Team/CAG Officer/authorised RTO under the direction of CAG Project Officer shall assess whether to invoke this procedure based on their judgmental assessment and experience:

(i) Surface flooding at runway/taxiway/taxilane
(ii) Pothole of size greater than 15 cm in diameter at runway / taxiway*
(iii) Outage of both sets of Precision Approach Path Indicator (PAPI) lights on the landing direction.
(iv) Unserviceable light adjacent to another unserviceable light during CAT II ILS operation / outage of one complete circuit of runway lights;
(v) Deep erosion of runway/ taxiway / taxilane strip surface;
(vi) Obstacles on the runway/taxiway or runway/taxiway strip or infringing the associated approach/take-off surfaces;
(vii) Rubber tyre debris or other large quantity of debris scattered on the runway/taxiway /taxilane surface;
(viii) Excessive bird activities on a runway or within the approach/take-off areas;
(ix) Fuel/Hydraulic Fluid leakage or spillage on runway/taxiway/ taxilane;
(x) Friction level that drops below 0.34 (95km/h) or 0.50 (65km/h) on any 100m section of the runway.

The ASIT/ALST/CAG Officer/authorised RTO under the direction of CAG Project Officer shall:

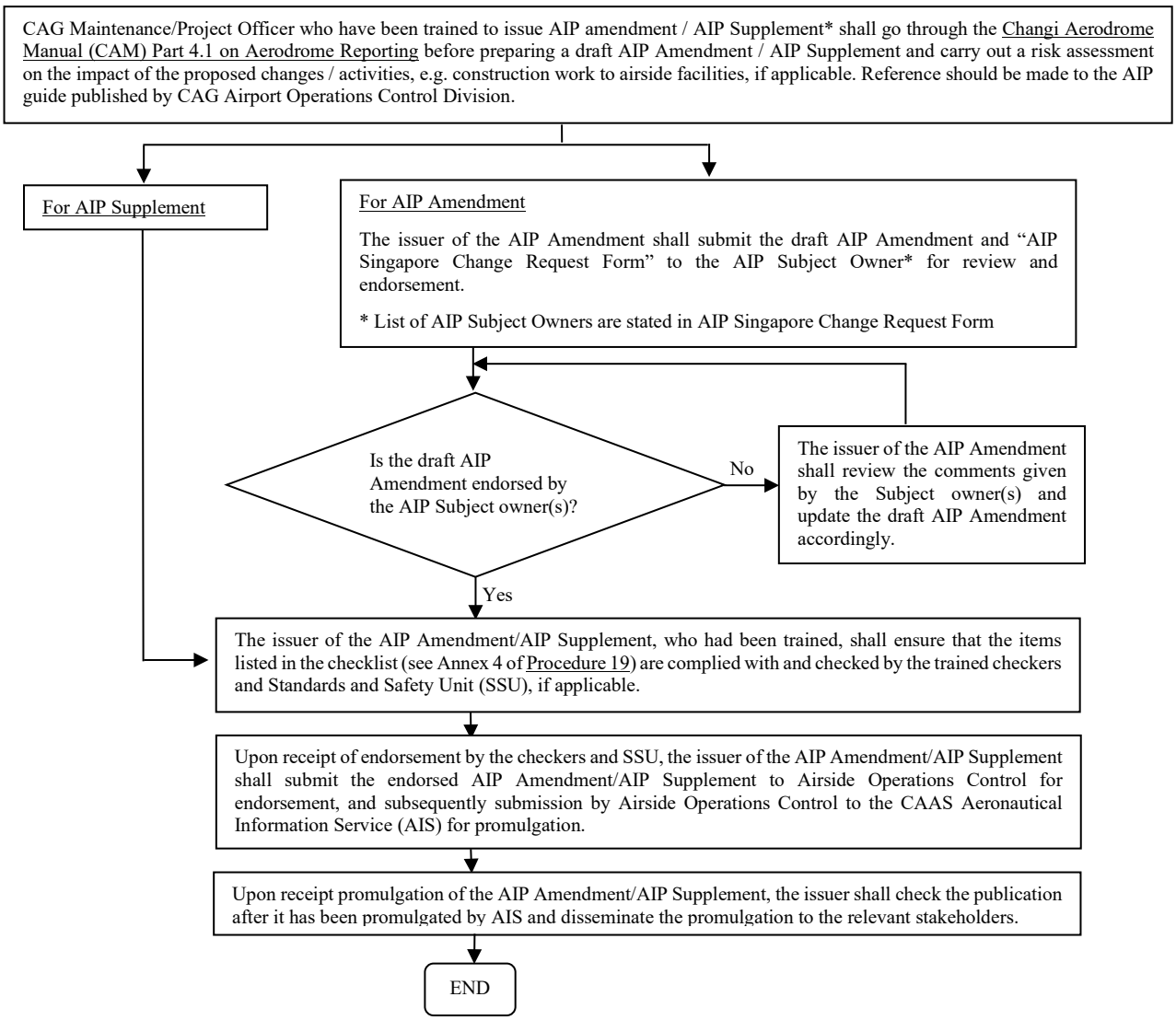
- Inform Changi Tower (For Runway 1 and Runway 2) and AMC that the runway/taxiway/taxilane is not safe for aircraft operations and how long is needed to rectify the defects;
- If NOTAM action is needed, CAG Project Officer shall submit draft & NOTAM proposal to CAG Airside Operations Control for promulgation.
- To seek approvals from Changi Tower (For Runway 1 and Runway 2) to close taxiway/taxilane, and from AMC to close runway for critical pavement defects;





The defined criteria that warrant immediate closure of the runway is:
A pothole on the runway of size greater than 150mm in diameter and 75mm in depth, enlarging and with the potential of generating FOD would warrant immediate closure of runway.

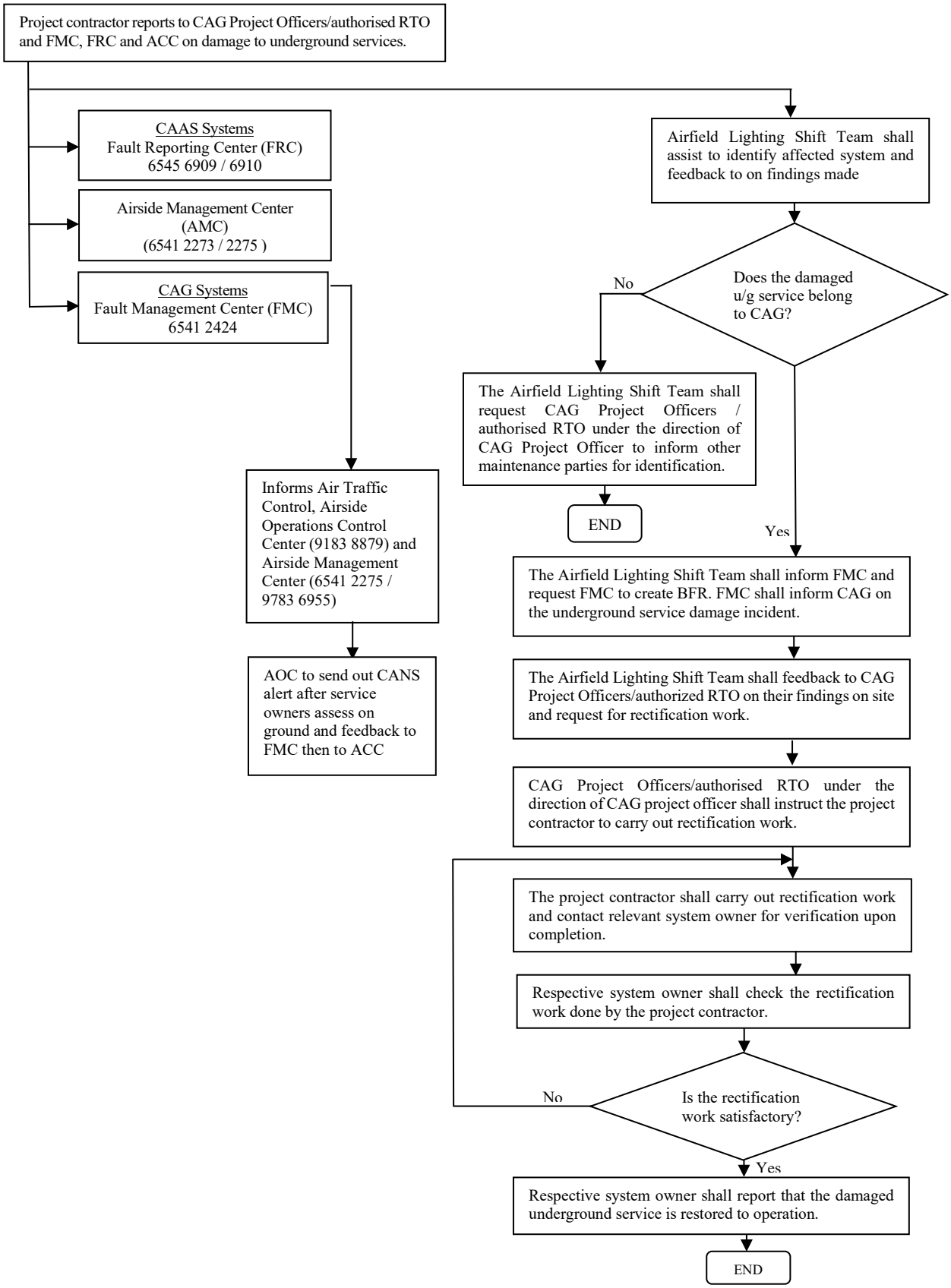
PROCEDURE 21: PREPARING AND DISSEMINATING AIP AMENDMENT/AIP SUPPLEMENT



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



PROCEDURE 23: PROCEDURE FOR CANCELLING RUNWAY/TAXIWAY/TAXILANE/AIRCRAFT STAND CLOSURE OUTSIDE CAG NORMAL WORKING HOURS

The Maintenance/Project contractor has requested and obtained approval for a runway/taxiway/taxilane/aircraft stand closure through CAG Officer. Due to unforeseen circumstances, the contractor requests to cancel the pre-arranged closure on the day of the closure which happens to be outside CAG normal working hours.

↓

The Maintenance/Project contractor shall inform the respective CAG Officer/authorised RTO under the direction of CAG Project Officer and make known his intent to cancel the pre-arranged closure.

↓

CAG Officer/authorised RTO under the direction of CAG Project Officer, upon notification by the contractor, shall convey the message to Changi Tower (For Runway 1 and Runway 2) (6541 2416) and FMC (6541 2424), giving his full name, area of work to be cancelled (provide NOTAM number if available) and handphone number in the event that clarification needs to be sought.

↓

CAG Officer (listed in CAG Authorised name list) shall call and email AIS to issue a NOTAM to cancel the pre-arranged runway/taxiway/taxilane/aircraft stand closure. (use standard email format and indicate the NOTAM number to be cancelled).

Standard email format: (AIS contact number: 6595 6056)

Caas_ATCSOA@caas.gov.sg
Caas_ATCSOB@caas.gov.sg
Caas_ATCSOC@caas.gov.sg
Caas_ATCSOD@caas.gov.sg
CAAS-ATSATCSO-WSALL@CAAS.gov.sg

Dear AIS officer,

As per our tele-conversation. Due to last minute unforeseen circumstances. We would like to cancel the closure on runway/taxiway/taxilane/aircraft stand _____. As such we would like to seek your assistance to issue a NOTAM to cancel existing NOTAM no. _____.

A return reply via this email is appreciated.

Regards

↓

Upon receiving the request for cancellation, AIS shall reply the email with a new NOTAM number confirming that the original NOTAM has been cancelled.

↓

Upon receiving the reply from AIS, CAG Officer/authorised RTO under the direction of CAG Project Officer shall inform Changi Tower (For Runway 1 and Runway 2), the NOTAM issuer and all affect parties.

↓

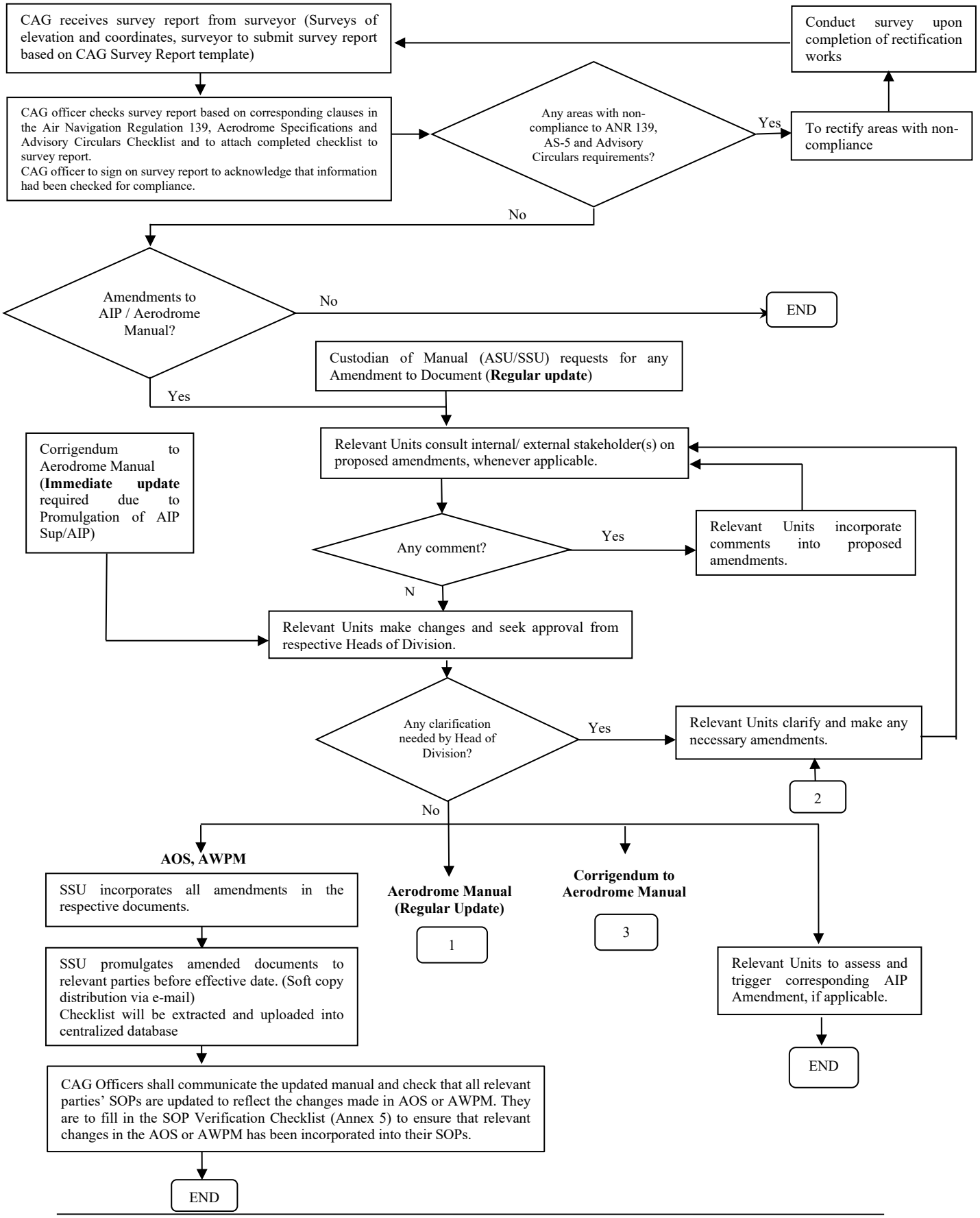
END

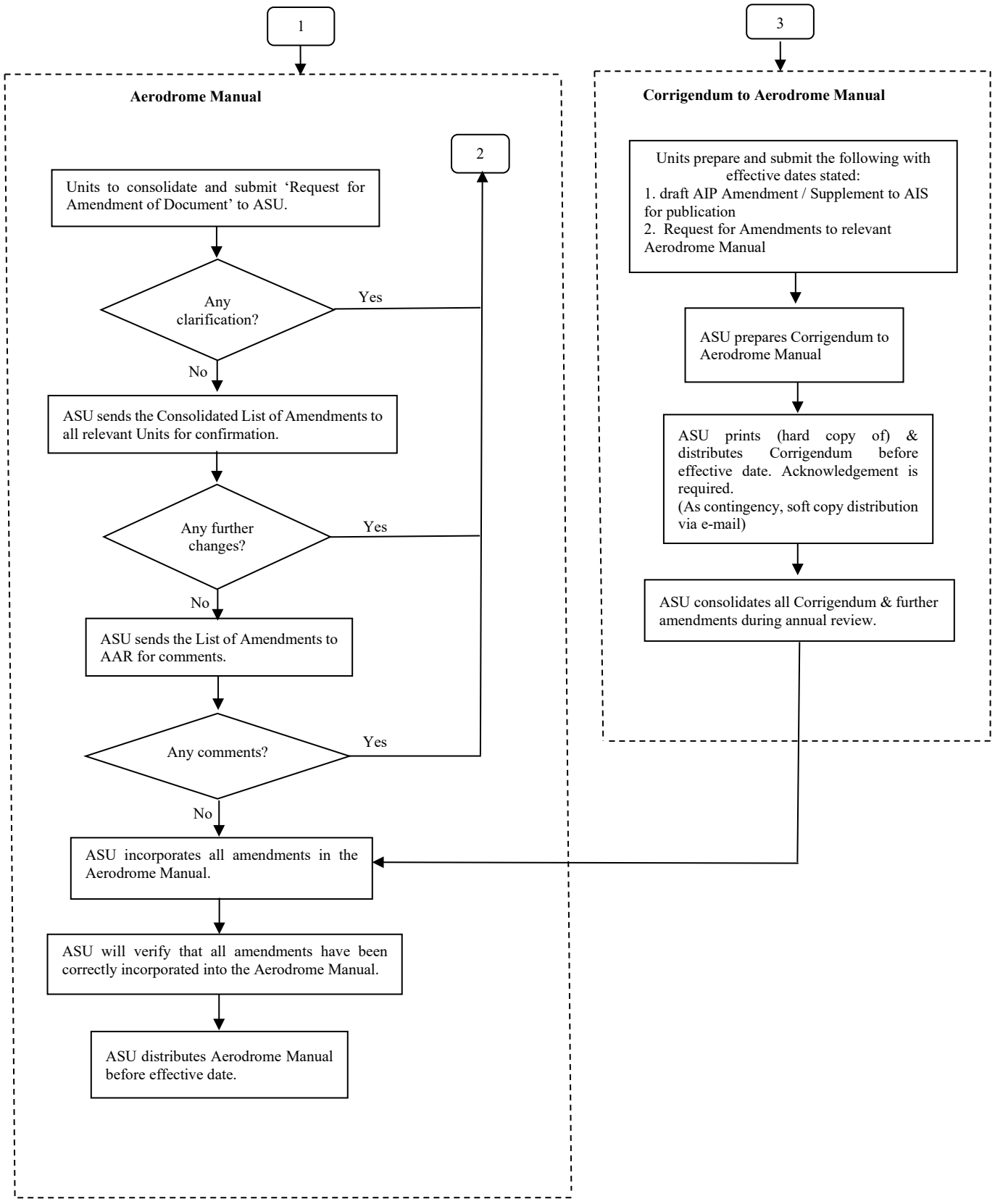
Note:

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




1
3
Aerodrome Manual
Corrigendum to Aerodrome Manual
2
Units to consolidate and submit 'Request for Amendment of Document' to ASU.
Any clarification?
Yes
No
ASU sends the Consolidated List of Amendments to all relevant Units for confirmation.
Any further changes?
Yes
No
ASU sends the List of Amendments to AAR for comments.
Any comments?
Yes
No
ASU incorporates all amendments in the Aerodrome Manual.
ASU will verify that all amendments have been correctly incorporated into the Aerodrome Manual.
ASU distributes Aerodrome Manual before effective date.
Units prepare and submit the following with effective dates stated:
1. draft AIP Amendment / Supplement to AIS for publication
2. Request for Amendments to relevant Aerodrome Manual
ASU prepares Corrigendum to Aerodrome Manual
ASU prints (hard copy of) & distributes Corrigendum before effective date. Acknowledgement is required.
(As contingency, soft copy distribution via e-mail)
ASU consolidates all Corrigendum & further amendments during annual review.

Annex 5

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

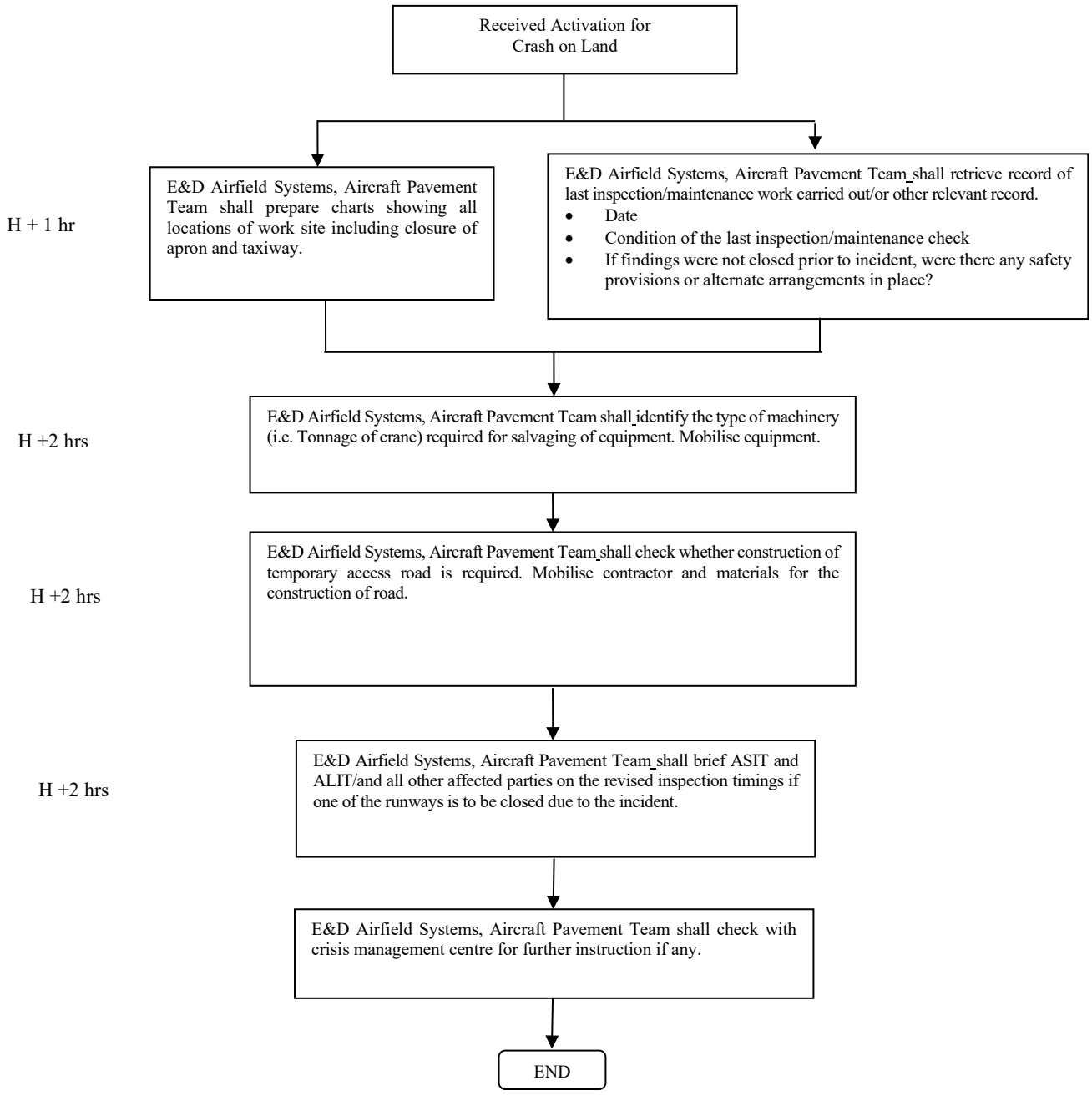
Reference number in list of amendment form	Clause reference in CAG Manual	Not Implemented	Not Applicable	Implemented	Remarks (Reason for not implementing / implemented with reference to work parties' SOP and to include work parties' SOP clause reference number)

Check by (CAG) : _____

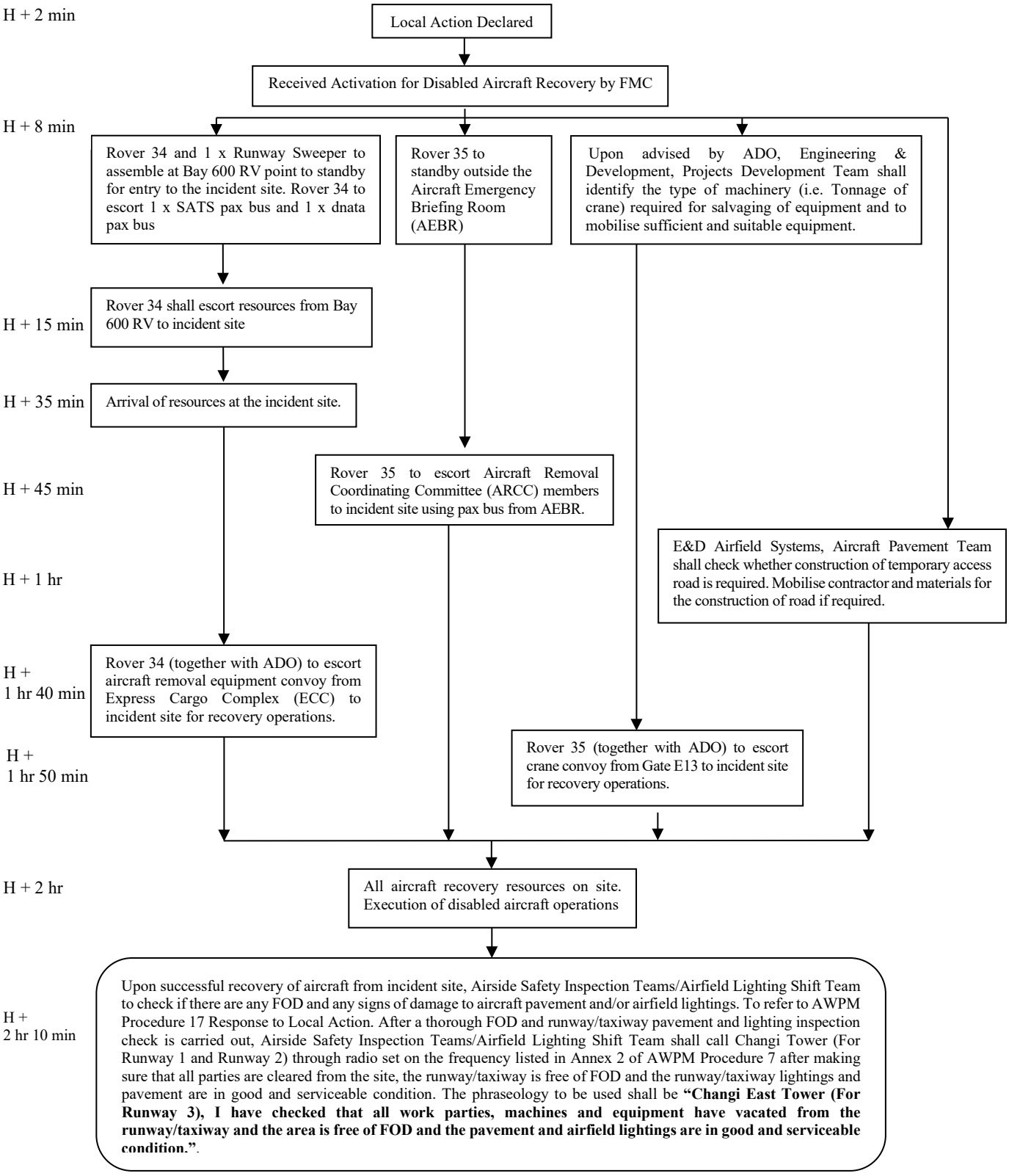
Date : _____

Scope of Work : _____

PROCEDURE 25: RESPONSE TO CRASH ON LAND WITHIN CHANGI AIRPORT WITHIN AES TURN-OUT AREA (RUNWAY 1 or 2)



PROCEDURE 26: RESPONSE TO DISABLED AIRCRAFT RECOVERY AT RUNWAY 3 AND ASSOCIATED TAXIWAYS



PROCEDURE 27: PROCESS FLOW ON COMMISSIONING AND HANDING OVER UPON COMPLETION OF PROJECT AT MOVEMENT AREA

Upon completion of any airside project work, the contractor shall conduct inspections, testing & commissioning works with CAG Maintenance/Project officers. The inspections and testing and commissioning works shall be carried out in accordance to the requirements spelt out in the contract specifications and the findings/ results shall be recorded in the inspections, testing and commissioning forms.

↓

Upon certifying that the project has been completed satisfactorily, the CAG Maintenance/Project officer shall inform the respective parties responsible for taking over the new facility for operations and maintenance and arrange for a handing over inspection with the users. CAG maintenance / project officer shall ensure that the new aircraft movement area remains inaccessible to aircraft by marking it as a closed aircraft movement area until the handing and taking over process has completed.

↓

This list below shall serve as a guide for areas to be checked, acknowledged and taken over by respective parties. The project officer shall consult all the respective system owners for their detailed handing/taking over checklist prior to handing over.

Civil work*
- Pavement condition
- Quality of dimension airfield marking
- Drainage, turfing
- FOD

Airfield Lighting System*
- Airfield Lighting
- Taxiway guidance signs
- Aircraft Stand Manoeuvring Guidance Light System
- Airfield Lighting Control System

CAFHI*
- Fuel pits available for the intended aircraft types

PLB/ADGS*
- PLB serviceability, including fixed gangway and movable arms
- PLB security doors
- PLB obstacle lights
- ADGS serviceability
- INS sign
- Aircraft stand bay indicator sign

Floodlights*
- Floodlights and lighting levels
- Obstacle lights on high mast
- Earth Receptacle & Lightning Protection

CCTV *
- CCTV on high mast, if any

Master Planning *
- Safety separation distances
- Safety distance to object
- Marking and lighting of obstacles
- Sizing of the ESA and EPS is sufficient for the ground handler
- 2nd layer of checks on as-built drawings, to ensure compliance to Air Navigation Regulation 139, Aerodrome Specifications and Advisory Circulars upon completion of markings, guidance sign and other visual aids modification or construction.

*if applicable

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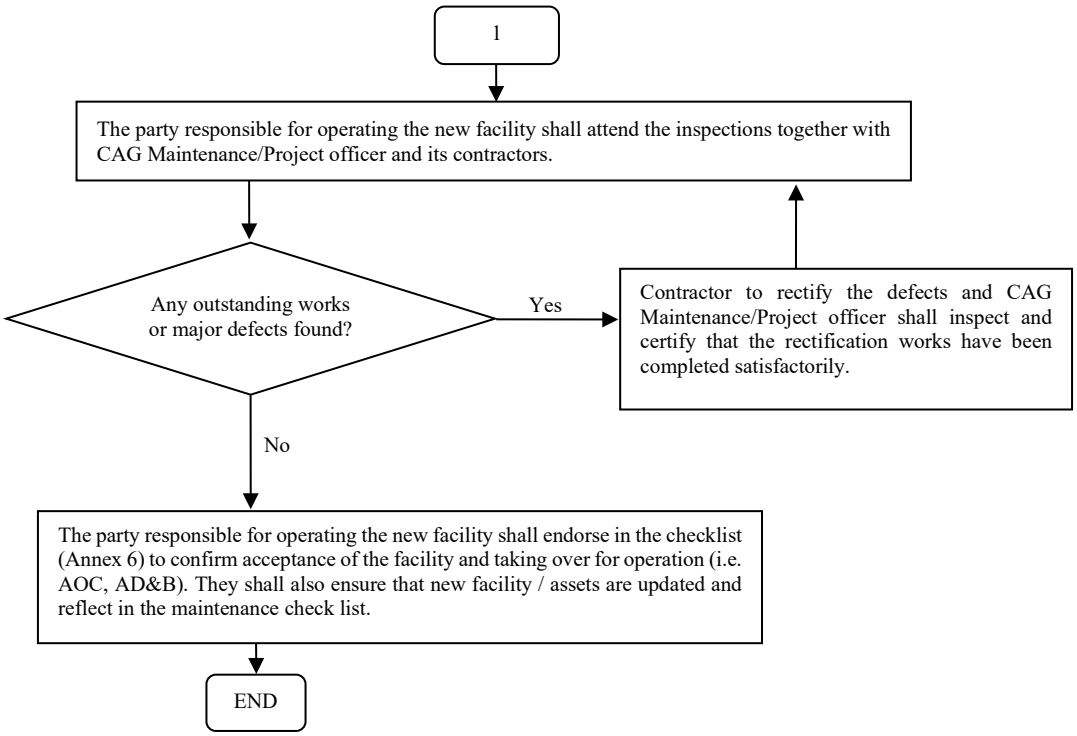
1


1
The party responsible for operating the new facility shall attend the inspections together with CAG Maintenance/Project officer and its contractors.
Any outstanding works or major defects found?
Yes
Contractor to rectify the defects and CAG Maintenance/Project officer shall inspect and certify that the rectification works have been completed satisfactorily.
No
The party responsible for operating the new facility shall endorse in the checklist (Annex 6) to confirm acceptance of the facility and taking over for operation (i.e. AOC, AD&B). They shall also ensure that new facility / assets are updated and reflect in the maintenance check list.
END

Annex 6

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	**Civil Works**						
1.1	Condition of Runway / Taxiway pavement		*Acceptable / To Rectify / NA			*Yes / No	
1.2	Runway / Taxiway ground markings dimension in accordance to specifications		*Acceptable / To Rectify / NA			*Yes / No	
1.3	Condition of Parking Stand pavement		*Acceptable / To Rectify / NA			*Yes / No	
1.4	Parking Stand ground markings dimension in accordance to specifications		*Acceptable / To Rectify / NA			*Yes / No	
1.5	Stop-line markings dimension in accordance to specifications for each aircraft type		*Acceptable / To Rectify / NA			*Yes / No	
1.6	Primary and Secondary Roadway		*Acceptable / To Rectify / NA			*Yes / No	
1.7	Roadway ground markings dimension in accordance to specifications		*Acceptable / To Rectify / NA			*Yes / No	
1.8	Jet blast deflector		*Acceptable / To Rectify / NA			*Yes / No	
1.9	Drains		*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	Turfing		*Acceptable / To Rectify / NA			*Yes / No	
2	**PLB / ADGS**						
2.1	Fixed gangway serviceability		*Acceptable / To Rectify / NA			*Yes / No	
2.2	PLB serviceability		*Acceptable / To Rectify / NA			*Yes / No	
2.3	PLB security doors		*Acceptable / To Rectify / NA			*Yes / No	
2.4	PLB red obstacle lights		*Acceptable / To Rectify / NA			*Yes / No	
2.5	PLB safety zone ground markings dimension in accordance to specifications		*Acceptable / To Rectify / NA			*Yes / No	
2.6	ADGS display & control panel		*Acceptable / To Rectify / NA			*Yes / No	
2.7	INS sign constructed in accordance to specifications		*Acceptable / To Rectify / NA			*Yes / No	
2.8	Bay indicator sign constructed in accordance to specifications		*Acceptable / To Rectify / NA			*Yes / No	
2.9	Gate Operating System (GOS) updated		*Acceptable / To Rectify / NA			*Yes / No	
3	**ANCILLARY BUILDING SERVICES AND M&E SYSTEMS**						
3.1	Apron Floodlight & lighting levels To attached lux level reading and check against specifications as stipulated in Air Navigation Regulation 139, Aerodrome Specifications and Advisory Circulars.		*Acceptable / To Rectify / NA			*Yes / No	
3.2	Apron floodlight OG box + plinth		*Acceptable / To Rectify / NA			*Yes / No	
3.3	Lightning protection shelter		*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		*Acceptable / To Rectify / NA			*Yes / No	
3.5	OBS lights for jet blast fence		*Acceptable / To Rectify / NA			*Yes / No	
4	**AFL system / ALCS**						
4.1	Runway / Taxiway centerline and edge lights 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		*Acceptable / To Rectify / NA			*Yes / No	
4.3	Airfield Lighting Control System (ALCS) updated		*Acceptable / To Rectify / NA			*Yes / No	
4.4	Aircraft Stand Manoeuvering Guidance Light System		*Acceptable / To Rectify / NA			*Yes / No	
4.5	Guidance signs are designed and constructed in compliance with Air Navigation Regulation 139, Aerodrome Specifications and Advisory Circulars / ICAO Annex 14		*Acceptable / To Rectify / NA			*Yes / No	
5	**CCTV**						
5.1	Camera Coverage of Aircraft Parking Stand/Runway/Taxiway		*Acceptable / To Rectify / NA			*Yes / No	
6	**Fuel hydrant system**						
6.1	Underground fuel hydrant pit location		*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	

No	Facility / Equipment	Compliance / Functionality Checked	Check Status	Checked By	Signed / Date	Maint Checklist Updated?	Remarks / Comments Addressed
7	**Compliance checks**						
7.1	Safety separation distances between runway / taxiway		*Acceptable / To Rectify / NA			*Yes / No	
7.2	Safety separation distances to object		*Acceptable / To Rectify / NA			*Yes / No	
7.3	Marking and lighting of obstacles		*Acceptable / To Rectify / NA			*Yes / No	
7.4	Sizing of the ESA/EPA at parking stand		*Acceptable / To Rectify / NA			*Yes / No	
7.5	Geographical WGS-84 survey requirements		*Acceptable / To Rectify / NA			*Yes / No	
7.6	Markings for ERA, ABL for parking stand		*Acceptable / To Rectify / NA			*Yes / No	
7.7	Pavement slope compliance to Air Navigation Regulation 139, Aerodrome Specifications and Advisory Circulars		*Acceptable / To Rectify / NA			*Yes / No	
8	**Documentation**						
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 AIS publication (AUP Supp, AIP amdt) Project officer to ensure that information submitted is aligned with updates to the aerodrome manual.		*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	
9	**Others**						
9.1	Operational item (pushback procedure in AOCS)		*Acceptable / To Rectify / NA			*Yes / No	
9.2	Operational item (fire extinguisher at parking stand)		*Acceptable / To Rectify / NA			*Yes / No	

No	Facility / Equipment	Compliance / Functionality Checked	Check Status	Checked By	Signed / Date	Maint Checklist Updated?	Remarks / Comments Addressed
9.3	Operational item (FOD bin)		*Acceptable / To Rectify / NA			*Yes / No	
9.4	Others (to specify: _____)		*Acceptable / To Rectify / NA			*Yes / No	

*<u>Note:</u>

- Handover shall only commence upon approval from CAAS, AAR
- All items checked should be compliant to Air Navigation Regulation 139, Aerodrome 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: (_____)

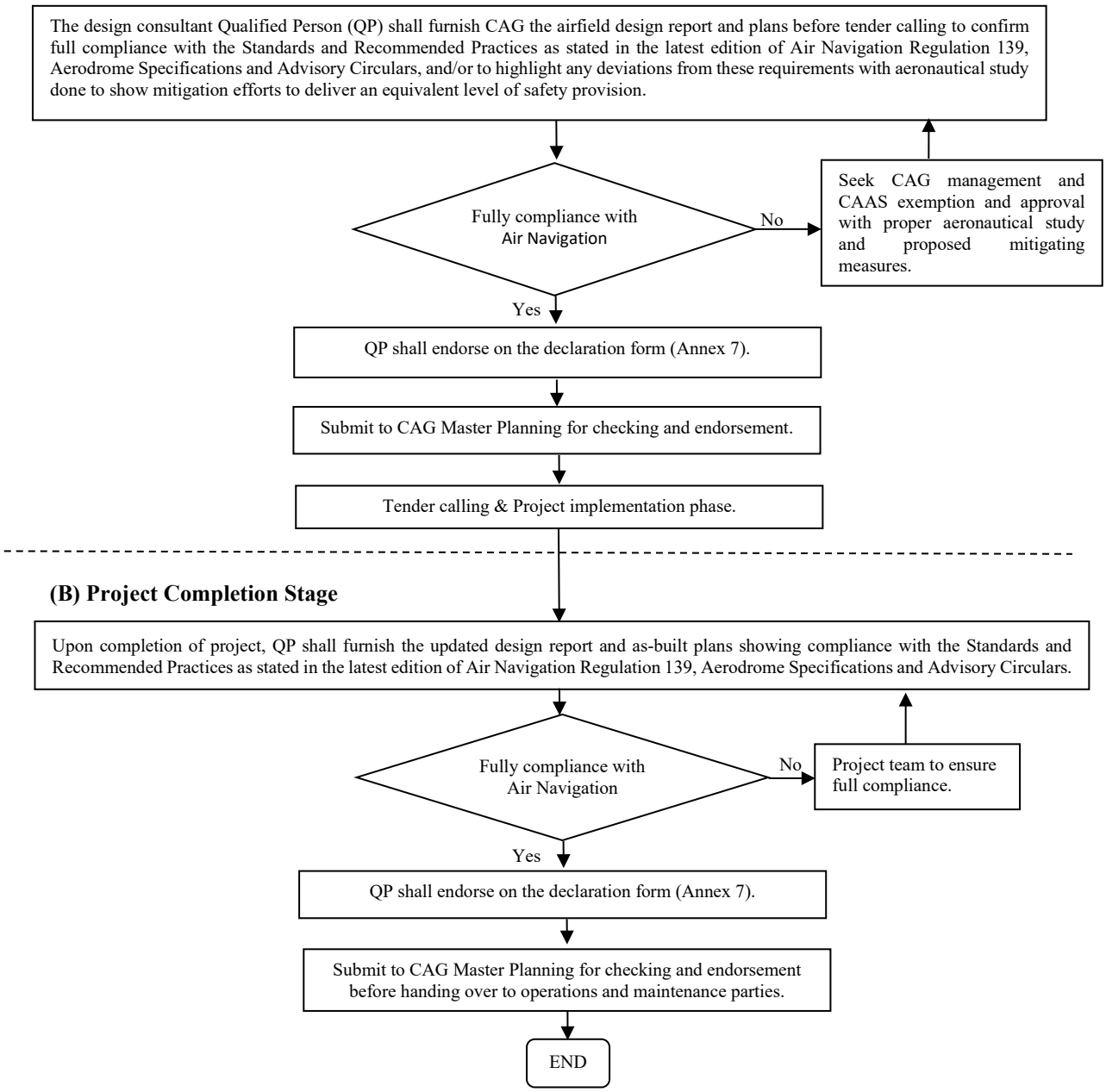
Hand Over (E&D / CE PDCO)		**Taking Over** (Operations)		**Witness By**	
Section	:	Division	:	Company	:
Name	:	Name	:	Name	:
Designation	:	Designation	:	Designation	:
Signature	:	Signature	:	Signature	:
Date / Time	:	Date / Time	:	Date / Time	:

Infrastructure Type: *Runway/ Taxiway / Taxilane / Aircraft Parking Stand / Others: (_____)

Hand Over (E&D / CE PDCO)		**Taking Over** (E&D Maintenance)		**Witness By**	
Section	:	Division	:	Company	:
Name	:	Name	:	Name	:
Designation	:	Designation	:	Designation	:
Signature	:	Signature	:	Signature	:
Date / Time	:	Date / Time	:	Date / Time	:

PROCEDURE 28: PROCESS FLOW ON DESIGN CHECK TO ENSURE COMPLIANCE TO CAAS AIR NAVIGATION REGULATION 139, AERODROME SPECIFICATIONS AND ADVISORY CIRCULARS

(A) Before Tender Calling Stage



(B) Project Completion Stage

Annex 7

DECLARATION ON COMPLIANCE TO CAAS AIR NAVIGATION REGULATION 139, AERODROME 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:

a. 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, Aerodrome Specifications and Advisory Circulars (version: ____) published by the Civil Aviation Authority of Singapore (CAAS), unless otherwise stated below;

b. The complete list of non-compliances are:

Air Navigation Regulation 139, Aerodrome Specifications and Advisory Circulars Clause	Details of Non-Compliance	Remarks
Note: to submit on a separate page if necessary		

DESIGN QUALIFIED PERSON

Name: _____ Designation: _____

Signature: _____ Date: _____

Company Stamp: _____

(C) CHECK BY CAG'S MASTER PLANNING

This is to certify that the design report and plan(s) submitted by the appointed design consultant have been checked to ensure that:

For the proposed airfield related development:
The consultant's 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, Aerodrome Specifications and Advisory Circulars (version: ____) published by the Civil Aviation Authority of Singapore (CAAS). The relevant chapter(s) checked are:

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

CHECKED BY

Name: _____ Designation: _____

Signature: _____ Date: _____

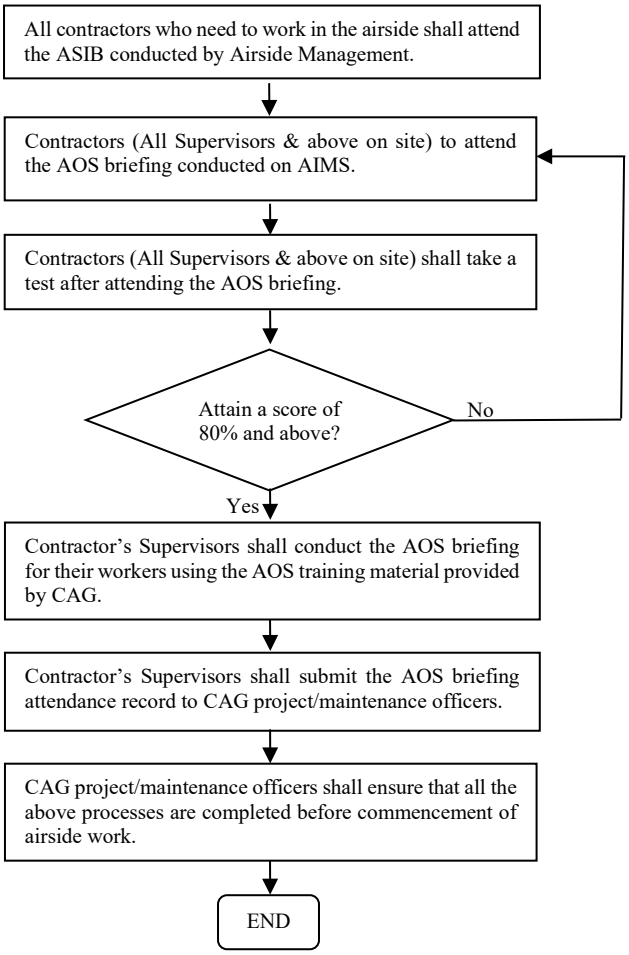
ENDORSED BY

Name: _____ Designation: _____

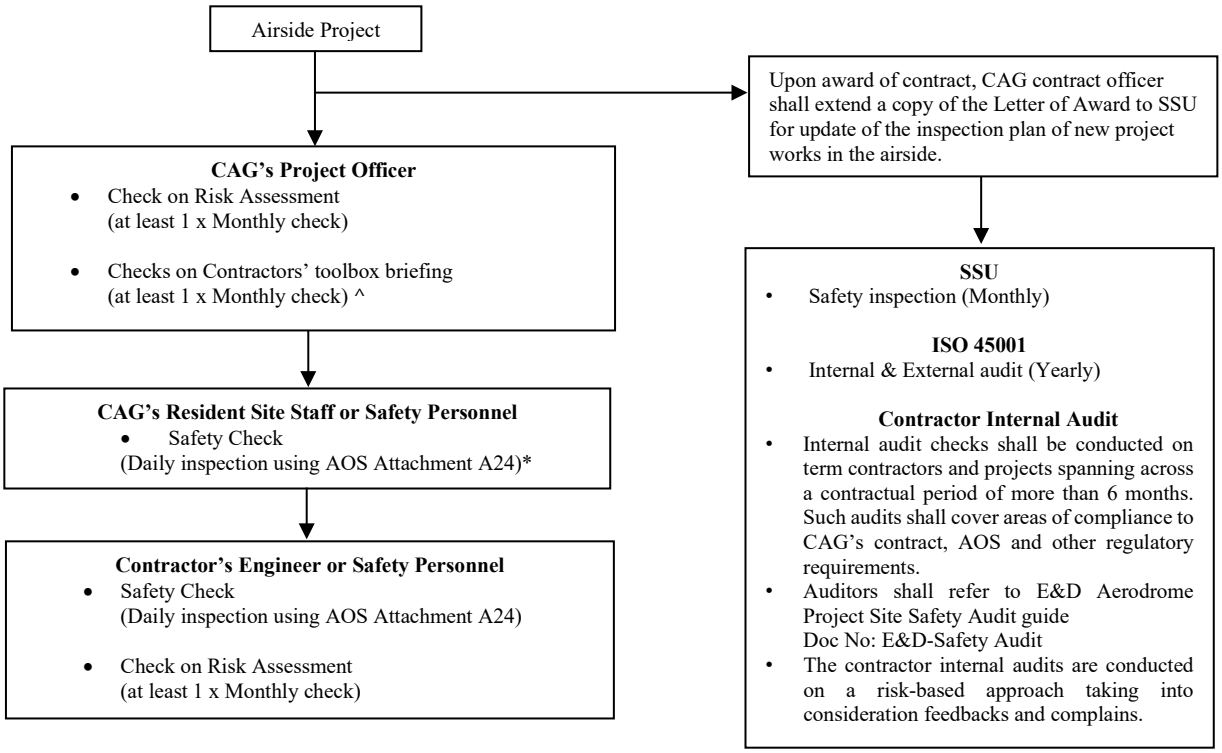
Signature: _____ Date: _____

* Delete where applicable

PROCEDURE 29: SAFETY BRIEFING WORKFLOW FOR AIRSIDE SAFETY INDUCTION BRIEFING (ASIB) & AIRPORT OPERATIONAL SAFETY REQUIREMENTS (AOS) BRIEFING



PROCEDURE 30: 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.