

# Advisory Circular

## GUIDANCE ON DEVELOPMENT WORKS AND MODIFICATION AT THE AERODROME

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### GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 11 of the Air Navigation Act 1966 (ANA), to demonstrate compliance with a statutory requirement. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

### PURPOSE

This AC provides the guidance to demonstrate compliance with, and information related to the development works and modifications at the aerodrome.

### APPLICABILITY

This AC is applicable to an operator who intends to or holds an aerodrome certificate or heliport certificate.

### RELATED REGULATIONS

This AC relates specifically to Regulation 21 of the Air Navigation (139 – Aerodromes) Regulations 2023 (“ANR-139”).

### RELATED ADVISORY CIRCULARS

- AC 1-3 Safety Management System
- AC 139-1-1 Guidance on the Application for, renewal and variation of an aerodrome certificate or heliport certificate
- AC 139-2-1 Guidance on aerodrome manual or heliport manual
- AC 139-4-3 Guidance on changes to aerodrome manual
- AC 139-7-2 Guidance on movement in airside

## **CANCELLATION**

This is the first AC issued on the subject.

## **EFFECTIVE DATE**

This AC is effective from 1 March 2023.

## **OTHER REFERENCES**

- ICAO Annex 14, Vol. I, Aerodrome design and operations, attachment A, section 18
- ICAO PANS Aerodromes (Doc 9981), Part II, Chapter 9

## **1 INTRODUCTION**

1.1 Regulation 21 of ANR-139 requires for works that affect the physical characteristics of any runway, taxiway, aircraft stand, final approach and take-off area, touch-down and lift-off area, helicopter ground taxiway or helicopter stand at the aerodrome or heliport, the aerodrome operator must –

- (a) notify the DGCA before carrying out the work;
- (b) ensure that consideration is given to the safety of aircraft operations at the aerodrome;
- (c) conduct a risk assessment in accordance with the operator's safety management system and notify the DGCA of the proposed changes before carrying out any work;
- (d) ensure that safety measures, which takes into account the risk assessment conducted are imposed; and
- (e) keep a record of the risk assessment conducted for the period specified in the Third Schedule of ANR-139.

1.2 Examples of aerodrome works that affect physical characteristics of the aerodrome includes:

- (a) introduction of new runway, taxiway/taxilane, or aircraft parking stand;
- (b) extension of runway, taxiway/taxilane;
- (c) reconfiguration of aircraft parking stand to multiple aircraft receiving stand (MARS);
- (d) extension or expansion of runway, taxiway/taxilane, or aircraft parking stand to accommodate a more exacting aircraft type;
- (e) construction of new final approach and take-off area, helicopter taxiway / taxi-route, or helicopter stand;
- (f) expansion of final approach and take-off area, helicopter taxiways / taxi-route, or helicopter stand; and
- (g) reconfiguration or relocation of final approach and take-off area, helicopter taxiways / taxi-route, or helicopter stand.

## **2 NOTIFICATION AND SUBMISSION OF DOCUMENTS**

2.1 The operator should notify CAAS at least 3 months prior to the planned commencement of works and submit minimally the following documentation:

- (a) completed form that includes a brief description, and the scope of the proposed new development/modification works, reason for the works, name and designation of the project manager and the expected start and end date. Refer to **Appendix A** for Form A – Notification of proposed changes to aerodrome infrastructure;

- (b) scaled drawings of the proposed new development or modification;
  - (c) work schedule; and
  - (d) compliance matrix to demonstrate compliance with the relevant clauses in the Aviation Specifications.
- 2.2 The operator should continually provide updates as and when they become available at significant junctures of the project in ensuring continued compliance with the ANR-139 and the relevant Aviation Specifications and submit associated risk assessments to CAAS as early as practicable, but at least two weeks prior to the commencement of each major phase of the project.
- 2.3 In cases where the development or modification works could result in any non-compliance with Aviation Specifications, the aerodrome operator should submit the required documents as stated in Paragraph 2.1 not later than 6 months prior to the commencement of works. The aerodrome operator must not commence works in the affected areas where any non-compliance is not resolved.
- 2.4 For any changes to the initial submission as per paragraph 2.1, the operator should inform CAAS using Form B – *Notification of variations to proposed changes to aerodrome infrastructure* (see **Appendix B**). As a result of such changes or any changes to the requirements in the ANR-139 or Aviation Specifications, CAAS may require the aerodrome operator to re-submit design compliance documents as necessary. The operator should not commence any works in the affected areas where any non-compliance is not resolved.
- 2.5 Notification and submission of documents to CAAS mentioned in paragraph 2.1 is not required for the aerodrome works that do not affect the physical characteristics of a runway, taxiway or aircraft parking stand. Some examples are as follows:
- (a) routine maintenance works on runway, taxiway/taxilane or aircraft parking stand such as repainting, replacement of lights and removal of rubber deposits;
  - (b) installation of new Airfield Ground Lightings (AGL) and other visual aids;
  - (c) runway, taxiway re-surfacing.

### **3 MANAGEMENT AND CONTROL OF AERODROME WORKS**

- 3.1 A operator should develop a work plan (See **Appendix C**) to demonstrate that it takes all reasonable measures to ensure that aerodrome works are well-organised and that all work personnel carry out aerodrome works in a manner that will ensure the safety of aircraft operations. The work plan should be submitted to CAAS prior to the start of the aerodrome works.
- 3.2 Persons, vehicles, plant and equipment required for carrying out aerodrome works should not be permitted to enter the movement area or remain on it except for the purpose of carrying out those works.
- 3.3 The operator should appoint a person responsible for the safe and proper execution of each item of aerodrome works. The person should be satisfied that the work plan is adequately prepared and that sufficient safety measures are put in place on the work site at all times during the execution of the aerodrome works when the aerodrome is open to aircraft operations. This person should be required to:

- (a) ensure the safety of aircraft operations is not affected by the aerodrome work plan;
- (b) ensure that, where applicable, the aerodrome works are notified by the issue of an AIP Supplement or a NOTAM and that the text of each AIP Supplement or NOTAM pertaining to such notification conveys the information on operational restrictions accurately and clearly to aerodrome users and service providers;
- (c) supply the aerodrome control tower services with whatever information necessary to ensure the safety of aircraft operations;
- (d) discuss with the work organisations involved, on a regular basis, any matters necessary to ensure the safety of aircraft operations;
- (e) ensure that unserviceable portions of the movement area, temporary obstructions and limits of the work areas are correctly marked and lit in accordance with the relevant requirements in the Aviation Specifications and the work plan;
- (f) ensure that vehicles, plant and equipment carrying out aerodrome works are properly marked and lit in accordance with the relevant requirements in the Aviation Specifications or are properly supervised;
- (g) ensure that all requirements under the work plan pertaining to vehicles, plant and equipment and materials are complied with;
- (h) ensure that access routes to work areas are in accordance with that designated in the work plan and are clearly identified and that access is restricted to these routes;
- (i) ensure that excavation is carried out in accordance with the work plan and relevant requirements, and in particular, that sufficient precautions are taken so as to avoid damage or loss of calibration to any underground power or control cable, utilities or other services associated with a precision approach and landing system, any navigational aid or facility or equipment essential for the safety of aerodrome operations;
- (j) report immediately to the aerodrome control tower services provider and the aerodrome operator any incident, or damage to facilities, likely to affect air traffic control services or the safety of aircraft;
- (k) provide adequate supervisors duty at the work areas while major works are in progress and the aerodrome is open to aircraft operations;
- (l) ensure that the aerodrome control tower services unit is kept informed of the radio call signs of vehicles used by the work organisations that are operating in the aircraft movement areas;
- (m) remove vehicles, plant and personnel from the movement area immediately, where necessary, to ensure the safety of aircraft operations;
- (n) ensure that the movement area is safe for normal aircraft operations following the removal of vehicles, plant and equipment and personnel from the work areas;
- (o) in the case of time-limited works, ensure that the work areas are restored to normal safety standards not less than 5 minutes before the time scheduled for opening the work areas to aircraft operations; and
- (p) ensure that floodlighting or any other lighting required for carrying out aerodrome works is shielded so as not to present a hazard to aircraft operations.

3.4 The operator should not close the aerodrome to aircraft operations due to aerodrome works unless an AIP Supplement or a NOTAM giving notice of the closure has been issued not less than 14 days before the closure takes place.

## **4 DOCUMENTATION OF PROCEDURES IN THE AERODROME MANUAL**

- 4.1 The details of the procedures for planning and safe carrying out of work activities at the aerodrome should be documented in the aerodrome manual. The operator may refer to *AC 139-2-1 Guidance on Aerodrome Manual or Heliport Manual* for more details.

## **5 MARKERS, MARKINGS AND LIGHTS**

- 5.1 Aerodrome markers, markings, signs and lights required for, or affected by, aerodrome works must be adjusted or installed in accordance with the relevant requirements in the ANR-139 and Aviation Specifications.
- 5.2 Parts of the movement area that are unserviceable as a result of the aerodrome works being carried out must be marked and lit in accordance with the relevant requirements in the ANR-139 and Aviation Specifications.
- 5.3 All obstacles created as a result of aerodrome works being carried out must be marked and lit in accordance with the relevant requirements in the ANR-139 and Aviation Specifications.
- 5.4 Vehicles and plant used in carrying out aerodrome works must be marked and lit, where necessary, in accordance with the relevant requirements in the ANR-139 and Aviation Specifications.

## **6 COMMUNICATIONS EQUIPMENT OF VEHICLES USED**

- 6.1 At a controlled aerodrome, a vehicle used by work parties carrying out aerodrome works on the manoeuvring area should be equipped with a radio for two-way communications with the aerodrome control tower services and maintain a continuous listening watch on the assigned frequency.
- 6.2 For the purpose of communication with the aerodrome control tower services, each vehicle used for carrying out aerodrome works on the manoeuvring area should be given a callsign.
- 6.3 Any vehicle or plant that is not:
- (a) marked or lit in accordance with the aerodrome work plan; or
  - (b) if applicable, equipped with a two-way radio;
- should only be used in carrying out aerodrome works if it is:
- (c) used under the direct supervision of another vehicle that is equipped with a two-way radio set and which is responsible for escorting the vehicle or plant without radio when carrying out aerodrome works; or
  - (d) used only within the limits of appropriately marked and lit work areas.
- 6.4 The drivers of vehicles equipped with a radio for two-way communications with the aerodrome control tower services must be properly trained and should be responsible for checking that their radio sets are switched on and serviceable at all times when working on the manoeuvring area. The operator may refer to *AC 139-7-2 Guidance on movement* in airside for more details.

## **7 WORKS NEAR AIRCRAFT MOVEMENT AREAS**

- 7.1 The operator must refer to the chapters on Physical Characteristics and Obstacles Restriction and Removal in the relevant Aviation Specifications and ICAO Airport Services Manual (Doc 9137) Part 6 – Control of Obstacles to determine the extent of work allowed near aircraft movement areas.
- 7.2 Works on or near aircraft movement areas or runway strips should be carried out as quickly as practicable to minimise any potential risks arising out of changes associated with the works in progress.
- 7.3 Where works are to be undertaken in the vicinity of navigational or landing aids located within the runway strips, considerations should be taken to ensure that neither the works nor vehicles or plant associated with the works may affect the performance of the aids.


## **8 APPROVAL OF COMPLETION**

- 8.1 The operator must not commence operations of any new or modified infrastructure, as required in Regulation 21 of ANR-139, without the approval of CAAS.
- 8.2 On completion of these aerodrome works and at least one month prior to operational use, the operator must submit Form C - Application for approval of completion of infrastructure (see **Appendix D**) and associated evidence demonstrating such compliance which minimally include:
- (a) safety case;
  - (b) aeronautical studies;
  - (c) site survey reports for example, as-built topographical surveys;
  - (d) computer simulation reports and test results for example, runway friction values, aircraft wheelpath simulations, jet blast effect simulations;
  - (e) demonstrations for example, AES response time, generator cut-over time, lighting controls; or
  - (f) inspection reports including testing and commissioning for example, pavement strength, AGL systems.
- 8.3 The operator is encouraged to indicate the methods demonstrating compliance with the Aviation Specifications for a particular works early to CAAS using the compliance checklist. Depending on the complexity of the works, CAAS may request for additional documents to be submitted.
- 8.4 For works that will be completed in phases, CAAS may grant approval of completion in a progressive manner to allow the operator to commence operational use of certain parts of the works, subject to the submission of a detailed project plan. The project plan should include, at the least, the following information (See **Appendix E** for a sample document):
- (a) description of works;
  - (b) record of revisions;
  - (c) compliance checklist detailing the relevant Aviation Specifications clauses, method of compliance and reference documents as necessary; and
  - (d) estimated schedule of completion.
- 8.5 For major works that have significant impact on aircraft operations, such as introduction of a new runway or apron, CAAS may request the aerodrome operator to submit a safety case or aeronautical study, in consultation with other relevant stakeholders,

detailing the safety assessment and mitigation strategies to manage the safety risks associated with operating the new infrastructure. (ASP) The operator may refer to *AC 139-5-2 Guidance on Conduct of an Aeronautical Study* for more details.


- 8.6 On the completion of aerodrome works and restoration of normal safety standards to the movement area, the operator must cancel any AIP Supplement or NOTAM issued to advise of those works.
- 8.7 Attention is drawn to Regulation 18 of the ANR-139 where the operator must inspect his aerodrome, as circumstances require, to ensure aviation safety during and immediately after any period of construction or repair of an aerodrome facility or equipment that is critical to the safety of aircraft operations, and at any other time when there are conditions at the aerodrome that could affect aviation safety.
- 8.8 If the development affects information in the aerodrome certificate or the layout of the aerodrome, the aerodrome operator must also apply for a variation of the aerodrome certificate. The operator should refer to *AC 139-1-1 Guidance on the Application for, renewal and variation of an aerodrome certificate or heliport certificate* for the procedures and timelines to vary an aerodrome or heliport certificate.
- 8.9 Application for a variation of the aerodrome certificate is not required for activities that do not affect information in the aerodrome certificate or the layout of the aerodrome. Some examples are as follows:
  - (a) Change runway, taxiway/taxilane, or aircraft parking stand to accommodate a different critical aircraft type;
  - (b) Closure of runway, taxiway/taxilane, or aircraft parking stand; and
  - (c) Change in designation of runway, taxiways, or aircraft parking stand.

## APPENDIX A – FORM A

<b>Notification of proposed changes to aerodrome infrastructure</b>			
Aerodrome Name:		Date of submission:	
<b>Project Details</b>			
Title of Works:			
Reason for Change:			
Brief Description of proposed change:			
Planned Commencement Date of Works:			
Estimated Completion Date of Works:			
<b>Supporting Documents to be attached with this submission:</b>			
1. Compliance Matrix 2. Scaled Drawings			
(Empty space for document details)			
<b>Declaration</b>			
I hereby declare that the above information and all documents submitted in this form are true in every respect.			
Name of Project Manager/Signature: _____			
Designation: _____			
Contact number/Fax:		E-mail:	
<b>For official use only:</b>			
Reference no:		Received by:	
Verified by:		Date:	
Name of Aerodrome Inspector/Signature:			
Designation		Contact number/Fax/E-mail:	




**APPENDIX B – FORM B**

<p><b>Notification Of Variations To Proposed Changes To Aerodrome Infrastructure</b></p>		
<p>Aerodrome Name:</p>		<p>Revision no. and Date of submission:</p>
<p><b>Project Details</b></p>		
<p>Title of Project:</p>		
<p>Brief Description of the Variations:</p>		
<p>Reason for Variations:</p>		
<p>Is there any non-compliance with relevant requirements of the ANR-139 or Aviation Specifications as a result of the variations?</p> <p><input type="checkbox"/> No    <input type="checkbox"/> Yes (Please provide details of the potential non-compliance including any supporting documents)</p>		
<p>Does the variation (s) affect the planned commencement and completion date of Works?</p> <p><input type="checkbox"/> No    <input type="checkbox"/> Yes (Please indicate the revised dates) .....</p>		
<p>Planned Commencement Date of Works:</p>		
<p>Estimated Completion Date of Works:</p>		
<p><b>Supporting Documents Attached</b></p>		
<p><b>Declaration</b></p> <p>I hereby declare that the above information and all documents submitted in this form are true in every respect.</p> <p>Name of Project Manager/Signature: _____</p> <p>Designation: _____</p>		
<p>Contact number/Fax:</p>		<p>E-mail:</p>
<p><b>For official use only:</b></p>		
<p>Reference no:</p>		<p>Received by:</p>
<p>Verified by:</p> <p>Name of Aerodrome Inspector/Signature:</p>		<p>Date:</p>
<p>Designation:</p>		<p>Contact number/Fax/E-mail:</p>

## APPENDIX C – GUIDANCE ON AERODROME WORK PLAN

- C1. Unless an aerodrome is closed during works in progress, or the work is of an emergency nature, an aerodrome operator should not carry out aerodrome works, other than time-limited works, without proper planning in advance.
- C2. The operator should establish a plan to address the following:
- (a) arrangements for carrying out those aerodrome works in coordination with all other operational, maintenance and development activities at the aerodrome.
  - (b) procedures for entering the work areas
  - (c) details of any special requirements or restrictions arising during or on completion of the works
  - (d) details of special arrangements to be made during works if emergencies or adverse weather conditions occur.
- C3. When preparing a work plan, the operator should consult:
- (a) commercial air transport operators using the aerodrome;
  - (b) the aerodrome control tower services;
  - (c) if the work plan might affect its operations, the Rescue and Fire Fighting Service unit at the aerodrome; and
  - (d) any other relevant aerodrome users
- so that the scope and impact of work is understood by related aerodrome users and service providers and to ensure the safety of aircraft operations at the aerodrome.
- C4. The operator should ensure that clear and ample prior notification for works at the maneuvering area is provided to the Aeronautical Information Services Provider, the aerodrome control tower services aircraft operators and other users or service providers of the aerodrome. Such notification should include timely and accurate promulgation of AIP Supplements or NOTAMs, with clear details of the extent and period of works.
- C5. The operator should provide an explanation for the work plan, and any alterations or updates thereof, to CAAS upon request.
- C6. Aerodrome works, for which a work plan is required, should be carried out in accordance with the arrangements set out in the work plan and any subsequent alterations or updates.
- C7. A work plan may not be required if the aerodrome operator closes the aerodrome to aircraft operations while aerodrome works are being carried out. CAAS, commercial air transport operators and all organisations and persons likely to be affected by the closure must be given reasonable notice of intention to close the aerodrome.
- C8. A work plan is not required for emergency aerodrome works carried out to repair damage to part of the manoeuvring area, or to remove an obstacle, or if the works do not require any restrictions to aircraft operations. Where practicable, a NOTAM giving the nature and time and date of the commencement of the urgent repair works should be issued, as early as possible, before the commencement of the works.

**APPENDIX D – FORM D**

<p><b>APPLICATION FOR APPROVAL OF COMPLETION OF INFRASTRUCTURE</b></p>			
<p>Aerodrome Name:</p>		<p>Submission Reference Number:</p>	
		<p>Date of submission:</p>	
<p><b>Work Details</b></p>			
<p>Title of Works:</p>			
<p>Planned Commencement Date of Operations in these areas:</p>			
<p><b>Supporting Documents demonstrating compliance with ANR-139 or Aviation Specifications</b></p>			
<p><b>Declaration</b></p>			
<p>I hereby declare that the above information and all documents submitted in this form are true in every respect.</p>			
<p>Name of Project Manager/Signature: _____</p>			
<p>Designation: _____</p>			
<p>Contact number/Fax:</p>		<p>E-mail:</p>	
<p><b>For official use only:</b></p>			
<p>File no.</p>			
<p>Approved by:</p>		<p>Date:</p>	
<p>Name of Aerodrome Inspector/Signature:</p>			
<p>Designation</p>		<p>Contact number/Fax/E-mail:</p>	

APPENDIX E – TEMPLATE FOR WORKPLAN

# PROJECT PLAN FOR <<TITLE OF PROJECT /WORKS>>

Document Number:	Revision:	Date:

## RECORDS OF REVISIONS

<u>Revision</u>	<u>Date</u>	<u>Description of revisions</u>	<u>Submitted by</u>

## COMPLIANCE CHECKLIST

Description of works: .....

<b>SUBJECT: PHYSICAL CHARACTERISTICS</b>		<b>RESPONSE BY OPERATOR</b>				
<b>QUESTIONS</b>	<b>REF TO AS-5</b>	<b>YES</b>	<b>NO</b>	<b>N.A.</b>	<b>METHOD OF COMPLIANCE</b> (To indicate the method to demonstrate compliance at completion eg. tests, survey reports, aeronautical studies, etc )	<b>REFERENCES &amp; REMARKS</b> (Include reference to documentation or reason for non-compliance / non-applicability)
1.						
2.						

ESTIMATED SCHEDULE OF COMPLETION

S/N	Description of works	Estimated completion date