Transport Canada Transports Canada

# Advisory Circular

**Subject:** **Airport Winter Maintenance and Planning**

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| Issuing Office: | Civil Aviation, Standards | Document No.: | AC 302-013 |
| File Classification No.: | Z 5000-34 | Issue No.: | 04 |
| RDIMS No.: | 14213105-V2 | Effective Date: | 2018-10-31 |

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## 1.0 INTRODUCTION

(1) This Advisory Circular (AC) is provided for information and guidance purposes. It describes an example of an acceptable means, but not the only means, of demonstrating compliance with regulations and standards. This AC on its own does not change, create, amend or permit deviations from regulatory requirements, nor does it establish minimum standards.

### 1.1 Purpose

(1) The purpose of this AC is to consolidate information related to winter maintenance that is found in several Aerodrome Safety Circulars (ASC) into one AC and to elaborate on the Notice of Proposed Amendments (NPA) 2001-257 and 2001-258.

### 1.2 Applicability

(1) This document applies to aerodrome operators who conduct winter maintenance.

### 1.3 Description of Changes

(1) Changes in Section 4.8 related to CRFI measurements on wet snow. When there is wet snow on a runway surface, CRFI is not valid and should not be provided.

(2) Addition of reference to AC 302-014 – *Runway Ice Control Chemicals* in Section 4.5 and to AC 302-026 – *Decelerometer Performance Specifications* in Section 4.8 (3).

(3) Other revisions of an editorial nature.

## 2.0 REFERENCES AND REQUIREMENTS

### 2.1 Reference Documents

(1) It is intended that the following reference materials be used in conjunction with this document:

- (a) Transport Canada Publication (TP) 312 5th Edition — *Aerodrome Standards and Recommended Practices;*
- (b) Advisory Circular (AC) 300-005 - *Changes to Runway Surface Condition Reporting;*
- (c) AC 302-014 – *Runway Ice Control Chemicals*;
- (d) AC 302-026 – *Decelerometer Performance Specifications*;
- (e) Notice of Proposed Amendments (NPA) 2001-257 – *Airport Winter Maintenance and Planning*;
- (f) NPA 2001-258 – *Airport Winter Maintenance and Planning*; and
- (g) *The Canadian NOTAM Procedures Manual*.

### 2.2 Cancelled Documents

(1) As of the effective date of this document, the following documents are cancelled:

- (a) Aerodrome Safety Circular (ASC) 98-003I, dated 1998-11-09 - *Active Runway Winter Maintenance*;
- (b) ASC 98-005, dated 1998-11-12 - *Clarification to Canadian Runway Friction Index Reporting*;

(c) ASC 2000-002, dated 2000-09-15 - *Aircraft Movement Surface Condition Reporting (AMSCR) for Winter Operations*;

(d) ASC 2000-004, dated 2000-10-26 - *Sands for Airside Winter Application*;

(e) ASC 2000-005, dated 2000-11-07 - *Winter Runway Surface Condition Reporting for Gravel Runways*;

(f) ASC 2001-011, dated 2001-11-26 - *Introduction of the Proposed Regulation and Standards Concerning Airport Winter Maintenance and Planning*; and,

(g) AC 302-007, dated 2009-11-23 - *Snow Profile Beyond Runway and Taxiway Edge for Airbus A380 Operations*.

(2) By default, it is understood that the publication of a new issue of a document automatically renders any earlier issues of the same document null and void.

### 2.3 Definitions and Abbreviations

(1) The following **definitions** are used in this document:

(a) **Air transport service**: means a commercial air service that is operated for the purpose of transporting persons, personal belongings, baggage, goods or cargo in an aircraft between two points.

(b) **Aircraft movement surface condition report**: means a report that details the surface conditions of all movement areas at an airport including runways, taxiways and aprons.

(c) **Cleared width**: means the narrowest portion of the runway width that has been cleared of loose contaminants.

(d) **Compacted snow**: means snow that has been compressed into a solid mass that resists further compression.

(e) **Contaminant**: means material on a surface including standing water, slush, snow, compacted snow, ice or frost, sand and ice control chemicals.

(f) **Canadian runway friction index**: means the average of friction measurements taken on runway surfaces with freezing or frozen contaminants present, using a mechanical or electronic decelerometer.

(g) **Frost**: means ice crystals formed from airborne moisture that has condensed on a surface whose temperature is below 0°C.

(h) **Ice control chemicals**: means chemicals used to prevent ice formation, to prevent ice from bonding to a surface or to break up or melt ice on a surface.

(i) **Loose snow**: means fresh falling dry snow or drifting or old standing snow that is neither compacted on nor bonded to a surface.

(j) **NOTAM**: means a notice containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

(k) **Priority 1 area**: means a primary runway system that is determined by the prevailing wind or operational requirements and is cleared throughout a storm to maintain the operational capability of an airport. It consists of the runway and the associated taxiways that are necessary to ensure the safe flow of traffic in winter storm conditions.

(l) **Priority 2 area**: means a secondary airside area that is cleared as soon as practicable in order to provide additional runway availability should wind conditions or operational requirements change.

(m) **Priority 3 area**: means an airside area that is cleared after a storm in order to return an airport to full operational use.

(n) **Percentage of contaminant**: means the amount of each contaminant present on the estimated surface of the aircraft movement area and reported separately as a percentage (%) of the whole surface.

(o) **Runway surface condition**: means the portion of the Aircraft Movement Surface Condition Report (AMSCR) which reports the surface condition of the runway.

(p) **Sand**: means small particles of crushed angular mineral aggregates or natural sand material used to improve runway surface friction levels.

(q) **Significant change**: means with respect to runway surface condition includes but is not limited to: changes in type of contaminant, such as from dry snow to wet snow; measurable changes in depth of contaminant; following the application or removal of sand or chemicals; following snow removal or sweeping; changes in conditions caused by rapid increases or decreases in temperature.

(r) **Slush**: means partially melted snow or ice, with a high water content, from which water can readily flow.

(s) **SNOWTAM**: A special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format.

(t) **SNOWiz**: An internet application for the direct entry of runway surface condition by an accountable source, the output being both a NOTAMJ and a SNOWTAM. The SNOWiz web application is for fixed, airport office use. SNOWiz is also an internet interface that allows dialog between automated reporting systems and the NAV CANADA database.

(u) **UNICOM**: means Universal Communications and is an air-to-ground communications facility operated by a private agency to provide Private Advisory Station service at uncontrolled aerodromes.

(v) **Wet snow**: means snow that will stick together when compressed, but will not readily allow water to flow from it when squeezed.

(2) The following **abbreviations** are used in this document:

(a) **AC:** Advisory Circular

(b) **AMS:** Aerospace Material Specification

(c) **AMSCR:** Aircraft Movement Surface Condition Report

(d) **ASC:** Aerodrome Safety Circular

(e) **ATF:** Aerodrome Traffic Frequency

(f) **CAR:** Canadian Aviation Regulations

(g) **CARS:** Community Aerodrome Radio Station

(h) **CRFI:** Canadian Runway Friction Index

(i) **FOD:** Foreign Object Damage

(j) **NPA**: Notice of Proposed Amendment

(k) **O/T**: Other Times

(l) **PNR**: Prior Notice Required

(m) **RSC:** Runway Surface Condition

(n) **SAE:** Society of Automotive Engineers

## 3.0 BACKGROUND

### 3.1 Regulatory Requirements

(1) The current requirements for winter maintenance are found in TP 312. As these requirements are not exhaustive, Notices of Proposed Amendments (NPA) 2001-257 and 2001-258 were developed to introduce the Airport Winter Maintenance and Planning Regulations and Standards. The proposed regulations were published in the Canada Gazette I in March 2009. Due to delays the proposals were not published in Canada Gazette II. As there remains a requirement for these regulations, Transport Canada expects that the proposed regulations will be re published in Canada Gazette I within the next 12 months.

(2) This AC consolidates information found in several ASCs and the proposals found in the NPAs 2001-257 and 2001-258.

## 4.0 GUIDANCE

### 4.1 Applicability

(1) The NPAs for Airport Winter Maintenance and Planning would apply to airports where aeroplanes are operated in an air transport service.

### 4.2 Planning

(1) An airport operator should develop an airport winter maintenance plan after consulting with a representative sample of air operators that use the airport.

(2) The airport operator should review the plan periodically and amend it as required. Amendments should be made in consultation with a representative sample of air operators that use the airport.

(3) The plan should be made available to the Minister and the air operators that use the airport.

### 4.3 Content of the Plan

(1) The plan should include the following items:

(a) identify priority 1 areas, priority 2 areas and priority 3 areas and describe the winter maintenance operations for each of those areas;

(b) document the communication procedures for the conduct of winter maintenance;

(c) document the procedures for the publication of a NOTAM in the event of winter conditions that might be hazardous to aircraft operations or affect the use of movement areas and facilities used to provide services relating to aeronautics;

(d) document the safety procedures for controlling the flow of ground vehicles during winter maintenance operations in order to ensure the safety of persons, other vehicles and aircraft;

(e) document the procedures to minimize the risk of ice control chemicals, other than the ice control chemicals specified in section 4.5 of this AC, from being tracked onto airside;

(f) document the lines of authority and organizational relationships with respect to winter maintenance, including contact names and telephone numbers;

(g) document how actions undertaken as part of winter maintenance will be coordinated;

(h) document the arrangements for snow clearance;

(i) document the process and procedures for the periodic review and amendment of the plan;

(j) document the administrative procedure for the distribution of the plan and amendments to it; and,

(k) signed copies of any agreements between the operator of the airport and the owners/operators of radio navigation aids at the airport respecting the provision of winter maintenance services for navigation aids.

(2) Priority areas should include the following:

(a) For a priority 1 area:

(i) The full length of the primary runway;

(ii) the width of the primary runway required to support the operational requirement of the aircraft movements at the airport during a storm;

(iii) taxiways, including entrance and exit access areas, to accommodate traffic to and from the primary runway;

(iv) de-icing pads or areas, including entrance and exit access to accommodate traffic to the primary runway and from the apron;

(v) apron areas necessary to accommodate aircraft traffic, passengers and cargo;

(vi) access roads, groundside and airside, to accommodate the movement of emergency vehicles to the runway, taxiways and apron areas referred to in this paragraph;

(vii) visibility of lights installed as visual aids associated with the primary runway;

(viii) visibility and legibility of mandatory signs on taxiways(s) referred to in paragraph 4.3(2)(a)(iii); and,

(ix) the areas adjacent to the approach aids, including glide path site, that require the removal of snow in order to maintain the signal integrity of the approach aid and as agreed to by the airport operator and owner/operator of the approach aid.

(b) For a priority 2 area:

(i) the full length of one or more secondary runway;

(ii) the width of one or more secondary runways required to support the aircraft operations at the airport during inclement weather;

(iii) taxiways, including entrance and exit access areas, to accommodate traffic to and from a secondary runway;

(iv) visibility of lights installed as visual aids associated with the secondary runways and taxiways; and,

(v) visibility and legibility of mandatory signs on the additional taxiways referred to in paragraph 4.3(2)(b)(iii) of this AC.

(c) For a priority 3 area:

(i) pre-threshold areas in accordance with Section 4.11;

(ii) In the case of remaining areas:

(A) runway and taxiway shoulder areas in accordance with Section 4.11 of this AC;

(B) apron shoulder areas;

(C) airside service roads, including access roads to approaches, emergency vehicle and personnel gates;

(D) other movement areas identified in the airport's winter maintenance plan; and,

(E) remaining airside signage and lights.

(3) The winter maintenance plan should document the communication procedures to be used in the execution of the plan to:

(a) describe the link between the airport operator and those assigned winter maintenance duties, with the following communications service providers, as applicable:

(i) the air traffic service unit;

(ii) community aerodrome radio station (CARS);

(iii) Universal Communications (UNICOM); or

(iv) if no ground radio station is provided at the airport, the aerodrome traffic frequency (ATF);

(b) identify the applicable radio frequencies and describe their use;

(c) ensure a standard terminology is established to transmit information; and

(d) immediately forward Canadian Runway Friction Index (CFRI) readings of 0.40 or less to the communications service provider referred to in paragraph 4.3(3)(a).

### 4.4 Clearance of Priority Areas

(1) When conducting winter maintenance operations (i.e. snow clearing, runway sweeping, etc...) the winter maintenance plan should be followed.

(2) Priority areas should be cleared in order of priority: priority 1 area – first; followed by priority 2 area; and finally priority 3 area.

(3) Successive hours or days of snow fall may result in significant delays in performing winter maintenance on a priority 3 area – as the equipment may be busy clearing priority 1 & 2 areas. This is acceptable as long as it is in accordance with the winter maintenance plan. If this type of delay results in the applicable snow bank slope limitations listed in section 4.11 of this AC (Appendices A, B, & C) being exceeded, then the airport operator should indicate this through NOTAM.

(4) Where ground conditions in a priority 3 area (i.e.: unfrozen ground) prevent equipment from operating and this results in the snow bank slope limits being exceeded, then the airport operator should indicate this through NOTAM. If and when the ground will support snow removal equipment, then the airport operator should clear the remaining priority 3 area in accordance with the winter maintenance plan.

### 4.5 Ice Control Chemicals

(1) On movement areas, only use ice control chemicals (fluids or compounds) that:

(a) have properties meeting the most current applicable Society of Automotive Engineers (SAE) Aerospace Material Specification (AMS); or

(b) consist of the product commonly known as Urea.

(2) Failure to use ice control chemicals that meet the SAE specifications may result in damage to aircraft components.

(3) Additional information is given in AC 302-014 *Runway Ice Control Chemicals*.

### 4.6 Sand

(1) Only sand that meets the following criteria should be used on movement areas:

(a) be an abrasive material for airside ice control consisting of either crushed angular mineral aggregated or natural sand;

(b) be free from chlorides and corrosive materials, clays, debris, cementation, organic matter and other non-friction material;

(c) the pH of the water solution containing the material should be approximately neutral (pH 7);

(d) have a stable physical and chemical structure that is unaffected by water or the elements:

(e) not be softer than and including 3.5 up to and including 7 on the MOHS hardness scale; and

(f) be of a granular size that falls within the following parameters:

**Table 1 - Minimum specification**

| Sieve Size (U.S. Standard) | Percent Passing by Weight |
|---|---|
| No. 4 (4.75 millimetres) | 100 % |
| No. 80 (0.180 millimetres) | 0 % to 2 % |

**Table 2 – Recommended specification**

| Sieve Size (U.S. Standard) | Percent Passing by Weight |
|---|---|
| No. 4 (4.75 millimetres) | 100 % |
| No. 16 (1.18 millimetres) | 10 % to 65 % |
| No. 80 (0.180 millimetres) | 0 % to 2 % |

(2) The minimum specification for sand shown in **Table 1** will accommodate the majority of locally available sand. However, particle size and application rate of abrasive materials can affect the potential for foreign object damage (FOD) as well as the effectiveness in improving friction levels. For airside applications, it is preferable to have sand with a balance of fine and coarse material. For this reason, the addition of a mid-range sieve size shown in **Table 2** is recommended.

(3) To promote visual awareness and absorption of solar heat, it is preferable to use abrasive material that is dark in colour.

(4) All sand helps improve friction and that the main difference between types of sand is in the quantity that needs to be applied. Either natural sand, manufactured sand, or a combination thereof, is acceptable, provided they meet the minimum specification.

(5) Sand on runways may cause FOD to aircraft. Very fine abrasives may cause erosion of turbine blades, and any material that is too coarse can cause damage to propellers or internal components of jet engines. Therefore, limits on the size of the grains of sand are established.

(6) Tests conducted under a wide range of conditions have shown that all of the types of sand tested improved friction once they were applied to the surface. Normally, acceptable improvements in friction levels can be achieved with different types of sand by adjusting the application rate. However, the relative application rates required for different types of sand to achieve the same friction level can be quite large (up to a factor of 5). Thus, sand selection becomes an operational issue that must be resolved by examining costs and the relative quantities of the different types of sand needed to achieve the required friction level. The optimum application rate for locally available sand should be determined through site experimentation.

### 4.7 Requirement to Provide Canadian Runway Friction Index Measurements

(1) An airport operator should conduct Canadian Runway Friction Index (CRFI) measurements and provide a CRFI in accordance with its airport winter maintenance plan.

(2) The NPA 2001-257 would require that CRFI be provided when:

(a) Subpart 705 of the *Canadian Aviation Regulation* (CAR) turbo-jet-powered or turbo-propeller-powered aeroplanes are operated on paved runways; and

(b) Subpart 705 of the CAR turbo-jet-powered aeroplanes are operated on gravel runways.

(3) The NPA 2001-257 would **not** require that CRFI be provided when:

(a) Subpart 705 of the CAR turbo-propeller-powered aeroplanes are operated on gravel runways (and all runways are gravel); and

(b) Subpart 704, 703, or 604 of the CAR aeroplanes are operated.

### 4.8 Friction Measurement

(1) CRFI should be provided when the area within 10 metres of either side of centreline of the runway, has more than 25% of its surface contaminated with any of the following:

(a) Ice;

(b) wet ice consisting of a thin film of water on ice;

(c) compacted snow;

(d) slush on ice;

(e) loose snow not exceeding 2.5 centimetres (1 inch) in depth;

(f) deicing chemical solution or sand on ice; or,

(g) frost.

(2) CRFI is not valid with the following conditions and should not be provided when any of the following runway surface conditions are present:

(a) the runway surface is simply is wet or damp with no other type of contaminant present;

(b) there is a layer of slush on the runway surface with no other type of contamination condition present;

(c) there is wet snow on the runway surface; or

(d) there is loose snow on the runway surface exceeding 2.5 centimetres (1 inch) in depth.

(3) A decelerometer must be used to measure the rate of deceleration for the determination of the CRFI. Technical performance requirements for decelerometers are given in AC 302-026 – *Decelerometer Performance Specifications*. **Readings taken from continuous friction**

**measuring devices are not valid for determining CRFI** (i.e.: Mu-Meter, Surface Friction Tester, BV-11 Skiddometer, Runway Friction Tester, etc…).

(4) The decelerometer should be operated, maintained, and calibrated in accordance with the manufacturer's instructions.

(5) Measurements of the rate of deceleration need to be obtained in the following manner:

(a) at intervals not greater than 300 metres within 10 metres and on both sides of the runway centreline at that distance from the centreline where the majority of aeroplane operations take place; or

(b) using the alternating side method in accordance with the following criteria:

(i) for operational purposes the alternating side method may only be conducted when the contaminated runway surface conditions are uniform on both sides of the runway centreline and when it has been demonstrated by means of the comparative tests of paragraph 4.8(5)(b)(vi) that the alternating side method results are the same as those obtained, within a tolerance of + or - .04, using the standard method referred to in paragraph 4.8(5)(a);

(ii) the alternating side method may only be used on runways exhibiting no patchy surface conditions;

(iii) decelerometer readings need to be obtained at intervals not greater than 300 metres measured along the full length of the runway;

(iv) if a decelerometer reading is cancelled or rejected, the friction reading at the cancellation or rejection spot needs to be retaken to maintain a reading interval not greater than 300 metres;

(v) as the vehicle is traversing diagonally from one side of the runway to the other, the driver needs to ensure that the vehicle is aligned parallel to the runway centre-line prior to bringing the vehicle to a four-wheel lock-up and that no diagonal or lateral forces are acting on the decelerometer when a reading is taken;

(vi) the operator of an airport needs to perform and document a minimum of one set of comparative tests utilizing both methods for each type of winter contaminated surface conditions under which the alternating side method will be used;

(vii) the documentation established by the operator of an airport under paragraph 4.8(5)(b)(vi) should include:

(A) the date and time of the test;

(B) the CRFI test results from both methods; and

(C) the surface condition, temperature, type of equipment, vehicle identification and the technique utilized for each test;

(viii) the documentation referred to in paragraph 4.8(5)(b)(vi) should be included in the airport operations manual.

(6) The decelerometer used to establish the CRFI should be mounted in the following vehicle types only:

(a) utility and passenger/cargo pick-up trucks (½, ¾, or 1 ton pick-up trucks or full size sport utility vehicles);

(b) full-size automobiles; or

(c) mini-vans.

(7) The vehicle's four-wheel traction or anti-lock braking system, if any, needs to be disengaged while friction measurements are being taken;

(8) In order to consistently provide accurate decelerometer readings, the vehicle needs to be equipped as follows:

(a) all four tires are of the same type of construction;

(b) both front tires have matching tread configurations and both rear tires have matching tread configurations;

(c) tires are replaced when the tread wear exceeds 75%;

(d) wear on all four tires are the same;

(e) tires are inflated to the tire manufacturer's specification;

(f) shock absorbers are of heavy duty type and in good condition;

(g) brakes are tested frequently to ensure operation in accordance with manufacturer's specifications; and

(h) all four tires are non-studded tires.

### 4.9 Reporting Canadian Runway Friction Index

(1) The decelerometer readings taken are to be averaged and reported as the CRFI number. CRFI may be reported as average for the runway or as an average for each third of the runway.

(2) When using the alternating side method, the recommended minimum runway length for reporting CRFI by runway thirds is 1829 metres (6000 feet). This is based on each decelerometer measurement requiring not more than 152 meters (500 feet) to complete. In order to maintain the statistical validity of the CRFI value, a minimum of 4 readings per runway third are required. 4 readings requiring 152 metres (500 feet) each to complete, equals 610 metres (2000 feet) per runway third and a total runway length of 1829 metres (6000 feet).

(3) If decelerometer readings are taken on each side of the centreline (down and back) then the minimum runway length for reporting by runway thirds may be reduced to 914 meters (3000 feet).

(4) If significant patches of contaminants cause lower readings than the average, their distance from the threshold of one end of the runway should be reported in the remarks section of the AMSCR.

### 4.10 Designation of Runway Thirds

(1) The runway thirds are defined by the runway thresholds and middle third of the runway.

(2) For example: for runway 07/25, CFRI readings would be reported for the threshold of runway 07, the middle of runway 07/25, and for the threshold of runway 25.

### 4.11 Maximum Snow Accumulation Slope (%) in Pre-threshold Area & Beside Runways & Taxiways

(1) In the case of pre-threshold areas;

(a) Width - the width of the runway plus the profile outlined in Appendix A or C (as applicable);

(b) Length - the distance from the end of the runway established in accordance with Appendix B of this AC and as follows:

(i) 30 metres for non-instrument runways less than 800 metres in length; or

(ii) 60 metres for all other runways; and

(c) Slope – the height of snow, ice or any other object may not exceed a plane having an upward slope established in accordance with Appendix B and as follows:

**Table 3 - Maximum Snow Accumulation Slope**

| Runway length (metres) | Maximum Snow Accumulation Slope (%) |
|---|---|
| less than 1200 | 2.0 |
| 1200 to less than 1800 | 1.5 |
| 1800 and greater | 1.25 |

(2) In the case of runway and taxiway shoulder areas in accordance with Appendix A or C (as applicable).

(3) The diagram in Appendix A of this AC shows the Maximum Height of Snow Profile beyond Runway and Taxiway Edge. This snow profile accommodates all types of aircraft except the Airbus A380.

(4) The diagram in Appendix B of this AC shows the maximum recommended snow slope in the pre threshold area.

(5) The diagram in Appendix C illustrates the recommended snow profile beyond the runway and taxiway edge for the A380. The recommendation for A380 operations increases the width of the area adjacent to the runway or taxiway by 5 metres - from 15 metres to 20 metres. The overall profile increases from 25 metres to 30 metres.

(6) The diagram in Appendix D illustrates the size difference between the A380 and the Boeing B747.

### 4.12 Movement Area Inspections and Reports

(1) The following requirements should be met when conducting movement area inspections and reporting the surface conditions of an airport:

(a) conduct daily inspections of the movement areas at the commencement and as necessary to identify significant changes in runway surface conditions until the end of AMSCR hours published in the *Canada Flight Supplement;*

(b) when contaminants are present on a movement area, make available the AMSCR during the published AMSCR hours as follows:

(i) at the commencement of published AMSCR hours;

(ii) a minimum of once every eight hours thereafter;

(iii) when a significant change in a runway surface condition occur;

(iv) following every accident or incident in which winter conditions may have been a factor, and

(v) whenever the cleared width of the runway falls below full width.

(c) use the “Airport Movement Surface Condition Report and Canadian Runway Friction Index” form AMSCR Form or similar electronic format that includes all of the elements of an AMSCR (more information concerning the AMSCR may be found in AC 300-005);

(d) provide an AMSCR with the Runway Surface Condition (RSC) data section completed for each CRFI measurement provided;

(e) identify, in the remarks column of the form or the remark section of the electronic format, the time of day that this report is valid to and that this report is the final report for the period; and

(f) the validity period of an AMSCR should not exceed the published operating hours for the airport, unless the surface conditions are being monitored.

***Note:*** *AC 300-005 describes recent changes to Runway Surface Condition Reporting that result of the introduction of the SNOWTAM / NOTAMJ format and SNOWiz by NAV CANADA.*

(2) The AMSCR should be forwarded to the air navigation services provider in a manner that will permit its prompt dissemination to aircraft operators.

(3) The operator of an airport needs to provide information about the availability of CRFIs and AMSCRs for publication in the *Canada Flight Supplement*. The operator of an operator may provide information concerning the preparation and distribution of AMSCR and CRFI outside the published hours.

(4) The operator of an airport who provides RCR information outside of the published AMSCR hours should indicate this with the annotation O/T (other times) and indicate the procedures to be followed to obtain the RSC information - i.e.: contact the airport operator, contact information, and prior notice required (PNR).

### 4.13 Surface Condition Reporting for Gravel Runways

(1) The reporting of surface conditions on a gravel runway is more difficult than it is for a paved runway. In the case of gravel runways, it is impossible to remove all the winter contaminants from the gravel surface. In many northern sites, the common practice is to prepare a solid snow-compacted base on top of the gravel whereby the compacted snow becomes the operational surface for winter operations. Thus, throughout most of the fall and winter, the operational base is not a normal gravel surface but is rather a frozen gravel, a compacted snow, or a compacted snow/gravel mix.

(2) The term that best describes the existing runway condition (compacted-snow base or compacted snow/gravel mix) should be used for reporting.

(3) In the case of gravel runways, the (AMSCR) forms should be used and the RSC data should report the top layer of contaminants as one unit or 100%, e.g. *30% compacted-snow base, 70% loose snow*. Any additional layer of contaminants below the surface layer that may affect aircraft braking performance should be defined in the "Remarks" Section.

(4) The Canadian NOTAM Procedures manual has more details concerning reporting surface conditions.

## 5.0 INFORMATION MANAGEMENT

(1) Not applicable.

## 6.0 DOCUMENT HISTORY

(1) AC 302-013 Issue 01, RDIMS 7902865 (E), 7963640 (F), dated 2012-12-17 – *Airport Winter Maintenance and Planning*.

(2) AC 302-013 Issue 02, RDIMS 9065970 (E), 9099255 (F), dated 2014-03-21 – *Airport Winter Maintenance and Planning*.

(3) AC 302-013 Issue 03, RDIMS 10770812 (E), 10772912 (F), dated 2015-07-10 – *Airport Winter Maintenance and Planning*.

## 7.0 CONTACT OFFICE

For more information, please contact:

http://www.tc.gc.ca/eng/regions.htm

Suggestions for amendment to this document are invited, and should be submitted via:

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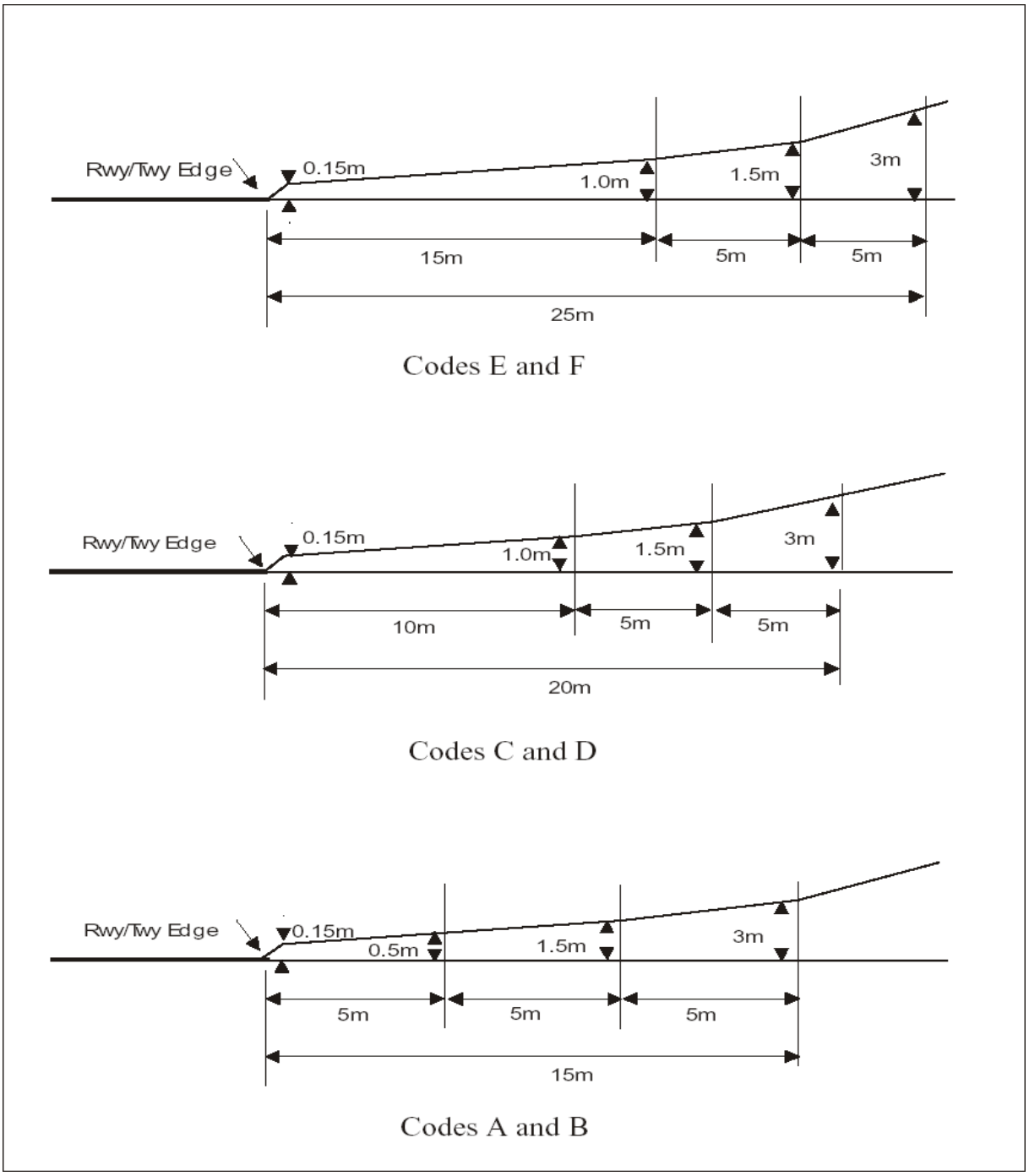
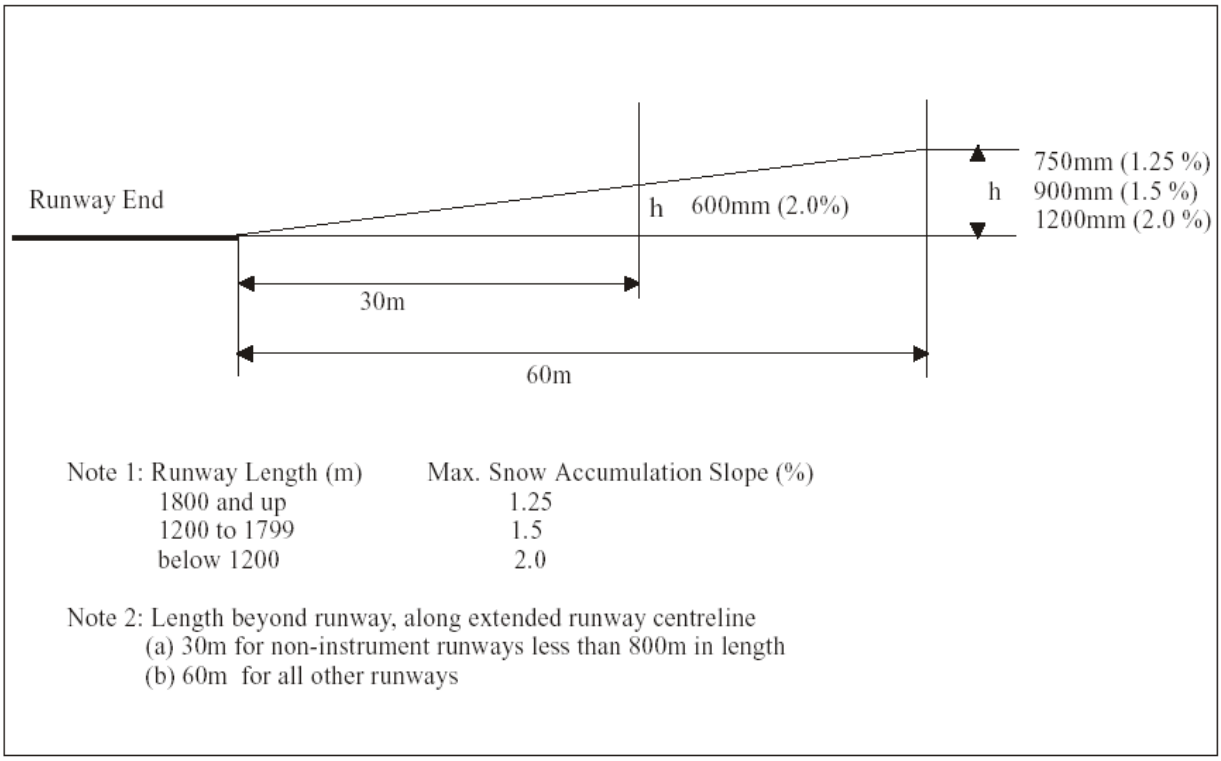
***Original signed by Pierre Ruel for***

Robert Sincennes
Director, Standards
Civil Aviation

**APPENDIX A — MAXIMUM HEIGHT OF SNOW PROFILE BEYOND RUNWAY & TAXIWAY EDGE**



## APPENDIX B — MAXIMUM SNOW ACCUMULATION SLOPE (%) IN PRE-THRESHOLD AREA

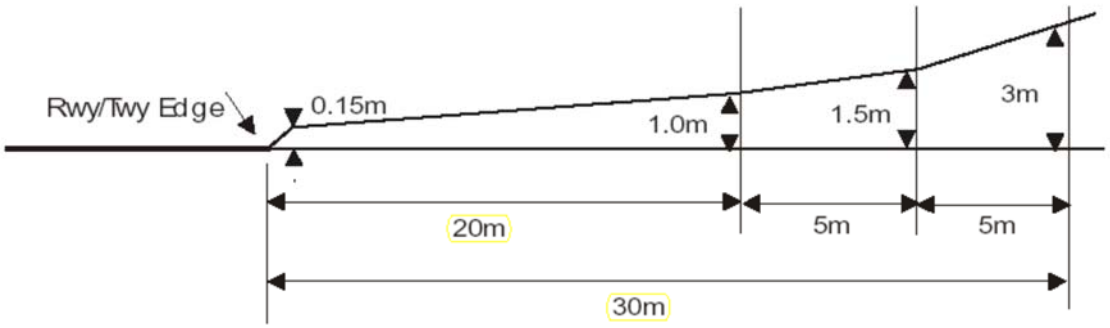



Note 1:

| Runway Length (m) | Max. Snow Accumulation Slope (%) |
|---|---|
| 1800 and up | 1.25 |
| 1200 to 1799 | 1.5 |
| below 1200 | 2.0 |

Note 2: Length beyond runway, along extended runway centreline
(a) 30m for non-instrument runways less than 800m in length
(b) 60m for all other runways

**APPENDIX C — MAXIMUM HEIGHT OF SNOW PROFILE BEYOND RUNWAY AND TAXIWAY EDGE FOR A380 AIRCRAFT**




For A380

## APPENDIX D — A380 & B747 SIZE COMPARISON