SNOW PLAN

2026/2027

Date of Issue: 6 October, 2026

Revisions

Revision number	Changes Made	Date	Initials
2015/2016	Reformat of historic document		ZB
2016/2017	Update	11/10/2016	ED
2017/2018	Update	04/10/2017	ED
2017/2018-2	Update	24/01/2018	ED
2018/2019	Update	24/09/2018	ED
2019/2020	Update	24/09/2019	ED
2020-2021	Update/Revert to 18-hour coverage	04/10/2020	ED
2021-2022	Update/addition of GRF	09/10/2021	ED
2022-2023	Update	03/10/2022	ED
2023-2024	Update	02/10/2023	ED
2024-2025	Update	06/10/2024	ED
2025-2026	Update	06/10/2025	ED
2026-2027	Update	09/23/2026	MW

Table of Contents

Revisions 1
Table of Contents 2
List of Appendices 3
NOTICE – LIMITATION OF LIABILITY 4
Distribution List 5
1.0 – GENERAL INFORMATION 6
1.1 - Introduction 6
1.2 – Contact Numbers 6
Urgent / Emergency Situations 6
Routine Maintenance Concerns 6
Airfield Maintenance Contacts 7
1.3 Reference information 7
1.4 Review, Amendment and Distribution 7
2.0 - ROLES AND RESPONSIBILITIES 8
2.1 - Manager, Facilities 8
2.2 - Supervisor, Surface and Fleet Maintenance 8
2.3 - Lead Hand, Airfield Maintenance 8
2.4 - Airfield Maintenance Specialist 9
2.5 - Airport Duty Manager 9
2.6 - Terminal Cleaners 9
2.7 – Ground Handlers 9
2.8 – Airlines 10
2.9 – Airport Tenants 10
2.10 – On-Site YXE Staff 10
3.0 – RESOURCES 10
3.1 - Personnel 10
3.2 - Schedule 11
3.3 – Equipment 11
4.0 – COMMUNICATIONS 12
5.0 - SNOW REMOVAL ACTION PLAN 13
5.1 – Air Side Priority Areas 13
5.11 - Priority 1 14
5.12 - Priority 2 14
5.13 - Priority 3 15

5.14 - Runway 16
5.15 - Aprons 17
5.2 - Miscellaneous Airside Snow Removal 18
5.21 - Edge Lights and Signs 18
5.22 - Approach Lighting 19
5.23 - ILS Snow Removal 19
5.3 - Groundside Snow removal 19
5.31 - Priority 1 20
5.32 - Priority 2 20
5.33 - Priority 3 20
5.4 - Tenant Snow Removal 21
5.5 - Movement area access and control 21
6.0 - ICE CONTROL 22
6.1 - Ice Control Chemical 22
6.2 - Ice Control Sand 22
7.0 - SURFACE CONDITION REPORTING 23
7.1 - Movement Area Inspections and Reports 23
7.2 - Recording Equipment 23
7.5 – Friction Measurement 24
7.6 – Global Reporting Format Visual inspection 25

List of Appendices

Appendix I SAA Rules and Procedures Access
Appendix II Sand Locker Locations
Appendix III Snow Removal Plan – Airside
Appendix IV Nav Canada ILS Critical Area Maintenance Briefing Appendix V Snow Removal Plan – Groundside
Appendix VI Snow Removal Plan – Tenant Responsibilities Appendix VII Ice Control Data Sheets
Appendix VIII TC Airport Runway sand spec
Appendix IX TC interim order to report CFRI by thirds
Appendix X AC 300-019 Gobal Reporting Format for Runway Surface Conditions

NOTICE – LIMITATION OF LIABILITY

YXE will use all reasonable efforts to give effect to the policies; procedures and standards set out herein.

All Tenants and Users of airport facilities should be aware that winter conditions at the airport could change suddenly, drastically and without notice. The ability of YXE to implement these procedures may be hampered due to unusual winter conditions.

All tenants and users of airport facilities should take responsible care and exercise appropriate judgment in their respective operations to ensure a safe and secure environment.

All Tenants and Users of the airport agree, in consideration for the right and license granted by YXE to carry out their operations on the restricted airside areas of the airport, they will conduct their operations at their own risk and thereby release YXE, its employees, and directors from all liability from injury to persons or property and from all claims and actions they may have, for any legal or physical loss or harm they may suffer arising from any failure to carry out the winter snow program as defined in this manual.

Distribution List

Company	Position
YXE	**CEO**
YXE	**VP Operational Excellence**
YXE	**VP Project Development**
YXE	**Manager, Airside Operations**
YXE	**Supervisor, Airfield & Fleet Maintenance**
YXE	**Airfield Maintenance Office**
YXE	**ECC**
YXE	**Airport Duty Manager**
Nav Canada	**ATC Manager**
Nav Canada	**FSS Station Manager**
AOC	
Hangar tenants	
Transport Canada	**Minister (via YXE Inspector)**

1.0 – GENERAL INFORMATION

1.1 - Introduction

All parties affected by snow removal operations at the Saskatoon Airport are required to familiarize themselves with the guidelines and procedures detailed in this manual. Your on-going cooperation is requested to assist with the efficient removal of snow during all winter weather conditions.

The following standards and procedures were used, in conjunction with historic experience at YXE, in the development of these procedures:

- TP312: Aerodrome Standards and Recommended Practices.
- Advisory Circular 302-013 Airport Winter Maintenance and Planning
- Advisory Circular 300-019 Global Reporting Format (GRF) for Runway
- Surface Conditions

The YXE Snow Plan is intended as a guideline only and provides insight to the course of action normally undertaken by YXE staff during snow removal operations.

1.2 – Contact Numbers

Urgent / Emergency Situations

All urgent needs for the assistance of YXE maintenance staff shall be reported to the Security Operations Center (SOC) at:

306-975-9700

This number is monitored 24 hours a day, 7 days a week

Routine Maintenance Concerns

Problems of a **non-critical** nature should be reported to the Snow Desk at:

VORTEX Work Request Form

Airfield Maintenance Contacts

To discuss winter maintenance issues directly with airfield maintenance personnel contact numbers are provided in Table 1: YXE Snow Team Contact List.

Table 1: YXE Snow Team Contact List

Position	Mobile number
Manager, Airside Operations	**639-480-6827**
Supervisor Airfield Maintenance	**306-261-6672**
Airfield Maintenance Lead Hand	**306-260-2539**
Airport Duty Manager	**306-361-6461**

Note: These phone numbers will roll over to voice mail if not answered. Please leave a detailed message and your call will be returned as soon as possible.

1.3 Reference information

Tenants should be familiar with YXE Airport Circulars.

- Appendix I YXE Airport Circular Access.

1.4 Review, Amendment and Distribution

A review of the Snow Plan will take place once per year, typically in fall. If snow fall occurs prior to a new Snow Plan being issued, the previous winters Snow Plan remains in effect.

The major focus of the annual review will be to complete a gap analysis to determine what areas of the plan are missing and or require further improvement based on the previous year's lessons learned.

A periodic review/update of the plan may be conducted at any time in response to changes to airport operations, major storm event lesson learned, changes to airline operations, and/or for cause.

The Manager of Airside Operations is responsible for the development, issuance, and control of amendments of this manual, a notification together with a copy of the updated plan will be forwarded to all manual holders electronically.

2.0 - ROLES AND RESPONSIBILITIES

The snow plan relies on several people to be executed effectively. Below is a summary of key roles and the associated responsibilities. These roles are not only limited to YXE employees but also include airport community partners.

2.1 - Manager, Airside Operations

- Overall responsibility and management of the snow removal and ice control program.
  - Implementation of snow removal and ice control programs
  - Coordinating and directing staff
  - Conducting frequent and regular inspections of all work areas, regardless of weather
  - Perform runway condition inspections and reports (when required)
  - Instructing employees in proper methods and procedures related to maintenance, repair, and upkeep of facilities
  - Maintaining a log of activity
  - Maintaining material use records

2.2 - Supervisor, Surface and Fleet Maintenance

- Reports to the Manager, Airside Operations duties include:
  - Implementation of snow removal and ice control programs
  - Coordinating and directing staff
  - Conducting frequent and regular inspections of all work areas, regardless of weather
  - Perform runway condition inspections and reports (when required)
  - Instructing employees in proper methods and procedures related to maintenance, repair, and upkeep of facilities
  - Maintaining a log of all activity
  - Maintaining material use records

2.3 - Lead Hand, Airfield Maintenance

- Reports to the Supervisor, Surface and Fleet Maintenance, duties include:
  - Perform daily airside and groundside inspections
  - Perform runway condition inspections and reports
  - Coordinate and direct staff
  - Operating equipment for snow and ice removal
  - Ensure proper procedures are used
  - Train new and returning employees
  - Coordinate application of ice control chemicals on surfaces

2.4 - Airfield Maintenance Specialist

- Reports to the Supervisor or Lead Hand, duties include:
  - Operating equipment in a safe and efficient manner
  - Perform snow removal as set out in snow plan
  - Perform duties as set out by Supervisor or Lead hand
  - Support the Lead hand in Training of new employees
  - Perform repairs as may be required
  - Perform other tasks as required
  - Empty trash containers and general house keeping
  - Applying ice control chemicals on surfaces

2.5 - Airport Duty Manager

- Reports to Manager of Operations, duties include:
  - 24/7 on site representative and tenant point of contact
  - Observe weather and runway conditions when airfield maintenance staff are not present
  - Coordinate call-out procedure when adverse weather commences when airfield maintenance staff are not present
  - Assist in coordinating deice-pad and apron operations
  - Coordinate the movement of GSE for apron snow clearing operations
  - Coordinate with Airfield Team regarding parking lot snow clearing operations
  - Maneuver passenger loading bridges to assist in apron clearing
  - Administer AVOP program
  - Perform other tasks as directed

2.6 - Terminal Cleaners

- Reports to Manager, Customer and Terminal Services, duties include:
  - Ensuring wet floor signs are deployed when floors are wet near entrances.
  - Mopping water, snow, and mud from entrances

2.7 – Ground Handlers

- Duties include:
  - Relocation of GSE equipment to allow for apron snow clearing
  - Ensure cones, chocks, and other items are out of the way of snow clearing operations
  - Sanding of bag room entrances with provided spreader, as necessary
  - Confirm all ground load walkways are free from ice and/or have been sanded prior to deplaning or enplaning passengers
  - Communicate with Airport Duty Manager regarding snow clearing operations

2.8 – Airlines

- Duties include:
  - Confirm all ground load walkways are free from ice and/or have been sanded prior to deplaning or enplaning passengers
  - Communicate with Airport Duty Manager regarding snow clearing operations

2.9 – Airport Tenants

- Duties include:
  - Snow clearing and removal from tenant areas
  - Ensuring Contracted snow removal companies are informed of and following the Airport Snow Plan
  - Ensure Snow Dumps are used and maintained accordingly

2.10 – On-Site YXE Staff

- Duties include:
  - Operate hand tools, light and medium duty equipment
  - Perform snow removal and ice control on all terminal curbside walkways, canopy center island, and pet relief areas.
  - Perform snow removal on all emergency exits
  - Maneuver passenger loading bridges to assist in apron clearing
  - Assist with groundside snow removal by clearing spitter-gates and entryways
  - Perform other tasks as required.

2.11 – Curbside Operations Group (COG)

- Reports to Manager, Customer and Terminal services, Winter Snow duties include:
  - Perform snow removal on all terminal curbside walkways, center island, valet area, and short-term parking walkways.
  - Communicate with Airfield Team regarding parking lot snow clearing operations
  - 24/7 on site representative and point of contact for all parking and ground transportation

3.0 – RESOURCES

3.1 - Personnel

All personnel employed by the YXE for the purpose of snow removal at the Saskatoon International Airport must meet certain basic qualifications. The staff is required to undergo a period of training to familiarize them with airport operations and the use of specialized airport maintenance equipment. Each employee must be an experienced operator, possess a class 3 driver's license with air endorsement, and have radio-communications skills and a restricted radio operator's license.

The goal of the training program is to qualify employees through effective training to maximize flight safety, ensure the safety of all airfield maintenance employees, safety of our customers, and to ensure economical and efficient snow removal.

3.2 - Schedule

The winter season will have four snow clearing crews covering 24hrs 7 days a week on a rotating Schedule. Furthermore, on-site YXE staff will be available to assist 5 days a week. The Airport Duty Manager is available on site 24/7. Further details of the snow team schedule are provided in Table 3.

Table 3: Snow Team Operational Hours	
Hours:	**24-hour schedule (2h + 12h shifts)**
Day Crew	**0700 – 1900 hrs.**
Evening Crew	**1900 – 0700 hrs.**
Days:	**Seven (7) days a week**
Airside Crew Size:	**4 persons**
Groundside Crew Size:	**Resources pulled from Airside crew**
Dates:	**October 15 to April 15** * Approximate dates based on year
Manager	**1 person (Mon – Fri 0900 to 1700 hrs.)**
Supervisor	**1 person (Mon – Fri 0700 to 1600 hrs.)**
Duty Manager	**24-hour schedule (12 h + 12 h shifts)**
On-site YXE Staff	**7 days a week (0800 to 1600 hrs.)**

Note: Additional personnel will be made available as dictated by weather conditions

3.3 – Equipment

The YXE uses a fleet of equipment for snow clearing and removal operations, details of this fleet are provided in Table 2. In addition to the major equipment listed, YXE provides hand push sand spreaders, sand bins, shovels, and brooms at various locations around the terminal for use by those working in the areas.

Table 2: YXE Snow Clearing Equipment

Equipment	Number	Primary use
Multi Task Snow Sweeper	6	Clearing Runways and taxiways
High Speed runway snow blowers	2	Removing windrows created by other snow clearing equipment
Large loader	2	Ramp and parking lot clearing and loading of snow for hauling
Small Loader	1	Parking Lots/Multiple tasks
Tractor with loader	1	(if required)
Grader	1	Clearing Roads and around runway lights

Equipment	Number	Primary use
Skid steer Loader	2	Multiple tasks
Small tractor with broom and sand spreader	1	Terminal and parking lot walkways
Sand Spreader truck	1	Spreading sand on roads and apron
Combi liquid/dry chemical truck	2	Spreading de-ice chemical on runways
Liquid Spray truck	1	Spreading anti ice chemical on the runway
Dump trucks	2	Hauling snow
Runway Friction Test vehicles	3	Runway condition inspections
Trackless multi-function tractor	1	Sweeping and spreading sand on the apron near the terminal, blowing snow in parking lots.
Backpack Leaf Blowers	2	Clearing of light snow on curbside
Walk-behind Power Broom	1	Clearing of moderate snow on curbside
Walk-behind Snow Blower	1	Clearing of heavy snow on curbside

4.0 – COMMUNICATIONS

It is imperative that there is consistent and clear communication to ensure smooth winter operations.

All YXE crew communications during an operational shift are normally relayed verbally from person to person, company radio's, company landline or company cell phones. Other pertinent information may be relayed via emails, meetings, memos, or standard operating guidelines.

4.1 Radio Communications

Communication between YXE personnel is on Channel #4 - Airfield.

Communication with Nav Canada ATC/FSS over radio is on Frequency 121.9 VHF.

The efficient use of radio depends to a large extent on the method of speaking and on the articulation of the operator. As the distinctive sounds of consonants are liable to become blurred in the transmission of speech and as words of similar length containing the same vowel sounds are apt to sound alike, special care is necessary to ensure their proper pronunciation.

When using radio, the operator should speak all words plainly and clearly to prevent words from running together. Avoid any tendency to shout, accent syllables, or to speak too rapidly.
It is expected that radio communications will be kept to the point and professional. The International Phonetic Alphabet should be used, when needed, to avoid confusion when transmitting difficult or unusual words. Standard number pronunciations are also used.

All applicable YXE personnel are required to obtain a Restricted Operator Certificate with Aeronautical Qualification (ROC-A) before being issued an AVOP D.

4.2 Nav Canada ATC/FSS

Saskatoon ATC/FSS maintains vehicle control on all maneuvering areas. Vehicle operators will use the appropriate radio communication/requests to inform ATC/FSS of their maintenance intentions (location, activities, duration, etc).

4.3 Surface Closure and NOTAM Procedures

If winter conditions, that might be hazardous to aircraft operations or affect the use of the movement areas and facilities used to provide service relating to aeronautics, are in place, a NOTAM will be published as notification. All NOTAMs must be coordinated through the YXE Duty Manager and must be reviewed and approved in advance by the Manager of Airside Operations or designate.

During a snow event in which snow accumulation exceeds max allowable accumulation on Priority 1 areas, the Lead Hand/Supervisor in consultation with Manager, Airside Operations, or on-call Manager may at their discretion **NOTAM a Priority 2 or 3 surface closed** until such time Priority 1 area's can be maintained.

Authority to close the entire airport rests only with the CEO or his designate.

5.0 - SNOW REMOVAL ACTION PLAN

Establishing procedures for snow removal and ice control is challenging due to the different characteristics of snow, wind speed and direction, fluctuating temperatures, maneuvering surfaces configuration, density of traffic, etc. Thus, the procedures that follow will be modified by the Manager, Airside Operations and their staff through good sound judgement and knowledge based on experience.

YXE staff shall make best efforts to follow the snow removal procedures contained in this manual, however, all customers shall be responsible for ensuring that they exercise reasonable care for their own safety in all circumstances.

5.1 – Air Side Priority Areas

To provide a coordinated approach to snow clearing and to minimize the impact of snow events on operations, YXE has classified airside areas of the airport as priority 1, 2, and 3; this prioritization is shown

Appendix III

Snow Removal Plan – Airside. The maximum allowable accumulation for each priority is shown in Table 3.

Table 3: Airside Allowable Accumulations

AREA	OPERATIONS	MAX ALLOWABLE ACCUMULATIONS
AIRSIDE	**Priority 1 areas**	**0.5 inches**
	Priority 2 areas	**2.0 inches**
	Priority 3 areas	**Storm accumulation**

Note: Airside Priority 2 areas are only addressed after Airside Priority 1 areas are maintained to an operational level. The severity of the snow event will determine referenced snow accumulation on these designated areas.

5.11 - Priority 1

The following areas are cleared on a continuous basis throughout the snowfall to maintain the operational capability of the airport*:*

- Active Runway (generally) Runway 09-27, 8300 feet long x 150 feet wide;
- Priority 1 Runway requires a minimum of 100 feet cleared width to support the operational requirement of the aircraft movements at the airport during a storm event;
- Sufficient area on Apron I and VIII to accommodate aircraft and related activities using the active runway, including the main de-icing pad, bag room entrances, lead in lines and working areas around bridges;
- Taxiway Alpha;
- Taxiway Foxtrot;
- Visibility and legibility of mandatory signs associated with the primary runway and taxiways
- Access Road from Firehall;
- Apron 4;
- Taxiway Charlie between TWY Alpha and Apron 3/5 entrance.
- Entrance to Air ambulance, when required.

The Priority 1 (active) runway is typically determined by wind direction. Prevailing winds usually favor runway 09-27. In addition, It is ordinarily the Priority 1 Runway because of its length and being the runway with an ILS approach, pilots often prefer it even if crosswind conditions exist. The snow removal team will clean the taxiways when traffic restricts snow removal on the active runway.

5.12 - Priority 2

Other operational areas on the airside are to be cleared throughout a snowfall, after Priority I areas have been cleared and accumulations are within tolerable levels. This is to ensure that airport operations may switch to the alternate runway, should conditions warrant:

- Alternate Runway (generally) Runway 15-33, 6200 feet long x 150 feet wide
- Priority 2 Runway requires a minimum of 100 feet cleared width to support the operational requirement of the aircraft movements at the airport during a storm event;
- Sufficient area on Apron I and VIII to accommodate aircraft using alternate runway, if different than above;
- Taxiway Bravo;
- Apron 3;
- Taxiway Charlie;
- Visibility and legibility of mandatory signs associated with the priority 2 runway and taxiway.

Priority 2 runways and Taxiways will be cleared of snow when priority "1" snow removal has been completed to the point that equipment can be removed without a rapid accumulation of snow back on the Priority "1" areas.

Crews will work on priority 2 areas when traffic restricts access to priority "1" areas. If conditions allow, Priority 1 and 2 are sometimes opened at the same time.

5.13 - Priority 3

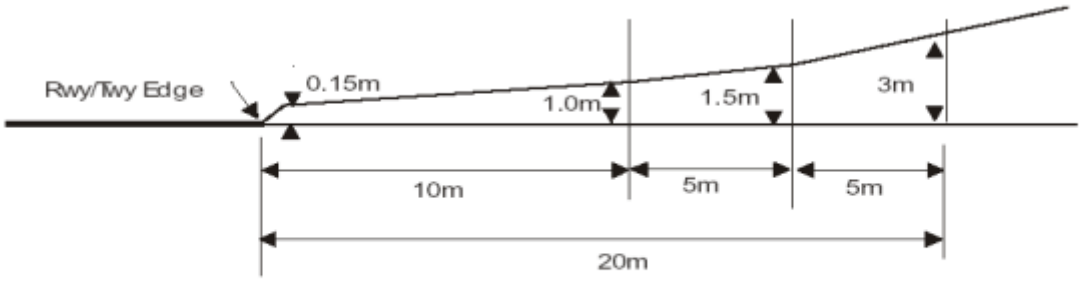
Priority 3 areas will not be cleaned until such time as the snow event has passed and all Priority 1 and Priority 2 areas are cleaned. Efforts will be made to keep access to the hangar line and other areas open depending on the severity of the storm and the availability of manpower.

The remainder of airside areas are to be cleared after a snow event:

- Remaining Apron areas (Apron 2, 5,6 and 7), as required;
- Service Roads and Lavatory waste facility;
- Perimeter Road (including access roads to approaches and emergency vehicle gates);
- NPSV-1 and 2(including Lav Dump), as required;
- Edge lights, signs, approach lights, as required;
- Pre-threshold areas to ensure not exceeding 1.25% slope (as per AC 302-013 (4.11))
- ILS and Nav Aid Sites.
- Airside Snow Dump access and management
- GSE Fueling Area

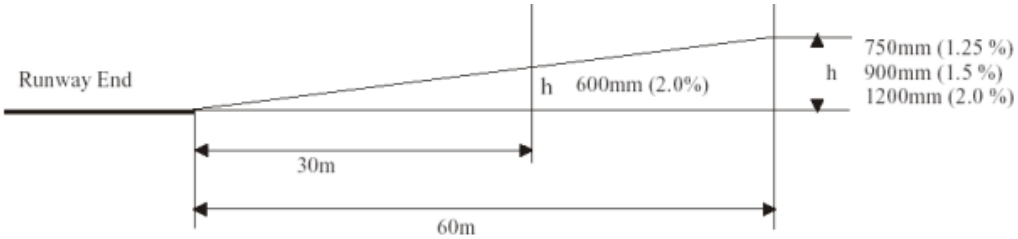
Where ground conditions in a priority 3 area (i.e.: unfrozen ground) prevent equipment from operating and this results in the snowbank slope limits being exceeded (see figures below), this should be indicated through NOTAM. If and when the ground will support snow removal equipment, maintain the remaining priority 3 area in accordance with the winter maintenance plan.

Maximum Height of Snow Profile Beyond Runway & Taxiway Edge



Codes C and D

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

Should certain isolated emergencies arise, Airport Maintenance may be requested to clean certain areas so a safe and operational airport can be maintained.

5.14 - Runway

Whenever possible, runways are cleared to a bare and dry surface for their full width. The Priority 1 runway is cleared to support the operational requirements of the aircraft movements throughout the storm, before all other surfaces. The Priority 2 runway may be NOTAM closed as required, as to not impact maintenance activities on priority 1 Surfaces. If at any time the cleared width falls below full width, Airfield Maintenance advises the Control Tower. If possible, clearing takes place in a manner that allows for the continuous operation of the runway during snow removal.

In most cases the runways will be cleared starting at center line and working outward. Usually a team of 2 plow/sweeper trucks does the snow removal, with extra equipment and personnel assigned if conditions warrant. However, when cleaning the Priority 2 runway there may be a strong cross wind and in this case snow removal will commence on the upwind side of the Runway. The snow must be moved all the way across the runway, and therefore the runway is not as readily available as if the center line method is used. ATC will be advised if the windward method is to be used.

Leaving a windrow on an aircraft maneuvering surface must be avoided so any windrows that develop will be blown over the lights into the infield as soon as possible. At the same time as the runway is being cleared it is important to ensure that all exits off the runway are kept open.

When icing conditions require chemical application, priority 1 runway surfaces are to be sprayed full length and width, in order to remove all ice from the entirety of the surface.

Crossing of Runway 09/27 is strictly prohibited.

The following procedures are to be followed:

Runway Condition Reports & Runway Inspections:

Any runway inspection (CRFI or not) starting on Runway 15/33, Tower will use the following phraseology:

- Maintenance XX procced Bravo onto Runway 33 HOLD SHORT Runway 09/27.
- Once the vehicle operator gets to the hold line at Runway 09/27, the vehicle operator will notify tower "Maintenance XX" is holding short Runway 09/27.
- Tower will then give permission for the vehicle to cross Runway 09/27 north and south and report off on Taxiway Alpha.

Maintenance Tasks:

Any maintenance (i.e., sweeping, blowing snow, electrical) being completed on Runway 15/33, the operator will proceed onto Runway 33 and hold short of Runway 09/27. When holding short, a request can then be made into the intersection or threshold of Runway 15 as required.
As a reminder, per AVOP Manual section 9.0:
No vehicle will proceed onto an aircraft maneuvering area unless their current activity requires to be performed on these areas, or their activity requires immediate action when the service roads are impassable.

5.15 - Aprons

The preparation of a safe operating environment on the apron areas is the responsibility of YXE Saskatoon Airport; The safe conduct of airline operations, including

the safety of passengers, is the responsibility of the airlines. Snow is removed from the Apron area in a manner that reflects the amount of accumulation. When snowfall is light airside crew will plow and sweep ramps as soon as possible after runway and taxiways have been opened. In times of heavier snowfalls, the loader and ramp hog will be assigned to the main apron to maintain the ramp and access to the bridges. Smaller equipment is used to clear areas around the bridges and walkways. Airfield Maintenance will sweep and sand the walkways at the ground load stations to keep them safe for passengers. Such maintenance procedures are usually done before the aircraft arrives. Every effort will be made during these conditions to keep sufficient apron and gate areas cleaned to facilitate safe movement of aircraft and passengers.

The work area around bridges and airline parking areas, de-icing pads, apron entrances/exits, lead-in lines and ground load areas are to be cleared first, followed by the other main aircraft maneuvering areas. De-icing pads should be cleared before de-icing begins. As required, these areas will be inspected numerous times daily by Airfield Maintenance.

Removal of snow in close proximity to the terminal building and around bridges requires close co-ordination between Airfield Maintenance, Duty Managers, and the airlines/ground handlers. In order to remove snow in these areas, they must be clear of parked aircraft and equipment. Airfield Maintenance will monitor the weather reports and gate schedule and coordinate a time to clear these areas during periods of lower activity as to not disrupt aircraft operations.

The area surrounding a bridge defined by red diagonal lines. This area provides a safe zone to maneuver and park a bridge free of equipment, vehicles, and other obstacles. Vehicles may not pass through a Bridge Movement Area or drive beneath a bridge.

Snow removal required either next to an active bridge or aircraft, must be coordinated through a supervisor and/or Duty Manager. This is to ensure all parties are informed and efforts can be safely completed.

5.2 - Miscellaneous Airside Snow Removal

5.21 - Edge Lights and Signs

Care must be taken to ensure that runway, taxiway, apron, and threshold lights are not covered or damaged by snow removal operations. During active snow events, no sweeper should get any closer than a plow blade away from the edge lights, this will help to eliminate moving snow from hitting and damaging the lights. When cleaning around lights the common practice is to keep the snow cleared to a distance of at least 25 feet behind the lights. This is to stop snow from drifting over the lights and provide a safety margin for aircraft.

Airfield signs shall be kept clean of plowed or cast snow to maintain the legibility of the signage. Priority shall be given to lights and signs associated with hold lines, direction and location signs, and ILS critical areas.

5.22 - Approach Lighting

Approach, PAPI and Runway End Identification Lighting must be kept clear of snow to prevent light beams from being obscured and thus creating false glide slope and/or reduced light intensity. Snow Removal is usually done during clean-up operations.

5.23 - ILS Snow Removal

ILS Snow removal will be carried out to standards as laid out in

Appendix IV

Nav Canada ILS ; Nav Canada will supply annual training for Airfield Maintenance staff on standards and procedures. Snow removal will be coordinated with Nav Canada through ATC/FSS/TOC.

5.24 – Airside Snow Dump

It is the responsibility of the Tenant to utilize the designated snow dump area by depositing snow at the rear-most extent of the pile.

Airfield Maintenance will monitor the snow dump through daily inspections and communicate any non-compliance to the Airfield supervisor. Additionally, Airfield Maintenance will provide access to the snow dump in accordance with its respective service priority and will, as necessary, maintain the dump's capacity by piling snow to increase its height.

5.3 - Groundside Snow removal

As with the airside areas, groundside surfaces have been broken down to priority 1, 2, and 3. These areas are shown in

Appendix V

Snow Removal Plan – Groundside. The maximum allowable accumulation for each of these areas is shown in Table 4.

Table 4: Groundside Allowable Accumulations

AREA	OPERATIONS	MAX ALLOWABLE ACCUMULATIONS
GROUNDSIDE	**Priority 1 areas**	**2.0 inches**
	Priority 2 areas	**Storm accumulation**
	Priority 3 areas	**Storm accumulation**

Note: Groundside Priority 1 areas may not be addressed until Airside Priority 1 areas are cleared to an operational level. The severity of the snow event will determine referenced snow accumulation on these designated areas.

5.31 - Priority 1

All reasonable efforts will be made to clear Priority 1 groundside areas at the same time as Priority 1 airside areas, however in some situations groundside snow clearing may be delayed due to airside requirements. The groundside Priority 1 areas include:

- Terminal curb sidewalk and center island
- Parking lot walkways
- Airport drive terminal loop
- P1 Spitter Gates
- P1 Accessible stalls

5.32 - Priority 2

Following the clearing of groundside Priority 1, crews will move to priority 2 areas. The sequence in which Priority 2 areas are cleared will be coordinated to cause minimal interaction between snow clearing equipment and the public, i.e. clearing of parking lots at night when traffic levels are reduced. Groundside Priority 2 areas include:

- P1 roadways
- P2 Roadways
- JetSet Main Roadway
- Wayne Hicks Lane
- Airport Cres.
- Koyl Ave,
- Thayer Ave.
- Hangar Rd.
- Airport Rd.
- Airport Lane

5.33 - Priority 3

Efforts will be made to keep access to all areas open depending on the severity of the storm and the availability of manpower. Groundside Priority 3 areas that will be cleared as resources allow following cleanup of all Priority 1 and 2 areas include:

- Jetset Contractor Stalls
- Clearing of parking stalls (P1 and P2)
- Access to snow dump
- JetSet main stalls and roadways

- Employee Parking Lot
- Lot C
- Cell Lot
- John G Diefenbaker Trail
- 45th and Airport Drive Bus Stop

5.4 - Tenant Snow Removal

In accordance with Appendix VI, the Snow Removal Plan, tenants are solely responsible for snow clearing on their leased areas. This responsibility includes clearing, loading, and hauling all snow from the premises. Snow from leased airside areas must not be pushed onto common apron areas or islands. Instead, tenants must transport it to the designated airside snow dumps, following the approved routing shown in Appendix VI. Similarly, tenants are responsible for all groundside snow removal on their leased land. A groundside snow dump is provided for this purpose and is strictly for snow from airport property; the dumping of offsite snow is prohibited. Furthermore, snow must not be pushed into ditches, onto boulevards, or piled against fences.

If tenants choose to outsource their snow removal activities to a third-party contractor, it remains the tenant's responsibility to ensure their contractor follows all SAA policies and procedures. Tenants must provide their contractor with a copy of the Snow Plan and inform the SAA of the contractor's name and designated contact information.

While these responsibilities lie with the tenant, Airfield Maintenance will make every effort to avoid blocking entrances to leased areas with windrows during snow events and will work to support airport tenants with their snow removal process whenever possible.

5.5 - Movement area access and control

The entire perimeter of the airport is surrounded by a wire mesh fencing, gates, airside hangers and other aviation related buildings. All snow piles MUST be at least 1 meter away on airside (except Apron 1/8) and 1 meter away on groundside from all fences. Apron 1/8 snow piles adjacent to fences must be 3 meters away on airside, and 1 meter away on groundside. Access to the airside is obtained through common use keyed gates, and via individual tenant property where it is the responsibility of each individual tenant to monitor and control fence lines.

All Personnel (YXE employees, contractors, tenants, etc.) who are required to operate a vehicle on airside must undergo certification through the Airside Vehicle Operators Permit program. All persons requiring access to Aprons I & VIII must go through NPS-V (Non-Passenger Screening Vehicle) and submit to screening before being allowed access.

The provision of apron management and safety is detailed in the relevant sections of the SAA Rules and Procedures Manual. This manual addresses the issues of aircraft de-icing areas, aircraft refueling, aircraft parking and gate management procedures, aircraft pushbacks, aprons safety issues and airside vehicle operations.

See Appendix I SAA Rules and Procedures Access

6.0 - ICE CONTROL

6.1 - Ice Control Chemical

The types of chemicals used as part of the ice control program listed below:

- Safeway KA (potassium acetate) – liquid
- Safeway SF(Sodium Formate) – dry
- Urea is no longer used by YXE

Liquid deicer (potassium acetate) is used as an anti-icer and a deicer. As an anti-icer it is applied prior to precipitation to prevent adhesion of ice to paved surfaces. As a deicer it is applied at a heavier rate to penetrate the ice or snow breaking the bond so the contaminant can be removed. Potassium acetate works at lower temperatures than Urea which is an advantage in our climate.

Safeway SF is applied as a deicer after ice has formed. It melts through the ice breaking the bond with the pavement so the contaminant can be removed. Safeway SF works at considerably lower temperatures than Urea.

Data sheets for both Safeway KA and Safeway SF are provided in

Appendix VII

Ice Control Data Sheets. Salt shall **not be used** on any airside surface as it can cause corrosion to aircraft components.

6.2 - Ice Control Sand

To prevent damage to aircraft the type of sand used on all aircraft maneuvering surfaces is strictly controlled. All sand conforms to Transport Canada specifications (Appendix VIII TC Airport Runway sand spec) and there is no salt mixed with the sand. All airside sand is stored separately from sand used on groundside.

Sand is used to improve traction on maneuvering surfaces until other ice control methods can be implemented. When sand is used it is removed as soon as possible after it is no longer needed.

Sand lockers are supplied on the main apron and around the terminal building for use by employees working at the airport, and locations are identified in Appendix II Sand Locker

Locations. Shovels and brooms have been provided for use at each bridge, ground load position, and terminal building entrance.

7.0 - SURFACE CONDITION REPORTING

Aircraft Movement Surface Condition Reports (AMSCR) are done in compliance with the following:

- TP 312;
- AC 300-019;
- AC 302-013;
- Nav Canada NOTAM Procedures Manual.

7.1 - Movement Area Inspections and Reports

During the winter season, Aircraft Movement Surface Condition Reports are issued under the following conditions:

- At least once every 8 hours, typically 05:00, 15:00 and 23:00 and/or as noted below
- Every time there is a significant change in runway surface condition both improvements or reduction
- Every time the runway is swept following anti-icing, deicing, or sanding. (Only if the clearing results in a significant change in the runway status. On-going clearing which merely maintains runway status does not require a report.)
- Every time the runway is cleared of snow. (Only if cleaning results in a significant change in runway status. On-going clearing which merely maintains runway status does not require a report.)
- Following every aircraft incident or accident on a runway.
- Whenever the cleared width of the runway falls below full width.
- In response to a reasonable request by a carrier or pilot.

Supervisors and Staff shall make best efforts to provide Aircraft Movement Surface Condition Reports on a timely basis. However, each airport user shall take note of changing conditions and be responsible for independently examining the surface condition for their own safety.

7.2 - Recording Equipment

Two Airfield Maintenance Vehicles are equipped with TES Mark III electronic decelerometers to measure braking friction of runways in conjunction with winter contaminants. These readings are on a scale known as the "Canadian Runway Friction Index" or "CRFI" and indicate the runway surface friction as a numerical value. Runway Surface Condition Reports are transmitted to ATC and Flight Services and airline dispatch offices via TRACR NG – GRF.

YXE's decelerometers are mounted and operated as per the Transport Canada Advisory Circular 302-013, and are operated, maintained, and calibrated in accordance with the

manufacturer's instructions.

7.5 – Friction Measurement

CRFI readings need to be obtained by using the "Standard Method" in the following manner:

- At intervals not greater than 300 meters within 10 meters and on both sides of the runway centerline (down and back) at that distance from the centerline where the majority of aircraft operations take place. The vehicle must be moving parallel to the runway center-line at a constant 50 km/hr when brakes are applied (until point of tire lock-up).

CRFI should be provided when the area within 10 meters of either side of centerline 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 or wet snow not exceeding 2.5 centimeters (1 inch) in depth;
f) deicing chemical solution or sand on ice; or
g) frost.

Friction measurements (CRFI) will not be taken on:

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 that when stepped on or driven on splatters, turns to slush, or results in the presence visible water; or
d) There is loose snow or wet snow on the runway surface exceeding 2.5 centimeters (1inch) in depth.

The CRFI reading shall be reported as an average for each runway in thirds. In order to maintain the statistical validity of the CRFI value, a minimum of 4 readings per runway third are required.

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.

Airport staff conducting AMSCR will immediately forward Canadian Runway Friction Index (CFRI) readings of 0.40 or less to Nav Canada ATC/FSS via TRACR NG – GRF.

7.6 – Global Reporting Format Visual inspection

In addition to CRFI measurements visual inspection of surfaces shall be conducted as part of the runway condition report using the Global Reporting Format (GRF) . During normal operating conditions, surface condition reports will be conducted as outlined in section 7.1. During active winter conditions, surface condition reports will be conducted as frequently as needed.

Global Reporting Format (GRF) for Runway Surface Conditions has been implemented as of August 12th, 2021. This consists of reporting the Runway Surface Condition in Thirds using a Runway Condition Assessment Matrix (RCAM). The RCAM allows YXE staff to assess the conditions and assign a Runway Condition Code (RWYCC) from 1-6 for each third of Runways 09-27 and 15-33. This information will then be issued by NOTAM and updated accordingly via YXE's TRACR NG - GRF Condition Reporting system See Appendix IX TRACR-NG GRF - Runway Condition Report.

The Process to determine Runway surface conditions can be found in Appendix X AC 300-019 Global Reporting Format (GRF) for Runway Surface Conditions

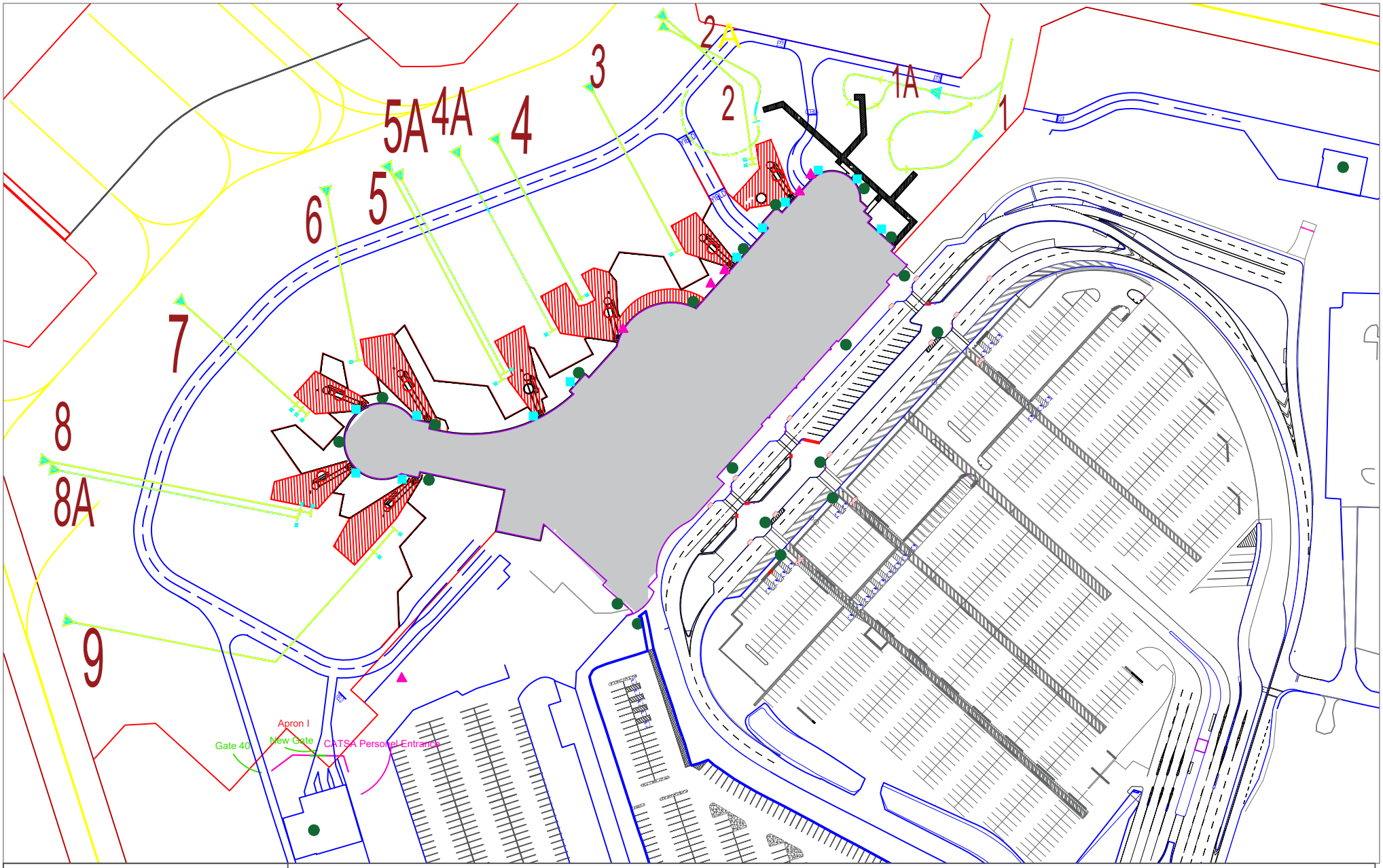
Appendix I

SAA Rules and Procedures Access

SAA Rules and Procedures can be accessed via the YXE Airport Partners website.
Contact YXE Duty Manager for Login Credentials

Appendix II

Sand Locker Locations



Sand Bin

FOD Bin

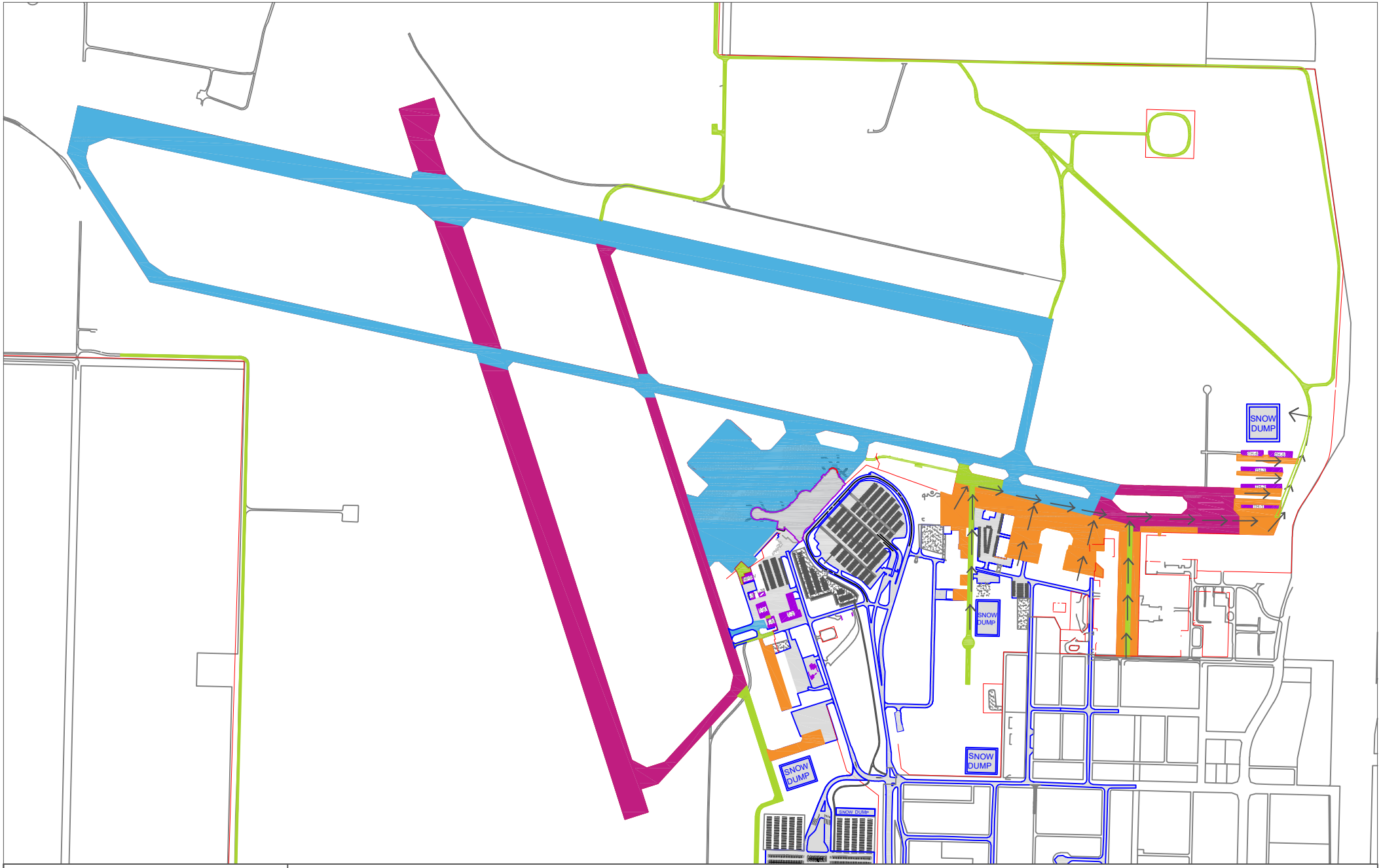
Spill Kits

Sand Locker Locations - Airside

skyxe

Appendix III

Snow Removal Plan – Airside



Priority 1

Priority 2

Priority 3

Tenant

Snow Removal Plan - Airside

Note: If winds dictate use of 15-33, priority 1 and 2 for runways and taxiways will switch

Appendix IV

Nav Canada ILS Critical Area Maintenance Briefing

04/07/2017

ILS CRITICAL AREA MAINTENANCE BRIEFING

For Local Airport Authorities

Version 1

Serving a world in motion
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AUTHORITY

- This presentation was produce under the authority of

  Training and Maintenance Services

Vice President, Technical Operations, NAV CANADA

Director, CNS Engineering, NAV CANADA

Director, Training and Maintenance Services, NAV CANADA

PURPOSE

The briefing provided is to enhance Local Airport Authorities (LAA) personnel working in the Instrument Landing System (ILS) Critical Areas for the following:

- ILS snow clearing requirements
- ILS Vegetation maintenance

It is a mandatory requirement for all personnel who partake in snow removal and vegetation control in the ILS critical area be briefed annually.

INTRODUCTION

In order to safely guide aircraft to the touchdown point on the center line of the runway, the ILS requires flat terrain in front of its antennas.

An ILS is comprised of a Localizer (LOC) and a Glide path (GP).

The Localizer provides ‘extended centerline’ guidance to approaching aircraft.

Localizer signals travelling down the runway area will be distorted by ‘sheer’ cut snow banks or wind drifts.

During snow clearing the following must be kept in mind:

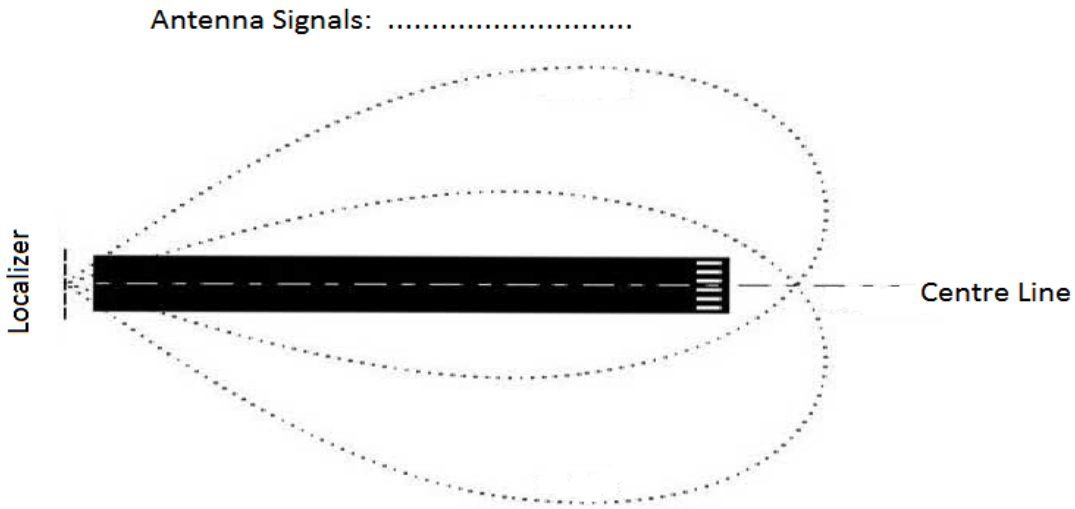
- Snow banks are to be tapered.
- Large snow banks or piled snow adjacent to critical areas are to be avoided.

EFFECTS OF SNOW ON LOCALIZER

Localizer signals, much like those of the Glide Path (GP), will be deflected by snow banks and/or wind drifts in the snow removal zone or on approach roads.

This will result in distortion of the ‘extended centerline’ as seen by an approaching aircraft.

LOCALIZER ANTENNA SIGNAL AND CENTRE LINE



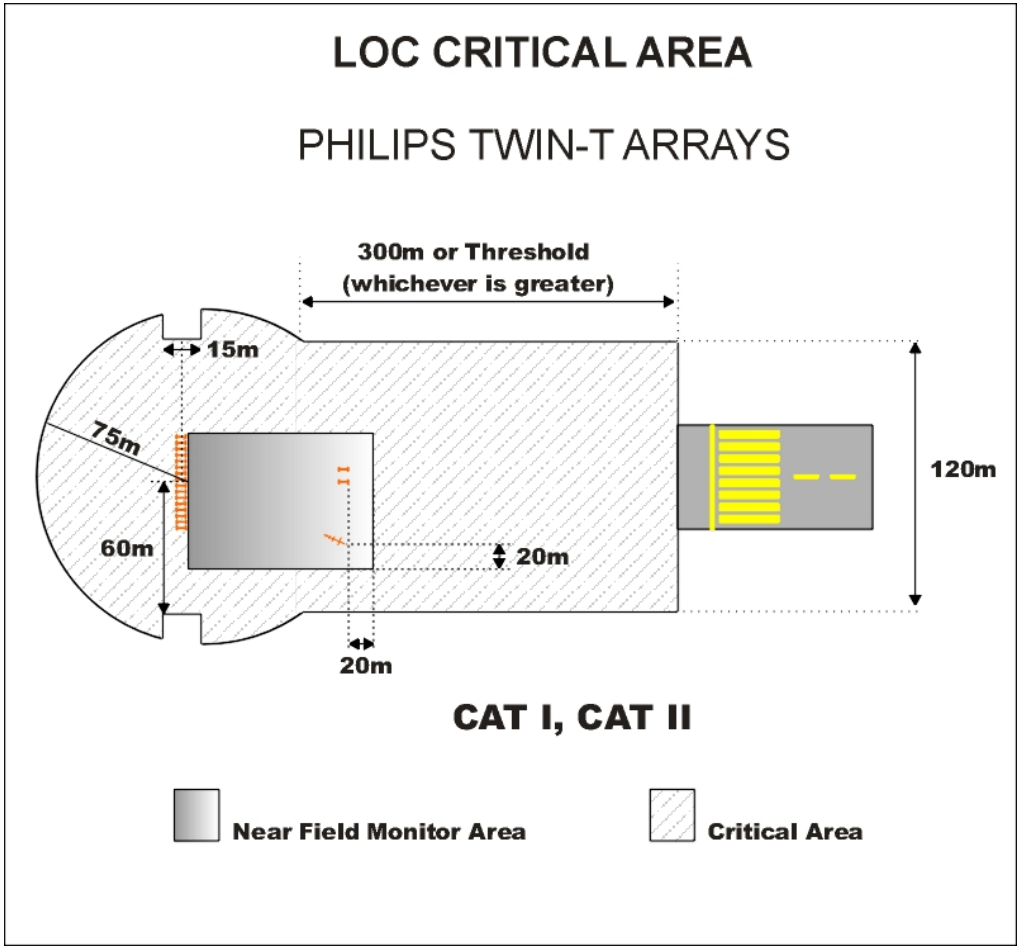
EFFECTS OF IMPROPER SNOW REMOVAL

Localizer signals will be deflected by snow banks and/or wind drifts in the snow removal zone or on approach roads.

For the Localizer:

- This will cause distortion of the ‘extended centerline’ as seen by an approaching aircraft and will result in an unsafe landing condition.
- The monitor antenna for some models of Localizers will sense a change in centerline and shut down the LOC and GP.

CRITICAL AREA - LOCALIZER

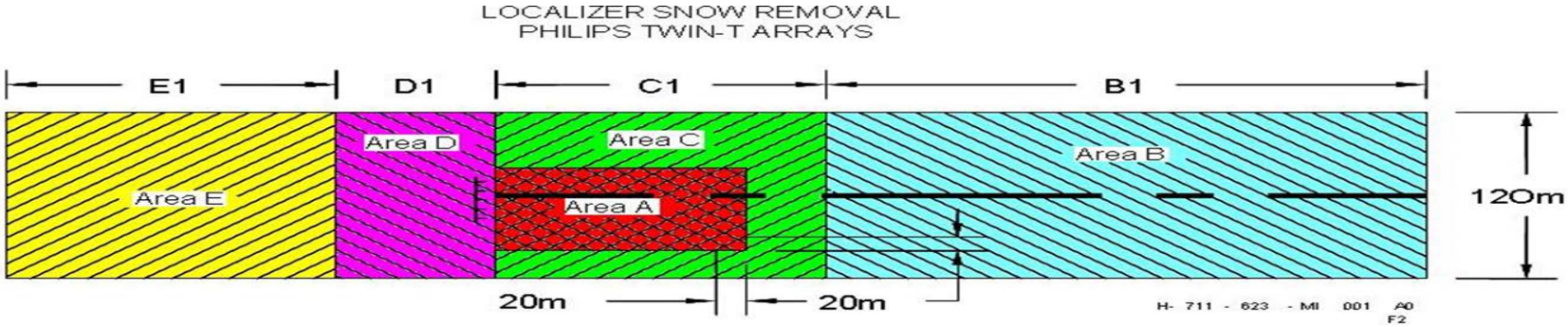


The critical area is an area where vehicles, including aircraft, are **not permitted** during all Localizer operations. This area must be protected because the presence of vehicles and/or aircraft inside its boundaries would likely cause unacceptable disturbance to the Localizer signal.

Philips Twin-T arrays Near Field monitor area:

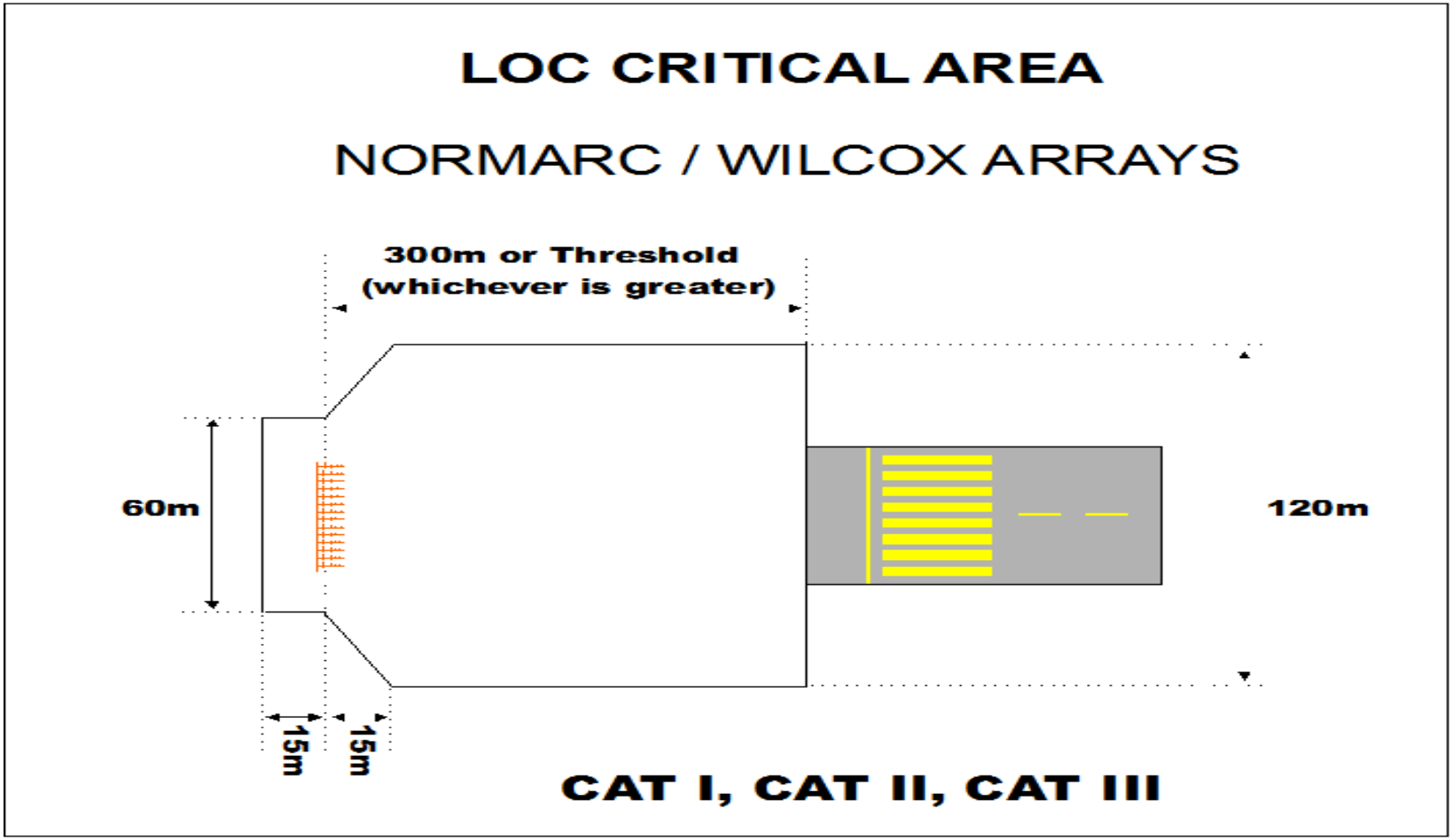
The Near field monitor critical area is an area where no objects are permitted during all Localizer operation; this includes humans, vehicles, construction and snow removal equipment, etc. The above rules also apply where aperture monitoring is used.

PHILIPS LOC SNOW CLEARING ZONES



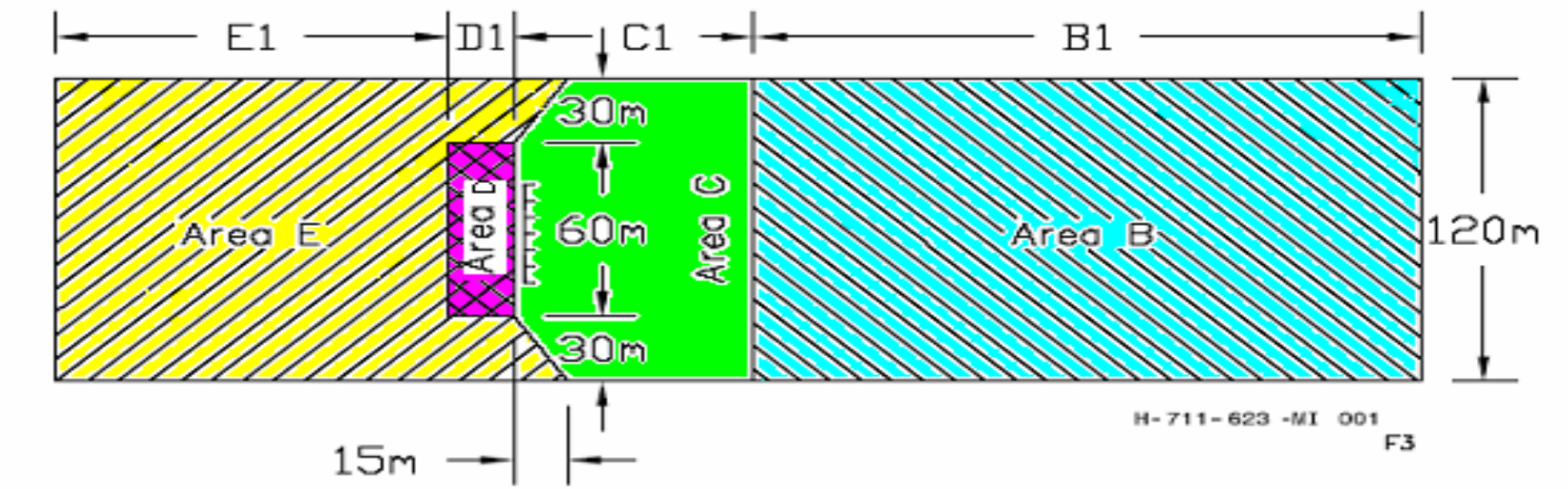
- Site specific zones and limits have been established based on equipment type, presence of a back course, array height and surrounding topography.
- Sites not specifically listed in table A1 or A2 must use the default zones and limits defined at the beginning of table A1.
- Most facilities have customized limits which follow in table A1.
- Exceptionally, some sites have customized zone definitions depicted in attached drawing and are listed in table A2.
- Table A3 lists sites that have specific equipment configurations.
- Area A: Corresponds to the near field monitor zone. Snow must be removed to stabilize the monitors. The size of this area is similar for all near field monitors. Facing the array, the zone is delimited on one side by the edge of the Array (right hand side) with the opposite side 20 m passed the Clearance monitor antenna.
- Area B: In most cases, this zone does not exist. It is necessary for sites where more than one snow depth tolerance is defined due to the nature of the terrain.
- Area C: In most cases, it corresponds to the zone delimited by the front of the Array and the runway end (normal sites) or the beginning of zone A where snow depth tolerance differs from C.
- Area D: The zone at the back of the Array that needs to be cleared.
- Area E: Snow naturally accumulating can be tolerated and snow removal is not required in this area. This area cannot be used as a dumping site for snow cleared from the runway or any other area. However, if there is a road in this area, snow removal is permitted to allow access.
- For sites with a reciprocal ILS system, the snow cleared between the Localizer and the runway stop end must not be deposited on the same side as the reciprocal Glide Path.
- Snow banks on the edge on either side of the cleared area between the Localizer and the runway stop end must be tapered with a maximum angle of 50 degree relative to the ground. Height of the snow bank should be limited to the height of the array.

CRITICAL AREA - LOCALIZER



The critical area is an area where vehicles, including aircraft, are not permitted during all Localizer operations. This area must be protected because the presence of vehicles and/or aircraft inside its boundaries would likely cause unacceptable disturbance to the Localizer signal.

NORMARC/WILCOX LOC SNOW CLEARING ZONES



Area B: In most cases, this zone does not exist. It is necessary for sites where more than one snow depth tolerance is defined due to the nature of the terrain.

Area C: In most cases, it corresponds to the zone delimited by the front of the Array and the runway end (normal sites)

Area D: The zone at the back of the Array that needs to be cleared.

Area E: Snow naturally accumulating can be tolerated and snow removal is not required in this area. This area cannot be used as a dumping site for snow cleared from the runway or any other area. However, if there is a road in this area, snow removal is permitted to allow access

For sites with a reciprocal ILS system, the snow cleared between the Localizer and the runway stop end must not be deposited on the same side as the reciprocal Glide Path.

Snow banks on the edge on either side of the cleared area between the Localizer and the runway stop end must be tapered with a maximum angle of 50 degree relative to the ground. Height of the snow bank should be limited to the height of the array.

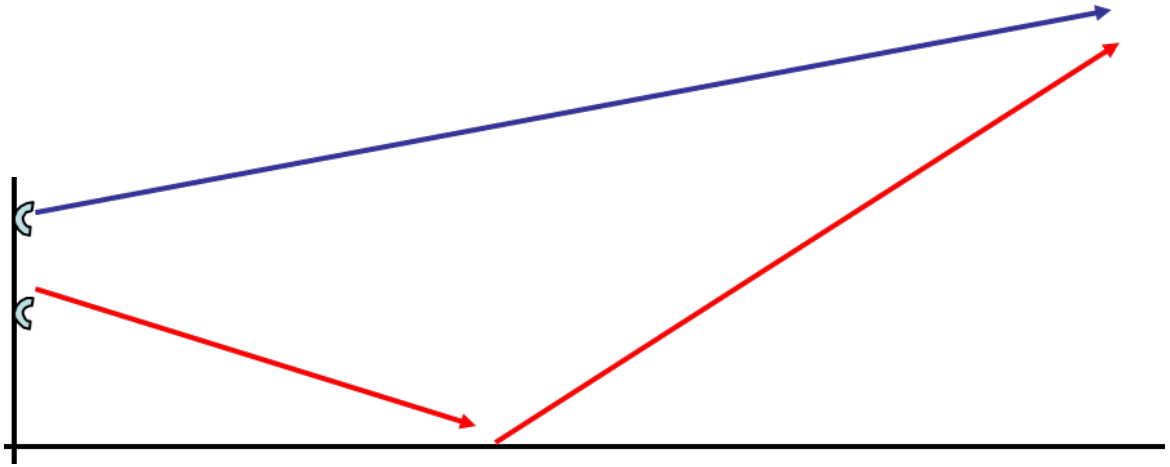
GLIDE PATH

The Glide Path provides an ‘angle of descent’ guidance to arriving aircraft.

An aircraft on an ILS approach receives two signals from the Glide Path antennas…

One signal path is directly from the radiating antenna to the aircraft.

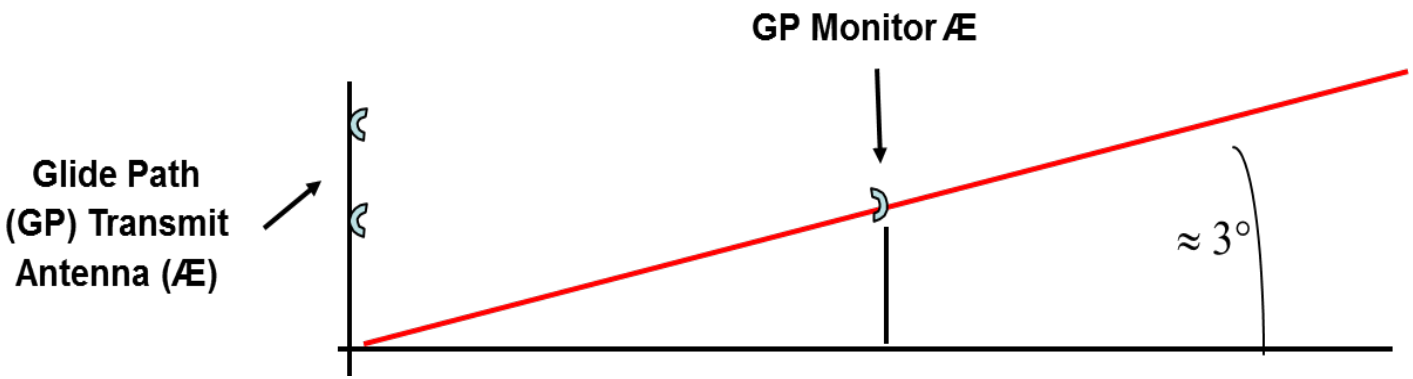
The other signal path bounces off the ground in front of the antenna and then travels to the approaching aircraft.



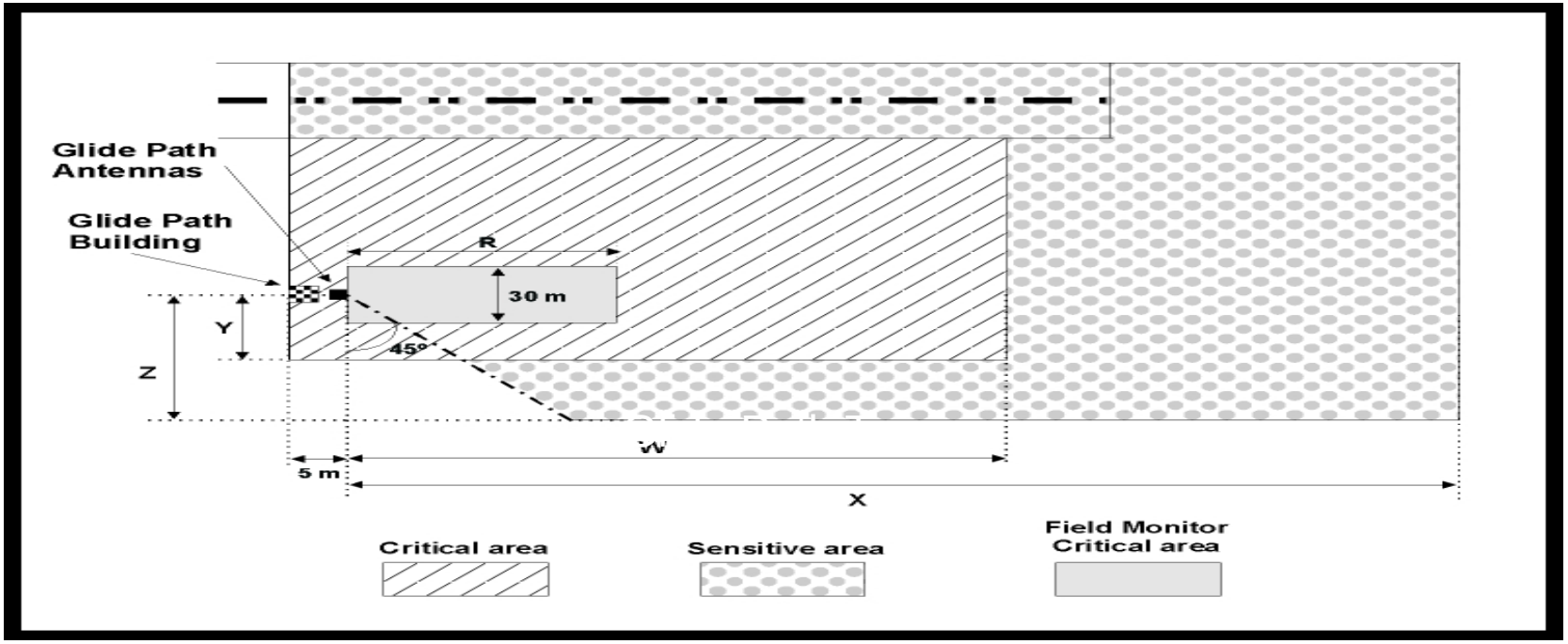
- The combination of these two signals results in radio frequency guidance which the aircraft can follow to the ‘touch-down’ point.

- Raising or lowering the Glide Path antennas will cause the ‘glide angle’ as seen by the aircraft instruments to become lower or higher.

- Increasing the height of the terrain in front of the antenna has the same impact on the ‘glide angle’ as moving the antennas down.

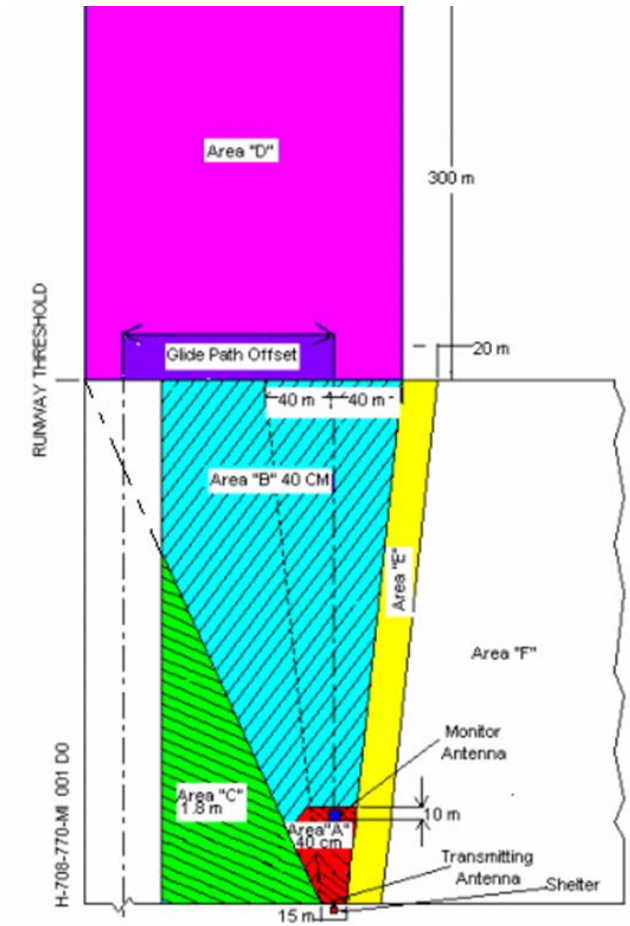


CRITICAL AREA – GLIDE PATH



- **Critical area:** The critical area is an area where vehicles, including aircraft, are **not permitted** during all Glide Path operations. This area is protected because the presence of vehicles and/or aircraft inside its boundaries would likely cause unacceptable disturbance to the Glide Path signal.

GP SNOW CLEARING ZONES



Area A: Average snow depth not to exceed 40 cm.
Area B: Average snow depth not to exceed 40 cm.
Area C: Average snow depth not to exceed 1.8 m.
Area D: Natural snow allowed. Snow cleared between the Glide Path and the runway threshold must not be deposited in this area.
Area E: Snow depth must not exceed 1.8 metres. Snow banks must be tapered with a maximum angle of 50 degrees relative to ground.
Area F: Natural snow allowed. Dumped snow higher than 1.8 metres must be tapered with a maximum angle of 6 degrees (1m per 10m) relative to 1.8m.

Note 1: Snow cleared from the runway must not be deposited in the Glide Path clearing zones.

Note 2: Snow banks on the edge of the cleared area between the Glide Path and the runway threshold must be tapered with a maximum angle of 50 degrees relative to ground.

EFFECTS OF IMPROPER SNOW REMOVAL

- Glide Path signals will be deflected by snow banks and/or wind drifts in the snow removal zone or on approach roads.
- Snow build-up will raise the reflecting surface (ground plane); the GP monitoring antenna typically located 90 m in front of the GP antennas will detect the change in angle of descent and shut down the equipment.
- The approaching aircraft sees a steeper, unbalanced or lop-sided ‘angle of descent’ resulting in an unsafe landing condition.
- In either case, the aircraft approaching, especially in poor visibility conditions, loses proper ILS guidance.

ADDITIONAL INFORMATION…

Two other important factors of snow effects are:

- Water content which will affect the ‘reflectivity’ of the snow.
- Roughness which distorts electronic path line making it difficult for the aircraft to follow.

Snow banks and wind drifts act as reflectors to ILS signals and must be avoided. Efforts must be made during snow clearing to ensure that any snow banks be tapered.

Avoiding large snow banks and piled snow adjacent to critical areas is mandatory.

COORDINATION ACTIVITIES

- Snow removal activities will be triggered by either a request from LAA or ATC/FSS of a requirement to remove snow because of snow depths or a failure of the ILS (LOC/GP).

- In either case, the TOC (Technical Operations Coordinator) will be the main point of contact and issue NOTAMs where required.

- When snow removal is requested, TOC/ATC/FSS will shut down equipment and advise the LAA that snow clearing is approved.

- In cases of failures, the TOC will verify snow depths with LAA, check weather conditions and will then ask for the snow to be cleared or dispatch a Technologist to the site.

COORDINATION ACTIVITIES

- Snow is cleared as per the requirements.
- Any anomalies during snow removal shall be reported to TOC.
- Once snow clearing activities or corrective action are completed, TOC will turn the equipment on and verify operation.
- Once operation is confirmed, the ILS will be given back to ATC/FSS and the NOTAM cancelled.

SUMMARY

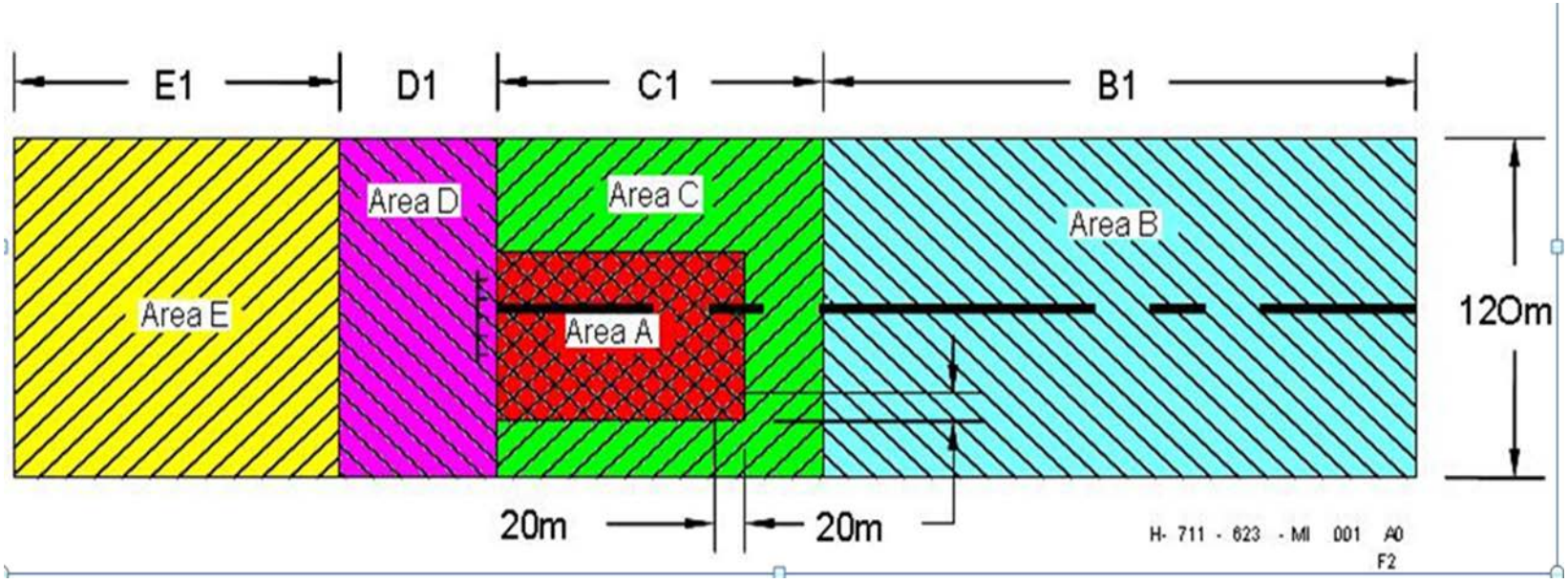
- Snow depth monitoring and control are critical in the prevention of unsafe landing conditions.
- Monitor snow depths and remove snow at Localizer and Glide Path before snow depths reach the prescribed maximum limits as per published standards and tolerances.
- The Localizer and Glide Path will become unusable and must be NOTAM’d off if snow cannot be removed before prescribed limits are reached.

SUMMARY

- Snow removal must be preventive in nature.
- To ensure that the maximum snow depth limits are not reached, snow should be monitored and removed as levels approach the limits.
- This allows the snow removal to be a scheduled preventive action rather than an immediate response to failure.
- Report any problems immediately (e.g. accidental contact with any antenna or structure).

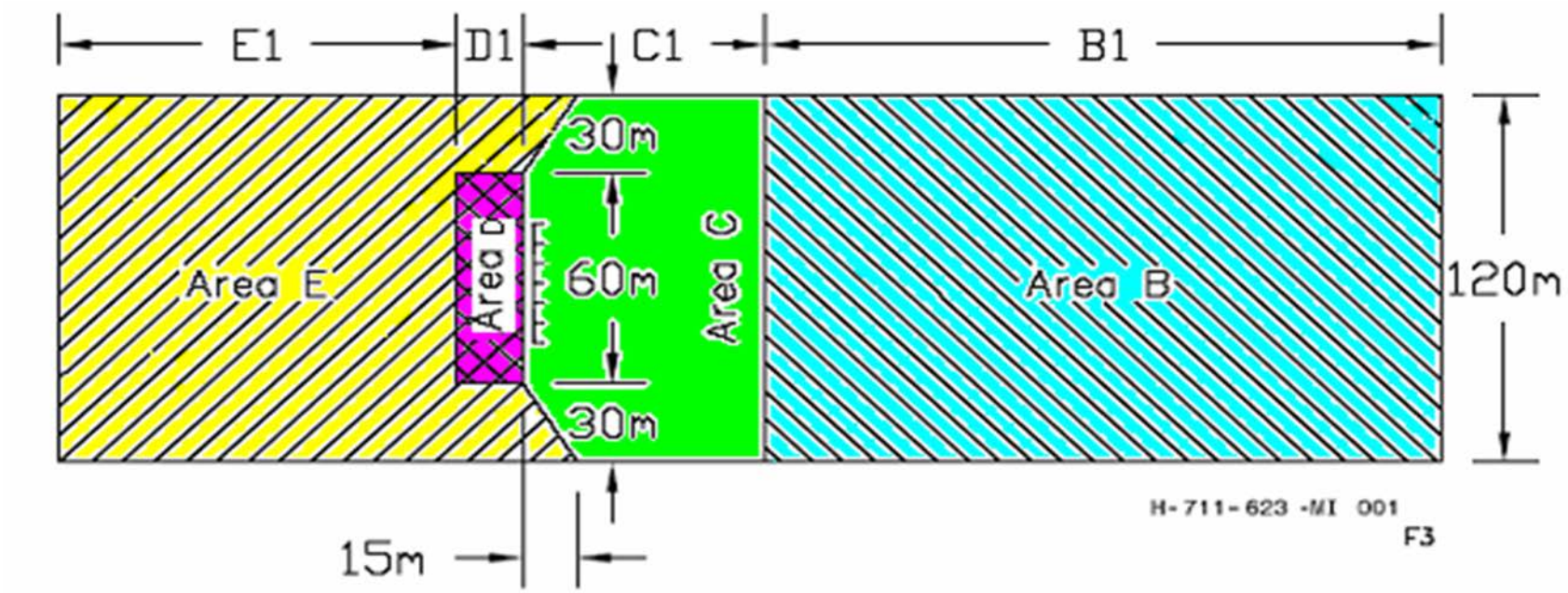
PHILIPS LOCALIZER VEGETATION HEIGHTS

- **Area A:** Heights not to exceed 50 cm.
- **Area B:** Heights not to exceed 50 cm.
- **Area C:** Heights not to exceed 50 cm.
- **Area D:** Heights not to exceed 50 cm.

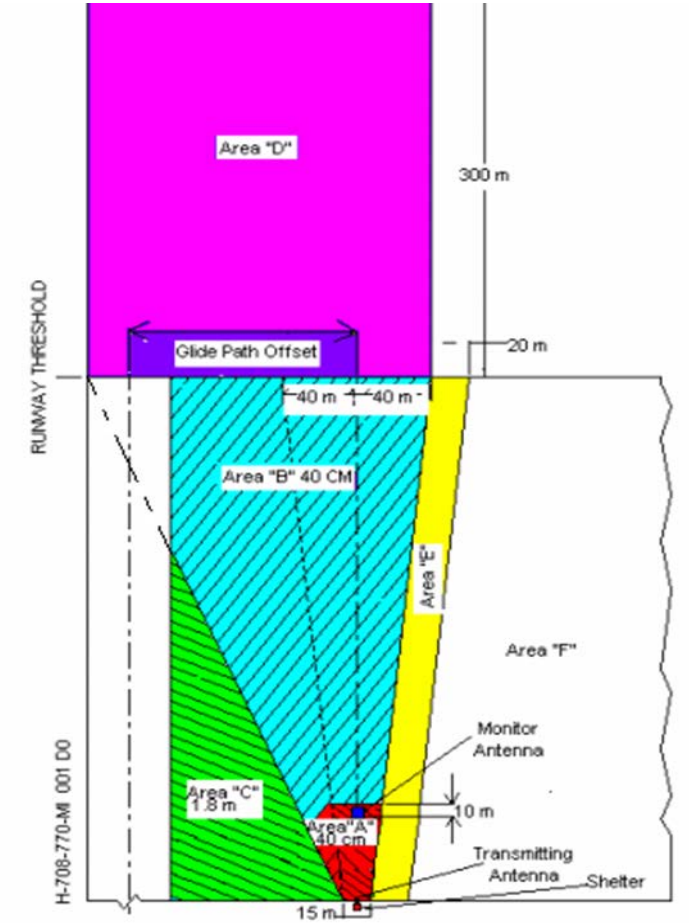


NORMARC/WILCOX LOCALIZER VEGETATION HEIGHTS

- **Area A:** Heights not to exceed 50 cm.
- **Area B:** Heights not to exceed 50 cm.
- **Area C:** Heights not to exceed 50 cm.
- **Area D:** Heights not to exceed 50 cm.



GP VEGETATION HEIGHTS



- **Area A:** Heights not to exceed 30 cm.
- **Area B:** Heights not to exceed 30 cm.
- **Area C:** Heights not to exceed 30 cm.
- **Area D:** Heights not to exceed 30 cm.

QUESTIONS?

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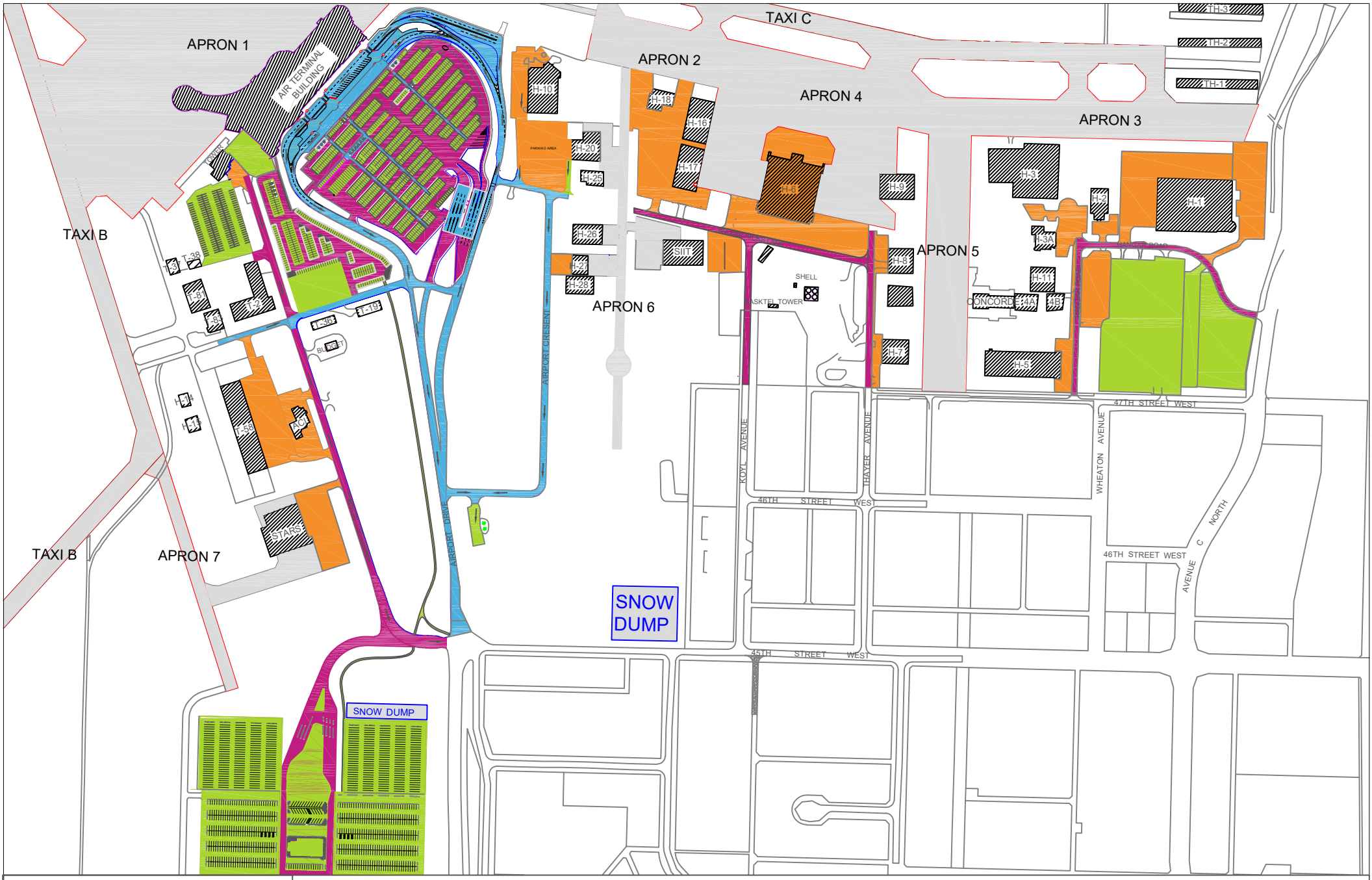
Appendix V

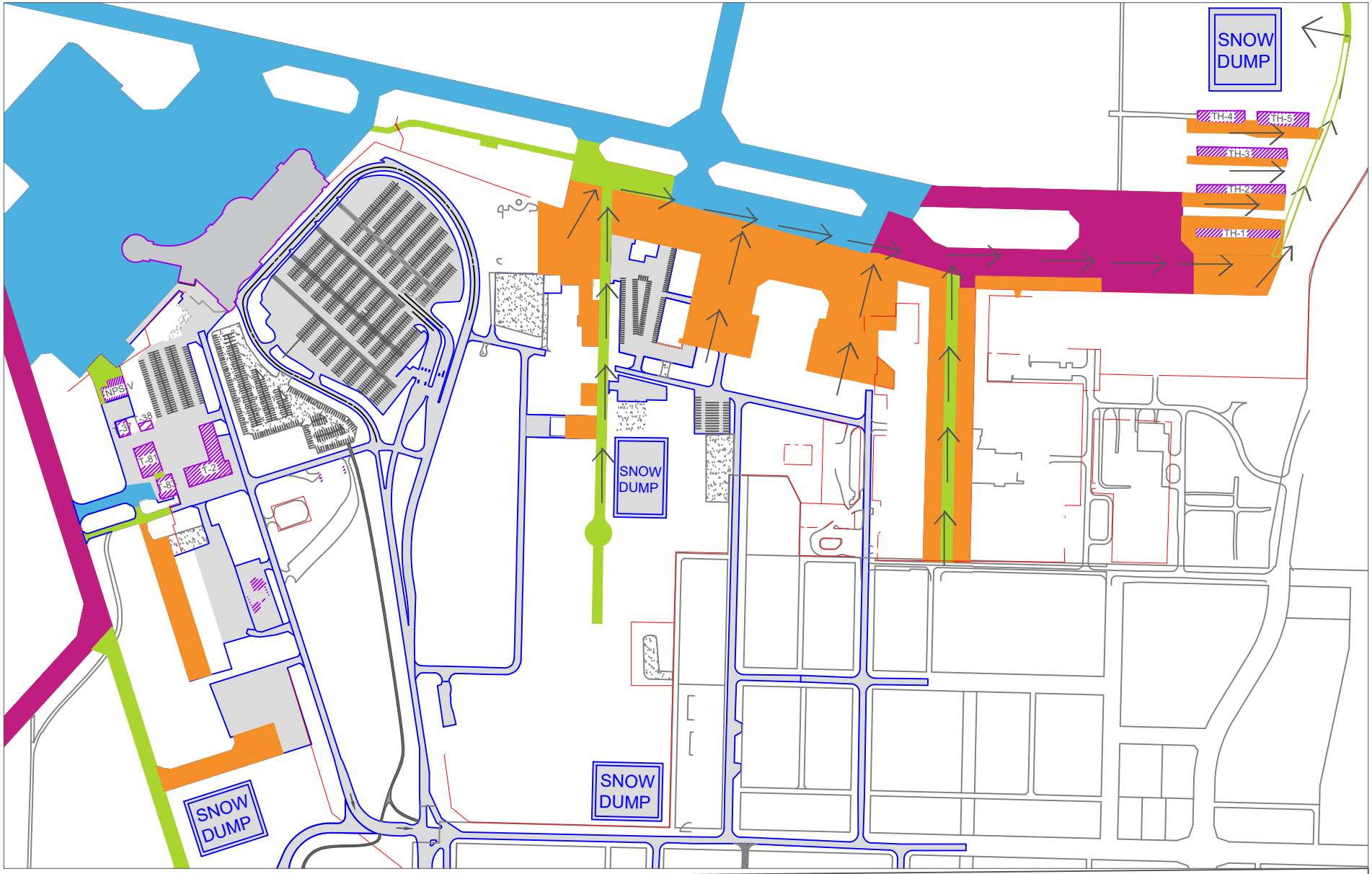
Snow Removal Plan – Groundside



Snow Removal Plan - Groundside

Appendix VI

Snow Removal Plan – Tenant Responsibilities



Priority 1
Priority 2
Priority 3
Tenant

Snow Removal Plan - Tenant Responsibilities

yxe

Appendix VII

Ice Control Data Sheets

CLARIANT

Liquid runway de-icing fluid
SAFEWAY® KA HOT

what is precious to you?

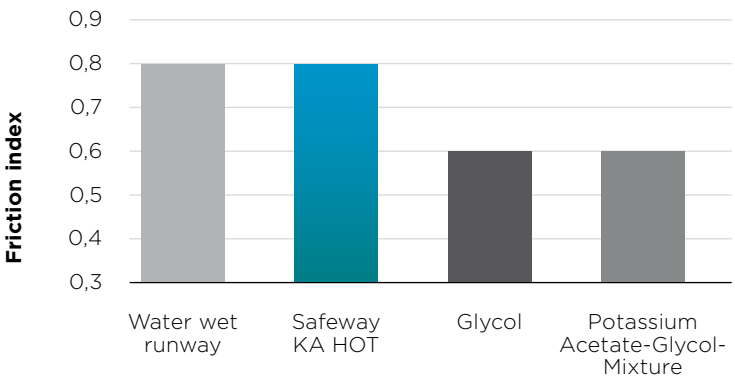
SAFEWAY® KA HOT

Clariant is the global leader in aircraft and runway de-icing products with over 40 years of experience. Our outstanding expertise in business relationships, product service, logistics and our world class research team make Clariant's Safewing®, Max Flight™, Octaflo™ and Safeway® products your preferred choice in the aviation business.

Safeway® KA HOT is an advanced acetate based runway de-icing solution. The HOT formulation gives the fluid an outstanding wetting performance, ensuring maximum surface coverage, optimizing friction values and de-/ anti-icing performance, as well as reducing corrosion and environmental impact.

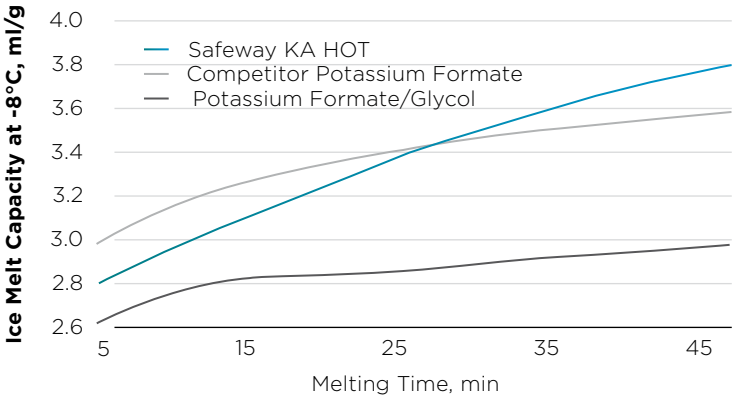
MAXIMIZED RUNWAY FRICTON

The aim of all de-icers is to maximize the runway friction during all plane movements at airports. Safeway® KA HOT provides best friction values as shown below.



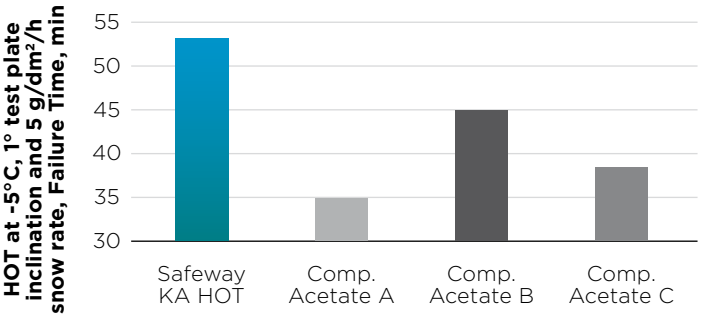
INCREASED EFFICIENCY

The ability of a fluid to melt ice is critical to de-icer performance. The more ice a fluid can melt, the more effectively it will perform in its role as a de-icer. This characteristic can be demonstrated as ice melting capacity. The Safeway® KA HOT formulation provides a superior ice melting capacity, as shown below.



EXTENDED ENDURANCE TIME

The HOT formulation results in an even coating of the fluid on the runway surface. This helps to prevent the build up of ice occurring between micro-droplets of sprayed fluid. A uniform surface coating increases anti-icing performance and also facilitates the mechanical removal of ice/slush during winter operations. Safeway® KA HOT, tested in artificial snow with NCAR Snow Maker of APS Aviation Inc., shows a clear holdover time benefit.



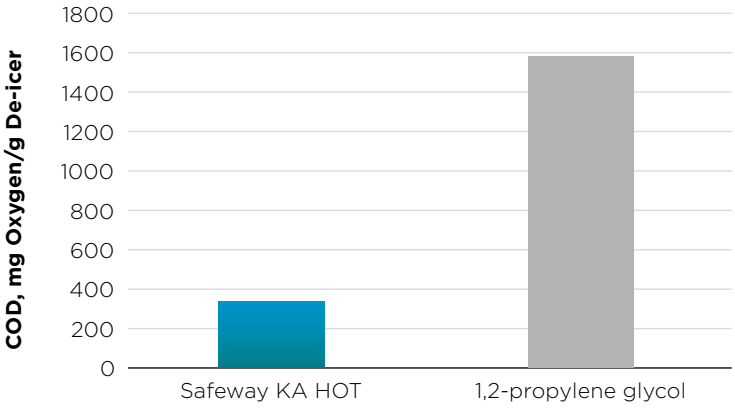
COMMERCIAL BENEFITS

Extended endurance times and ease of ice/slush removal optimizes time, personnel, fuel and operational costs. During periods of precipitation every minute the runway surface maintains its friction performance is absolutely vital. Using the right fluid during winter operations will optimize airport traffic and minimize costly delays. The optimized environmental profile of Safeway® KA HOT helps reducing the costs of expensive runway effluent treatment.

SAFEWAY® KA HOT

ENVIRONMENTAL BENEFITS

New and developing environmental legislation requires that airports manage their effluent streams and ensure minimal environmental impact. Safeway® KA HOT has a significantly lower chemical oxygen demand than its organic counterparts, e. g. glycol based formulations and urea. Decreasing the COD greatly reduces the cost of effluent treatment at the airport.



ADDITIONAL BENEFITS

- Chloride, nitrate, nitrite, triazole free
- Low toxicity to flora and fauna
- Helps airports meet ecological requirements
- Readily biodegradable

IMPROVED CORROSION PROTECTION

Safeway® KA HOT maximizes material compatibility due to the unique corrosion inhibitor system, fulfilling and exceeding the global standard as defined by SAE AMS 1435.

PRODUCT PROPERTIES

Chemical Composition	approx. 50 % aqueous potassium acetate
Appearance	clear liquid
Density (20 °C)	approx. 1.28 g/cm³
pH (as is)	9.0 – 11.4

CERTIFICATIONS AND APPROVALS

Safeway® KA HOT is certified to the latest version of the international standard AMS 1435.

APPLICATION

Safeway® KA HOT can be applied using conventional spray trucks. The amount of Safeway® KA HOT must be adjusted according to the weather situation and runway condition.

DELIVERY & STORAGE

Safeway® KA HOT is available in bulk tank trucks and IBC containers. It can be stored in tanks made of stainless steel, alkaline resistant plastic or mild steel coated with synthetic resin. Always use properly labelled tanks to prevent potential contamination.

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CLARIANT

Solid runway de-icing fluid
SAFEWAY® SF

what is precious to you?

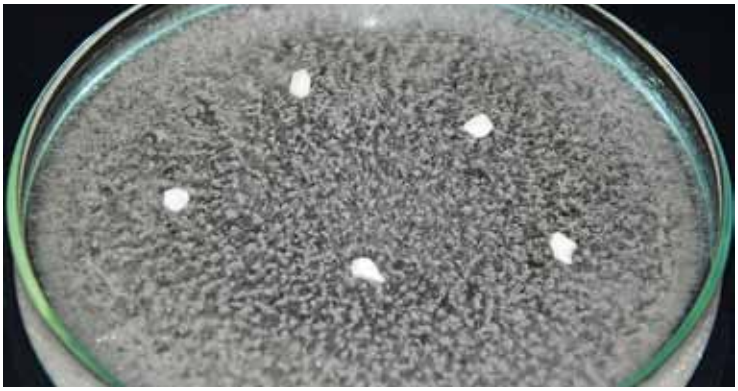
SAFEWAY® SF

Clariant is the global leader in aircraft and runway de-icing products with over 40 years of experience. Our outstanding expertise in business relationships, product service, logistics and our world class research team make Clariant's Safewing®, Max Flight™, Octaflo™ and Safeway® products your preferred choice in the aviation business.

Safeway® SF is an advanced sodium formate based runway and apron de-icing solid. The formulation makes Safeway® SF an extremely effective and easy applicable de-/anti-icing product that gives long-term protection against snow, slush and ice.

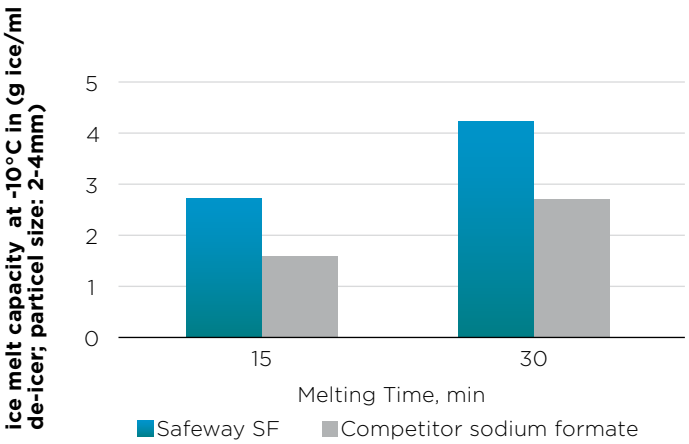
MAXIMIZED ICE PENETRATION

The ability of solid de-icers to penetrate through ice layers and undercut them is very important. This is reflected by the ice penetration ability. Safeway® SF provides excellent ice penetration, as shown below.



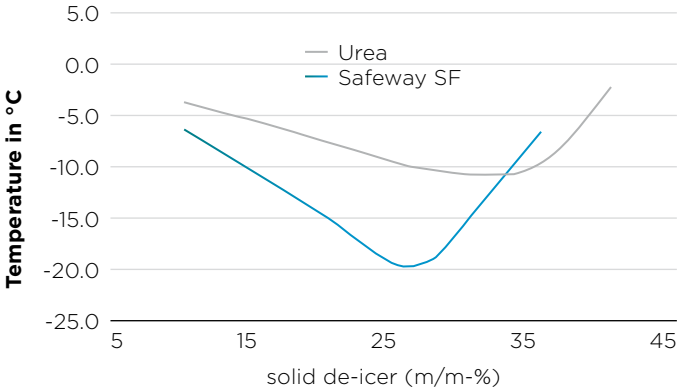
INCREASED EFFICIENCY

The characteristic can be demonstrated as ice melting capacity. The Safeway® SF formulation provides an excellent ice melting capacity, as shown below.



LOWER FREEZING POINT

During precipitation applied runway de-icers are diluted and, thus, the freezing point of the solution on the runway increases. Which results in earlier re-freezing. Therefore, solid de-icers need to show a good freezing-point depression, as shown below.



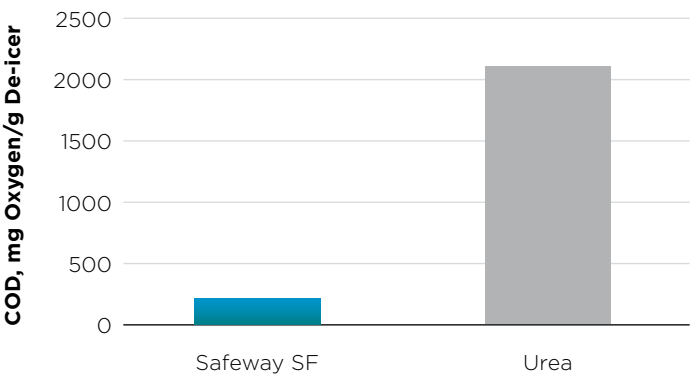
COMMERCIAL BENEFITS

Extended endurance times and ease of ice/slush removal optimizes time, personnel, fuel and operational costs. During periods of precipitation every minute the runway surface maintains its friction performance is absolutely vital. Using the right fluid during winter operations will optimize airport traffic and minimize costly delays. The excellent environmental profiles of Safeway® SF helps reducing the costs of expensive runway effluent treatment.

SAFEWAY® SF

ENVIRONMENTAL BENEFITS

New and developing environmental legislation requires that airports manage their effluent streams and ensure minimal environmental impact. The formate formulation has considerably less COD than glycol and urea based products and about one third the COD of acetate based de-icers.



ADDITIONAL BENEFITS

- Chloride, nitrate, nitrite, and triazole free
- Low toxicity to flora and fauna
- Helps airports meet ecological requirements
- Readily biodegradable

IMPROVED CORROSION PROTECTION

Safeway® SF maximizes material compatibility due to the unique corrosion inhibitor system, fulfilling and exceeding the international standard AMS 1431.

PRODUCT PROPERTIES

Chemical Composition	approx. 98 % sodium formate
Appearance	white solid
Bulk density	approx. 941 kg/m³
pH (50 g/l at 20°C)	approx. 11.5

CERTIFICATIONS AND APPROVALS

Safeway® SF is certified to the latest version of the international standard AMS 1431.

APPLICATION

Safeway® SF can be applied using conventional spreaders. The amount of Safeway® SF must be adjusted according to the weather situation and runway conditions.

DELIVERY & STORAGE

Safeway® SF is available in 1000 kg, 500 kg and 25 kg bags. In order to avoid sticking always use properly labeled tanks to prevent possible contamination.

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Appendix VIII

TC Airport Runway sand spec

322.415 Ice Control Chemicals and Sand

(1) The operator of an airport shall only use, on movement areas, ice control chemicals that:

(a) have properties meeting the most current applicable Society of Automotive Engineers (SAE) Aerospace Materials Specifications; or

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

Information note:

The manufacturer or supplier of ice control chemicals should provide to the operator information pertaining to the environmental impact of applying the chemicals.

(2) The operator of an airport shall only use sand for airport movement areas that meet the following criteria:

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

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

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

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

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

Information note:

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

Appendix IX

TRACR-NG GRF - Runway Condition Report

default	RSC 09 5/5/5 100 PCT WET, 100 PCT WET, 90 PCT WET. VALID SEP 10 1121 - SEP 10 1921. RSC 27 5/5/5 90 PCT WET, 100 PCT WET, 100 PCT WET. VALID SEP 10 1121 - SEP 10 1921. RSC 15 5/5/5 90 PCT WET, 90 PCT WET, 90 PCT WET. VALID SEP 10 1120 - SEP 10 1920. RSC 33 5/5/5 90 PCT WET, 90 PCT WET, 90 PCT WET. VALID SEP 10 1120 - SEP 10 1920. ADDN NON-GRF/TALPA INFO: CRFI 09 NR. CRFI 27 NR. CRFI 15 NR. CRFI 33 NR. RMK: TWY ALPHA, FOXTROT, 202109101122, WET. TWY BRAVO, 202109101121, WET. TWY CHARLIE, 202109101123, WET. RMK: APN APRON I, APRON II, APRON III, APRON IV, APRON V, APRON VI, APRON VII, DE-ICING BAY, 202109101123, WET.
en	RSC 09 5/5/5 100 PCT WET, 100 PCT WET, 90 PCT WET. VALID SEP 10 1121 - SEP 10 1921. RSC 27 5/5/5 90 PCT WET, 100 PCT WET, 100 PCT WET. VALID SEP 10 1121 - SEP 10 1921. RSC 15 5/5/5 90 PCT WET, 90 PCT WET, 90 PCT WET. VALID SEP 10 1120 - SEP 10 1920. RSC 33 5/5/5 90 PCT WET, 90 PCT WET, 90 PCT WET. VALID SEP 10 1120 - SEP 10 1920. ADDN NON-GRF/TALPA INFO: CRFI 09 NR. CRFI 27 NR. CRFI 15 NR. CRFI 33 NR. RMK: TWY ALPHA, FOXTROT, 202109101122, WET. TWY BRAVO, 202109101121, WET. TWY CHARLIE, 202109101123, WET. RMK: APN APRON I, APRON II, APRON III, APRON IV, APRON V, APRON VI, APRON VII, DE-ICING BAY, 202109101123, WET.

Information available by NOTAM.

Appendix X

AC 300-019 Global Reporting Format for Runway Surface Conditions

Transport Canada Transports Canada

Advisory Circular

Subject:	**Global Reporting Format (GRF) for Runway Surface Conditions**		
Issuing Office:	Civil Aviation, Standards	Document No.:	AC 300-019
File Classification No.:	Z 5000-34	Issue No.:	02
RDIMS No.:	15565688-V62	Effective Date:	2021-02-21

Table of contents

1.0 Introduction ... 3

1.1 Purpose ... 3

1.2 Applicability ... 3

1.3 Description of changes ... 3

2.0 References and requirements ... 4

2.1 Reference documents ... 4

2.2 Cancelled documents ... 4

2.3 Definitions and abbreviations ... 4

3.0 Background ... 7

4.0 Components of the global reporting format (GRF) in Canada ... 8

4.1 General ... 8

4.2 Aircraft movement surface condition report (AMSCR) and runway surface condition (RSC) NOTAM ... 8

4.3 Runway condition assessment matrix (RCAM) ... 8

4.4 Runway condition code (RWYCC) ... 8

4.5 Runway surface conditions ... 9

5.0 Reporting criteria for aircraft movement surface condition report (AMSCR) ... 9

5.1 General ... 9

5.2 Direction of report ... 9

5.3 Reporting by runway thirds ... 9

5.4 Runway surface descriptions ... 10

5.5 Percent coverage ... 11

5.6 Depth assessments ... 12

5.7 Number of runway surface descriptions that may be reported ... 12

5.8 Wet runways ... 13

5.9 Standing water ... 15

5.10 Slippery when wet ... 15

5.11 Unpaved and partially paved runways ... 16

5.12 Cleared width ... 17

5.13 Conditions on remaining width of runway ... 18

6.0 Runway condition assessment matrix (RCAM)....18
6.1 General....18
6.2 Assessment criteria....19
6.3 Runway surface description....19
6.4 Runway condition code (RWYCC)....19
6.5 CRFI information presented in the RCAM....23
6.6 RWYCC downgrade assessment criteria....24
6.7 Pilot reported braking action....25
6.8 RWYCC upgrade assessment criteria....26
7.0 Process to determine the RWYCC....27
7.1 Step 1 – determine applicability of RWYCCs....27
7.2 Step 2 – apply assessment criteria to determine preliminary RWYCC....27
7.3 Step 3 – validate preliminary RWYCCs....27
7.4 RWYCC for slippery when wet runways....28
8.0 Other reported runway condition information....30
8.1 Treatments applied to the runway surface....30
8.2 Snow drifts, windrows, or snowbanks on the runway....30
8.3 Other localized conditions....31
8.4 Snowbanks adjacent to the runway....32
8.5 Runway remarks....32
9.0 Additional non-GRF/TALPA information....33
9.1 Canadian runway friction index (CRFI) – overview....33
9.2 Regulatory requirements for CRFI measurement and reporting....33
9.3 Format of CRFI report....34
10.0 Taxiway and apron information....35
11.0 General remarks....36
12.0 Order of reported runway condition information....36
13.0 Requirements to issue an AMSCR....37
14.0 Validity period....38
15.0 Examples of runway surface condition (RSC) NOTAM....38
16.0 Conclusion....42
17.0 Information management....43
18.0 Document history....43
19.0 Contact us....43
Appendix A — Preliminary RWYCC single contaminant decision process....44
Appendix B — Preliminary RWYCC multiple contaminant decision process....45
Appendix C — Full process to determine the RWYCC....46
Appendix D — Example illustrating significant change....47
Appendix E — Training....48

1.0 Introduction

(1) This Advisory Circular (AC) is provided for information and guidance purposes. It provides guidance with respect to section 302.417 of the *Canadian Aviation Regulations* (CARs) – Movement Area Inspections and Reports and section 322.417 of the *Airport Standards* — Airport Winter Maintenance in consideration of upcoming changes related to the Canadian implementation of the International Civil Aviation Organization (ICAO) Global Reporting Format (GRF). 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 document is to introduce and explain the forthcoming Canadian implementation of the GRF for runway surface condition reporting. The Canadian implementation of GRF is based on the Take-off and Landing Performance Assessment (TALPA) methodology which was developed by the United States Federal Aviation Administration (FAA).

(2) This document is also being made available to the aviation industry for the purpose of conveying flight safety information. All aerodrome personnel involved with runway condition assessment should be aware of the forthcoming implementation of the new GRF for runway condition reporting. These personnel are encouraged to utilize this AC to assist them in reviewing this topic and to determine the applicability to their specific operations.

1.2 Applicability

(1) This document is applicable to:

(a) Canadian airport operators holding an Airport Certificate issued pursuant to Part 3 of the *Canadian Aviation Regulations* (CARs);

(b) Canadian aerodrome operators;

(c) Transport Canada Civil Aviation (TCCA) inspectors with certification and safety oversight responsibilities; and

(d) This document is also available to the aviation industry at large for information purposes. Its contents is of particular interest to:

(i) Canadian pilots, flight dispatchers, air operators and private operators as well as foreign air operators, and

(ii) Individuals and organizations that exercise privileges granted to them under an External Ministerial Delegation of Authority.

1.3 Description of changes

(1) The guidance in this document has been extensively modified in consideration of feedback from industry stakeholders, including NAV Canada, resulting from the GRF winter trials which occurred during the winter of 2019-2020. These changes are numerous and affect all parts of the document and therefore are not itemized individually here. Airport and aerodrome operators should review this document in its entirety to ensure familiarity with all changes.

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) *Aeronautics Act* (R.S.C., 1985, c. A-2)

(b) Part III, Subpart 01 of the *Canadian Aviation Regulations* (CARs) — Aerodromes;

(c) Part III, Subpart 02 of the CARs — Airports;

(d) Transport Canada Publication, TP 312, 5th Edition — Aerodrome Standards and Recommended Practices;

(e) Advisory Circular (AC) 300-005 — Changes to Runway Surface Condition Reporting;

(f) AC 302-017 — Runway Friction Measurement;

(g) NAV CANADA - Canadian NOTAM Operating Procedures; (CNOP)

(h) Federal Aviation Administration AC 150/5200-28F, 2016-12-30 — Notices to Airmen (NOTAMs) for Airport Operators;

(i) FAA AC 150/5200-30D, 2018-03-08 — Airport Field Condition Assessments and Winter Operations Safety;

(j) International Civil Aviation Organization (ICAO) Annex 14 to the Convention on International Civil Aviation — International Standards and Recommend Practices: Aerodromes – Volume I Aerodrome Design and Operations (Eighth Edition, July 2018);

(k) ICAO Circular 355– Assessment, Measurement and Reporting of Runway Surface Conditions;

(l) ICAO Doc 9981 Procedures for Air Navigation Services – Aerodromes (Second Edition, 2016); and

(m) ICAO Amendment 2 to Doc 9981 Procedures for Air Navigation Services, 2018-11-08 — Aerodromes.

(n) ASTM 3188 – Standard Terminology for Aircraft Braking Performance

2.2 Cancelled documents

(1) Not applicable.

(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) **Aircraft Movement Surface Condition Report:** means a report that details the surface conditions of all movement areas at an airport, including runways and taxiways.

(b) **Canadian Runway Friction Index:** means the average of the friction measurements taken on runway surfaces on which freezing or frozen contaminants are present.

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

(d) **Compacted snow**: means snow that has been compacted into a solid mass such that aeroplane tires, at operating pressures and loadings, will run on the surface without significant further compaction or rutting of the surface.

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

(f) **Contaminated runway:** A runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the following substances: compacted snow, dry snow, frost, ice, slush, standing water, wet ice or wet snow.

Note: Sand and ice control chemicals are also contaminants but are not included in the definition of contaminated runway because their effect on runway surface friction characteristics and the runway condition code cannot be evaluated in a standardized manner.

(g) **Dry:** means a surface condition that is free of visible moisture, and has no observed contaminants.

(h) **Dry snow:** means snow that does not contain sufficient water to allow the crystals to stick together or bond to a surface. (Dry snow, when compressed, falls apart, and a snowball cannot readily be made from it.)

(i) **Frost:** means ice crystals formed from airborne moisture on a surface whose temperature is below freezing. Frost differs from ice in that the frost crystals grow independently and therefore have a more granular texture.

Note 1: Below freezing refers to air temperature equal to or less than the freezing point of water (0°C).

Note 2: Heavy frost that has noticeable depth may have friction qualities similar to ice and downgrading the runway condition code accordingly should be considered. If driving a vehicle over the frost does not result in tire tracks down to bare pavement, the frost may be of sufficient depth to consider a downgrade of the runway condition code.

(j) **Ice:** means water that has frozen on a surface and includes the condition commonly known as black ice as well as the condition in which compacted snow has turned into a polished ice surface.

(k) **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.

(l) **Paved surface:** means a surface of asphaltic concrete (flexible) or Portland cement concrete (rigid).

(m) **Percent coverage:** means the estimated amount of a condition or contaminant present on the surface of the runway.

(n) **Remaining width:** means the un-cleared portion of the runway. (See cleared width.)

(o) **Runway Condition Assessment Matrix:** means a matrix allowing for the assessment of runway condition code from a set of observed runway surface condition(s).

(p) **Runway Condition Code:** means a number describing the runway surface condition.

(q) **Runway Surface Condition:** means the portion of the AMSCR which reports the surface condition of the runway.

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

(s) **Significant change:** means a material change to the runway surface condition which may impact the operational performance of the surface. Significant changes can include: changes in type of condition or contaminant, such as from dry snow to wet snow; measurable changes in depth of condition or 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.

(t) **Slippery when wet runway:** means a wet runway where the surface friction characteristics of the runway have been determined to be degraded.

Note: A runway or any portion of a runway is deemed as having low friction (e.g. due to rubber accumulation, surface texture degradation, etc.) when the friction measurements (as measured by a continuous friction measuring device in accordance with AC 302-017) are below the minimum coefficient of friction specified in TP 312.

(u) **Slush:** means partially melted snow or ice, with a high water content, from which water readily flows. (Slush will spatter if stepped on forcefully, and water will drain from slush when a handful is picked up.)

(v) **Snowbank:** means a heap or mound of snow created mechanically that is higher than the surrounding snow cover, and is located:

(i) next to or on the edge of a runway or taxiway; and/or

(ii) next to or on the edge of the cleared area of a runway or taxiway

Note: 'Snowbank' is used to describe accumulations which will remain over longer time periods; see 'Windrow' for shorter-term accumulations, such as those resulting from clearing operations in progress.

(w) **Snow drift:** A heap or mound of snow created by action of the wind.

(x) **Standing water:** means water of depth greater than 1/8 inch (3mm).

(y) **Take-off and Landing Performance Assessment:** means a method of reporting runway conditions (which relates to aeroplane performance), developed by the US FAA, which is intended to reduce the risk of runway excursions.

(z) **Wet:** means a surface condition where there is any visible dampness or water up to and including 1/8 inch (3mm) deep.

(aa) **Wet ice:** means ice with water on top of it or ice that is melting.

(bb) **Wet snow:** means snow that will stick together when compressed but will not readily allow water to flow from it if squeezed. (Wet snow contains enough water to be able to make a well-compacted, solid snowball, but water will not squeeze out.)

(cc) **Windrow:** means a ridge of material, such as snow or gravel, created by airside maintenance equipment.

Note: A windrow is typically temporary in nature, having been formed during clearing operations with the intent of subsequent removal in the near-term (either ploughed/swept to the runway edge or graded for gravel runways).

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

(a) **AC:** Advisory Circular

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

(c) **ASTM:** American Society for Testing and Materials

(d) **ATS:** Air Traffic Services

(e) **AWMS:** Airport Winter Maintenance Standard

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

(g) **CL:** Centreline

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

(i) **FAA:** Federal Aviation Administration

(j) **GRF:** Global Reporting Format

(k) **ICAO:** International Civil Aviation Organization

(l) **NOTAM:** Notice to Airmen

(m) **NR:** Not Reported (applies to CRFI reports)

(n) **PIREP:** For the purpose of this AC, PIREP means a pilot report of braking action which reflects the pilots' assessment of the available wheel braking.

(o) **RCAM:** Runway Condition Assessment Matrix

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

(q) **RVR:** Runway Visual Range

(r) **RWY:** Runway

(s) **RWYCC:** Runway Condition Code

(t) **TALPA:** Takeoff and Landing Performance Assessment

(u) **TCCA:** Transport Canada Civil Aviation

(v) **TP:** Transport Canada Publication

(w) **TWY:** Taxiway

3.0 Background

(1) The International Civil Aviation Organization (ICAO) has developed a new globally harmonized methodology for runway condition assessment and reporting. This internationally accepted methodology is called the Global Reporting Format (GRF). The implementation date for GRF in Canada is August 12th, 2021.

(2) The philosophy of the GRF is that the airport operator assesses the runway surface conditions whenever water, snow, slush, ice or frost are present on an operational runway. From this assessment, a runway condition code (RWYCC) and a description of the runway surface are reported which can be used by the flight crew for aeroplane performance calculations. This format, based on the type, depth and coverage of contaminants is the best assessment of the runway surface condition by the airport operator. All other pertinent information should also be taken into consideration. When changes in conditions occur, they should be reported without delay.

(3) The RWYCC reflects the expected braking capability as a function of the surface conditions. With this information, the flight crews can derive, from the performance information provided by the aeroplane manufacturer, the landing distance of an aeroplane under the existing conditions. When a RWYCC is not provided, pilots reference the reported runway surface description (condition or type and depth of contaminant) to determine expected landing performance.

(4) Flight crews utilize the reported runway surface description (condition or type and depth of contaminant) when determining their aeroplane’s expected take-off performance.

(5) In preparation for the implementation of GRF in Canada, Transport Canada Civil Aviation (TCCA) has developed the new runway condition reporting methods which are described in this AC.

(6) Canadian implementation will meet the intent and important safety elements of the GRF and will also provide some enhancements. One of the main differences from the ICAO format is the ability to report two runway surface descriptions (condition or type and depth of contaminant) per runway third. The option to report two runway surface descriptions will harmonize the reporting in North America. This approach provides more flexibility for airports or aerodromes, where RWYCCs will not be reported. It also gives pilots more detailed information for the purpose of making take-off performance calculations.

(7) NAV CANADA is updating its technology and software to meet these new TCCA requirements.

4.0 Components of the global reporting format (GRF) in Canada

4.1 General

(1) The Global Reporting Format (GRF) is an internationally accepted concept which utilizes a consistent method to report runway surface conditions. The GRF consists of five fundamental elements:

(a) Aircraft movement surface condition report (AMSCR) and Runway Surface Condition (RSC) NOTAM;

(b) Runway condition assessment matrix (RCAM);

(c) Runway condition code (RWYCC);

(d) Runway surface conditions and

(e) Runway surface descriptions.

4.2 Aircraft movement surface condition report (AMSCR) and runway surface condition (RSC) NOTAM

(1) Consistent with the principles of the GRF, the AMSCR and RSC NOTAM have been specially designed to align with the aeroplane performance information (based on TALPA methods) which is used by pilots.

4.3 Runway condition assessment matrix (RCAM)

(1) The RCAM is used to determine a runway condition code from a set of observed runway surface condition(s).

(2) Details respecting the RCAM are provided in Section 6 of this AC.

4.4 Runway condition code (RWYCC)

(1) The Assessment Criteria consist of Runway Surface Descriptions which are used to determine the Runway Condition Code (RWYCC).

(2) Flight crews use the final RWYCC for determining the landing performance of their aeroplane. (The RWYCC is not utilized for determining aeroplane takeoff performance.)

(3) The process for determining the RWYCC is provided in Section 6 of this AC.

4.5 Runway surface conditions

(1) There are four defined runway surface conditions:

(a) Dry runway;

(b) Wet runway;

(c) Slippery when wet runway; and

(d) Contaminated runway.

(2) The runway surface conditions are further sub-divided into **runway surface descriptions**, which describe the specific details of a runway surface.

(3) The runway surface descriptions, including depth and temperature (when applicable), are used to determine the preliminary RWYCC

(4) Information on runway surface descriptions is provided in Section 5.4.

5.0 Reporting criteria for aircraft movement surface condition report (AMSCR)

5.1 General

(1) The following sections describe the data fields for the runway condition information to be included in the new Aircraft Movement Surface Condition Report (AMSCR) format.

(2) To harmonize the data being entered into the software, each data field has a range of acceptable entries (parameters). This results in some constraints for some of the items reported by the individual inspecting the runway.

5.2 Direction of report

(1) When runway condition information is reported for each third of the runway, as described in Section 5.3, the RSC NOTAM will include two reports; one for each runway direction (i.e. RSC RWY 07 and RSC RWY 25). This provides information to pilots which is oriented in their direction of flight.

(2) When runway condition information is reported by full runway length (i.e. not in thirds), the NOTAM will provide a single report for the runway pair, as per the previous practice (e.g. RSC RWY 07/25).

(3) The airport or aerodrome operator will only complete one AMSCR per runway pair (e.g. RWY 07/25), regardless of whether or not the NOTAM will present this information by:

(a) runway thirds (with two reports; one for each runway direction); or

(b) full runway length (with a single report for the runway pair).

5.3 Reporting by runway thirds

(1) The runway condition information will normally be entered for each third of the runway. Reporting the runway condition information in thirds provides useful information for pilots. This format allows pilots to identify where conditions or contaminants are located on a runway and where the biggest impact on aeroplane performance may exist.

(2) In consideration of the types of aircraft operating at airports or aerodromes, the operator may choose to report full runway length (i.e. not to report by runway thirds). All other input parameters will be the same.

(3) The decision whether or not to report by runway thirds or by full runway length should be made in consultation with the airport/aerodrome users. To minimize confusion, the reporting methodology needs to remain consistent within the season.

Note: Subsections 302.406(1) and 302.410(1) of the CARs require airport operators to consult with a representative sample of the air operators that use the airport.

(4) An airport or aerodrome operator may choose to report a runway(s) in thirds and choose to report another runway(s) by full runway length. This would typically be the case where:

(a) longer runways serving larger aircraft would normally be reported in thirds; and

(b) shorter runways serving smaller aircraft would normally be reported by full runway length.

(5) When runway condition information is reported in thirds a RWYCC is to be reported. Conversely, if the runway condition information reported by full runway length, then the RWYCC will not be reported.

(6) Reporting by runway thirds is not applicable for unpaved runways (gravel, turf, etc.).

(7) There is no specific regulatory link between the requirements for reporting CRFI in thirds and the criteria for reporting runway surface conditions in thirds. Information on Canadian Runway Friction Index (CFRI) reports, including an explanation of the circumstances when CRFI reports must be provided in thirds, are detailed in Section 9.

5.4 Runway surface descriptions

(1) The following terms will be used to describe the runway surface condition for each runway third or for the full runway length:

(a) COMPACTED SNOW

(b) DRY

(c) DRY SNOW

(d) DRY SNOW ON TOP OF COMPACTED SNOW

(e) DRY SNOW ON TOP OF ICE

(f) FROST

(g) ICE

(h) SLIPPERY WHEN WET

(i) SLUSH

(j) SLUSH ON TOP OF ICE

(k) STANDING WATER

(l) WATER ON TOP OF COMPACTED SNOW

(m) WET

(n) WET ICE

(o) WET SNOW

(p) WET SNOW ON TOP OF COMPACTED SNOW

(q) WET SNOW ON TOP OF ICE

5.5 Percent coverage

(1) The percent coverage is reported using the increments listed in Table 1. If the assessed percent coverage is between increments, it should be rounded up as indicated.

Table 1 – Percent coverage increments

Assessed Percent Coverage	Reported Percent Coverage
1 - 10	10 PCT
11 – 20	20 PCT
21 – 25	25 PCT
26 – 30	30 PCT
31 – 40	40 PCT
41 – 50	50 PCT
51 – 60	60 PCT
61 – 70	70 PCT
71 – 75	75 PCT
76 – 80	80 PCT
81 – 90	90 PCT
91- 100	100 PCT

Note: When assessing percentage of coverage, airport and aerodrome operators should be aware that the NAV CANADA software limits the total percentage of contaminants from exceeding 100%.

(2) Where some sections of the runway or sections of a runway third are not wet or contaminated (i.e. are DRY), the reported runway conditions and contaminants are not required to add up to 100%. For example:

(a) If 50% of the runway third is covered with half an inch of DRY SNOW and the other 50% is DRY, this will be reported as “50 PCT 1/2IN DRY SNOW”.

(b) If 50% of the runway third is covered with half an inch DRY SNOW, 25% is covered with ICE, and the remaining 25% is DRY, this will be reported as “50 PCT 1/2IN DRY SNOW AND 25 PCT ICE.”

Notes:

1) In both of the above examples DRY is not reported; this is a change from the previous practice.

2) The reasons for reporting DRY conditions are provided in 5.7(3).

5.6 Depth assessments

(1) Contaminant depths will continue to be reported in inches and fractions of inches, as illustrated in Table 2, below.

Table 2 – Contaminant depth increments

Assessed Depth	Reported Depth
1/8 inch or less	1/8IN
> 1/8 inch to and including 1/4 inch	1/4IN
> 1/4 inch to and including 1/2 inch	1/2IN
> 1/2 inch to and including 3/4 inch	3/4IN
> 3/4 inch to and including 1 inch	1IN
> 1 inch to and including 1 ½ inches	1 1/2IN
> 1 ½ inch to and including 2 inches	2IN

Note: At depths greater than two inches, the depth is rounded up and reported as the nearest whole number (e.g. an actual depth of two and a half inches is reported as 3IN).

(2) When the depth of contaminant(s) is variable:

(a) the maximum depth should be entered, since only one value may be entered in this field, and the maximum depth is the most important information for pilots; and

(b) the remarks section may be used to report a range of values for depth.

(3) Contaminant depths will be reported for:

(a) STANDING WATER;

(b) SLUSH;

(c) DRY SNOW;

(d) WET SNOW; and

(e) Combinations of contaminants where a loose contaminant (DRY SNOW, WET SNOW, SLUSH or STANDING WATER) overlies a hard contaminant (COMPACTED SNOW or ICE). In these cases, the depth of the loose contaminant is to be reported.

(4) For STANDING WATER, 1/4 inch is the minimum depth which can be reported. When the water depth is 1/8 inch or less, the runway is reported to be WET.

5.7 Number of runway surface descriptions that may be reported

(1) The number of runway surface descriptions that may be reported for each runway third is limited to two. Similarly, when the runway is reported by full runway length, the number of runway surface descriptions reported for the entire runway is also limited to two.

(2) If more than two conditions or contaminants are present, only the two most prevalent are reported. Other factors that may be taken into consideration in determining which two runway surface descriptions to report, include:

(a) the location of the condition or contaminant on the runway; and

(b) the slipperiness of the condition or contaminant, which is reflected in the corresponding RWYCC.

(3) A “DRY” runway surface condition should be reported:

(a) when there is need to report wet or contaminated conditions on the remainder of the surface. This would be the case when a runway third(s) is 100% DRY and:

(i) there are contaminants in other runway third(s), or

(ii) the other runway third(s) is wet; or

(b) the cleared width is less than the published width and the cleared portion of the runway is 100% DRY;

(c) when a significant change has occurred. For example when a runway third(s) reported as RWYCC 5 is now RWYCC 6; and

(d) when a runway(s) at an aerodrome is DRY and another runway(s) at the same aerodrome is reported to be wet or contaminated.

5.8 Wet runways

(1) As per the previous practice, airport and aerodrome operators are to report “WET” conditions associated with winter contaminants. Additionally, when a runway has been treated with chemicals to mitigate a specific contaminant and the resulting surface is now “WET,” this condition is also to be reported.

Note: Section 6.4 provides information on RWYCCs.

(2) The timely and accurate reporting of conditions when water or moisture is present on the runway is recognized to be challenging. For example, during an active thunderstorm a runway may rapidly transition from dry, to wet (water 1/8 inch or less) to contaminated with standing water (water greater than 1/8 inch), in a very short period of time. In addition, variations in the drainage capabilities of a runway and/or portions of a runway further complicate accurate reporting. Therefore, airport or aerodrome operators may not be able to report these conditions. Figure 1 illustrates the dynamic nature of rainfall conditions.

Figure 1 – In a rainfall event such as an active thunderstorm, the amount of water or moisture on a runway can change rapidly. The dynamic nature of rainfall can present challenges for the timely and accurate reporting of water or moisture on a runway.

(3) Where practicable, the reporting of wet runway conditions (which are not associated with winter contaminants and/or chemical treatments) is encouraged.

(4) When an airport or aerodrome operator reports water or moisture on a runway, the following should be considered:

(a) A surface condition where there is any visible dampness or water up to and including 1/8 inch (3mm) is reported as “WET.”

Note: A damp runway that meets this definition is considered wet, regardless of whether or not the surface appears reflective. This is a change from past practices, where a distinction was made for runways which were not dry, but were not reflective.

(b) A surface condition where there is water of depth greater than 1/8 inch (3mm) is reported as “STANDING WATER” as described in Section 5.9, below .

(5) The reporting of “SLIPPERY WHEN WET” runway conditions is described in Section 5.10, below.

(6) The reporting of standing water patches (localized standing water conditions – such as puddles or pools of water) is described in Section 8.3.

5.9 Standing water

(1) Water on a runway at a depth greater than 1/8 of an inch (3mm) is reported as “STANDING WATER.”

Note: Section 6.4 provides information on RWYCCs.

(2) As discussed in Section 5.8, due to the dynamic nature of rainfall conditions, the timely and accurate reporting of conditions when water or moisture is present on the runway, is recognized to be challenging.

(3) Where practicable, the reporting of standing water is encouraged.

(4) To facilitate the accurate reporting of standing water, airport and aerodrome operators should also be aware of the conditions which would lead to the accumulation of standing water including:

(a) the drainage characteristics of their runways, and

(b) the rate and amount of precipitation.

5.10 Slippery when wet

(1) A runway or any portion of a runway is deemed as having low friction (e.g. due to rubber accumulation, surface texture degradation, etc.) when the friction measurements (as measured by a continuous friction measuring device in accordance with AC 302-017) are below the minimum coefficient of friction specified in TP 312 – Aerodrome Standards and Recommended Practices.

(2) A normal NOTAM (as opposed to a RSC report) which states that a runway may be “slippery when wet” is issued whenever the surface friction characteristics of a runway fall below the minimum standard, as described above in paragraph (1).

Note: The designation “slippery when wet” – when applied to a normal NOTAM – is a function of the friction characteristics of the pavement.

(3) The airport or aerodrome operator may cancel this normal “slippery when wet” NOTAM only when the runway friction level meets or exceeds the minimum standard.

(4) When there is a “slippery when wet” normal NOTAM in effect, runway conditions and contaminants on a runway are reported in the following manner:

(a) for any visible dampness or water up to and including 1/8 inch (3mm) present on the runway, an AMSCR is issued with a runway condition of "SLIPPERY WHEN WET;”

(b) with more than 1/8 inch (3mm) of water present on the runway, an AMSCR is issued with a runway condition of "STANDING WATER” with the corresponding percentage of coverage and depth (e.g. 25 PCT 1/4IN STANDING WATER); and

(c) for all conditions and contaminants other than wet or standing water, an AMSCR is issued with the type of contaminant, with the percentage of coverage and depth (e.g. 25 PCT 3IN DRY SNOW).

Note: As outlined in Sections 5.8 and 5.9, the reporting of water on a runway is acknowledged to be challenging; where practicable, the reporting of these conditions is encouraged.

(5) When there is a “slippery when wet” normal NOTAM in effect and there is a need to report a dry runway condition as outlined in Paragraph 5.7 (3), an AMSCR is issued with a runway condition of “DRY.”

(6) As per paragraph (5) above, when reporting in thirds and there is a “slippery when wet” normal NOTAM in effect, the runway surface conditions for each third will be reported as shown in the following examples:

(a) If the first third of a runway had twenty percent coverage of an **1/8 inch or less water** and the remaining runway thirds were dry, this would be reported as:

```
SLIPPERY WHEN WET, DRY, DRY
```

(b) If the first third of a runway had thirty percent coverage of 1/2 inch of water (**more than 1/8 inch of water**) and the last two thirds were wet, this would be reported as:

```
30 PCT 1/2IN STANDING WATER, SLIPPERY WHEN WET, SLIPPERY
WHEN WET
```

(c) If the first third of a runway had thirty percent coverage of a **contaminant other than standing water** such as 1/2 inch dry snow and the remaining thirds were dry, this would be reported as:

```
30 PCT 1/2IN DRY SNOW, DRY, DRY
```

(7) When reporting by full runway length (i.e. not by thirds) and there is a “slippery when wet” normal NOTAM in effect, the runway surface conditions for the runway will be reported as shown in the following examples:

(a) If there is **1/8 of an inch or less** water on any portion of the runway, this would be reported as:

```
SLIPPERY WHEN WET
```

(b) If there is thirty percent coverage of 1/2 inch of water (**more than 1/8 inch of water)** this would be reported as:

```
30 PCT 1/2IN STANDING WATER
```

(c) If there is thirty percent coverage of a **contaminant other than standing water** such as 1/2 inch dry snow and the remainder of the runway is dry, this would be reported as:

```
30 PCT 1/2IN DRY SNOW
```

(8) The processes used to determine a RWYCC when there is a “slippery when wet” normal NOTAM in effect are described in Section 7.4.

5.11 Unpaved and partially paved runways

(1) RWYCCs will not be provided for unpaved or partially paved runways.

(2) The following additional information can be reported for unpaved and partially paved runways:

(a) Graded (levelling of the runway surface);

(b) Packed (compaction of the runway surface); and/or

(c) Scarified (cutting of longitudinal grooves in the ice or compacted snow surface to improve directional control).

Note: A paved runway which is covered by ice may also be scarified, In this case, this information is entered as free text in Runway Remarks.

(3) Where applicable, airport and aerodrome operators should ensure that their facility’s entry in Canada Flight Supplement (CFS) includes the following information:

(a) “Compacted snow and gravel mix during winter conditions” as a runway surface description; and/or

(b) "Surface may be soft during freeze and thaw periods"

5.12 Cleared width

(1) If the cleared width is less than the published width, the width for which the runway conditions and RWYCCs apply is reported in feet.

Example: `RSC 32 … 160FT WIDTH.`

(2) Figure 2 illustrates various possibilities for cleared width.

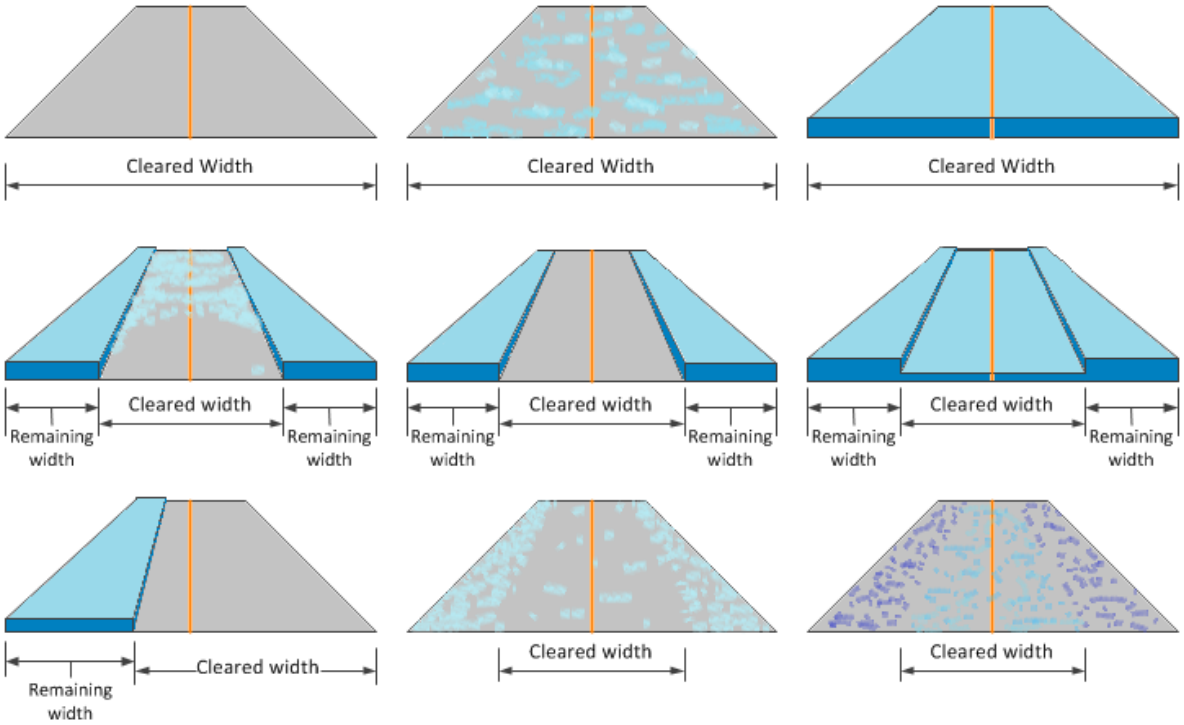

Figure 2 – Cleared width and remaining width

(3) If the cleared width is not symmetrical about the runway centreline, the cardinal (or inter-cardinal) direction of the offset from the runway's centreline is to be included in the RSC report.

Example: `RSC 32 … 160FT WIDTH OFFSET NORTH.`

(4) Figure 3 depicts runways with an asymmetric cleared width. (Example a) is provided for comparison purposes.)

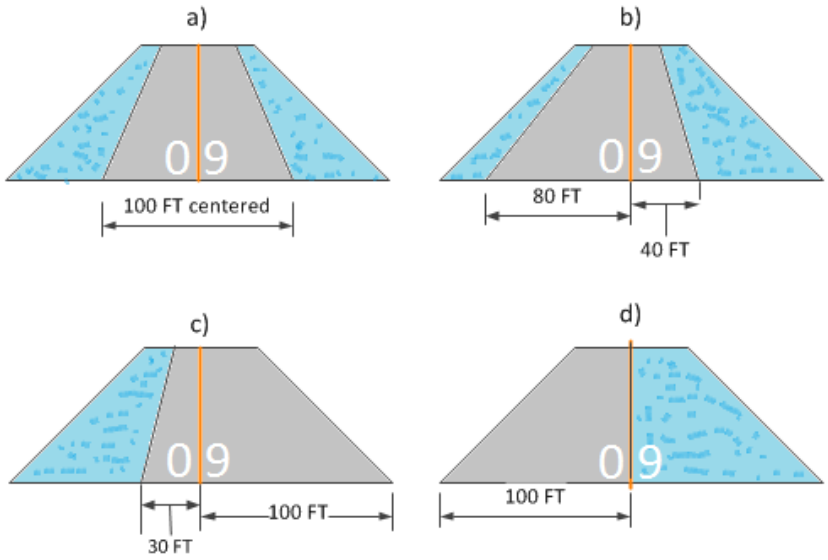

Figure 3 – Cleared width offset

(5) Examples of reports corresponding to the illustrations in Figure 3 appear below:

(a) RSC 09… 100FT WIDTH.

(b) RSC 09… 120FT WIDTH OFFSET NORTH.

(c) RSC 09… 130FT WIDTH OFFSET SOUTH.

(d) RSC 09… 100FT WIDTH OFFSET NORTH.

5.13 Conditions on remaining width of runway

(1) The conditions on the un-cleared portion of the runway (i.e. remaining width) will continue to be reported by full runway length (i.e. not by runway thirds).

(2) Only one type of surface condition and corresponding depth, should be reported for the un-cleared width of the runway, where applicable.

Example: `RSC 07… REMAINING WIDTH COMPACTED SNOW`

(3) While contaminant depths may vary from the centre cleared portion to the remaining portions or edges of the runway, the condition of the outlying portions should not present an operational hazard.

6.0 Runway condition assessment matrix (RCAM)

6.1 General

(1) The Runway Condition Assessment Matrix (RCAM) (Table 3) is the method by which the airport or aerodrome operator determines a preliminary Runway Condition Code (RWYCC) for each runway third, whenever water, snow, slush, ice or frost is present on the runway surface.

(2) The RCAM applies only to paved (asphalt and concrete) runway surfaces, and does not apply to unpaved or partially paved surfaces.

(3) When runway condition information is reported in thirds a RWYCC is to be reported. Conversely, if the runway condition information is not entered for each runway third, then the RWYCC will not be reported.

6.2 Assessment criteria

(1) This section of the RCAM consists of a Runway Surface Description and a Runway Condition Code. The Runway Surface Descriptions in each category are linked to the corresponding Runway Condition Code based on their effect on aeroplane braking performance.

6.3 Runway surface description

(1) The Runway Surface Description column of the RCAM lists:

(a) the contaminants on the runway (e.g. slush, dry snow, wet snow, etc.); and

(b) runway surface conditions, if a runway is dry, wet or slippery when wet.

(2) These runway surface descriptions are directly correlated to aeroplane landing performance and are listed in order of slipperiness (i.e. from least slippery to most slippery).

6.4 Runway condition code (RWYCC)

(1) Runway Condition Codes (Format: X/X/X) represent the runway condition description based on defined terms and increments. Use of these codes harmonizes with ICAO Annex 14, providing a standardized “shorthand” format for reporting runway condition, which can be used by pilots to determine landing performance parameters.

(2) A preliminary RWYCC is determined using the RCAM based on type and depth of contaminant and outside air temperature (where applicable); or the runway condition, when the runway is dry, wet, or slippery when wet. The preliminary RWYCC must be confirmed, downgraded or upgraded. The full process to determine the final RWYCC is outlined in Section 7.

(3) In the event the full width of the runway is not cleared, the runway condition code will be determined based on the contaminants present in the cleared portion of the runway (typically centre 100 feet).

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Table 3 – Runway condition assessment matrix (RCAM)

Assessment Criteria		Downgrade Assessment Criteria (Control/Braking Assessment Criteria)		
Runway Surface Description	**RWYCC**	**CRFI Range**	**Vehicle Deceleration or Directional Control Observation**	**Pilot Braking Action**
• DRY	**6**		-	-
• FROST • WET (The runway surface is covered by any visible dampness or water up to and including 1/8 **inch** (3mm) depth) **Up to and including 1/8 inch (3mm) depth:** • SLUSH • DRY SNOW • WET SNOW	**5**	**0.40 or higher**	Braking deceleration is normal for the wheel braking applied AND directional control is normal	GOOD
-15°C and Colder outside air temperature: • COMPACTED SNOW	**4**	**0.39 to 0.35**	Braking deceleration OR directional control is between Good and Medium	GOOD TO MEDIUM
• SLIPPERY WHEN WET (wet runway) • DRY SNOW or WET SNOW (Any depth) ON TOP OF COMPACTED SNOW **Greater than 1/8 inch (3mm) depth:** • DRY SNOW • WET SNOW **Warmer than -15°C outside air temperature:** • COMPACTED SNOW	**3**	**0.34 to 0.30**	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced	MEDIUM
Greater than 1/8 inch (3mm) depth: • STANDING WATER • SLUSH	**2**	**0.29 to 0.20**	Braking deceleration OR directional control is between Medium and Poor	MEDIUM TO POOR
• ICE	**1**	**0.19 or lower**	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced	POOR
• WET ICE • SLUSH ON TOP OF ICE • WATER ON TOP OF COMPACTED SNOW • DRY SNOW or WET SNOW ON TOP OF ICE	**0**		Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain	LESS THAN POOR / NIL

Notes (1 to 4):

1) Refer to Section 6.5 – CRFI Information Presented in the RCAM, for an explanation of the relationship between CRFI and RWYCCs.

2) When available, the runway surface temperature should be used.

3) **CAUTION**: At temperatures near and above freezing (i.e. at -3°C and warmer), the runway surface condition may be more slippery than indicated by the preliminary RWYCC determined with reference to the RCAM assessment criteria. At these temperatures, airport and aerodrome operators should exercise vigilance and should downgrade the runway condition code if appropriate.

4) **CAUTION**: Heavy frost that has noticeable depth may have friction qualities similar to ice and downgrading the runway condition code accordingly should be considered. If driving a

vehicle over the frost does not result in tire tracks exposing bare pavement, the frost should be considered to have sufficient depth to consider a downgrade of the runway condition code.

(4) The processes used to determine the preliminary RWYCC are described and illustrated below:

Note: These processes are summarized in flowcharts which appear in Appendix A for a single contaminant and in Appendix B for two contaminants.

(a) When the runway third contains a single contaminant, the preliminary RWYCC for that third is based directly on that contaminant in the RCAM (Table 3) as follows:

(i) If the percent coverage of contaminant for the runway third is less than or equal to 25%, a RWYCC of 6 is reported for that third;

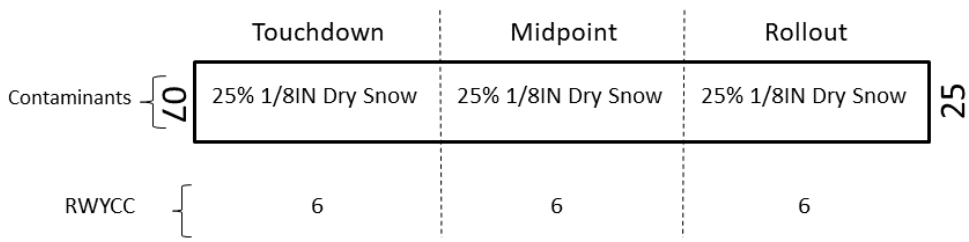

Figure 4 – Single contaminant, less than or equal to 25% coverage per runway third

(ii) If the percent coverage of contaminant for the runway third is greater than 25%, the preliminary RWYCC for that third is based on the code for that contaminant that is specified in the RCAM.

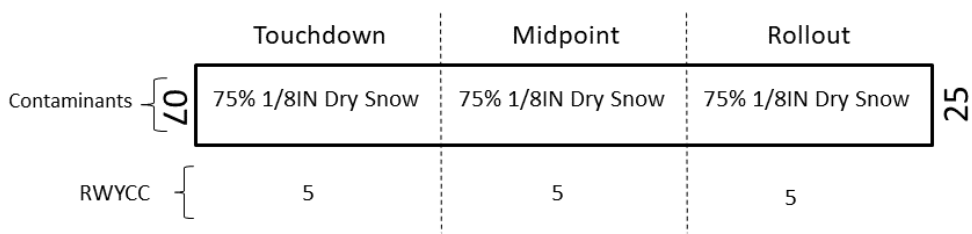

Figure 5 – Single contaminant, greater than 25% coverage per runway third

(b) When two contaminants are present in a runway third and the percent coverage for each individual contaminant is less than or equal to 25%, the preliminary RWYCC is determined as follows:

(i) If the total of the percent coverage of contaminant for the runway third is less than or equal to 25%, a RWYCC of 6 is reported for that third;

	Touchdown	Midpoint	Rollout
Contaminants	10% 1/8IN Slush 10% Ice	10% 1/8IN Slush 10% Ice	10% 1/8IN Slush 10% Ice
Total Coverage	20%	20%	20%
RWYCC	6	6	6

07 25

Figure 6 – Two contaminants, less than or equal to 25% total coverage per runway third

(ii) If the total of the percent coverage of contaminant for the runway third is greater than 25%, and the percent coverage of both contaminants is not equal, the preliminary RWYCC for that third is based on the contaminant with the higher percentage of coverage in that third.

	Touchdown	Midpoint	Rollout
Contaminants	**25% 1/8IN Slush** 10% Ice	**25% 1/8IN Slush** 10% Ice	**25% 1/8IN Slush** 10% Ice
Total Coverage	35%	35%	35%
RWYCC	5	5	5

07 25

Figure 7 – Two contaminants, greater than 25% total coverage (contaminant coverages unequal – with both contaminants less than or equal to 25%) per runway third

(c) If the total of the percent coverage of contaminant for the runway third is greater than 25%, and the percent coverage of both contaminants is equal, the preliminary RWYCC is based on the contaminant with the lower RWYCC in the RCAM.

	Touchdown	Midpoint	Rollout
Contaminants	25% 1/8IN Slush **25% Ice**	25% 1/8IN Slush **25% Ice**	25% 1/8IN Slush **25% Ice**
Total Coverage	50%	50%	50%
RWYCC	1	1	1

07 25

Figure 8 – Two contaminants, greater than 25% total coverage (contaminant coverages equal) per runway third

(d) When two contaminants are present in a runway third and the percent coverage of only one of the contaminants is greater than 25%, the preliminary RWYCC for that third is based on the contaminant with the higher percent coverage for that third.

	Touchdown	Midpoint	Rollout
Contaminants	10% 1/8IN Slush **50% Ice**	10% 1/8IN Slush **50% Ice**	10% 1/8IN Slush **50% Ice**
Total Coverage	60%	60%	60%
RWYCC	1	1	1

07 25

Figure 9 – Two contaminants, greater than 25% total coverage (contaminant coverages unequal – with only one contaminant greater than 25%) per runway third.

(e) When two contaminants are present in a runway third and the percent coverage of both of the contaminants is greater than 25%, the preliminary RWYCC for that third will be based on the contaminant with the lower RWYCC in the RCAM.

	Touchdown	Midpoint	Rollout
Contaminants	50% 1/8IN Slush **50% Ice**	50% 1/8IN Slush **50% Ice**	50% 1/8IN Slush **50% Ice**
Total Coverage	100%	100%	100%
RWYCC	1	1	1

07 25

Figure 10 – Two contaminants, both greater than 25% coverage (contaminant coverages equal) per runway third

6.5 CRFI information presented in the RCAM

(1) CRFI is a valuable tool which provides an objective measure of the runway friction that will allow the airport or aerodrome operator to:

(a) validate the preliminary RWYCCs determined through the use of the RCAM,

(b) downgrade the RWYCC, when appropriate, and

(c) upgrade the RWYCC, when appropriate.

(2) An approximate range of CRFI values correspond to various RWYCCs. These CRFI ranges are used to downgrade a RWYCC, as described in Section 6.6.

Note: Due the variability of conditions these CRFI ranges may span more than one RWYCC.

(3) In contrast, a specific minimum CRFI value – as opposed to a range of CRFI values – is required to upgrade a RWYCC. The associated criteria and limitations for upgrading a RWYCC are provided in Section 6.8.

6.6 RWYCC downgrade assessment criteria

(1) As described in Section 6.4, the preliminary RWYCC is initially determined using the RCAM based on type and depth of contaminant and outside air temperature (where applicable); or the runway condition, when the runway is dry, wet, or slippery when wet.

(2) The airport or aerodrome operator should consider downgrading a RWYCC when CRFI measurements (if available), vehicle deceleration or directional control observations, pilot report(s), local knowledge and/or other information reveal that the runway surface is more slippery than the preliminary RWYCC indicated.

(3) The airport or aerodrome operator should exercise vigilance and downgrade the RWYCC when appropriate – so that flight crews are provided with a RWYCC that best reflects the actual slipperiness of the runway.

(4) The shaded area of the RCAM provides Downgrade Assessment Criteria, as detailed below:

(a) **Subject to the limitations for the use of a decelerometer to measure CRFI** (see 322.416 of the *Airport Standards – Airport Winter Maintenance*), the airport or aerodrome operator should utilize CRFI readings, when available, to assess slipperiness of the runway.

(b) Pilot reports may also provide useful information. These reports may relate to the specific sections of the runway in which wheel braking was applied, and should be considered for the applicable runway third (information on pilot reported braking action is provided in Section 6.7).

(c) Vehicle control or deceleration observations are another source of useful information. As with pilot reports, vehicle control or deceleration observations may relate to specific sections of the runway and should be considered for the applicable runway third.

(5) **CAUTION**: At temperatures near and above freezing (i.e. at -3°C and warmer), the runway surface condition may be more slippery than indicated by the preliminary RWYCC determined with reference to the RCAM assessment criteria. At these temperatures, airport or aerodrome operators should exercise vigilance and should downgrade the runway condition code if appropriate.

(6) Figure 11, below provides an example of a situation where a RWYCC downgrade should be considered.

(7) When a RWYCC has been downgraded this information needs to be included in the runway remarks. For further information on runway remarks see Section 8.5.

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Assessment Criteria		Downgrade Assessment Criteria (Control/Braking Assessment Criteria)		
Runway Surface Description	**RWYCC**	**CRFI Range**	**Vehicle Deceleration or Directional Control Observation**	**Pilot Braking Action**
• DRY	6		-	-
• FROST • WET (The runway surface is covered by any visible dampness or water up to and including 1/8 **inch** (3 mm) depth) **Up to and including 1/8 inch (3 mm) depth:** • SLUSH • DRY SNOW • WET SNOW	5	0.40 or higher	Braking deceleration is normal for the wheel braking applied AND directional control is normal	GOOD
-15°C and Colder outside air temperature: • COMPACTED SNOW	4	0.39 to 0.35	Braking deceleration OR directional control is between Good and Medium	GOOD TO MEDIUM
• SLIPPERY (WHEN) WET (wet runway) • DRY SNOW or WET SNOW (Any depth) ON TOP OF COMPACTED SNOW **Greater than 1/8 inch (3 mm) depth:** • DRY SNOW • WET SNOW **Warmer than -15°C outside air temperature:** • COMPACTED SNOW	3	0.34 to 0.30	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced	MEDIUM
Greater than 1/8 inch (3 mm) depth: • STANDING WATER • SLUSH	2	0.29 to 0.20	Braking deceleration OR directional control is between Medium and Poor	MEDIUM TO POOR
• ICE	1	0.19 or lowe	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced	POOR
• WET ICE • SLUSH ON TOP OF ICE • WATER ON TOP OF COMPACTED SNOW • DRY SNOW or WET SNOW ON TOP OF ICE	0		Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain	LESS THAN POOR / NIL

Figure 11 – An example situation where a RWYCC downgrade should be considered. The reported runway surface description of `50 PCT 1/2IN DRY SNOW` has a corresponding preliminary RWYCC of 3. The downgrade assessment criteria, outlined in red, indicate that the RWYCC should be downgraded to 1

6.7 Pilot reported braking action

(1) A pilot report (PIREP) of braking action reflects the pilots' assessment of the available wheel braking.

(2) Where available, pilot reports of braking action should be taken into consideration as part of the ongoing monitoring process, using the following principles:

(a) A pilot report of braking action should be taken into consideration for downgrading purposes; and

(b) A pilot report of runway braking action can also prompt the airport or aerodrome operator to consider a RWYCC upgrade providing all of the requirements detailed in Section 6.8 are satisfied.

Notes:

1) Airport and aerodrome operators need to ensure that runway surface descriptions (type and depth) are reported in accordance with the pertinent regulatory requirements and the guidance provided in Section 13, regardless of pilot braking action reports.

2) Where Air Traffic Services (ATS) are provided, ATS are to notify airport or aerodrome operators of any significant change in surface conditions that they have observed or have been provided knowledge of.

(3) When previous pilot braking action reports have indicated GOOD or MEDIUM braking action, two consecutive pilot braking action reports of POOR indicates that surface conditions may be deteriorating. In this situation, the airport or aerodrome operator should conduct a runway assessment prior to the next aircraft operation.

(4) When one pilot report of runway braking action of LESS THAN POOR (or NIL) is received:

(a) the information should be disseminated;

(b) a new assessment should be made; and

(c) the suspension of aircraft operations on that runway should be considered.

Note: If considered appropriate, maintenance activities may be performed simultaneously or before a new assessment is made.

6.8 RWYCC upgrade assessment criteria

(1) Under very cold conditions, typically below -15ºC, frozen contaminants may exhibit a higher degree of friction than indicated in the RCAM. In these circumstances, upgrading the RWYCC may be possible.

(2) A preliminary RWYCC of 2, 3, 4 or 5 cannot be upgraded.

(3) The airport or aerodrome operator may only upgrade a preliminary RWYCC of 0 or 1 up to but no higher than a RWYCC of 3, when all the following requirements are met:

(a) CRFI values of 0.35 or greater are obtained for the affected third(s) of the runway (subject to limitations for the use of a decelerometer to measure CRFI (see 322.416 of the *Airport Standards – Airport Winter Maintenance*);

(b) All other observations support a higher RWYCC as judged by a trained person; and

(c) When a RWYCC of 0 or 1 is upgraded, the runway surface must be assessed frequently during the period the higher RWYCC is in effect to ensure the runway surface condition does not deteriorate below the assigned code.

Note: Any process that transfers heat to the surface may make the runway more slippery. Heat sources can come from the aircraft tires, engine exhaust/thrust reverse, atmospheric conditions and precipitation. Runway treatments can also temporarily result in more slippery conditions.

(4) **CAUTION**: Variables to be considered include, but are not limited to:

(a) Any precipitation conditions;

(b) Changing temperatures;

(c) Effects of wind;

(d) Frequency of runway use; and

(e) Type of aircraft using the runway.

(5) **CAUTION**: If sand or other runway treatments are used to support the upgrading, the runway surface must be assessed frequently to ensure the continued effectiveness of the treatment.

(6) When a RWYCC has been upgraded this information needs to be included in the runway remarks. For further information on runway remarks see Section 8.5.

7.0 Process to determine the RWYCC

(1) To use the Runway Condition Assessment Matrix (RCAM), the airport or aerodrome operator will use similar runway condition assessment practices as they have used in the past. The airport or aerodrome operator will assess surfaces, and report contaminants present on each runway. Based on the reported information, the preliminary RWYCCs will be determined using the RCAM in accordance with the process described in Section 6.4. The airport or aerodrome operator will then be prompted to confirm whether the preliminary RWYCCs are appropriate in consideration of other available information. Details of this process are provided in Sections 7.1 to 7.3, below.

Note: The process described in Sections 7.1 to 7.3 is summarized in a flowchart in Appendix C.

(2) A separate process outlined in Section 7.4 is used to determine the RWYCC for a runway that does not meet the minimum coefficient of friction specified in TP 312, for which a "slippery when wet" normal NOTAM must be issued. (Information on these runways and the corresponding runway condition reporting procedures is found in Section 5.10.)

7.1 Step 1 – determine applicability of RWYCCs

(1) RWYCCs are only applicable if:

(a) the runway condition information is reported by runway thirds; and

(b) the runway surface is paved

7.2 Step 2 – apply assessment criteria to determine preliminary RWYCC

(1) Based on the runway surface description, the RCAM is used to determine a preliminary RWYCC for each third of the runway.

(2) NAV CANADA has developed software which will generate the preliminary RWYCC for each third of the runway as applicable, based on the reported runway condition information.

(3) **CAUTION**: The NAV CANADA software will generate preliminary RWYCCs in accordance with the procedures established in AC 300-019. The RWYCCs generated by this software are only intended to assist the airport or aerodrome operator in their determination of the preliminary RWYCC and conveys no responsibility on NAV CANADA. The determination of the RWYCC remains solely the responsibility of the airport or aerodrome operator, who must ensure that the preliminary RWYCC is confirmed, downgraded or upgraded, as applicable.

(4) For airports or aerodromes that do not have access to the NAV CANADA software, a printable AMSCR is available for runway condition reporting. The airport or aerodrome operator is to include RWYCCs on the printable AMSCR form if applicable (paved runway and reporting in thirds). As the airport and aerodrome operator is responsible for determining and accepting the RWYCC, the information provided is deemed to be correct. Therefore, for information submitted using the printable AMSCR form, the Final RWYCC entered on the AMSCR forms will be entered into the software.

7.3 Step 3 – validate preliminary RWYCCs

(1) After the preliminary RWYCCs have been assigned, the airport or aerodrome operator should determine that the preliminary RWYCCs accurately reflect the runway condition. Through this determination, which should consider CRFI (if available), vehicle deceleration or directional control observations, pilot report(s), local knowledge and/or other information, the preliminary RWYCC will then be:

(a) Confirmed;

(b) Downgraded; or

(c) Upgraded

(2) If the preliminary RWYCCs accurately represent the runway condition, the preliminary RWYCCs will be confirmed and the final RWYCCs may be disseminated.

(3) However, if it is determined – through CRFI, pilot report(s), and/or other information – that the runway is more slippery than indicated by the preliminary RWYCC (determined with reference to the RCAM Assessment Criteria), the RWYCC should be downgraded. Guidance for the downgrade process is provided in Section 6.6 of this AC.

(4) Alternatively, given the variability of certain contaminants, there are circumstances when a RWYCC of "0" or "1" may not be as slippery as the preliminary RWYCC determined with reference to the RCAM assessment criteria. In this case, the airport may upgrade the RWYCC up to but no higher than a RWYCC of "3", in accordance with the upgrade criteria given in Section 6.8 of this AC.

(5) When a RWYCC has been upgraded or downgraded this information needs to be included in the runway remarks. For further information on runway remarks see Section 8.5.

7.4 RWYCC for slippery when wet runways

(1) The processes used to determine a RWYCC for runways which do not meet the minimum coefficient of friction specified in TP 312 are outlined below. These procedures are applicable for both:

(a) runway conditions associated with winter contaminants; and

(b) wet conditions or standing water not associated with winter contaminants, where these conditions are reported.

Note: Guidance for reporting runway surface conditions for these runways are described in Section 5.10.

(2) For these procedures the percentage of coverage does not factor into the determination of the RWYCC. In addition, when more than one condition or contaminant is present, the lowest corresponding RWYCC is used, regardless of the amount of coverage.

(3) Where any runway third has a runway surface description (for moisture or frozen contamination) which has a corresponding RWYCC that is **greater than or equal to 3**, a preliminary RWYCC **no greater than 3** will be assigned to all three runway thirds (i.e. 3/3/3). This is shown in the following examples:

(a) Where the first third of a runway has twenty percent coverage of 1/8 of an inch or less water and the remaining runway thirds were dry:

(i) this will be reported as: "SLIPPERY WHEN WET, DRY, DRY"; and

(ii) a preliminary RWYCC of 3 will be assigned to all three runway thirds (i.e. 3/3/3).

(b) Where the first third of a runway has twenty percent coverage of 1/8 of an inch dry snow and the remaining thirds are DRY:

(i) this will be reported as: "20 PCT 1/8IN DRY SNOW, DRY, DRY"; and

(ii) a preliminary RWYCC of 3 will be assigned to all three runway thirds (i.e. 3/3/3).

(4) Where any runway third has a runway surface description which has a corresponding RWYCC that is **less than 3**, this value will be the preliminary RWYCC assigned to all three runway thirds (i.e. 2/2/2; 1/1/1; or 0/0/0). This is shown in the following examples:

(a) Where the final third of a runway has twenty percent coverage of ice and the remaining runway thirds are dry:

(i) this will be reported as: “DRY, DRY, 20 PCT ICE”; and

(ii) a preliminary RWYCC of 1 will be assigned to all three runway thirds (i.e. 1/1/1).

(b) Where the middle third of a runway has ten percent coverage of 1/4 of an inch of standing water and the remaining runway thirds are dry:

(i) this will be reported as: “DRY, 10 PCT 1/4IN STANDING WATER, DRY”; and

(ii) a preliminary RWYCC of 2 will be assigned to all three runway thirds (i.e. 2/2/2).

(5) Where **more than one runway condition or contaminant(s)** are reported in any runway third, or if there are different conditions or contaminants in various runway thirds:

(a) the procedures described in (3) and (4) above are used to assess each runway surface description to determine the lowest preliminary RWYCC; and

(b) the lowest preliminary RWYCC will be assigned to all three runway thirds, regardless of which condition or contaminant has greater coverage.

(6) The reporting of more than one runway condition or contaminant is shown in the following examples:

(a) Where the first and middle thirds of a runway have twenty percent coverage of 1/8 of an inch or less water and the final runway third has twenty percent coverage of 1/4 of an inch of water:

(i) this will be reported as: “SLIPPERY WHEN WET, SLIPPERY WHEN WET, 20 PCT 1/4IN STANDING WATER”; and

(ii) a preliminary RWYCC of 2 (corresponding to 1/4IN STANDING WATER) will be assigned to all three runway thirds (i.e. 2/2/2).

(b) Where the first and middle thirds of a runway have eighty percent coverage of 1/8 of an inch slush and the final runway third is covered by eighty percent coverage of 1/4 of an inch slush:

(i) This will be reported as” “80 PCT 1/8IN SLUSH, 80 PCT 1/8IN SLUSH, 80 PCT 1/4IN SLUSH”; and

(ii) a preliminary RWYCC of 2 (corresponding to 1/4IN SLUSH) will be assigned to all three runway thirds (i.e. 2/2/2).

(7) After the preliminary RWYCC has been assigned, the airport or aerodrome operator should determine that the preliminary RWYCCs accurately reflect the runway condition. Through this determination, which should consider CRFI (if available), vehicle deceleration or directional control observations, pilot report(s), local knowledge and/or other information, the preliminary RWYCC will then be:

(a) Confirmed; or

(b) Downgraded

Note: The RWYCC upgrade process specified in Section 6.8 is not applicable for a runway which does not meet the minimum coefficient of friction specified in TP 312.

(8) If the airport or aerodrome operator deems that a downgrade is necessary, the downgrade will apply to all three runway thirds (i.e. 2/2/2; 1/1/1; or 0/0/0).

(9) When RWYCCs are reported for a runway which does not meet the minimum coefficient of friction specified in TP 312, the following information is to be included in the runway remarks:

(a) RWYCC DUE RWY SLIPPERY WHEN WET; and

(b) If the preliminary RWYCCs have also been downgraded, RWYCC DOWNGRADED

Note: Guidance on runway remarks is provided in Section 8.5.

8.0 Other reported runway condition information

(1) Other reported runway condition information includes:

(a) Treatments applied to the runway surface;

(b) Snow drifts, windrows or snowbanks on the runway;

(c) Other localized conditions;

(d) Snowbanks adjacent to the runway; and

(e) Runway remarks

8.1 Treatments applied to the runway surface

(1) Treatments applied to the runway surface are reported using up to two of the following terms as applicable:

(a) CHEMICALLY TREATED

(b) LOOSE SAND

(2) The time that the treatment was applied may also be listed, but is not mandatory.

(3) Examples:

(a) RSC 02 … CHEMICALLY TREATED AT 1200

(b) RSC 02 … LOOSE SAND APPLIED AT 1200

8.2 Snow drifts, windrows, or snowbanks on the runway

(1) This information is reported using the term “SNOW DRIFTS,” “WINDROWS” or “SNOWBANKS” as applicable.

(2) The maximum snow drift, windrow or snowbank height is to be reported in feet and/or inches, as applicable.

(3) The location of a **windrow or snowbank** is reported:

(a) as a distance from the nearest threshold in 100 foot increments (e.g. `RSC 07 … 3IN WINDROWS 200FT FROM THR RWY 25`);

(b) by indicating the distance, to the nearest foot, from: the runway edges, the edge of the cleared width or the runway centerline (e.g. `RSC 12/30 … 1FT SNOWBANKS 20FT SOUTHEAST FM RWY EDGE`); or

(c) with reference to an intersecting runway (e.g. `RSC 07 … 3IN WINDROWS ACROSS INT OF RWY 14/32`).

(4) Reporting the location of a **snow drift** is optional since there may be numerous snow drifts, and may be reported:

(a) as a distance from the nearest threshold in 100 foot increments (e.g. `RSC 07 … 6IN SNOW DRIFTS 200FT FM THR 25`);

(b) by indicating the distance, to the nearest foot, from: the runway edges, the edge of the cleared width or the runway centerline (e.g. `RSC 04 … 3IN SNOW DRIFTS 50FT SOUTHEAST FM CL`); or

(c) with reference to an intersecting runway (e.g. `RSC 14 … 4IN SNOW DRIFTS ACROSS INT OF RWY 05/23`).

(5) When describing a snow drift, windrow or snowbank that is to one side of the centreline or the runway edge, the four cardinal points (North, South, East or West) or four intercardinal (ordinal) points (Northeast, Southeast, Southwest or Northwest) should be used instead of "left" or "right". This is illustrated in Table 4 below.

Table 4 – Directional reference with respect to RWY designators

RWY Designators	Cardinal or intercardinal direction right of the runway	Cardinal or intercardinal direction left of the runway
01 02	EAST	WEST
03 04 05 06	SOUTHEAST	NORTHWEST
07 08 09 10 11	SOUTH	NORTH
12 13 14 15	SOUTHWEST	NORTHEAST
16 17 18 19 20	WEST	EAST
21 22 23 24	NORTHWEST	SOUTHEAST
25 26 27 28 29	NORTH	SOUTH
30 31 32 33	NORTHEAST	SOUTHWEST
34 35 36	EAST	WEST

(6) Examples:

(a) RSC 06 … 3IN SNOW DRIFTS 5FT ALONG INSIDE SOUTHEAST RWY EDGE

(b) RSC 02 … 10IN WINDROWS 50FT EAST AND WEST FM CL

(c) RSC 14 … 2FT SNOWBANKS ALONG INSIDE NORTHEAST RWY EDGE

8.3 Other localized conditions

(1) Localized conditions that reduce the friction locally should be reported by indicating the distance in feet from the nearest threshold (in 100 foot increments).

(2) These localized conditions, are separate and distinct from the runway surface conditions that serve as assessment criteria in the RCAM; they include:

(a) ice patches,

(b) compacted snow patches, and

(c) standing water patches.

(3) Examples:

(a) RSC 04 … ICE PATCHES 1600FT FROM THR 22

(b) RSC 07 … STANDING WATER PATCHES ACROSS INT OF RWY 14/32

(4) Any other localized conditions not itemized in Paragraph (2) are to be described in the Runway remarks section as described in Section 8.5 of this AC.

8.4 Snowbanks adjacent to the runway

(1) The presence of a runway snowbank, its height (in inches and/or feet) and its distance (in feet) from outside the runway edge is to be reported. For details see the height profile specified in Standard 322 Division IV – *Airport Winter Maintenance*.

(2) When the height of snowbanks vary, the highest value should be reported.

(3) When the distances from the outer edges vary, the least distance from the runway edge should be reported.

(4) Examples:

(a) RSC 06 … 3FT SNOWBANKS 5FT OUTSIDE SOUTHEAST RWY EDGE

(b) RSC 22 … 4FT 6IN SNOWBANKS 10IN OUTSIDE NORTHWEST AND SOUTHEAST RWY EDGE

(c) RSC 14 … 5FT SNOWBANKS ON SOUTHWEST RWY EDGE

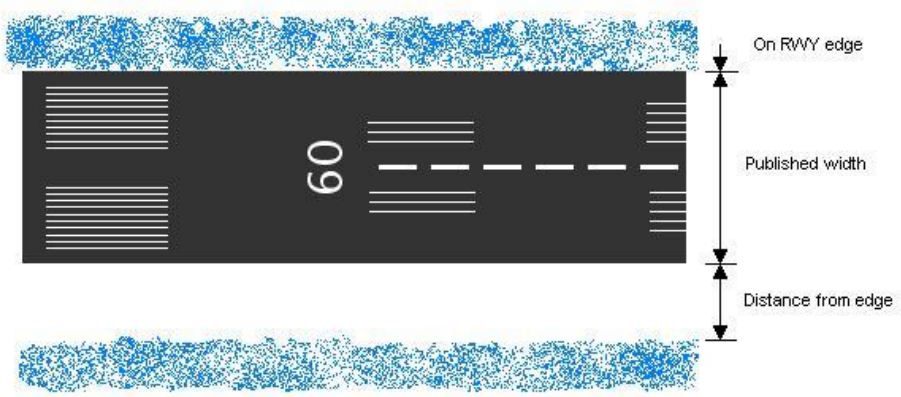


Figure 12 – Snowbanks on or adjacent to the runway edge

8.5 Runway remarks

(1) Runway remarks serve to capture any other operationally significant information related to a given runway, which is not otherwise described. These remarks serve an important function by enhancing situational awareness.

(2) Runway remarks need to be kept brief and concise, to ensure that only important safety information is conveyed.

(3) As per paragraph 7.3(4) when a RWYCC has been downgraded or upgraded this information needs to be included in the runway remarks as follows:

(a) RWYCC DOWNGRADED; or

(b) RWYCC UPGRADED.

(4) As per paragraph 7.4(9) when RWYCCs are reported for a runway which does not meet the minimum coefficient of friction specified in TP 312 the phrase: “RWYCC DUE RWY SLIPPERY WHEN WET” needs to be included in the runway remarks.

(5) In addition, when applicable, the following predetermined phrases should be used:

(a) RWY MARKINGS OBSCURED (See note)

(b) RWY CL LGTS AND MARKINGS OBSCURED (See note)

(c) HIGH SPEED TAXIWAYS SLIPPERY

Note: The regulations for pilots require runway markings and/or centreline lights "that are plainly visible to the pilot throughout the take-off run" for conducting take-offs with reported visibility of RVR 1200 (1/4 sm) and RVR 600.

9.0 Additional non-GRF/TALPA information

9.1 Canadian runway friction index (CRFI) – overview

(1) CRFI provides an objective measurement of runway slipperiness. Subject to known limitations, CRFI plays an important role in allowing airport and aerodrome operators to confirm, downgrade or upgrade the preliminary RWYCC.

9.2 Regulatory requirements for CRFI measurement and reporting

(1) CRFI readings are measured and reported in accordance with:

(a) the requirements specified in:

(i) Subpart 302– Airports, Division IV of the CARs – *Airport Winter Maintenance*, and

(ii) Subpart 322 – *Airport Winter Maintenance Standards* (AWMS); and

(b) the guidance provided in AC 300-005 – Changes to Runway Surface Condition Reporting.

(2) The applicability of the above regulations is dependent upon the type of air transport service, if any, being operated at an airport. This is outlined in Subsection 302.402 (2) of the CARs – Applicability, which states:

Sections 302.410 to 302.419 apply in respect of an airport if:

(a) aeroplanes at the airport are operated in an air transport service under Subpart 4 or 5 of Part VII; or

(b) aeroplanes at the airport are operated in an air transport service under Subpart 3 of Part VII and the operator of the airport has decided to comply with those sections instead of sections 302.406 and 302.407.

(3) For airports outlined in paragraph (2) above, CRFI is reported as follows:

(a) For runways greater than or equal to 1829m in length, the measurement of CRFI readings is performed and averaged for each third of the runway length in the report;

(b) For runways less than 1829m in length, CRFI can be reported as in (3)(a), or CRFI can be measured and averaged for the full runway length in the report.

(4) The regulatory requirements for reporting CRFI in thirds (which are detailed in Paragraphs (1) through (3), above) and the criteria for reporting runway surface conditions in thirds (which are detailed in Section 5.3) are summarized in Table 5.

(5) There is no specific regulatory link between the requirements for reporting CRFI in thirds and the criteria for reporting runway surface conditions in thirds.

Table 5 – Summary of requirements for reporting CRFI in thirds and criteria for reporting runway surface conditions in thirds

CRFI [1]		**Runway Surface Conditions** [2]
Must **be reported in thirds when:**	***May*** **be reported in thirds when:**	**Reported in thirds (with RWYCCs) when:**
• Aeroplanes are operated in an air transport service under Subpart 4 or 5 of Part VII at the airport; and • The runway is greater than or equal to 1829m (6000ft) in length	• Aeroplanes are operated in an air transport service under Subpart 3 of Part VII, and the airport or aerodrome operator has decided to comply with sections 302.410 through 302.419 of the CARs; and/or • The runway is less than 1829m (6000ft) in length, and the airport or aerodrome operator has decided to report by thirds [3]	• The runway being assessed is paved; and • The airport or aerodrome operator has decided to report runway conditions by thirds; this decision is made in consultation with the air operators who utilize their facility

Notes:

1) Reporting requirements for CRFI are stipulated in:

   (a) Sections 302.402(2)(a) and 302.416(1) of the CARs

   (b) Section 322.416 of the AWMS

2) See Section 5.3 for guidance respecting reporting by runway thirds.

3) A minimum of four CRFI measurements per third are required to report CRFI by runway thirds. A minimum runway length of 1829m (6000ft) is required for reporting in thirds. However, runways of at least 914m (3000ft) can be reported in thirds when measurements are taken on both sides of the runway centreline (down and back method). See AC 300-005 for more information on CRFI reporting.

9.3 Format of CRFI report

(1) Two different formats are used for reporting CRFI; one for reporting in thirds and one for reporting by full runway length, as show in the following examples:

   (a) Reporting CRFI in thirds:

```
ADDN NON-GRF/TALPA INFO:
CRFI 09 -3C .40/.32/.28 OBS AT 1909131504
CRFI 27 -3C .28/.32/.40 OBS AT 1909131504
```

Note: When reporting CRFI in thirds, each runway end is reported (i.e. 09 and 27)

(b) Reporting CRFI by full runway length:

```
ADDN NON-GRF/TALPA INFO:
CRFI 07/25 -3C .25 OBS AT 1902141408
```

(2) When reporting CRFI in thirds, in a situation may occur where a CRFI report is required for one third(s), but should not be reported for another third(s). This can happen when an individual runway third(s) are either dry or covered with a condition or contaminant(s) are not conducive to CRFI reporting. (Examples include runways which are wet or covered by slush or standing water). In this case, the applicable runway third is listed as “NR” (not reported) as shown in the example below.

```
ADDN NON-GRF/TALPA INFO:
CRFI 09 -3C .32/NR/.28 OBS AT 1909131504
```

(3) The air temperature in degrees Celsius and time of measurement are included with the CRFI report.

10.0 Taxiway and apron information

(1) Where contaminants are present on taxiways and aprons that may be of “operational significance” to aircrews, the airport operator is required to include these conditions in the report. Aerodrome operators should also report these conditions.

(2) Due to the lower speed at which aircraft move on taxiways and aprons, the originator should take care to only include the information that has an impact on safety and normal operations, such as the risk of becoming stuck, losing control on a slippery surface, or damaging the aircraft.

(3) Only one type of surface condition and corresponding depth, if applicable, should be reported for taxiways and aprons. The percentage of contaminants is not to be reported.

(4) It is important to provide pertinent and concise information. Where possible, the use of approved abbreviations is recommended.

Note: Airport and aerodrome operators are cautioned against providing excessive and overly detailed information regarding the condition of taxiways and aprons. This can be a needless distraction and is a disservice to flight crews as it adds significantly to pilot workload and may contribute to flight crews missing other critical information.

(5) If the same conditions apply to several taxiways or aprons, the information should be grouped together. The term ALL TWY or ALL APN can be used to describe the conditions that apply to all taxiways and/or aprons.

(6) Taxiway and apron information can include but is not limited to:

(a) type of contaminant and depth,

(b) qualitative friction (e.g. “BRAKING ACTION POOR”),

(c) presence of snow drifts, windrows and snowbanks, and

(d) presence of treatments.

(7) Examples:

(a) RMK: TWY E AND F: 8IN WET SNOW

(b) RMK: TWY B BRAKING ACTION POOR

(c) RMK: TWY A 1FT 6IN SNOWBANKS

(d) RMK: APN II AND III ICE COVERED. CHEMICALLY TREATED

(e) RMK: ALL TWY 2IN DRY SNOW

11.0 General remarks

(1) This section is used to record:

(a) maintenance activities (plowing, sweeping, etc.); or

(b) any unusual contamination conditions such as a contaminant location that is not otherwise be recorded.

(2) Examples include, but are not necessarily limited to:

(a) CLEARING/SWEEPING IN PROGRESS; and

(b) CONDITIONS CHANGING RAPIDLY

Note: The NAV CANADA software will only permit CONDITIONS CHANGING RAPIDLY to be issued as a part of a RSC NOTAM. It cannot be issued as a stand-alone NOTAM.

(3) These remarks need to be kept brief and concise, to ensure that only important safety information is conveyed.

(4) The next scheduled time of observation is included in general remarks where applicable.

12.0 Order of reported runway condition information

(1) The following order of reporting applies to a complete RSC NOTAM:

(a) NOTAM information;

(b) RSC information including:

(i) Runway in use designator, when reporting by thirds (e.g. `RSC 33`), or

(ii) Full runway designator, when reporting by full runway length (e.g. `RSC 07/25`);

(c) Surface conditions for each runway, as applicable:

(i) Runway condition code for each runway third (where applicable);

(ii) Condition or contaminant(s) within the cleared width: percent coverage, depth (if applicable), and condition or type of contaminant for each third of the runway (if applicable);

(iii) Condition of unpaved and partially paved runways: graded, packed, and/or scarified (where applicable);

(iv) Cleared width (if applicable);

(v) Snow drifts, windrows and/or snowbanks on the runway (where applicable);

(vi) Localized conditions (where applicable);

(vii) Treatments (where applicable);

(viii) Conditions for remaining width (where applicable);

(ix) Snowbanks adjacent to runway (where applicable);

(x) Runway remarks (where applicable);

(xi) RSC validity time.

(d) CRFI Header: ADDN NON-GRF/TALPA INFO;

(e) CRFI readings for each runway as applicable;

(f) Taxiway conditions;

(g) Apron conditions;

(h) General remarks, including next scheduled time of observation (where applicable).

13.0 Requirements to issue an AMSCR

(1) The requirements to conduct movement area inspections and report the surface conditions are described in:

(a) Subpart 302 of the CARs – Airport Winter Maintenance; and

(b) Section 322 of the Airport Winter Maintenance Standards (AWMS)

(2) When contaminants are present on a movement area, an AMSCR is to be made available during the published AMSCR hours as follows:

(a) at the commencement of the published AMSCR hours,

(b) a minimum of once every eight or twenty-four hours, as applicable, as described in Section 14 of this AC;

(c) when a significant changes occurs, as described below in (4);

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

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

(3) Reporting of the runway surface conditions should continue until the runway is no longer contaminated. When this occurs, the airport or aerodrome operator will issue an AMSCR that states the runway is wet or dry as appropriate.

(4) A new AMSCR is also issued when a significant change occurs. Significant changes include:

(a) Any change in the RWYCC;

(b) Any change in CRFI of 0.05 or more;

(c) Any change in the contaminant type;

(d) Any change of 20% or more in the reportable contaminant coverage;

(e) Any change in contaminant depth as described in Table 6, below; and

(f) Any other information, which according to assessment techniques, is considered to be significant. For example, 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.

Table 6 – Significant change by contaminant type

Contaminant	Valid depth values to be reported (minimum depth/assessed value)	Significant change
STANDING WATER	1/4 inch, then assessed value	1/8 inch
SLUSH	1/8 inch, then assessed value	1/8 inch
WET SNOW	1/8 inch, then assessed value	1/4 inch
DRY SNOW	1/8 inch, then assessed value	3/4 inch

Notes:

1) For STANDING WATER, 1/4 inch is the minimum depth which can be reported. (When the water depth is 1/8 inch or less, the runway is reported to be WET).

2) For SLUSH, WET SNOW and DRY SNOW, 1/8 inch is the minimum depth which can be reported.

(5) An example illustrating significant change for contaminant depth is given in Appendix D.

14.0 Validity period

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

(2) For airports, the maximum validity period for an AMSCR is 8 hours.

(3) For aerodromes reporting RWYCCs, the maximum validity period for an AMSCR is 8 hours.

(4) For aerodromes not reporting RWYCCs, the maximum validity period for an AMSCR is 24 hours.

(5) Due to the time factor between conducting a runway surface condition inspection and publication of the report in a RSC NOTAM, the end time of a NOTAM may exceed the validity period of the corresponding AMSCR. Furthermore, a RSC NOTAM may contain reports for multiple runways, which may each have differing report times. The airport or aerodrome operator should ensure that, for each specific runway, a new AMSCR is made available prior to the expiry time of the preceding AMSCR, rather than the RSC NOTAM.

15.0 Examples of runway surface condition (RSC) NOTAM

(1) Examples of RSC NOTAMS, together with explanatory notes, are provided below to illustrate the following situations:

(a) Reporting by runway thirds for an individual runway;

(b) Reporting by runway thirds for more than one runway;

(c) Reporting by full runway length for an individual runway;

(d) Reporting by full runway length for more than one runway;

(e) Reporting one runway(s) by thirds and another runway(s) by full runway length; and

(f) Reporting additional information such as localized conditions, snowbanks, as well as taxiway and apron remarks.

(2) Example of RSC NOTAM when reporting by runway thirds for an individual runway:

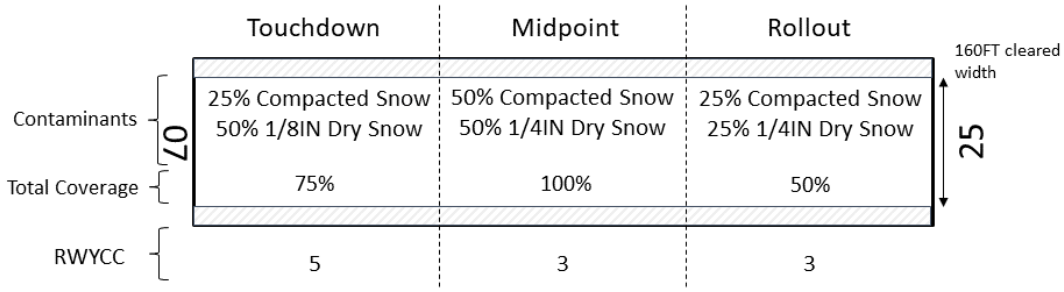


Figure 13 – Example of a contaminated runway where operator reports by thirds

(B1667/20 NOTAMN

A) CAAA B) YY11141505 C) YY11142305

E) RSC 07 5/3/3 50 PCT 1/8IN DRY SNOW AND 25 PCT COMPACTED SNOW, 50 PCT COMPACTED SNOW AND 50 PCT 1/4IN DRY SNOW, 25 PCT COMPACTED SNOW AND 25 PCT 1/4IN DRY SNOW. 160FT WIDTH. 6IN SNOW DRIFTS 200FT FM THR 25. REMAINING WIDTH COMPACTED SNOW. VALID NOV 14 1457 – NOV 14 2257.

RSC 25 3/3/5 25 PCT COMPACTED SNOW AND 25 PCT 1/4IN DRY SNOW, 50 PCT COMPACTED SNOW AND 50 PCT 1/4IN DRY SNOW, 50 PCT 1/8IN DRY SNOW AND 25 PCT COMPACTED SNOW. 160FT WIDTH. 6IN SNOW DRIFTS 200FT FM THR 25. REMAINING WIDTH COMPACTED SNOW. VALID NOV 14 1457 – NOV 14 2257.

ADDN NON-GRF/TALPA INFO:

CRFI 07 -3C .40/.32/.30 OBS AT 2111141457.

CRFI 25 -3C .30/.32/.40 OBS AT 2111141457.

Note: When runway condition information is reported for each third of the runway, the RSC NOTAM will include two reports; one for each runway direction (i.e. RSC RWY 07 and RSC RWY 25).

(3) Example of RSC NOTAM with more than one runway when reporting by thirds:

```
(A1667/20 NOTAMN
A) CAAA B) YY01122330 C) YY01130730
E) RSC 07 3/3/3 50 PCT COMPACTED SNOW, 50 PCT COMPACTED SNOW, 50 PCT
COMPACTED SNOW. 160FT WIDTH. LOOSE SAND APPLIED AT 2245. REMAINING
WIDTH COMPACTED SNOW. VALID JAN 12 2316 - JAN 13 0716.

RSC 25 3/3/3 50 PCT COMPACTED SNOW, 50 PCT COMPACTED SNOW, 50 PCT
COMPACTED SNOW. 160FT WIDTH. LOOSE SAND APPLIED AT 2245. REMAINING
WIDTH COMPACTED SNOW. VALID JAN 12 2316 - JAN 13 0716.

RSC 14 1/1/1 30 PCT ICE, 30 PCT ICE, 30 PCT ICE. CHEMICALLY TREATED AT
2300. VALID JAN 12 2326 - JAN 13 0726.

RSC 32 1/1/1 30 PCT ICE, 30 PCT ICE, 30 PCT ICE. CHEMICALLY TREATED AT
2300. VALID JAN 12 2326 - JAN 13 0726.

ADDN NON-GRF/TALPA INFO:
CRFI 07 -3C .40/.32/.30 OBS AT 2101122304.
CRFI 25 -3C .30/.32/.40 OBS AT 2101122304.
CRFI 14 -3C .20/.18/.22 OBS AT 2101122308.
```

```
CRFI 32 -3C .22/.18/.20 OBS AT 2101122308.
```

Notes:

1) When reporting by thirds and two or more runways are included in a RSC NOTAM, the RSC is listed in ascending order starting with the lowest runway designator, with the corresponding reciprocal runway direction immediately following. (e.g. RSC 07; RSC 25; RSC 14 and RSC 32).

2) When parallel runways are reported, the ascending order begins with the left runway having the lowest runway designator (RSC 05; RSC 23; RSC 06L; RSC 24R, RSC 06R; RSC 24L; RSC 15L; RSC 33R; RSC 15R and RSC 33L).

3) The report for each runway will be separated by a line (break) to ensure that the information is presented clearly.

4) When CRFI for two or more runways are included in a RSC NOTAM, the same format as described above applies except there is no line (break) separation between runway CRFI information.

(4) Example of RSC NOTAM when reporting by full runway length for one runway:

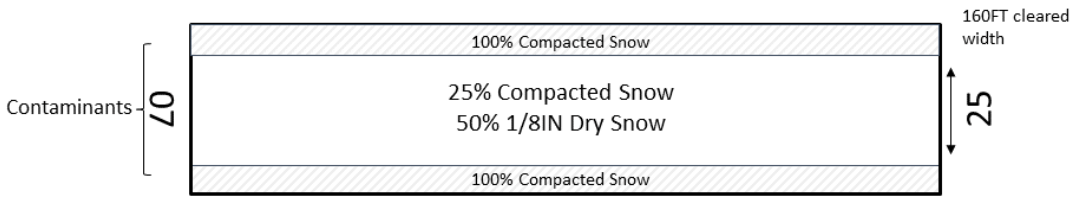


Figure 14 – Example of a contaminated runway where the operator does not report by thirds

```
C1667/20 NOTAMN
A) CAAA B) YY01120025 C) YY01120825
E) RSC 07/25 50 PCT 1/8IN DRY SNOW AND 25 PCT COMPACTED SNOW. 160FT
WIDTH. REMAINING WIDTH COMPACTED SNOW. VALID JAN 12 0016 - JAN 12 0816.

ADDN NON-GRF/TALPA INFO:
CRFI 07/25 -3C .40 OBS AT 2201120008.
```

Note: When runway condition information is reported by full runway length (i.e. not in thirds), the NOTAM will provide a single report for the runway pair, as per the previous practice (e.g. RSC RWY 07/25*).*

(5) Example of RSC NOTAM when reporting by full length for more than one runway:

```
(A1667/20 NOTAMN
A) CAAA B) YY02141500 C) YY02142300
E) RSC 04/22 50 PCT 1/4IN DRY SNOW AND 25 PCT 1IN DRY SNOW OVER
COMPACTED SNOW. 150FT WIDTH. 3IN SNOW DRIFTS 50FT SOUTHEAST FM CL. ICE
PATCHES 1200FT FROM THR 22. LOOSE SAND APPLIED AT 1400. REMAINING WIDTH
COMPACTED SNOW. 3FT SNOWBANKS 5FT OUTSIDE SOUTHEAST AND NORTHWEST RWY
EDGE. VALID FEB 14 1436 - FEB 14 2236.

RSC 12/30 50 PCT 1/2IN SLUSH AND 40 PCT 1/2IN WET SNOW. 150FT WIDTH
OFFSET SOUTHWEST. 8IN WINDROWS ON RWY EDGE. CHEMICALLY TREATED AT 1425.
REMAINING WIDTH 3IN WET SNOW. 2FT SNOWBANKS 8FT OUTSIDE SOUTHWEST AND
NORTHEAST RWY EDGE. VALID FEB 14 1443 - FEB 14 2243.
```

```
ADDN NON-GRF/TALPA INFO:
CRFI 04/22 -3C .32 OBS AT 2202141437.
CRFI 12/30 -3C .24 OBS AT 2202141456.
```

Notes:

1) When reporting by full runway length and two or more runways are included in a RSC NOTAM, the RSC information is listed in ascending order starting with the lower runway designator. (e.g. RSC 04/22 and RSC 12/30)

2) When parallel runways are reported, the ascending order begins with the left runway having the lower runway designator. (e.g. (RSC 05/23; RSC 06L/24R; RSC 06R/24L; RSC 15L/33R and RSC 15R/33L)

3) The report for each runway will be separated by a line (break) to ensure the information is presented clearly. All RSC information is presented prior to displaying CRFI information.

4) When the CRFI for two or more runways are included in a RSC NOTAM, the same format as described above applies except there is no line (break) separation between runway CRFI information.

5) At aerodromes with multiple runways if a runway is listed in the Canada Flight Supplement as having no winter maintenance that runway is not to be included in the RSC report.

(6) Example of RSC NOTAM when reporting one runway(s) by thirds and one runway(s) by full length:

```
(S1017/20 NOTAMN
A) CAAA B) YY01051000 C) YY01051800
E) RSC 02/20 60 PCT 1/4IN DRY SNOW. 70FT WIDTH. REMAINING WIDTH 1/4IN
DRY SNOW ON TOP OF COMPACTED SNOW. VALID JAN 05 0945 - JAN 05 1745.

RSC 06 3/3/3 30 PCT 1/8IN DRY SNOW, 50 PCT 1/8IN DRY SNOW, 40 PCT 1/8IN
DRY SNOW. 175FT WIDTH. CHEMICALLY TREATED AT HHMM. REMAINING WIDTH
1/4IN DRY SNOW ON TOP OF COMPACTED SNOW. RWYCC DOWNGRADED, RWY MARKINGS
OBSCURED. VALID JAN 05 0900 - JAN 05 1700.

RSC 24 3/3/3 40 PCT 1/8IN DRY SNOW, 50 PCT 1/8IN DRY SNOW, 30 PCT 1/8IN
DRY SNOW. 175FT WIDTH. CHEMICALLY TREATED AT HHMM. REMAINING WIDTH
1/4IN DRY SNOW ON TOP OF COMPACTED SNOW. RWYCC DOWNGRADED, RWY MARKINGS
OBSCURED. VALID JAN 05 0900 - JAN 05 1700.

RSC 16 5/5/5 30 PCT 1/8IN DRY SNOW, 30 PCT 1/8IN DRY SNOW, 30 PCT 1/8IN
DRY SNOW. 190FT WIDTH. CHEMICALLY TREATED AT HHMM. REMAINING WIDTH
1/4IN DRY SNOW ON TOP OF COMPACTED SNOW. VALID JAN 05 0830 - JAN 05
1630.

RSC 34 5/5/5 30 PCT 1/8IN DRY SNOW, 30 PCT 1/8IN DRY SNOW, 30 PCT 1/8IN
DRY SNOW. 190FT WIDTH. CHEMICALLY TREATED AT HHMM. REMAINING WIDTH
1/4IN DRY SNOW ON TOP OF COMPACTED SNOW. VALID JAN 05 0830 - JAN 05
1630.

ADDN NON-GRF/TALPA INFO:
CRFI 02/20 -8C .30 OBS AT 2201050945.
CRFI 06 -8C .32/.33/.30 OBS AT 2201050900.
CRFI 24 -8C .30/.33/.32 OBS AT 2201050900.
CRFI 16 -8C .39/.40/.40 OBS AT 2201050830.
CRFI 34 -8C .40/.40/.39 OBS AT 2201050830.
```

Note: When reporting one runway(s) by thirds and another runway(s) by full runway length, and two or more runways are included in a RSC NOTAM, the RSC is listed in

ascending order starting with the lowest runway designator; with the corresponding reciprocal runway direction immediately following, for those runways reported in thirds. (e.g. RSC 02/20; RSC 06; RSC 24; RSC 16 and RSC 34).

(7) Example of RSC NOTAM with additional information including snow drifts, localized conditions, snowbanks, as well as taxiway and apron remarks:

```
(A1667/20 NOTAMN
A) CXXX B) YY02141500 C) YY02142300
E) RSC 04 5/3/3 50 PCT 1/8IN DRY SNOW AND 20 PCT COMPACTED SNOW, 40 PCT
1/4IN DRY SNOW, 25 PCT COMPACTED SNOW AND 25 PCT 1IN DRY SNOW OVER
COMPACTED SNOW. 150FT WIDTH. 3IN SNOW DRIFTS 50FT SOUTHEAST FM CL. ICE
PATCHES 1200FT FROM THR 22. LOOSE SAND APPLIED AT 1400. REMAINING WIDTH
COMPACTED SNOW. 3FT SNOWBANKS 5FT OUTSIDE SOUTHEAST AND NORTHWEST RWY
EDGE. VALID FEB 14 1436 - FEB 14 2236.

RSC 22 3/3/5 25 PCT COMPACTED SNOW AND 25 PCT 1IN DRY SNOW OVER
COMPACTED SNOW, 40 PCT 1/4IN DRY SNOW, 50 PCT 1/8IN DRY SNOW AND 20 PCT
COMPACTED SNOW. 150FT WIDTH. 3IN SNOW DRIFTS 50FT SOUTHEAST FM CL. ICE
PATCHES 1200FT FROM THR 22. LOOSE SAND APPLIED AT 1400. REMAINING WIDTH
COMPACTED SNOW. 3FT SNOWBANKS 5FT OUTSIDE SOUTHEAST AND NORTHWEST RWY
EDGE. VALID FEB 14 1436 - FEB 14 2236.

RSC 12 3/2/2 50 PCT 1/2IN WET SNOW, 40 PCT 1/2IN SLUSH AND 30 PCT 1/2IN
WET SNOW, 50 PCT 1/2IN SLUSH. 150FT WIDTH OFFSET SOUTHWEST. 8IN
WINDROWS ON RWY EDGE. CHEMICALLY TREATED AT 1425. REMAINING WIDTH 3IN
WET SNOW. 2FT SNOWBANKS 8FT OUTSIDE SOUTHWEST AND NORTHEAST RWY EDGE.
VALID FEB 14 1443 - FEB 14 2243.

RSC 30 2/2/3 50 PCT 1/2IN SLUSH, 40 PCT 1/2IN SLUSH AND 30 PCT 1/2IN
WET SNOW, 50 PCT 1/2IN WET SNOW. 150FT WIDTH OFFSET SOUTHWEST. 8IN
WINDROWS ON RWY EDGE. CHEMICALLY TREATED AT 1425. REMAINING WIDTH 3IN
WET SNOW. 2FT SNOWBANKS 8FT OUTSIDE SOUTHWEST AND NORTHEAST RWY EDGE.
VALID FEB 14 1443 - FEB 14 2243.

ADDN NON-GRF/TALPA INFO:
CRFI 04 -3C .40/.32/.30 OBS AT 2202141437.
CRFI 22 -3C .30/.32/.40 OBS AT 2202141437.
CRFI 12 -3C .32/.22/.24 OBS AT 2202141456.
CRFI 30 -3C .24/.22/.24 OBS AT 2202141456.

RMK: TWY A ICE PATCHES, CHEMICALLY TREATED. TWY B, C, D, E 100 PCT
COMPACTED SNOW, 2FT SNOWBANKS. TWY F, G 2IN WET SNOW, LOOSE SAND
APPLIED. TWY H BRAKING ACTION POOR.
RMK: ALL APN ICE PATCHES, CHEMICALLY TREATED. APN I 1IN WET SNOW.
RMK: CLEARING/SWEEPING IN PROGRESS.
```

16.0 Conclusion

(1) It is expected that NAV CANADA will phase in the use of the Global Reporting Format in preparation for the winter of 2021/22. NAV CANADA will advise airport or aerodrome operators as the new software becomes available for their use.

(2) When the Canadian GRF software is available for use, and the airport or aerodrome operator wishes to use a form to prepare inputs to the GRF software, TCCA recommends that airport or aerodrome operators use the newly developed Canadian GRF version of the AMSCR form.

(3) The new AMSCR form is designed to accommodate the GRF input process and may have to be adapted for specific airport circumstances, in consultation with NAV CANADA.

(4) Training information is provided in Appendix E.

17.0 Information management

(1) Not applicable.

18.0 Document history

(1) AC 300-019 Issue 01, RDIMS 14249495 (E), 14392238 (F), dated 2019-07-31 – Global Reporting Format (GRF) for Runway Surface Condition Reporting.

19.0 Contact us

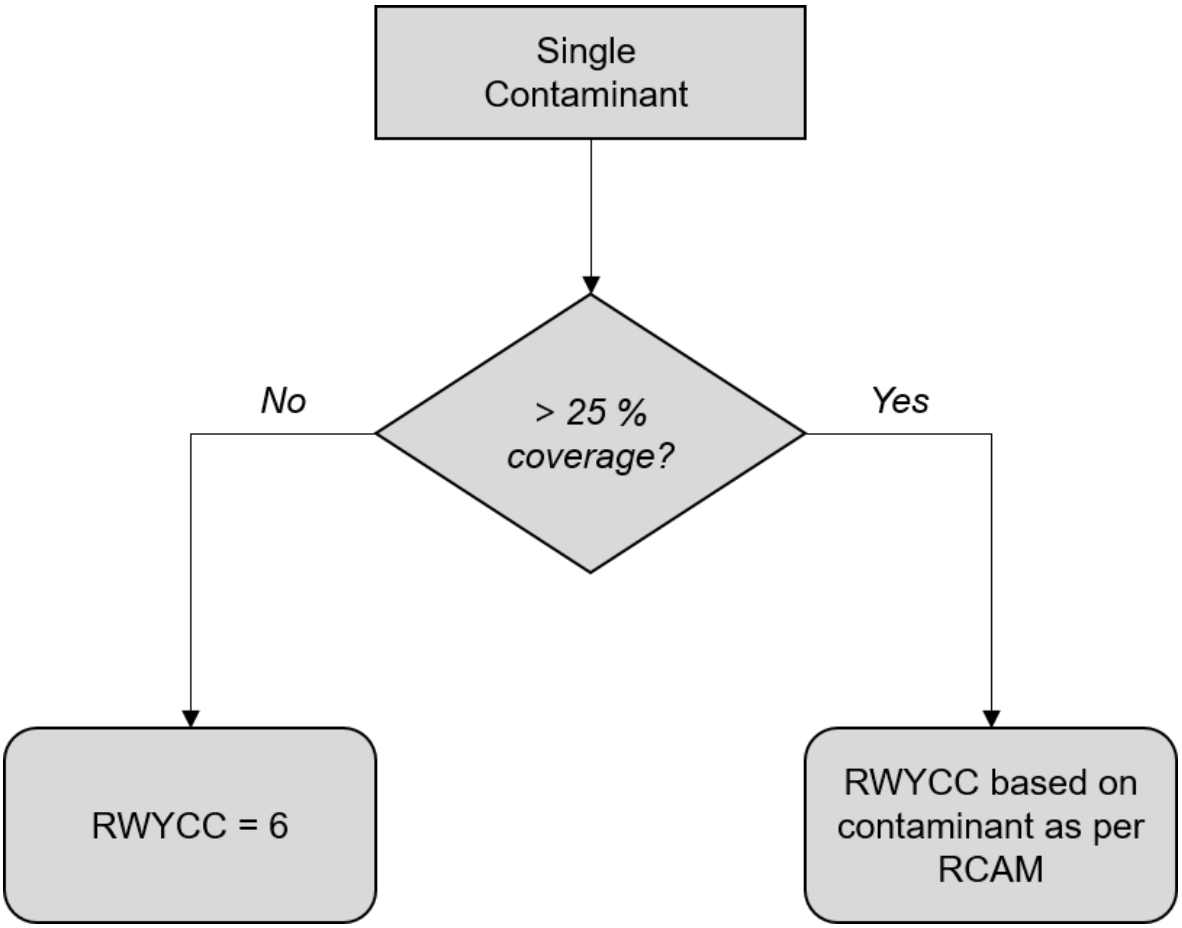
For more information, please contact:
http://www.tc.gc.ca/eng/regions.htm

Suggestions for amendment to this document are invited, and should be submitted via:
TC.FlightStandards-Normsvol.TC@tc.gc.ca

Original signed by

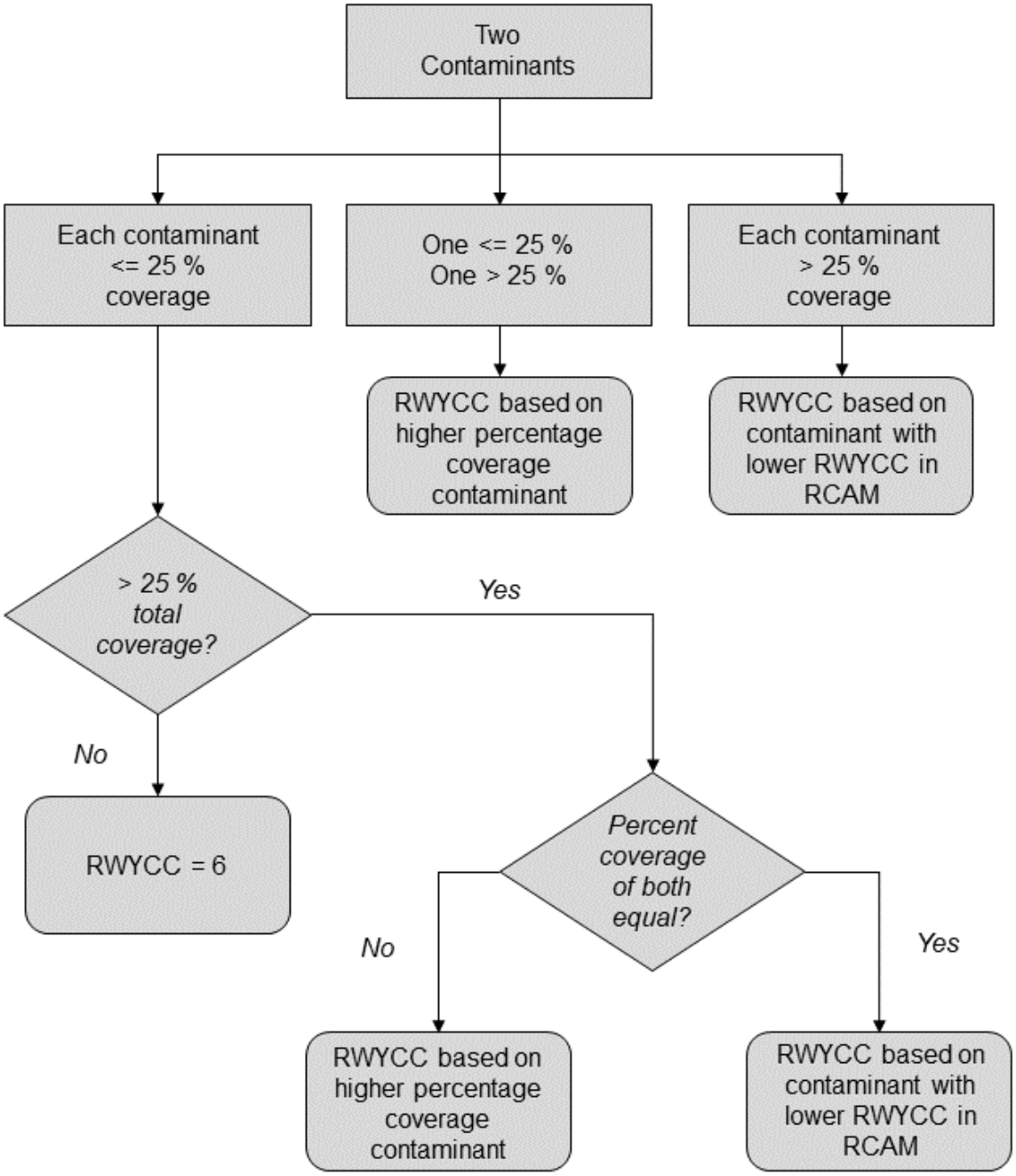
Félix Meunier
Director, Standards branch
Civil Aviation

Appendix A — Preliminary RWYCC single contaminant decision process



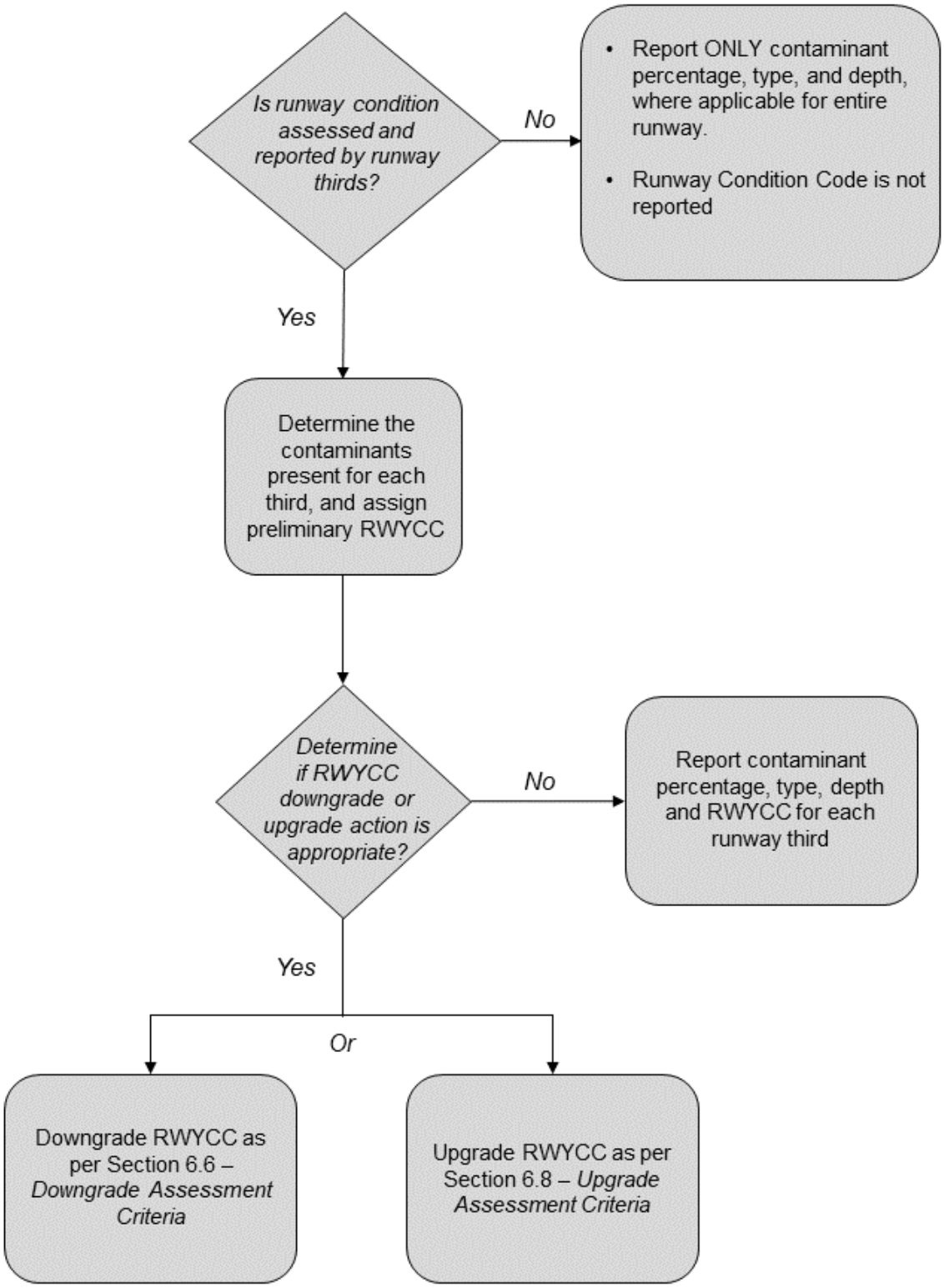
Note: Refer to Appendix C for complete process to determine RWYCC (including downgrade/upgrade, as appropriate).

Appendix B — Preliminary RWYCC multiple contaminant decision process



Note: Refer to Appendix C for complete process to determine RWYCC (including downgrade/upgrade, as appropriate).

Appendix C — Full process to determine the RWYCC



Appendix D — Example illustrating significant change

(1) In the following example, a runway is assessed to be contaminated with 1/8IN DRY SNOW. After the first assessment of runway condition, a **first AMSCR** is generated. The initial report is:

```
5/5/5 100 PCT 1/8IN DRY SNOW, 100 PCT 1/8IN DRY SNOW, 100 PCT 1/8IN DRY
SNOW
```

Note: The full information string is not used in this example.

(2) With continuing precipitation, a new runway condition report is required to be generated as subsequent assessment reveals a change in the runway condition code. A **second AMSCR** is therefore created as:

```
3/3/3 100 PCT 1/4IN DRY SNOW, 100 PCT 1/4IN DRY SNOW, 100 PCT 1/4IN DRY
SNOW
```

(3) With even more precipitation, further assessment reveals the depth of precipitation has increased from 1/4IN to 1/2IN along the entire length of the runway. However, a new AMSCR **is not** required because the change in depth is less than the significant change threshold of 3/4IN for DRY SNOW.

(4) A final assessment of the precipitation reveals that the depth has increased to 1IN. A new runway condition report is required because the change in depth from the last runway condition report (**second AMSCR**) i.e. from 1/4IN to 1IN meets or exceeds the change threshold of 3/4IN for DRY SNOW. A **third AMSCR** is thus created as below:

```
3/3/3 100 PCT 1IN DRY SNOW, 100 PCT 1IN DRY SNOW, 100 PCT 1IN DRY SNOW
```

Appendix E — Training

E.1 Background

(1) Airport and aerodrome operators are responsible for ensuring that their personnel are adequately trained, so that they can perform their duties. This is reflected by Section 107.03(d) of the CARs – Safety Management System, which states, in part:

> *"A safety management system shall include… a process for ensuring that personnel are trained and competent to perform their duties."*

(2) It is recommended that airport and aerodrome operators develop a training program for all personnel who will assess and report runway conditions. This training program should include:

(a) Initial Training; and

(b) Annual Recurrent training.

E.2 Initial Training

(1) For the purpose of Initial Training, airport and aerodrome operators should:

(a) Utilize the information in this AC to develop and conduct training which includes both:

(i) a review of the theoretical concepts; and

(ii) practical exercises

Note: Scenario-based training, which allows airport and aerodrome personnel to practice reporting conditions under various conditions, is considered to be a particularly effective.

Note: A written examination is recommended.

(b) Maintain records of completed training for the duration of the trainee's employment.

(2) Initial training should include, but is not limited to, a review of the following topics:

(a) Background (Section 3.0 of this AC)

Note: This section is intended to help trainees understand:

(i) the importance of accurate and timely reporting of runway surface conditions; and

(ii) how this information is utilized by flight crews

(b) Implementation of the Global Reporting Format (GRF) in Canada (Section 4 of this AC)

(c) Reporting Criteria for Aircraft Movement and Surface Condition Report (AMSCR) (Section 5 of this AC)

(d) Runway Condition Assessment Matrix (RCAM) (Section 6 of this AC)

(e) Process to Determine the RWYCC (Section 7 of this AC)

(f) Other Reported Runway Condition Information (Section 8 of this AC)

(g) Additional NON-GRF/TALPA INFORMATION (Section 9 of this AC)

(h) Taxiway and Apron Information (Section 10 of this AC)

(i) General Remarks (Section 11 of this AC)

(j) Order of Reporting Runway Condition Information (Section 12 of this AC)

(k) Requirements to Issue a New AMSCR/Significant Change (Section 13 of this AC)

(l) Validity Period (Section 14 of this AC)

(m) Example Runway Condition Report (Section 15 of this AC)

E.3 Annual Recurrent Training

(1) For the purpose of Annual Recurrent Training, airport and aerodrome operators should:

(a) Utilize the information in this AC to develop and conduct appropriate training for their personnel which:

(i) focuses primarily on the practical aspects of runway condition assessment and reporting; and

(ii) incorporates “lessons learned” from the previous year(s) operations.

Note 1: A written examination is recommended.

Note 2: Ideally, annual recurrent training should take place during the fall, so that personnel have completed their training in preparation for the coming winter season.

(b) Maintain records of completed training for the duration of the trainee’s employment.