Section 313
Snow and Ice Control Plan

Richmond International Airport (RIC) is susceptible to winter precipitation due to its location in the Mid-Atlantic region of the United States. FAR Part 139.313 requires certificated airports to develop a plan of action to control snow and ice when it appears. Therefore, RIC has developed a Snow and Ice Control Plan (SICP) highlighting actions taken by the airport during winter weather.

Annually, the SICP is reviewed by airport staff and updated as necessary.

- RIC includes the SICP as part of its Airport Certification Manual (ACM) but maintains the document separately.

FEDERAL AVIATION ADMINISTRATION
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Snow and Ice Control Plan
Section 313

Richmond International Airport (RIC)

FEDERAL AVIATION ADMINISTRATION

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Table of Contents

Original Date_____ FAA Approval _____
Revision Date_____

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Appendices

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2014

Phase #1

Pre- and Post-Winter Season Topics

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2014

Chapter 1. Pre-Season Actions

1.1 Airport Preparation

a) Airport Management Meetings

The Airport Operations Manager will typically initiate a meeting the month of May timeframe to discuss equipment and material inventory, repair needs, staffing, budget, training, previous years issue's, and any other topics associate with snow and ice control and its plan.

b) Personnel Training

All Capital Region Airport Commission Public Safety/Maintenance Department personnel receive annual, recurrent snow removal training. All training for airport personnel is conducted by the individual airport departments: based on responsibility. Training records are maintained by the Airport Operations Department.

i) Airport Operations—weather observation, surface condition observation and assessment, runway friction meter operation, NOTAMs, Snow Desk operation, and Snow Control.

ii) Maintenance Departments— Snow Plan, equipment operation, chemical application, weather observation

c) Equipment Preparation

Annually, the airport's approved runway friction meter will be calibrated, inspected, and certified.by the equipment's manufacturer.(timeframe recommended by manufacturer i.e. annually) (when i.e. during summer if applicable).

Sixty days prior to snow season the Maintenance Department will inspect and prepare each piece of snow removal equipment. Required fluids, replacement parts, and snow removal equipment components will be inventoried and stockpiled.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

1.2 Snow and Ice Control Committee (SICC) Meetings.

The Airport has developed a Snow and Ice Control Committee (SICC) to provide feedback and make recommendations to snow and ice removal operations and Snow and Ice Control Plan (SICP) updates at Richmond International Airport (RIC). The SICC is chaired by the Airport Operations Manager and includes other representatives of the Public Safety/Maintenance Departments, Federal Aviation Administration (Air Traffic/Tech Ops), and airline/tenant management.

If applicable:
Tenants and airport users not able to participate in the SICC are provided minutes and kept apprised of all changes and provided the opportunity to comment.

During the month of August, the Airport will begin notifying tenants and airport users to review and provide comments to be discussed at the season kick-off meeting in early fall.

The following topics should be discussed in the SICC:

- Airport Clearing Operations Discussion Topics
  - Areas Designated as Priority I area, any new airfield infrastructure
  - Clearing operations and follow-up airfield assessments
  - Potentials for pilot or vehicular runway incursions or incidents
  - Staff requirements and qualifications (training)
  - Update training program
  - Streamline decision making process
  - Response time to keep runways, taxiways and ramp areas operational
  - Communication, terminology, frequencies, and procedures
  - Monitoring and updating of runway surface conditions
  - Issuance of NOTAMS and dissemination to ensure timely notification
  - Equipment inventory
  - Status of procurement contracts, including storage of materials
  - Procedures for storm water runoff mitigation
  - Snow hauling/disposing, snow dumps
  - New runoff requirements for containment or collection
  - Changes to contract service for clearing ramps

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

- Air Carrier Ground Deicing/anti-icing programs
  - Assessing all air carriers deicing programs by reviewing airport surface flow strategies; reviewing ground time and takeoff clearances after deicing; analyzing and adjusting airplane deicing plans
  - Maximizing efficiency of operations during icing conditions by identifying locations for airplane deicing; planning taxi routes to minimize ground times; developing rates for deiced departures; allocating departure slots; determination airport deicing crew needs; verifying communications.
  - Validation of deicer certification letters from vendors (if applicable)
  - Any requirements for containment/collection of deicing/anti-icing.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Chapter 2. Post-Event/Season Actions

2.1 Post Event.

After each snow event, airport management may host an internal meeting to discuss any issues that have arisen from the event.

All members of the SICC will be encouraged to provide feedback to airport management before, during or following each snow event. After a significant event or a challenging operation, a separate SICC meeting will be held.

Note:
During the snow season, winter operations are an agenda item at tenant manager meetings which is held monthly.

2.2 Post Season.

After each snow season a SICC closeout meeting will be held, typically in May to review the snow season issues and recommendations for changes. The same topics as pre-season should be reviewed.

After the SICC closeout meeting, members of the Public Safety/Maintenance departments will de-mobilize equipment and begin post season inspections and repair. The following is a list of participants and their actions post winter operations season:

Airport Operations Department—compiles winter season's reports, service friction meter (calibration), and update the SICP

Maintenance Departments—Inspect and repair equipment

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Phase #2

Winter Storm Actions and Procedures

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Chapter 3. Snow Removal Action Criteria

3.1 Activating Snow Removal Personnel.

The responsibilities for snow and ice control fall upon the Public Safety and Maintenance Departments of the Capital Region Airport Commission. When the Snow and Ice Control Plan (SICP) is implemented, these departments report to the Snow Coordinator, who oversees all aspects of the Snow and Ice Control Plan.

A. The Airport Operations Manager acts as the Snow Coordinator. This person is assisted and/or backed up by a designee. Their responsibilities involve:

1. The overall program information and direction.

2. Determination of when snow removal or anti-icing operations will begin.

3. Establishing the priority or cleaning surfaces based upon field conditions, weather forecasts, consultation with the scheduled airlines and the FAA.

4. Issuance of NOTAMs.

5. Providing information to Public Relations for dissemination to the public.

6. Assuming responsibility or the clearing of all NAVAID critical areas and appropriated notifications to the FAA Tech Ops immediately upon implementing the SICP.

7. Keeping scheduled airlines informed of current field conditions via internal Snow Reports.

8. The Airport Operations department, with the assistance of Administration personnel, will assist the general public by providing up-to-date airfield condition reports and airline information during normal working hours.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

9. The Airport Operations Manager, with the assistance of the Commission, is responsible for the final inspection authority and complete oversight of all snow and ice control procedures including, but not limited to supervision of snow, slush and ice removal on runways, taxiways, commercial ramps, cargo ramps, pedestrian areas, surface parking lots, parking garages and roadways.

B. The Grounds Maintenance Department Foreman acts as Snow Control and he/she is responsible for snow, slush and ice removal. He/she is assisted and/or backed up by the Airport Operations Department, or designee. Their responsibilities involve:

1. Directing the operation of snow removal equipment.

2. Directing the actions of personnel within the Maintenance Departments

3. Directing the actions of snow removal contractors.

4. Inspecting all snow removal equipment immediately prior to and immediately following each now, slush and ice control event.

5. Chemical treatment on all noted roadways, surface parking lots and parking garages.

a) Weather Forecasting

RIC's Public Safety Department monitors local and distant weather patterns using a collective mix of forecasting tools: television, Internet weather forecasting, and a local automated weather station. Information provided from the previous sources includes temperature, precipitation, and projected storm track. On contract is a twenty-four hour private independent weather monitoring service. Local NOAA-National Weather Service (Wakefield, VA) personnel can also be contacted. The airport relies on contract weather forecasting to determine future weather patterns and expected accumulation: which the airport uses to determine when snow removal operations should commence.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Surface Sensor Monitoring

RIC has installed surface sensors in its most oft used runways. Both Runways (RWY) 2/20 and 16/34 have these sensors present. RIC surface sensors monitor surface and air temperatures. Surface sensors may also present the airport with a generic surface status code.

b) Chain of Command

At the onset of forecasted winter weather, RIC's Public Safety Department will begin monitoring weather reports from an array of weather reporting sources. Approximately twenty-four hours prior to the forecasted start of snow or icing conditions at RIC, a Snow Watch or Snow Alert will be declared by the Snow Coordinator.

- A Snow Watch will prompt a heightened state of readiness to address a forecast event. Staffing levels may be marginally increased to cover an upcoming event.

- A Snow Alert will prompt a heightened state of readiness beyond that of a Snow Watch and staffing levels will be significantly increased to cover the winter event.

c) Triggers for Initiating Snow Removal Operations

Once winter precipitation begins to fall, a member of the Public Safety Department will begin to inspect the airfield, as needed. If the inspector determines that precipitation on the airfield has the potential to rapidly deteriorate braking action on runways or obstruct movements on Priority Surfaces, he or she will notify the Snow Control with a request for action.

Snow removal operations will begin when contaminants begin accumulating on pavement surfaces. However, the following table highlights contaminant types and depths at which snow removal action is required.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Precipitation	Depth in Inches
Slush	1/2
Wet Snow	1/2
Dry Snow	2
Ice or Freezing Rain	1/4

3.2 Personnel Responsible.

At RIC, response to winter weather that could affect airport operations is a collaborative effort. Airport Management provides the logistical support (finance, food, supplies, and lodging) to snow removal operations. The Airport Operations Department is the leader of the response effort and liaison for airport tenants: to ensure as minimal disruption to airport flow. The Maintenance Department is the working arm of the response effort to winter operations. This department is responsible for all removal of winter precipitation (both airside and landside) as well as the pre-/post treatment of usable surfaces.

3.3 Snow Control Center (SSC).

The Snow Control Center (SCC) is the central hub and coordination center for winter operations and snow removal at RIC. The SCC is made active prior to the beginning of snow removal operations. Physical location of the SCC (whether stationary or mobile) will be determined based on the winter event present and the response needed. Airport tenants, airlines, and the FAA are made aware of the opening of the SCC via mass notification. The SCC may be closed when response to winter operations has dwindled and resources have been curbed to the minimum. A mass notification will also be made to airport tenants, airlines, and FAA Air Traffic when the SCC is closed. Communications, requests, and responses for winter operations will be filtered through the Airport Communications Center after the SCC is closed.

The SCC will be staffed by members of the Public Safety Department. Individuals that staff the SCC, at a minimum, will be able to perform the following functions:

- Manage active snow removal operations
- Inform Airport Management, FAA Air Traffic, Air Carriers, Airport tenants, and other users of the airport of current conditions.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

- Serve as the prime source for initiating RWY/TWY closures and openings, and conducting surface assessments.
- Issue NOTAMs.
- Manage Snow Logs

3.4 Airfield Clearing Priorities.

RIC sets is clearing priorities based on providing and maintaining access for life safety functions (Aircraft Rescue and Firefighting –ARFF) and access to its RWYs with systems that guide aircraft during periods of Instrument Meteorological Conditions (IMC). Therefore, all surfaces deemed not Priority 1 will either be placed in a lower priority category or closed until the Airport can re-assess if a hazard exists.

a) Priority 1

1. Runway 16/34.
2. Simultaneous clearing of Taxiway "A" (between Taxiways "C" and "E") and Taxiway C (between RIC Air Carrier ramp and Taxiway "U").
3. Clearing of Taxiways "U" (North of Taxiway G), "E", "G", "L" (South of Taxiway "E"), "R" (between Taxiway "A" and Taxiway "V"), and "T" (South of Air Carrier ramp).
4. Clearing of Taxiway "M", "M5", "M9","M10", and "M11"
5. Simultaneous clearing of the commercial and cargo ramps.
6. Simultaneous clearing of pedestrian movement areas.
7. Simultaneous clearing of Airport entrance roads in the following priority:
    a. Airport Drive from Williamsburg Road to Charles City Road.

b. Terminal Drive.
c. All other Airport roadways.

8. Simultaneous clearing of ARFF access road, public parking and employee parking lots.

b) Priority 2

1. Remaining majority of Runway 2/20.

2. Clearing of Taxiways "A" (South of Taxiway "E"), "A" (Between Taxiway "C" and Taxiway "R"), "C" (between Taxiway "U" and Runway 16/34), "L" (North of Taxiway "E"), "F", "U" (South of Taxiway "G"), "U1", "R" (West of Taxiway "V"), and "V".

3. Continuous maintenance of commercial and cargo ramps.

4. Continuous maintenance of pedestrian areas.

5. Continuous maintenance of Airport roadways, ARFF access road, public parking and employee parking lots.

c) Priority 3

1. Taxiways "B", "H", "J", "K", "M2", "M3", "M4", "M6", "M7", "M8", "N".

2. Remaining taxiways and connecting taxiways.

3. Continuous maintenance of commercial and cargo ramps.

4. Continuous maintenance of pedestrian areas.

5. Continuous maintenance of Airport roadways, ARFF access road, public parking, and employee parking lots.

3.5 Airfield Clearance Times.

As required by the Advisory Circular 150/5200-30 (Airport Winter Safety and Operations), the Airport will have sufficient equipment to clear within a reasonable time, 1 inch (2.54 cm) of weighing up to 25 lb/ft ^{3} (400 kg/m^3) from Priority 1 area within the FAA recommended clearance time. The following table, Table 1-1, outlines clearance times for Commercial Service Airports. Annually, RIC has 40,000 or more Airplane Operations.

Table 1-1. Clearance Times for Commercial Service Airports

Annual Airplane Operations (includes cargo operations)	***Clearance Time*** [1] ***(hour)***
40,000 or more	*½*
10,000 – but less than 40,000	*1*
6,000 – but less than 10,000	*1½*
Less than 6,000	*2*
General: Commercial Service Airport means a public-use airport that the U.S. Secretary of Transportation determines has at least 2,500 passenger boardings each year and that receives scheduled passenger airplane service [reference Title 49 United States Code, Section 47102(7)].	
Footnote 1: These airports should have sufficient equipment to clear 1 inch (2.54 cm) of falling snow weighing up to 25 lb/ft^3 (400 kg/m^3) from Priority 1 areas within the recommended clearance times.	

3.6 Snow Equipment List.

All snow removal and ice control vehicles operating on aircraft movement areas shall be equipped with a two-way radio in communication with the Richmond Air Traffic Control Tower or be under the direct control of a vehicle so equipped. Vehicles operated by snow removal contractors shall adhere to all airport rules and regulations and operate only when supervised by authorized Airport personnel.

The following is a list of equipment used to support winter operations at RIC.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Unit # Description

7117 2006 GMC 2500 – Snow Control
7175 1999 Ford F-250 4x4 - Snow Control
8012 2008 GMC Dump truck Crew Cab (w/ mat spreader)
7739 1997 Caterpillar backhoe to load trucks
8008 1999 Volvo tandem dump truck

Airfield Displacement Plows

8024 2000 Oshkosh dump truck w/ 22' plow 2000 TPH (w/ mat spreader)
8046 2004 Oshkosh dump truck w/ 22' plow 2000 TPH (w/ mat spreader)
8048 2007 Oshkosh dump Truck w/ 22' plow 2000 TPH (w/ mat spreader)

Airfield Rotary Plows

8042 2003 Oshkosh Sweepster w/ 18' Broom (22' plow 2000 TPH, 3000TPH blower)
8053 2011 Snow Dozer w/ 18' Broom (Blower)
7356 1991 Schmidt w/ 3000 TPH blower (18' broom, 16' plow)

Ramp Plows

8051 2007 New Holland Wheel loader w/ 22' ramp plow
8054 2011 New Holland Wheel loader w/ 22' ramp plow
8055 2013 Hyundai Wheel loader w/ 22' ramp plow
8056 2013 Hyundai Wheel loader w/ 22' ramp plow

De-Icing Equipment

7381 1996 GMC tandem dump truck w/ 100 ft boom deicer
7372 1970 Kaiser 6x6 w/ 2000 gal spray truck with 50' boom

Runway Friction Meters (Decelerometers)

VC305011564 VC3000-RFM Unit #1
VC306052200 VC3000-RFM Unit #2

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

3.7 Storage of Snow and Ice Control Equipment.

All essential snow removal equipment is kept inside a Snow Removal Equipment (SRE) building. This building is heated and designed to perform onsite maintenance during winter events.

3.8 Definitions.

Airside Urea.
(Otherwise known as "Carbamide") The approved specifications are SAE AMS 1431, Compound, Solid Runway and Taxiway Deicing/Anti-Icing, and MIL SPEC DOD-U-10866, Technical Urea. Agricultural grade urea that meets any of these specifications, called airside urea, is acceptable.

Approved Chemical.
A chemical, either solid or liquid, that meets a generic SAE or MIL specification.

Ash.

A grayish-white to black solid residue of combustion normally originating from pulverized particulate matter ejected by volcanic eruption.

Compacted Snow.
Snow that has been compressed and consolidated into a solid form that resists further compression such that an airplane will remain on its surface without displacing any of it. If a chunk of compressed snow can be picked up by hand, it will hold together or can be broken into smaller chunks rather that falling away as individual snow particles.

Note: A layer of compacted snow over ice must be reported as compacted snow only.

Example: When operating on the surface, significant rutting or compaction will not occur. Compacted snow may include a mixture of snow and embedded ice; if it is more ice than compacted snow, then it should be reported as either ice or wet ice, as applicable.

Contaminant.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

A deposit such as frost, any snow, slush, ice, or water on an aerodrome pavement where the effects could be detrimental to the friction characteristics of the pavement surface.

Contaminated Runway.

For purposes of generating a runway condition code and airplane performance, a runway is considered contaminated when more than 25 percent of the runway surface area (within the reported length and the width being used) is covered by frost, ice, and any depth of snow, slush, or water.

When runway contaminants exist, but overall coverage is 25 percent or less, the contaminants will still be reported. However, a runway condition code will not be generated.

While mud, ash, sand, oil, and rubber are reportable contaminants, there is no associated airplane performance data available and no depth or Runway Condition Code will be reported.

Exception: Rubber is not subject to the 25 percent rule, and will be reported as Slippery When Wet when the pavement evaluation/friction deterioration indicates the averaged Mu value on the wet pavement surface is below the Minimum Friction Level classification specified in Table 3-2 of FAA Advisory Circular 150/5320-12.

Dry (Pavement).

Describes a surface that is neither wet nor contaminated.

Dry Runway.

A runway is dry when it is neither wet, nor contaminated. For purposes of condition reporting and airplane performance, a runway can be considered dry when no more than 25 percent of the runway surface area within the reported length and the width being used is covered by:

Visible moisture or dampness, or

Frost, slush, snow (any type), or ice.

A FICON NOTAM must not be originated for the sole purpose of reporting a dry runway. A dry surface must be reported only when there is need to report conditions on the remainder of the surface.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Dry Snow.
Snow that has insufficient free water to cause it to stick together. This generally occurs at temperatures well below 32° F (0° C). If when making a snowball, it falls apart, the snow is considered dry.

Eutectic Temperature/Composition.
A deicing chemical melts ice by lowering the freezing point. The extent of this freezing point depression depends on the chemical and water in the system. The limit of freezing point depression, equivalent to the lowest temperature that the chemical will melt ice, occurs with a specific amount of chemical. This temperature is called the eutectic temperature, and the amount of chemical is the eutectic composition. Collectively, they are referred to as the eutectic point.

FICON (Field Condition Report).
A Notice to Airmen (NOTAM) generated to reflect Runway Condition Codes, vehicle braking action, and pavement surface conditions on runways, taxiways, and aprons.

Fluid Deicer/Anti-Icers. The approved specification is SAE AMS 1435, Fluid, Generic Deicing/Anti-icing, Runways and Taxiways.

Frost.
Frost consists of ice crystals formed from airborne moisture that condenses 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: 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 should be considered to have sufficient depth to consider a downgrade of the runway condition code.

Generic Solids. The approved specification is SAE AMS 1431, Compound, Solid Runway and Taxiway Deicing/Anti-Icing.

Ice.
The solid form of frozen water to include ice that is textured (i.e., rough or scarified ice).

A layer of ice over compacted snow must be reported as ice only.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Layered Contaminant.

A contaminant consisting of two overlapping contaminants. The list of layered contaminants has been identified in the RCAM and include:

- Dry Snow over Compacted Snow
- Wet Snow over Compacted Snow
- Slush over Ice
- Water over Compacted Snow
- Dry Snow over Ice
- Wet Snow over Ice

Mud.

Wet, sticky, soft earth material.

Multiple Contaminants.

A combination of contaminants (as identified in the RCAM) observed on paved surfaces. When reporting multiple contaminants, only the two most prevalent / hazardous contaminants are reported. When reporting on runways, up to two contaminant types may be reported for each runway third. The reported contaminants may consist of a single and layered contaminant, two single contaminants, or two layered contaminants. The reporting of "multiple contaminants" represent contaminants which are located adjacent to each other, not to be confused with a "layered contaminant" which is overlapping. For example:

- Single contaminant and Layered contaminant.

  'Wet' and 'Wet Snow over Compacted Snow'
- Single contaminant and Single contaminant.

  'Wet Snow' and 'Slush'
- Layered contaminant and Layered contaminant.

  'Dry Snow over Compacted Snow' and 'Dry Snow over Ice'

Oil.

A viscous liquid, derived from petroleum or synthetic material, especially for use as a fuel or lubricant.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Runway (Primary and Secondary).

Primary.

Runway(s) being actively used or expected to be used under the existing or anticipated adverse meteorological conditions, where the majority of the takeoff and landing operations will take place.

Secondary.

Runway(s) that supports a primary runway and is less operationally critical. Takeoff and landing operations on such a runway are generally less frequent than on a primary runway. Snow removal operations on these secondary runways should not occur until Priority 1 surfaces are satisfactorily cleared and serviceable.

Runway Condition Assessment Matrix (RCAM).

The tool by which an airport operator will assess a runway surface when contaminants are present.

Runway Condition Code (RwyCC).

Runway Condition Codes describe runway conditions based on defined contaminants for each runway third. Use of RwyCCs harmonizes with ICAO Annex 14, providing a standardized "shorthand" format (Eg: 4/3/2) for reporting. RwyCC (which replaced Mu values) are used by pilots to determine landing performance calculations.

Sand.

A sedimentary material, finer than a granule and coarser than silt.

Slush.

Snow that has water content exceeding a freely drained condition such that it takes on fluid properties (e.g., flowing and splashing). Water will drain from slush when a handful is picked up. This type of water-saturated snow will be displaced with a splatter by a heel and toe slap-down motion against the ground.

Slush over Ice.

See individual definitions for each contaminant.

Slippery When Wet Runway.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

A wet runway where the surface friction characteristics would indicate diminished braking action as compared to a normal wet runway.

Slippery When Wet is only reported when a pavement maintenance evaluation indicates the averaged Mu value on the wet pavement surface is below the Minimum Friction Level classification specified in Table 3-2 of FAA Advisory Circular 150/5320-12. Some contributing factors that can create this condition include: Rubber buildup, groove failures/wear, pavement macro/micro textures.

Water.

The liquid state of water. For purposes of condition reporting and airplane performance, water is greater than 1/8-inch (3mm) in depth.

Wet Runway.

A runway is wet when it is neither dry nor contaminated. For purposes of condition reporting and airplane performance, a runway can be considered wet when more than 25 percent of the runway surface area within the reported length and the width being used is covered by any visible dampness or water that is 1/8-inch or less in depth.

Wet Ice.

Ice that is melting, or ice with a layer of water (any depth) on top.

Wet Snow.

Snow that has grains coated with liquid water, which bonds the mass together, but that has no excess water in the pore spaces. A well-compacted, solid snowball can be made, but water will not squeeze out.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2014

Chapter 4. Snow Clearing Operations and Ice Prevention

4.1 Snow Clearing Principals.

a) Ramp and Terminal

Snow Control develops an annual tactical snow removal plan which defines the snow routes and procedures for all ramp and terminal obligations. Stockpile locations are identified, and procedures for hauling are determined. All maintenance personnel are assigned and trained with regard to their particular routes and responsibilities.

Contract personnel are often used to support Landside Snow Removal operations. Snow control develops a tactical snow removal plan which defines the snow routes and procedures for all Contractor Landside obligations

b) Runway and Taxiways

Due to limited resources at RIC, Snow Control must take a multi pass approach to removing snow. A combination of rotary brooms, displacement plows and blowers are used in configurations as described in AC 150/5200-30D, dependent on wind conditions and type of snowfall. Often, RIC experiences multiple changes in weather type throughout the storm which will require Snow Control to alter an approach to maximize effort. Runways will be cleared full length and width.

c) Snow banks

The height of snow banks alongside of usable runways, taxiways, and ramp surfaces will allow all aircraft propellers, engine pods, rotors and wingtips to clear each snow bank when the aircrafts landing gear traverses any full strength portion of the movement area. Maximum allowable snow bank height is defined in Figure 4-1. RIC is currently using the Group III-IV profile to meet standard. Appropriate NOTAMS will be issued for less than perfect conditions.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

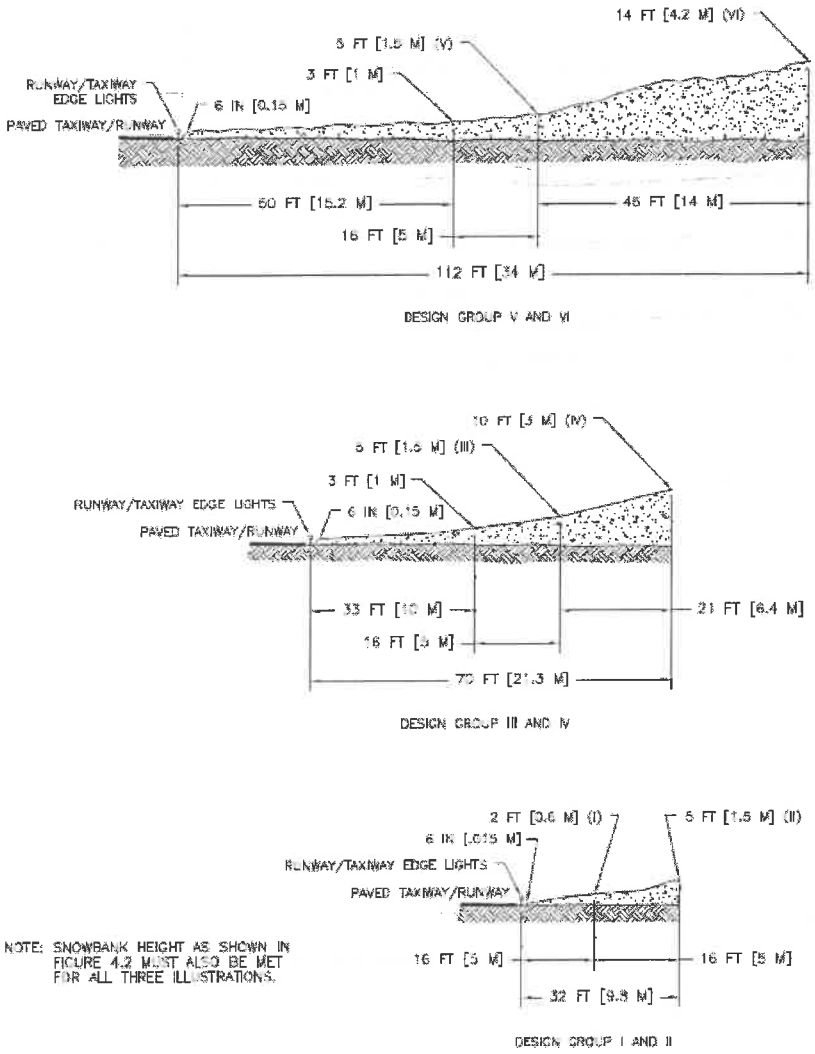
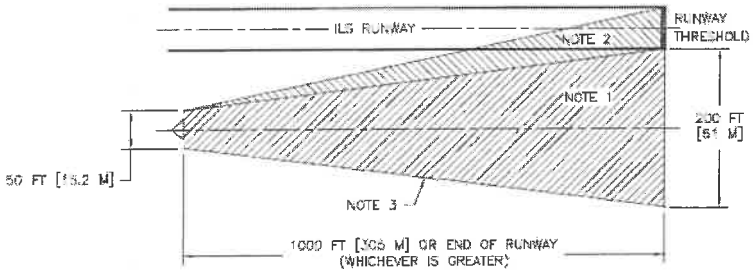


Figure 4-1. Snow Bank Profile Limits Along Edges of Runways and Taxiways with the Airplane Wheels on Full Strength Pavement (see Figure 4-2 guidance)

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

d) NAVAIDs

Glide slope will be evaluated by FAA-AF personnel. FAA Airways Facility personnel will issue the appropriate NOTAM advising the ILS is out-of-service when snow exceed the parameters identified in Figure 4-2. NOTE: Terrain and ground conditions prohibit the clearing of glide slope critical areas.



NOTES:

1. CATEGORY I GLIDE SLOPE SNOW CLEARANCE AREA.
2. CATEGORY II AND III GLIDE SLOPE SNOW CLEARANCE AREA. THE AREA DEPICTED UNDER NOTE 1 SHALL ALSO BE CLEARED.
3. THE DEPTH OF SNOWBANKS ALONG THE EDGES OF THE CLEARED AREA SHALL BE LESS THEN 2 FEET.

ACTION TAKEN	SNOW DEPTH		
	SBR <6 IN [15 cm] NR. CECS <18 IN [46 cm]	SBR 6 TO 8 IN [15 TO 20 cm] NR. CECS 18 TO 24 IN [45 TO 60 cm]	SBR >8 IN [20 cm] NR. CECS <24 IN [60 cm]
SNOW REMOVAL (SEE ABOVE FIGURE)	REMOVAL NOT REQUIRED RESTORE FULL SERVICE AND CATEGORY.	ILS CATEGORY I REMOVE SNOW 50 FT [15M] WIDE AT MAST WIDENING TO 200 FT [60M] WIDE AT 1000 FT [300M] OR END OF RUNWAY TOWARD MIDDLE AMRKER. ILS CATEGORIES II AND III AS ABOVE PLUS WIDEN THE AREA TO INCLUDE A LINE FROM THE MAST TO THE FAR EDGE OF RUNWAY THRESHOLD.	
NO SNOW REMOVAL	RESTORE FULL SERVICE AND CATEGORY.	ALL CATEGORIES RESTORE TO CATEGORY I SERVICE, CATEGORY D AIRCRAFT MINIMA RAISED TO LOCALIZER ONLY. TYPICAL NOTAM TEXT: "DUE TO SNOW ON THE IXXX (APPROPRIATE IDENTIFER) GLIDE SLOPE, MINIMA TEMPORARILRY RAISED TO LOCALIZER ONLY FOR CATEGORY D AIRCRAFT" IF APPLICABLE, "CATEGORY II NA"* OR "CATEGORY II/III NA".	ALL CATEGORIES APPROACH RESTRICTED TO LOCALIZER ONLY MINIMA. TYPICAL NOTAM TEXT: "DUE TO SNOW ON THE IXXX (APPROPRIATE IDENTIFER) GLIDE SLOPE, MINIMA TEMPORARILRY RAISED TO LOCALIZER ONLY.

* NA - (NOT AUTHORIZED)

Figure 4-2. ILS CAT I and CAT II/III Snow Clearance Area Depth Limitations

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DATE: 10/6/2016

4.2 Controlling Snow Drifts.

Drifted or windrowed snow will be promptly removed from runways, taxiways, and ramp surfaces.

4.3 Snow Disposal.

Areas are defined annually for disposal and melting of snow.

4.4 Methods for Ice Control and Removal–Chemicals.

When surface moisture exist and the temperature falls within the icing range, the Operations Department, or designee, will maintain frequent communication with the National Weather Service and/or the contract weather service, and monitor runway sensors to ensure timely application of anti-icing chemicals. Liquid de-icing chemical, meeting the latest edition of SAE AMS 1435, will be applied when condition dictates. Solid chemical meeting specifications of the latest edition of SAE AMS 1431 may also be used. Products are applied in accordance with manufacturers' recommendations.

No chloride salts or other corrosive chemicals are used on aircraft movement areas.

4.5 Sand (for the purposes of treating a winter surface).

When complete removal to bare pavement is difficult or impossible to achieve within a required span of time, it may require techniques to increase the friction coefficient of a pavement covered with ice or compacted snow. Sand is applied. Sand meets FAA gradient standards table 4.3 below.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Table 4-2. Standard Gradation for Sand

Sieve Designation	Percent by Weight Passing
8	100
80	0-2

Table 4-3. Expanded Sand Gradation Standard

Sieve Designation	Percent by Weight Passing
8	100
30	20-50
80	0-2

4.6 Surface Incident/Runway Incursion Mitigation Procedures.

Following each snow and ice removal event, a critique will be held to determine necessary improvement to the plan. The following may be in attendance:

1. Various Airport personnel
2. Airline Station Managers and fixed base operators
3. FAA Air Traffic Control Representative
4. Snow Removal Contractor

Vehicles will be marked and lighted in accordance with AC 150/2510-5, Painting, Marking and Lighting of Vehicles Used on an Airport.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

a) Radio Communication

During active snow removal operations, Snow Control is the lead voice and will coordinate directly with FAA Air Traffic (ground/tower) on behalf of his/her team. Snow Control is also the voice that relays movements and actions of equipment back to the Snow Control Center (SCC).Communications with RIC Air Traffic are accomplished with a radio mounted in the Snow Control vehicle. Information and communications passed along from Snow Control>>>Snow Team or Snow Control >>>SCC is done through handheld radios on a closed radio band.

b) Failed Radio Communication

At any time that Snow Control loses radio contact with RIC Air Traffic, due to equipment malfunction, he/she will notify the Snow Team immediately on the local airport radio band. Snow Control will then call RIC Airport Operations, via cell, and report the loss of communications. Airport Operations will notify RIC Air Traffic and proceed to get the Snow Team to a safe area for further assessment.

c) Low Visibility and Whiteout Conditions

If visibility suddenly drops or a whiteout conditions exist, Snow Control may temporarily stop all movement of vehicles under his control and notify tower of the situation. He will advise once visibility lift to continue safe operations.

d) Driver Fatigue

Operators are scheduled on rotating shifts, in an attempt to avoid operator fatigue.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2014

Chapter 5.Surface Assessment and Reporting

Conducting Surface Assessments:

The Capital Region Airport Commission Public Safety Department will remain aware and monitor all paved surface conditions in order to plan and carry out appropriate maintenance actions in accordance with the Snow and Ice Control Plan. The airport strives to maintain a 'no worse than wet' surface condition.

The airport operator in complying with Part 139.339, at a minimum, will utilize the NOTAM system for collection, dissemination and logs of airport information to air carriers, and other airport users.

Currently, RIC uses the FAA's legacy NOTAMS Manager to report surface conditions worldwide.

5.1 Conducting Surface Assessments.

During active winter precipitation, Public Safety personnel will conduct surface assessments as needed. The presence of winter precipitation adhering to paved surfaces will act as an indicator that a surface assessment needs to be conducted.

Once Public Safety personnel determine that the presence of contaminant on surfaces may affect braking action, runway friction testing will begin. An approved runway friction meter will be used to conduct testing on available runways. Pilot braking action reports are also considered. Both taxiways and aprons will undergo a visual inspection to include a measure of the depth of contaminant and a physical inspection of contaminant consistency: dry/wet snow, slush, or ice.

5.2 Applying the Runway Condition Assessment Matrix (RCAM).

a) Determining Runway Conditions

RIC identifies contaminants present on runway surfaces using the reportable contaminants listed in the Runway Condition Assessment Matrix (RCAM).

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Table 5-2. Runway Condition Assessment Matrix (RCAM) *(for Airport Operators' Use Only)*

Assessment Criteria		Downgrade Assessment Criteria		
Runway Condition Description	**Code**	**Mu (μ) [1]**	**Vehicle Deceleration or Directional Control Observation**	**Pilot Reported Braking Action**
• Dry	6		---	---
• Frost • Wet (Includes Damp and 1/8 inch depth or less of water) ***1/8 inch (3mm) depth or less of:*** • Slush • Dry Snow • Wet Snow	5	40 or Higher	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	Good
5° F (-15°C) and Colder outside air temperature: • Compacted Snow	4	39 to 30	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) over Compacted Snow ***Greater than 1/8 inch (3mm) depth of:*** • Dry Snow • Wet Snow ***Warmer than 5° F (-15°C) outside air temperature:*** • Compacted Snow	3		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
Greater than 1/8 (3mm) inch depth of: • Water • Slush	2	29 to 21	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice [2]	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice [2] • Slush over Ice • Water over Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]	0	20 or Lower	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	Nil

[1] The correlation of the Mu (μ) values with runway conditions and condition codes in the Matrix are only approximate ranges for a generic friction measuring device **and are intended to be used only to downgrade a runway condition code; with the exception of circumstances identified in Note 2.** Airport operators should use their best judgment when using friction measuring devices for downgrade assessments, including their experience with the specific measuring devices used.

[2] In some circumstances, these runway surface conditions may not be as slippery as the runway condition code assigned by the Matrix. The airport operator may issue a higher runway condition code (but no higher than code 3) for each third of the runway if the Mu value for that third of the runway is 40 or greater obtained by a properly operated and calibrated friction measuring device, **and all other observations, judgment, and vehicle braking action support the higher runway condition code. The decision to issue a higher runway condition code than would be called for by the Matrix cannot be based on Mu values alone; all available means of assessing runway slipperiness must be used and must support the higher runway condition code.** This ability to raise the reported runway condition code to a code 1, 2, or 3 can only be applied to those runway conditions listed under codes 0 and 1 in the Matrix.

The airport operator must also continually monitor the runway surface as long as the higher code is in effect to ensure that the runway surface condition does not deteriorate below the assigned code. The extent of monitoring must consider all variables that may affect the runway surface condition, including any precipitation conditions, changing temperatures, effects of wind, frequency of runway use, and type of aircraft using the runway. If sand or other approved runway treatments are used to satisfy the requirements for issuing this higher runway condition code, the continued monitoring program must confirm continued effectiveness of the treatment.

Caution: Temperatures near and above freezing (e.g., at 26.6° F (-3°C) and warmer) may cause contaminants to behave more slippery than indicated by the runway condition code given in the Matrix. At these temperatures, airport operators should exercise a heightened level of runway assessment, and should downgrade the runway condition code if appropriate.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Step 1: Runway Condition Code (RwyCC) Applicability:

If 25 percent or less of the overall runway length and width or cleared width is covered with contaminants, RwyCCs must not be applied, or reported. The airport operator in this case, will simply report the contaminant percentage, type and depth for each third of the runway, to include any associated treatments or improvements.

Or

If the overall runway length and width coverage or cleared width is greater than 25 percent, RwyCCs must be assigned, and reported, informing airplane operators of the contaminant present, and associated codes for each third of the runway. (The reported codes, will serve as a trigger for all airplane operators to conduct a takeoff and/or landing performance assessment).

Step 2: Apply Assessment Criteria

Based on the contaminants observed, the associated RwyCC from the RCAM for each third of the runway will be assigned.

Step 3: Validating Runway Condition Codes

If the observations by the airport operator determine that RwyCCs assigned accurately reflect the runway conditions and performance, no further action is necessary, and the RwyCCs generated may be disseminated.

b) Downgrade Assessment Criteria

When observations indicate a more slippery condition than generated by the RCAM, the airport operator may downgrade the RwyCC(s). When applicable, the downgrade of RwyCCs may be based on friction (μ) readings, vehicle control or pilot reported braking action or temperature.

> NOTE: Temperatures near and above freezing (e.g., at 26.6° F (-3° C) and warmer) may cause contaminants to behave more slippery than indicated by the runway condition code given in the RCAM. At these temperatures, airport operators should exercise a heightened awareness of airfield conditions, and should downgrade the RwyCC if appropriate.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: AUG 28 2017

c) Upgrade Assessment Criteria Based on Friction Assessments.
RwyCCs of 0 or 1 may only be upgraded when the following requirements are met.

1. All observations, judgment, and vehicle braking action support the higher RwyCC, and

a) Mu values of 40 or greater are obtained for the affected third(s) of the runway by a calibrated friction measuring device that is operated within allowable parameters.

b) This ability to raise the reported RwyCC to no higher than a code 3 can only be applied to those runway conditions listed under code 0 and 1 in the RCAM. (See footnote 2 on the RCAM.)

c) The airport operator must also continually monitor the runway surface as long as the higher code is in effect to ensure that the runway surface condition does not deteriorate below the assigned code.

a. The extent of monitoring must consider all variables that may affect the runway surface condition, including any precipitation conditions, changing temperatures, effects of wind, frequency of runway use, and type of aircraft using the runway.

b. If sand or other approved runway 'treatments are used to satisfy the requirements for issuing the higher runway condition code, the monitoring program must confirm continued effectiveness of the treatment.

5.3 Runway Friction Surveys, Equipment, and Procedures.

RIC currently uses a Vericom Runway Friction Meter (decelerometer) to measure the coefficient of friction (Mu values) on available runways during winter weather. Mu values are part of a broader assessment used in generating a RwyCC.

a) Conditions Acceptable to Use Decelerometers or Continuous Friction Measuring Equipment to Conduct Runway Friction Surveys on Frozen Contaminated Surfaces.

The data obtained from such runway friction surveys are only considered to be reliable when the surface is contaminated under any of the following conditions.

- Ice or wet ice.
- Compacted snow at any depth.
- Dry snow 1 inch or less.
- Wet snow or slush 1/8 inch or less.

b) When to Conduct

Friction assessments should be conducted if any of the following occurs:

- When the central portion of the runway, centered longitudinally along the runway centerline, is contaminated 500 feet or more.
- After any type of snow removal operations or chemical application (including sanding)
- After two consecutive 'Poor' braking action reports by aircraft
- After closing a RWY due to a 'Nil' braking action report by an aircraft.
- Immediately following any aircraft incident or accident on the runway.

c) How to Conduct

RIC Public Safety personnel conduct friction testing by doing the following:

- Call in to the Snow Control Center (SCC) and advise that a runway friction survey will begin.
- Advise RIC Air Traffic of the need to conduct runway friction testing on contaminated runways in use during winter operations.
- Once Air Traffic allows access to the runway, testing vehicles should line up on the arrival runway; no more than 10' either side of centerline; and on centerline for runs in the respective runway zones—touchdown, midpoint, and rollout. Runs in the respective runway zones should total three for each zone at 20 mph. (a total of 9 runs)
- Fill out the Airport Conditions Assessment Worksheet
- Issue RwyCCs and report surface conditions directly to RIC Air Traffic.
- Report findings to the SCC with a request that NOTAMs are updated.

d) Calibration

Calibration of runway friction meters, used by RIC, is completed by the manufacturer of the device.

5.4 Taxiway, Apron, and Holding Bay Assessments.

Assessments to these surfaces will occur when contaminants are present, and whenever a contaminant is present on the surface. Assessments will occur anytime the pavement is worse than wet. Surfaces will be monitored on a regular, continual basis.

RIC Tenant Responsibility

All tenants are responsible for the assessment, removal, and control of snow; ice; and other reportable contaminants on surfaces within their respective leaseholds—unless otherwise stipulated in their contractual agreement with the Capital Region Airport Commission. Tenants whose leaseholds border common areas of aprons, taxiways, or roadways should be aware that leaving snow banks on such borders may block access to their facilities. The Commission will extend assistance (equipment and manpower) to airport tenants as clearing priorities allow.

5.5 Surface Condition Reporting.

RIC personnel responsible for implementing the SICP will carefully monitor changing airfield conditions and disseminate information about those conditions via the NOTAM System in a timely manner to airport users.

Runway: Runway condition reports will occur when contaminants are present on a runway surface via the Federal NOTAM System. Condition Reports and RwyCCs will be updated as necessary whenever conditions change, such as a contaminant type, depth, percentage or treatment/width change.

Taxiway, Apron or Holding Bay: Taxiway, Apron or Holding bay condition reports will occur when contaminants are present on these surfaces via the Federal NOTAM System. NOTAMS will be updated as necessary whenever conditions change: such as a contaminant type, depth, percentage or treatment/width change.

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

Changes in surface conditions reports may also occur:

- After plowing/brooming/deicing/sanding operations
- When rising or falling temperatures create changes in winter precipitation
- When conditions begin to rapidly deteriorate

RIC Public Safety personnel visually assess runway conditions as soon as contaminants begin to adhere to runway surfaces. Depending on the depth, coverage, and type of contaminant, visual assessments may be substituted for a runway friction survey. Runway friction surveys prompt an inspector to issue RwyCCs and report findings back to RIC Air Traffic and the Snow Control Center (SCC). The SCC is responsible for generating NOTAMs (via NOTAMs Manager), based on the inspector's findings. Airport users can obtain runway surface conditions through NOTAMs or by contacting the SCC directly.

Use of the term 'DRY'

The term 'DRY' is used to describe a surface that is neither wet nor contaminated. While a FICON NOTAM is not generated for the sole purpose of reporting a dry runway, a dry surface will be reported when there is need to report conditions on the remainder of the surface. (e.g., snow present on the first two thirds of the runway but not the last)

5.6 Reportable Contaminants without Performance Data.

If present, unable to be removed, and posing no hazard, mud will be reported with a measured depth. Ash, oil, sand, and rubber contaminants will be reported without a measured depth. These contaminants will not generate a RwyCC.

5.7 Slippery When Wet Runway.

For runways where a friction survey (for the purposes of pavement maintenance) indicates the averaged Mu value at 40 mph on the wet pavement surface failed to meet the minimum friction level classification specified in AC 150/5320-12, the airport will report via the NOTAM system a RwyCC of '3' for the entire runway (by thirds: 3/3/3) when the runway is wet.

A runway condition description of 'Slippery When Wet' will be used for this condition.

If it is determined by the airport that a downgrade is necessary, the downgrade will be made to all three runway thirds match (i.e. 3/3/3, 2/2/2, 1/1/1).

The NOTAM will be cancelled when the minimum runway friction level classification has been met or exceeded.

5.8 Requirements for Closures.

Runways receiving a NIL braking (either pilot reported or by assessment by the airport) are unsafe for aircraft operations and will be closed immediately when this unsafe condition exists.

Describe what procedures and Letters of Agreement (include LOA's) that your airport has in place to immediately cease all aircraft operations, and close runway(s) when a NIL braking action is received, or when a NIL assessment is made.

When previous PIREPs have indicated GOOD or MEDIUM braking action, two consecutive POOR PIREPS should be taken as evidence that surface conditions may be deteriorating. If the airport operator has not already instituted its continuous monitoring procedures, an assessment should occur before the next operation. If the airport operator is already continuously monitoring runway conditions, this assessment should occur as soon as air traffic volume allows.

The airport will maintain available airport surfaces in a safe operating condition at all times and provide prompt notifications when areas normally available are less than satisfactorily cleared for safe operations. If a surface (runway, taxiway, apron, lane or holding bay) becomes unsafe due to a NIL (by braking action or assessment) or otherwise unsafe hazard or condition, the surface will be closed until the condition no longer exists and is safe.

It is recommended that airports develop additional triggers for runway, taxiway, apron, and holding bay closures (i.e., Maximum slush, wet, dry snow depths, ice, freezing rain, and a minimum RwyCC level). These tables may be derived from auditing a variety of the most common airplane operations at your airport.

5.9 Continuous Monitoring and Deteriorating Conditions.

Under deteriorating conditions, the airport will take all reasonable steps using available equipment and materials that are appropriate for the condition to

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016

improve the braking action. If braking action cannot be improved, and the surface is not NIL, the airport will continually monitor the runways, taxiways, aprons and holding bays to ensure braking does not become NIL.

Including but not limited to:

- Frozen or freezing precipitation.
- Falling air or pavement temperatures that may cause a wet runway to freeze.
- Rising air or pavement temperatures that may cause frozen contaminants to melt.
- Removal of abrasives previously applied to the runway due to wind or airplane effects.
- Frozen contaminants blown onto the runway by wind.

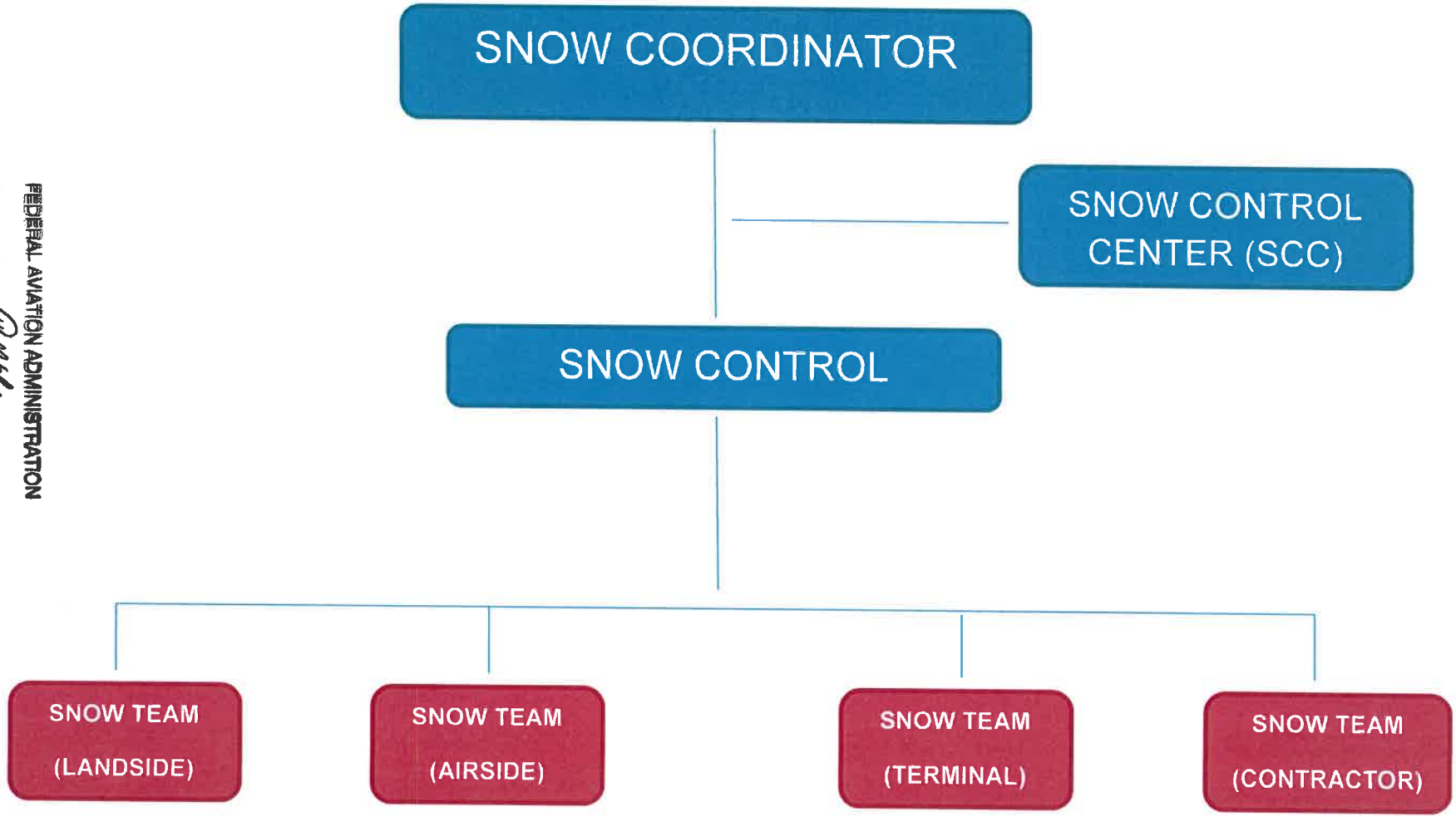
Expand upon additional continuous monitoring procedures that are put in place and what deteriorating braking action, weather, and surface conditions triggers continuous monitoring. What constitutes continuously monitoring a runway at your airport (details)?

5.10 Surface Conditions Not Being Monitored/Reported

If conditions at your airport are not being monitored/reported at certain times, provide details.

(See FAA Advisory Circular 150/5200-28, current version, for NOTAM format guidance.)

FEDERAL AVIATION ADMINISTRATION
APPROVED:
DATE: 10/6/2016



APPENDIX B. RIC AIRPORT CONDITIONS ASSESSMENT WORKSHEET

Airport ID:_____ **Date:**_____ **Pilot Reported Braking Action** (within 15 minutes of assessment when available): _____

Observed time (local): _____

Instructions

- Fill out a separate form for each runway.
- **Outside Air Temperature (OAT)**: Only applicable to compacted snow. If the OAT is warmer than 5°F (-15 °C), the RCAM generates Code 3. If the OAT is 5° F (-15 °C) or colder, the RCAM generates Code 4.
- **Depth**. Report inches or feet, as directed by the current version of AC 150/5200-30.
- **Contaminants**. See the current version of AC 150/5200-30 for a list of approved contaminant entries.
- **Runway Condition Code**: See Table 5-2, Runway Condition Assessment Matrix (RCAM), in AC 150/5200-30. Only report if contaminant coverage is greater than 25 percent. Otherwise, leave blank.
- **Airport Operator Generated Condition Codes (Optional)**: If you do not think the RCAM generated code accurately reflects conditions, use the optional table below to indicate the upgraded or downgraded codes that you intend to report in the NOTAM system. Upgrade Codes 0 or 1 only.

Airport Conditions Assessment

Runway direction in use:_____ **Is OAT warmer than 5° F (-15 °C)?** Yes No

Coverage		Depth	Contaminants	Runway Cond. Code
Location	%			
Touchdown				
Midpoint				
Rollout				

Optional Information

Use the table below if you intend to report a downgraded or upgraded code in the NOTAM system.

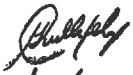
Airport Operator Generated Condition Codes Reported in NOTAM System

Upgrade or Downgrade?*	Touchdown Code	Midpoint Code	Rollout Code

*For upgrades, the issuer certifies all upgrade requirements are met: Friction values ≥40 in affected third(s), friction equipment is calibrated; airport judgment, observations, and vehicle braking action support upgraded codes; continuously monitor conditions while the upgraded codes are in effect.

*For downgrades, the issuer certifies all downgrade requirements are met: Airport operator experience, Friction values <40 in affected third(s), deceleration and directional control observation(s), and/or Pilot reported braking action from landing aircraft.

FEDERAL AVIATION ADMINISTRATION

APPROVED: 

DATE: 10/6/2014

Remarks, if applicable (Remainders, Treatments, Snowbanks, etc.):

ATCT:_____ **ISSUER:** _____

Taxiway/Holding Bay Condition

Designation	Estimated Braking	Contaminants

Apron Condition

Designation	Estimated Braking	Contaminants

ATCT:_____ **ISSUER:** _____

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