

Snow and Ice Control Plan

Dallas/Fort Worth International Airport

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DFW ACM Exhibit 1 - 1

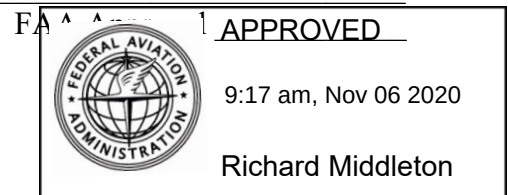


Table of Contents

Phase #1 Pre- and Post-Winter Season Topics

Chapter 1. Pre-Season Actions

1.1	Airport Preparation.....	
	Airport Management.....	
	Meetings.....	
	Personnel Training.....	
	Equipment Preparation.....	
1.2	Snow and Ice Control Committee (SICC) Meetings.....	

Chapter 2. Post Event/Season Actions

2.1	Post Event.....	
2.2	Post Season.....	

Phase #2 Winter Storm Actions and Procedures

Chapter 3. Snow Removal Action Criteria

3.1	Activating Snow Removal Personnel.....	
	Weather Forecasting.....	
	Chain of Command.....	
	Triggers for Initiating Snow Removal Operations.....	
3.2	Personnel Responsible.....	
3.3	Emergency Operations Center (EOC)	
	Activation.....	
3.4	Airfield Clearing Priorities.....	
	Priority 1.....	
	Priority 2.....	
	Airfield Clearance Times.....	
3.5.	Snow Equipment List.....	
3.6.	Storage of Snow and Ice Control Equipment.....	
3.7.	Definitions.....	

Chapter 4. Snow Clearing Operations and Ice Prevention

4.1	Snow Clearing Principles.....	
	Ramp and Terminal.....	
	Runway and Taxiways.....	
	Snowbanks.....	
	NAVAIDS.....	
4.2	Snow Disposal.....	
4.3	Methods for Ice Control and Removal–Chemicals.....	
4.4	Sand.....	
4.5	Surface Incident/Runway Incursion Mitigation Procedures.....	
	Radio Communication.....	
	Failed Radio Communication.....	
	Low Visibility and Whiteout Conditions.....	
	Driver Fatigue.....	

Original Date__10/21/2016__
Revision Date__11/05/2020__



Chapter 5. Surface Assessment and Reporting

5.1	Conducting Surface Assessments.....
5.2	Applying the Runway Condition Assessment Matrix (RCAM).....
	Determining Runway Conditions.....
	Downgrade Assessment Criteria
	Upgrade Assessment Criteria Based on Friction Assessments.....
5.3	Runway Friction Surveys, Equipment, and Procedures.....
	Conditions acceptable to use Decelerometers or Continuous Friction Measuring Equipment to conduct runway friction surveys on frozen contaminated surfaces.....
	When to Conduct.....
	How to Conduct.....
5.4	Taxiway, Apron, and Holding Bay Assessments.....
5.5	Surface Condition Reporting.....
5.6	Reportable Contaminants without Performance Data.....
5.7	Slippery When Wet Runway.....
5.8	Requirements for Closures.....
5.9	Continuous Monitoring and Deteriorating Conditions.....

Appendices

Appendix A – List of Snow and Ice Control Equipment
Appendix B – Priority 1 North Flow Airfield Clearing Map
Appendix C – Priority 1 South Flow Airfield Clearing Map
Appendix D – Priority 2 Option 1 North Flow Airfield Clearing Map
Appendix E – Priority 2 Option 1 South Flow Airfield Clearing Map
Appendix F – Priority 2 Option 2 North Flow Airfield Clearing Map
Appendix G – Priority 2 Option 2 South Flow Airfield Clearing Map
Appendix H – Priority 2 Option 3 North Flow Airfield Clearing Map
Appendix I – Priority 2 Option 3 South Flow Airfield Clearing Map
Appendix J – RCAM Matrix
Appendix K – Snow Bank Profiles
Appendix L – Snow Bank Limits
Appendix M – ILS CAT I and CAT II/III Snow Clearance Limitations

Glossary

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Revision Date 11/05/2020

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Phase #1

Pre- and Post-Winter Season Topics

Original Date__10/21/2016__
Revision Date__11/05/2020__

DFW ACM Exhibit 1 - 4

FAA



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9:17 am, Nov 06 2020

Richard Middleton

Chapter 1. Pre-Season Actions

1.1 Airport Preparation

The Dallas/Fort Worth International Airport (DFW) is located within a region of north Texas, which is susceptible to snow and icing conditions. Typically, the snow and ice season occurs from December through February, with unexpected freezing precipitation possible in November or March.

Weather patterns indicate that the likelihood of a winter storm, usually associated with a frontal passage and drop in temperature, will approach from the Northwest. In many cases, the DFW Metroplex will experience a variety of effects from no precipitation to several inches of snow. Icing conditions also may only occur in portions of the Metroplex, and then it may only affect bridges and elevated surfaces.

a) Airport Management Meetings

The Snow and Ice Control Committee (herein called the "Committee") is a standing committee of representatives from air carrier airlines serving DFW, FAA Airport Traffic Control and Board staff. Its function is to establish priorities and to provide the guidance necessary to maintain safe operations. The Committee will determine the proper course of action associated with airfield operations and Airport utilization requirements.

The Vice President of Operations will chair the Committee, and as the snow and ice season approaches each year, to discuss equipment and material inventory, repair needs, staffing, training, previous years issue's, and any other topics associate with snow and ice control and its plan.

b) Personnel Training

Airfield Operations, Energy, Transportation, and Asset Management (ETAM), and Department of Public Safety (DPS) personnel receive annual, recurrent snow removal training. All training for airport personnel is conducted by the Airfield Operations, ETAM, and DPS Training Officers. Training records are maintained by each Training Office.

- Formal classroom lectures, modules and discussion periods to teach the contents of the SICP
- Hands-on training for equipment operators on how their equipment works as well as practice runs under typical operational scenarios
- Instruction on airfield familiarization that includes both day and night tours of the airfield and ensures an understanding of all surface markings, signs, and lighting

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

- Instruction for all personnel on proper communication procedures and terminology.
- Training in following runway closure criteria for personnel responsible for closing and opening runways during snow events

c) Equipment Preparation

Sixty (60) days prior to the normal snow season the Vehicle Fleet Maintenance Manager will inspect and prepare each piece of snow removal equipment. Required fluids, replacement parts, and snow removal equipment components will be inventoried and stockpiled.

The airports GripTester friction tester will be calibrated, updated, and certified prior to the start of the winter weather season

1.2 Snow and Ice Control Committee (SICC) Meetings.

The Snow and Ice Control Committee (herein called the "Committee") is a standing committee of representatives from air carrier airlines serving DFW, FAA Airport Traffic Control and Board staff. Its function is to establish priorities and to provide the guidance necessary to maintain safe operations. The Committee will determine the proper course of action associated with airfield operations and Airport utilization requirements.

During the month of October, the Airport will begin notifying tenants and airport users to review and provide comments to be discussed at the season kick-off meeting which typically occurs in the first week of November.

The following topics are typically discussed in the SICC:

- Airport's preparedness for the winter weather season
- Updates to the airport's Snow and Ice Control Plan
- Snow and Ice Control equipment availability
- Priority 1 and Priority 2 clearing areas
- Airfield pavement assessments
- NOTAMS
- Emergency Operations Center (EOC) activations
- Aircraft deice operations

Original Date__10/21/2016__
Revision Date__11/05/2020__

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			Richard Middleton

Chapter 2. Post-Event/Season Actions

2.1 Post Event.

After each snow event, airport management may host a meeting and invite key stakeholders to discuss any issues that have arisen from the event.

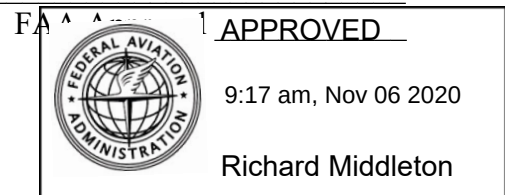
All members of the SICC will be encouraged to provide feedback to airport management before, during, or following each snow event. After a significant event, a challenging operation, or as special circumstances dictate, a Committee meeting may be scheduled upon request of any member of the Committee.

2.2 Post Season.

After each snow season a SICC meeting will be held, typically no later than the end of April to review the snow season issues and recommendations for changes. The same topics as pre-season should be reviewed.

Original Date__10/21/2016__
Revision Date__11/05/2020__

DFW ACM Exhibit 1 - 7

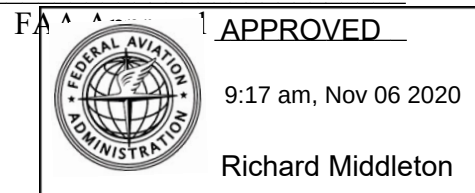


Phase #2

Winter Storm Actions and Procedures

Original Date__10/21/2016__
Revision Date__11/05/2020__

DFW ACM Exhibit 1 - 8



Chapter 3. Snow Removal Action Criteria

3.1 Activating Snow Removal Personnel.

When a winter weather condition level is declared, appropriate notifications to Airport Board (“Board”) staff, airlines, FAA and other tenants or agencies will be made by the Airport Operations Center (AOC). Consultations among Board staff to determine the degree of response will be initiated and a plan formulated. In the event the Snow and Ice Control Committee is convened, Board staff will identify the recommended course of action and resources available to the Airport.

DFW Airport relies on the services provided by the National Weather Service Office in Fort Worth when formulating decisions regarding winter weather operations.

Snow and Ice Weather Conditions:

- 1) The National Weather Service (NWS) issues unscheduled products (forecasts) as needed. Unscheduled products are transmitted to the public via the National Oceanic and Atmospheric Administration (NOAA) via weather wire. These unscheduled products include, "Advisories", "Watches", and "Warnings" to the winter weather forecasts. Please see Glossary. Declarations of winter weather condition levels will be based upon National Weather Service (NWS) forecasts and unscheduled products, as well as other available information.
- 2) The response to winter weather conditions depends largely upon the nature of the forecasted precipitation. The following winter weather condition levels will be declared to initiate planning for the implementation of snow/ice control measures.

Weather Alert

When National Weather Service (NWS) forecasts indicate that a potentially hazardous snow/icing condition will occur in the airport area within twenty-four (24) hours; or a Winter Storm Watch, which includes the Metroplex area, is issued by NWS.

Weather Warning

When National Weather Service (NWS) forecasts indicate a potentially hazardous snow/icing condition will occur in the airport area within twelve (12) hours; or when the presence or immediate approach of light freezing precipitation threatens the airport; or an Advisory that includes the Metroplex area is issued by NWS.

Original Date__10/21/2016__
Revision Date__11/05/2020__

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Weather Emergency

When the National Weather Service (NWS) forecasts indicate a potentially hazardous snow/icing condition will occur in the airport area within six (6) hours; or a Warning, which includes the Metroplex area, is issued by NWS.

When a winter weather condition level is declared, appropriate notifications to Board staff, airlines, FAA and other tenants or agencies will be made by the Airport Operations Center (AOC). Consultations among Board staff to determine the degree of response will be initiated and a plan formulated. In the event the Snow and Ice Control Committee is convened, Board staff will identify the recommended course of action and resources available to the Airport.

When a Weather Alert, Warning, or Emergency is declared, the Airport Duty Manager will initiate notification procedures through the AOC. Appropriate notifications will be made to other departments and Board staff, as well as tenant airlines, FAA and other outside agencies.

1) Operations Department:

a) Airfield Operations:

Initiate call-in of essential personnel as may be appropriate.

b) AOC:

Initiate recall of employees as needed; establish Snow and Ice Work Schedule, as needed.

2) Transportation Business Unit:

a) Point of Service (landside and airside bussing):

Initiate activities to ensure the safe transportation of the public and Airport employees per established procedures.

Activate call-in of essential personnel as may be appropriate.

b) Parking Operations Section:

Activate call-in of essential personnel as may be appropriate to maintain sufficient entrance/exit lanes to process anticipated traffic.

c) Ground Transportation:

Notify ground transportation service providers of pending weather conditions and advises service providers to take appropriate action to ensure ground transportation service is available at DFW Airport. Initiate call-in of essential personnel as may be appropriate

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

3) Customer Service:

Notify appropriate Terminal airlines and other ground services tenants of the impending weather condition.

Coordinate with managers or Assistant managers for additional staffing, as appropriate.

4) Energy, Transportation, and Asset Management (ETAM):

Initiate call-in of essential personnel as may be appropriate to provide snow/ice removal or control activities on airside and landside areas, and to provide and to prepare and stage snow control equipment.

Coordinate and communicate with Design, Code, and Construction (DCC) if additional equipment and personnel are needed to supplement ETAM operations.

Initiate snow/ice removal or control operations in areas identified by Operations and DPS as needing treatment.

a) Skylink Services:

Coordinate with the Airport Duty Manager regarding ability to continue Skylink service for the public per established procedures.

b) Vehicle Fleet Services:

Prepare equipment and supplies to properly cope with snow and ice conditions.

5) Department of Public Safety

a. Police Services:

Initiate call-in of essential personnel to provide for the safety and security of the public and Airport employees.

b) Fire Services:

Initiate call-in of essential personnel as may be appropriate for fire protection services.

Declaration of Airport Status and Response Criteria:

The Vice President of Operations will, in consultation with the Vice President of Energy, Transportation, and Asset Management (ETAM), declare the appropriate snow and ice category. The Assistant Vice President of Airfield Operations will act on the Vice President's behalf in his absence

- 1) Prior to or at the declaration of the airport's snow and ice category the airport's Emergency Operations Center (EOC) will be activated and staffed with resources to support the operation of the airport and provide command and control for the execution of the snow and ice control plan.

Original Date__10/21/2016__

Revision Date__11/05/2020__



- 2) The Vice President of Operations is responsible for directing snow and ice removal or control. In consultation with Energy, Transportation and Asset Management (ETAM), the size and composition of the work force to remain on duty as well as the deployment of personnel and equipment for actual operations will be determined. In the absence of the Vice President of Operations the Vice President of ETAM, will assume removal or control responsibilities.
 - 3) The Airfield Operations Officer on duty is responsible for continuously monitoring and identifying conditions that require snow and ice removal/control and closing portions of the airfield to air carriers in conjunction with CFR Part 139 requirements. The on-duty Airfield Operations Officer, with direction from the EOC, will execute the airport's snow and ice removal operations and will close portions of the airfield deemed to be hazardous.
 - Any portion of the airfield deemed to be unsafe for aircraft operations will be closed, and all attempts made to restore the area to an acceptable condition. When in the opinion of the Committee Chairperson the Airport cannot be safely maintained due to uncontrollable conditions, the Chairperson will recommend to the Board's Executive Vice President Operations the closing of the Airport. In that event, immediate steps will be implemented to systematically reopen those areas of highest priority. Every available resource will be sought to avoid closures and to maintain the airfield with at least a minimal operational capability.
 - 4) The Department of Public Safety's Police Operations On-Duty Supervisor is responsible for monitoring public roadways and reporting unsafe conditions to the Airport Operations Center (AOC) for remedial action. The Police Operations On-Duty Supervisor will have authority to close airport roadways deemed hazardous and open roadways when the hazardous conditions have been remedied.
 - 5) Leasehold areas are the responsibility of the primary tenant.
- c) Triggers for Initiating Snow Removal Operations

Snow removal operations will commence when snow begins to accumulate on the Movement Area surfaces. Generally, runway(s) will be closed if the pavement surface has more than one-half inch (1/2" or 13 mm) of wet snow or slush, or more than two inches (2" or 5 cm) of dry snow.

Original Date 10/21/2016
Revision Date 11/05/2020

FAA		1	<u>APPROVED</u>
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Snow/ice removal or control will begin in accordance with the order of priorities established in this Plan or as otherwise determined to sustain safe aircraft operations.

3.2 Personnel Responsible.

Upon notification of pending snow and ice removal operations, the following actions will be accomplished when deemed necessary:

1) Operations Department

a. Airfield Operations:

Initiate call-in of essential personnel as may be appropriate.

Coordinate resources for obtaining up-to-date airfield condition assessment.

Coordinate with the EOC on the status and availability of CFME and snow/ice removal or control equipment; and arrange for friction surveys of runways per established procedures.

Issue NOTAM when CFME friction surveying has been discontinued due to equipment failure.

Provide escorts and closing portions of the airfield for ETAM equipment performing snow/ice removal or control activities.

Issue NOTAMs on snow and ice removal operations or treatment of airfield surfaces, closures, and openings of runways and taxiways, airfield condition reports and other pertinent information as may be required.

Support from the AOC may be utilized for the issuing and canceling of NOTAMs. Maintain records of inspections, friction surveys, snow and ice removal operations or treatment, closure and openings of runways and taxiways, and other pertinent information as may be required.

b. AOC:

Initiate recall of employees as needed; establish Snow and Ice Work Schedule, as needed.

Coordinate resources for obtaining up to date weather observations and forecasts.

Update Airport Board Staff on any changes in the weather forecast, pavement conditions, as well as status of Airfield, Landside,

Transportation, and Parking Operations as may be deemed necessary.

Initiate appropriate notification to air carriers of the airfield condition (per Airport Certification Manual, Section 1, Chapter D.6, Airport Conditions Reporting).

Maintain logs and records of notifications.

Original Date 10/21/2016

Revision Date 11/05/2020



2) Transportation Business Unit

a. Point of Service (landside and airside bussing):

Initiate activities to ensure the safe transportation of the public and Airport employees per established procedures.

Activate call-in of essential personnel as may be appropriate.

Coordinate with airlines and other tenants regarding limited transportation abilities due to hazardous road conditions and/or Skylink shutdowns.

Notify the AOC of special needs for bus operations, fueling or roadway treatment (especially around terminal and parking area bus stops).

Notify AOC of bus operational status for public and employee areas.

b. Parking Operations Section:

Activate call-in of essential personnel as may be appropriate to maintain sufficient entrance/exit lanes to process anticipated traffic.

Coordinate with AOC for special needs and/or equipment, and treatment of roadways around plazas.

Notify AOC of revenue area gate malfunctions.

Provide for adequate funds to handle revenue demands at exit plazas.

Notify AOC of plaza and parking lot status.

c. Ground Transportation:

Notify ground transportation service providers of pending weather conditions and advises service providers to take appropriate action to ensure ground transportation service is available at DFW Airport.

Initiate call-in of essential personnel as may be appropriate.

Notify AOC and Customer Service/Terminal Support Services of availability of taxicab service.

Coordinate with AOC for treatment of Central Queue entry/exit lanes, staging area, and dispatch lanes.

3) Customer Service

Notify appropriate Terminal airlines and other ground services tenants of the impending weather condition.

Coordinate with managers or Assistant managers for additional staffing, as appropriate.

Coordinate, as needed, with the AOC for special needs and/or snow removal of the terminal ramp areas that are not the responsibility of the leaseholders and the former GA Ramp.

Original Date 10/21/2016

Revision Date 11/05/2020

FAA		1	<u>APPROVED</u>
			9:17 am, Nov 06 2020
			Richard Middleton

4) Energy, Transportation, and Asset Management (ETAM)

Initiate call-in of essential personnel as may be appropriate to provide snow/ice removal or control activities on airside and landside areas, and to provide and to prepare and stage snow control equipment.

Coordinate and communicate with Design, Code, and Construction (DCC) if additional equipment and personnel are needed to supplement ETAM operations.

Initiate snow/ice removal or control operations in areas identified by Operations and DPS as needing treatment.

Maintain communications with other departments concerning public area snow/ice removal or control requirements.

Coordinate special request by airlines and airport tenants regarding special needs as may be allowable.

Provide qualified personnel to perform CFME (Continuous Friction Measuring Equipment) friction surveys and coordinate with Airfield Operations regarding inspection of snow/ice removal and control activities and for CFME friction survey operations.

Coordinate with Operations concerning CFME and snow/ice removal or control equipment status and availability.

Maintain CFME recordings and documentation of runway treatment.

a. Skylink Services:

Coordinate with the Airport Duty Manager regarding ability to continue Skylink service for the public per established procedures.

b. Vehicle Fleet Services:

Prepare equipment and supplies to properly cope with snow and ice conditions. This equipment and supplies will be maintained per the DFW International Airport Snow and Ice Control Support Plan.

c. Energy and Utility Services:

Energy and Utility Services has management responsibilities of the airports' Source Isolation Deice Site (SIDS) infrastructure. Please refer to the Aircraft Deice Operations Plan for responsibilities.

5) Environmental Affairs

Environmental Operations:

Environmental Operations has ownership of air, water, and environmental issues related to snow and ice events. Please refer to the Aircraft Deice Plan for responsibilities.

6) Department of Public Safety

a. Police Services:

Initiate call-in of essential personnel to provide for the safety and security of the public and Airport employees.

Original Date__10/21/2016__

Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

Assess the conditions of all roadways and parking lots and closes or requests resources to close hazardous areas as may be necessary. Notify the AOC/EOC of public areas needing snow/ice removal or control.

Notify the AOC/EOC of any unserviceable areas closed due to snow/icing conditions and coordinate with AOC to mark and/or light closed or hazardous areas as may be appropriate.

b. Fire Services:

Initiate call-in of essential personnel as may be appropriate for fire protection services.

Protect fire service equipment from the elements of weather and maintain ARFF readiness per established procedures.

Notify Operations of ARFF equipment outages per CFR Part 139 requirements.

Notify AOC and Operations of hazardous ARFF road conditions and determine alternate response routes if necessary.

Upon conclusion of the need to protect the Airport from snow/icing conditions or when the forecast no longer indicates a threat of impending freezing precipitation, the winter weather condition level will be downgraded, and/or terminated and appropriate notifications made.

3.3 Emergency Operations Center (EOC)

During the snow season, the airport will activate the Emergency Operations Center for snow and ice control activities. The EOC will perform the following primary functions:

- (1) Provide command and control for the execution of the airport's snow and ice control plan.
- (2) Managing snow/ice clearing operations
- (3) Serve as a prime resource for field conditions, status of equipment
- (4) Monitor the field clearing operations, plan for the treatment/clearing of additional airfield pavement surfaces
- (5) Ensure appropriate resources are coordinated for and available

Original Date__10/21/2016__
Revision Date__11/05/2020__



3.4 Airfield Clearing Priorities.

The Committee may identify specific needs for remedial action, based upon operational requirements and airport flow and capacity. Generally, the following priorities will be applied to snow and ice removal or control. Weather, pavement conditions, and operational priority will determine the order of succession addressing airfield surfaces:

a) Priority 1

- Runway 18L/36R - Includes High Speed Exits for flow and taxi routes to the Central Terminal Area, off ramp deice sites and cargo areas.
- ARFF Roads supporting Runway 18L/36R.
- DPS Stations 1, 2, 3, 4 (Mutual Aid Response Points)

b) Priority 2

- Priority Two Option 1
Runway 18R/36L includes High Speed Exits for flow and taxi routes to the Central Terminal Area, off ramp deice sites and cargo areas.
- Priority Two, Option 2
Runway 17R/35L, includes High Speed Exits for flow and taxi routes to Central Terminal Area, off ramp deice sites, and cargo areas.
- Priority Two, Option 3
Runway 17C/35C, includes High Speed Exits for flow and taxi routes across 17R/35L to the Central Terminal Area, off ramp deice sites, and cargo areas.
- Note: When the situation and resources allow, more than one runway may be involved in snow and ice control and/or removal at any one time. During West Flow conditions Runway 31R and the associated taxiways to the terminals will be Priority 1 for clearing operations, Runway 31L and associated taxiways to the terminals will be Priority 2.
- If the Off-Ramp Aircraft Parking Plan is implemented, taxiways and taxi routes to and from these areas will be plowed, sanded, and/or treated as required. The associated taxi routes to the Central Terminal Area and the cargo ramps will also be kept open.

Original Date__10/21/2016__
Revision Date__11/05/2020__

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			9:17 am, Nov 06 2020
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Airside – Non-Movement Areas, Taxilanes

- a. Taxilanes C9, WK, Z; west of Taxiway C
- b. East Air Freight ramp
- c. UPS ramp
- d. Corporate Aviation ramp

Original Date__10/21/2016__
Revision Date__11/05/2020__

DFW ACM Exhibit 1 - 18

FAA		1	APPROVED
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3.5 Airfield Clearance Times.

DFW is classified as a commercial service airport with more than 40,000 annual aircraft operations, therefore, DFW should have sufficient equipment to clear 1 inch of falling snow weighing up to 25 pounds per cubic foot from Priority 1 surfaces within 30 minutes and complies with the following table from A/C 150/5200-30:

Table 1-1. Clearance Times for Commercial Service Airports

Annual Airplane Operations (includes cargo operations)	Clearance Time¹ (hour)
40,000 or more	1/2
10,000 – but less than 40,000	1
6,000 – but less than 10,000	1 1/2
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 [see 49 U.S.C. 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/ft³ (400 kg/m³) from Priority 1 areas within the targeted clearance times.	

3.6 Snow Equipment List.

Please see Appendix A for the snow and ice control equipment.

3.7 Storage of Snow and Ice Control Equipment.

Due to the size, quantity, and variety of equipment utilized by DFW for snow and ice control operations equipment is stored at various locations on the east and west side of the airport.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
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3.8 Definitions.

Approved Chemical

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

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 than 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

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

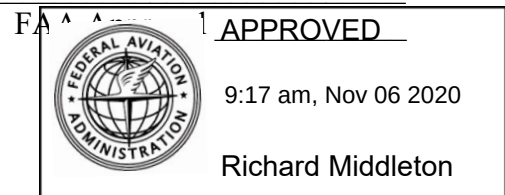
For purposes of generating a runway condition code and airplane performance, a runway is considered contaminated when more than 25 percent of the runway surface area (within the reported length and the width being used) is covered by frost, ice, and any depth of snow, slush, or water.

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, current edition.

Original Date__10/21/2016__
Revision Date__11/05/2020__



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.

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.

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			9:17 am, Nov 06 2020
			Richard Middleton

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.

Layered Contaminant.

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

- 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

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’

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

- Layered contaminant and Layered contaminant.
'Dry Snow over Compacted Snow' and 'Dry Snow over Ice'

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 (E.g.: 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.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

Slippery When Wet Runway

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.

Original Date__10/21/2016__
Revision Date__11/05/2020__



Chapter 4. Snow Clearing Operations and Ice Prevention

4.1 Snow Clearing Principals.

a) Ramp and Terminals

Snow/ice removal or control within lease areas other than the central terminal area (noted below) will be the responsibility of the primary tenant. Snow/ice removal or control will begin in accordance with the order of priorities established in this Plan or as otherwise determined in order to sustain safe aircraft operations. All of these locations are within the non-movement areas.

Snow/ice removal or control within the terminal ramp areas noted below will be conducted by a vendor under contract with the airport, in coordination with the airport and its stakeholders.

- Terminals A, B, C, and D Ramps - coordination is accomplished with American Airlines.
- Terminal E Ramp- coordination is accomplished with the various OALs at the terminal

b) Runway and Taxiways

A. Airfield Condition Assessment

The Airfield Operations Officer is responsible for the inspection and condition assessment of runways, taxiways and other essential areas of the airfield in accordance with CFR Part 139. Special inspections of runways, taxi routes, ARFF routes, NAVAID Critical Areas, and taxilanes will be conducted to assess changing conditions. Pilot braking action reports, Continuous Friction Measuring Equipment (CFME), and pavement condition sensors are resources used in conducting assessments. The Officer utilizes Assistant Airfield Operations Officers, Airfield Operations Agents and other Airfield Operations employees, as necessary, to complete these tasks.

B. Runway Condition Assessments

Runway surfaces will be assessed by Runway Condition Assessment Matrix (RCAM) procedures as outlined in Paragraphs 5.3 and 5.4, and Table 5-2 of FAA Advisory Circular 150/5200-30, "Airport Field Condition Assessments, and Winter Operations Safety."

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

NOTAMs containing Runway Condition Codes (RwyCCs) and other pertinent airfield condition reports will be disseminated to air carrier airlines providing scheduled service to the Airport in the same manner as prescribed for NOTAMs (reference Airport Certification Manual, Section 1, Chapter D, Paragraph 6).

C. Runway (CFME) Friction Surveys

- 1) The Airport has qualified personnel and Continuous Friction Measuring Equipment (CFME) to carry out runway friction surveys.
- 2) Friction assessments will be conducted if any of the following occurs:
 - a. After snow removal operations or chemical operations, including sand.
 - b. When the center portion of the runway, centered longitudinally along the runway centerline is contaminated 500 feet or more (excluding rubber contaminant).
 - c. Immediately following an aircraft incident or accident on the runway, if contaminants fall within the parameters listed in Paragraph C.3.
- 3) Data obtained from CFME Friction Surveys are considered to be unreliable when the surface is contaminated under any of the following conditions:
 - a. Ice or wet ice, with any liquid water film greater than .04 inches (1 mm)
 - b. Dry snow greater than 1 inch (25.4 mm)
 - c. Wet snow or slush greater than 1/8 inch (3.2 mm)

It will not be acceptable to use continuous friction measuring equipment to assess any contaminants outside of these parameters.

D. Runway Condition Assessment Reporting

- 1) Generally, runway conditions will be reported by Airfield Operations whenever there is a change in the runway condition that is not reflected in the current information available to Airport users. Changes may include weather events, plowing or sweeping operations, or the application of chemicals or sand. Runway conditions will generally be reported at the beginning of each shift of Airfield Operations when conditions are not changing but frozen contaminants are present.
- 2) Runway conditions will be reported for each third of the runway per RCAM procedures.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

- 3) A NIL pilot braking action report or NIL braking action assessment by the airport requires that the runway be closed before the next flight operation. The affected runway will remain closed until the NIL condition no longer exists.
- 4) Two consecutive POOR PIREPS should be taken as evidence that surface conditions may be deteriorating and require Airfield Operations to conduct a runway assessment. This assessment must occur as soon as air traffic permits. Deteriorating conditions include but are 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 affects.
 - Frozen contaminants blown onto the runway by wind.

Under the conditions noted above, the airport will take all reasonable steps using all available equipment and materials that are appropriate for the condition to improve the braking action. If the runway cannot be improved, the airport will continuously monitor the runway to ensure braking action does not become NIL. As identified in Advisory Circular 150/5200-30, Airport Winter Safety and Operations (current edition), DFW's continuous monitoring activities include:

- Observing which exit taxiways are being used.
 - Maintaining a regular program of friction testing to identify trends in runway traction.
 - Monitoring runway physical conditions including air and surface temperatures, contaminant types, and depths.
 - Monitoring pilot communications.
 - Monitoring weather patterns.
- 5) Runway conditions and Runway Condition Codes (RwyCCs) are disseminated via NOTAMS and are updated as runway conditions change.

Snow Bank Height Profiles – See Appendix K

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

The following principles regarding snow and ice removal or control will be applied to maintain safe operating conditions on Movement Areas:

- A. Drifted or windblown snow on runways and taxiways will be promptly removed or controlled to the extent practicable.
- B. In the event of heavy snow accumulation, the height of snow banks alongside usable runway or taxiway surfaces will be such that:
 - All aircraft propellers, engine pods, rotors, and wingtips will clear each snow bank when the aircraft landing gear traverses any full-strength portion of the Movement Area.
 - The permissible snow heights in glide slope critical areas will be properly maintained.
 - All runway hold position signs and ILS critical area signs are clearly visible.
 - All taxiway guidance signs are clearly visible.

4.2 Snow Disposal.

In coordination with EAD snow contaminated with spent aircraft deicing fluid (SADF) that has been removed from the airside will be dumped within one of the airport designated aircraft deicing pads or other areas designated by EAD staff to properly capture the SADF. Snow that has been contaminated with hydrocarbon (fuel or oils) should be picked up and disposed of properly. Hydrocarbons will not be allowed to runoff into the collection tanks.

Non-contaminated snow may be stockpiled on the 1E Corporate Aviation ramp. Coordination must take place in advance with EAD, Airport Duty Manager and the Corporate Aviation staff prior to stockpiling non-contaminated snow.

4.3 Methods for Ice Control and Removal–Chemicals.

DFW utilizes a liquid potassium acetate-based solution (Cryotech E36) runway deicer which is a 50% aqueous potassium acetate solution, by weight. This solution meets FAA approved Society of Automotive Engineers (SAE) Aerospace Material Specification (AMS) 1435 for deicing and anti-icing compounds in the form of a liquid for use on runways and taxiways. This solution is used both for anti-icing and deicing operations. Typically, fluid is sprayed on key airfield pavements prior to the onset of freezing precipitation and is also applied to airfield surfaces contaminated with ice or slush.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

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

Snow, ice, and slush will be removed as much as practicable on runways, high-speed turnoffs, and taxi routes. When necessary, surface friction will be improved by the application of airfield sand when icing conditions persist and ice cannot be removed. Sand used on the AOA will be washed, free of debris and corrosive materials, and screened through a # 8, 30 and 80 sieve per specifications as noted in Figure 4-3, A/C 150/5200-30, current edition.

Table 4-3. Expanded Sand Gradation Standard

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

4.5 Surface Incident/Runway Incursion Mitigation Procedures.

All vehicles engaged with snow and ice control operations are not permitted to enter a runway unless clearance has been received from FAA ATC or the runway has been closed by Airfield Operations.

ETAM will notify Airfield Operations when the snow removal team is assembled and prepared for snow and ice control operations. While operating on the AOA standard aviation phraseology will be used for communications between ETAM, Airfield Operations, and FAA ATC. DFW Board personnel will read back ATC instructions.

Runways will be closed by Airfield Operations in coordination with the FAA Tower.

All snow removal personnel working in the movement area that are in direct support of the SICP will have had runway incursion awareness training.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

Annual SICP training for Airfield Operations, ETAM, and DPS personnel will be conducted in the weeks prior to the normal snow and ice season to ensure familiarization with SICP procedures and equipment operation. Training will include identification of priority one and two pavements and runway snow removal dry-run exercises.

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

a) **Radio Communication**

Vehicle operations on the aircraft movement area performing snow and ice control activities will be conducted in a manner to prevent interference and conflict with aircraft operations. Coordination and communication between FAA ATC and the snow and ice control equipment will typically be conducted by DFW Airfield Operations personnel. The radio frequencies typically utilized are 121.65 on the east side of the airport, 121.8 on the west side of the airport, or as assigned by FAA ATC.

b) **Failed Radio Communication**

If radio communication is lost between the airfield clearing crews and FAA ATC, attempts to communicate will be made by cell phone. ATC will coordinate movements between the field crews and ATC by cell phones as required until VHF radio communications are re-established.

If a single vehicle loses radio communication, that vehicle will either be escorted out of the movement area by a vehicle with radio communication or that vehicle will be escorted at all times by another vehicle equipped with a VHF radio.

c) **Low Visibility and Whiteout Conditions**

Vehicle operations on the aircraft movement areas during low visibility operations will be conducted in accordance with the airport's FAA approved Surface Movement Guidance and Control System (SMGCS) Plan.

d) **Driver Fatigue**

Work shifts will typically not exceed 12 hours and breaks for personnel will be provided when possible.

Original Date__10/21/2016__
Revision Date__11/05/2020__



Chapter 5. Surface Assessment and Reporting

Conducting Surface Assessments:

The Airfield Operations Officer is responsible for the inspection and condition assessment of runways, taxiways and other essential areas of the airfield in accordance with CFR Part 139. Special inspections of runways, taxi routes, ARFF routes, NAVAID Critical Areas, and taxilanes will be conducted to assess changing conditions. Pilot braking action reports, Continuous Friction Measuring Equipment (CFME), and pavement condition sensors are resources used in conducting assessments. The Officer utilizes Assistant Airfield Operations Officers, Airfield Operations Agents and other Airfield Operations employees to complete these tasks.

DFW utilizes the NOTAM Manager system for the documentation and dissemination of airfield information to the air carriers and the FAA.

5.1 Conducting Surface Assessments.

Generally, runway conditions will be reported by Airfield Operations whenever there is a change in the runway condition that is not reflected in the current information available to Airport users. Changes may include weather events, plowing or sweeping operations, or the application of chemicals or sand.

- Runway conditions will generally be reported at the beginning of each shift of Airfield Operations when conditions are not changing but frozen contaminants are present. Assessments will be performed by the Airfield Operations Officer or Assistant Airfield Operations Officers.
- Assessments (IE: Vehicles, Sensors, Pilot Reports, CFME/Decelerometers, etc.), the Airport has qualified personnel and approved Continuous Friction Measuring Equipment (CFME) to carry out runway friction surveys. In addition, pilot reports (PIREPs) are monitored as well.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

5.2 Applying the Runway Condition Assessment Matrix (RCAM).

a) Determining Runway Conditions

Runway conditions will be reported for each third of the runway per RCAM procedures.

Runway conditions and Runway Condition Codes (RwyCCs) are disseminated via NOTAMS and are updated as runway conditions change. Changes to status of the airfield conditions are disseminated via NOTAM Manager System.

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.

Original Date__10/21/2016__
Revision Date__11/05/2020__



NOTE: Temperatures near and above freezing (e.g., at negative 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.

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
2. 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.
3. 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.)
4. 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.

Original Date__10/21/2016__
Revision Date__11/05/2020__



5.3 Runway Friction Surveys, Equipment, and Procedures.

DFW Airport utilizes a Grip Friction Tester.

- a) Conditions Acceptable to Use Continuous Friction Measuring Equipment (CFME) to Conduct Runway Friction Surveys on Frozen Contaminated Surfaces.
- Data obtained from CFME Friction Surveys are considered to be unreliable when the surface is contaminated under any of the following conditions:
 - Ice or wet ice with any liquid water film greater than .04 inches (1 mm)
 - Compacted snow at any depth.
 - Dry snow greater than 1 inch (25.4 mm)
 - Wet snow or slush greater than 1/8 inch (3.2mm)

It will not be acceptable to use continuous friction measuring equipment to assess any contaminants outside of these parameters.

b) When to Conduct

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

- After snow removal operations or chemical operations, including sand.
- When the center portion of the runway, centered longitudinally along the runway centerline is contaminated 500 feet or more (excluding rubber contaminant).
- Immediately following an aircraft incident or accident on the runway, if contaminants fall within the parameters listed in Paragraph C.3

c) How to Conduct

Friction surveys will be accomplished as weather conditions change, but in no more than eight (8) hour intervals during any time that runway pavement is contaminated with snow, ice, or slush. If pilots report consistent favorable braking conditions, this interval may be extended.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

Friction surveys will be conducted whenever it is felt that the information will be helpful in the overall snow/ice removal effort. The following guidelines, however, pertain to friction surveys conducted for the benefit of aircraft operations:

- When the central 50 feet (15m) of the runway, centered longitudinally along the runway centerline, is contaminated over a distance of 500 feet (150 m) or more, subject to the limitations in paragraphs 3 and 4 above.
- Whenever pilot braking action reports indicate that runway friction is changing.
- Following anti-icing, de-icing, or sanding operations.
- At least once during each eight-hour period while contaminants are present.
- Immediately following any aircraft incident on the runway.
- Any other time Airport management believes friction surveying would be useful, within the parameters of the equipment.

Procedures for performing CFME friction surveys will be followed as outlined below. The FAA ATCT will be notified in advance that friction surveying is required. Coordination between ATCT and Airfield Operations will be accomplished to the maximum extent possible to avoid disruption to aircraft operations.

- The CFME vehicle operator will ensure that all equipment is properly calibrated for each use and all ancillary systems (recording devices, radios, etc.) are operating properly.
- Unless surface conditions are noticeably different on either side of the runway centerline, a test on one side of the centerline in the same direction the aircraft lands will be accomplished.
- Friction tests will be conducted 10 feet to the right of the runway centerline to determine the worst-case condition and will be conducted in the same direction aircraft are using the runway.
- The runway length will be divided by three (3) to obtain the touchdown, midpoint and rollout zones, according to aircraft landing direction. Surveying will be conducted for each zone.

Original Date 10/21/2016
Revision Date 11/05/2020

FAA		1	<u>APPROVED</u>
			9:17 am, Nov 06 2020
			Richard Middleton

- Friction surveys will be conducted to obtain the average MU number for each third of the runway. The CFME vehicle speed will consistently be held at 40 mph or as conditions dictate.
- If, when friction survey readings have been issued on a regular basis and the CFME vehicle used to obtain these readings becomes unserviceable, a NOTAM will be issued until the equipment is restored to service or the snow/ice conditions no longer exist. In the interim, runway advisories, using pilot reports, will be issued.

d) Calibration

The GripTester friction tester will be calibrated, updated, and certified prior to the start of the winter weather season. ETAM has the responsibility for ensuring this is completed.

5.4 Taxiway, Apron, and Holding Bay Assessments.

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

5.5 Surface Condition Reporting.

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 NOTAM Manager System. NOTAMS are updated as necessary whenever conditions change, such as a contaminant type, depth, percentage, or treatment/width change.

Any time a change to the surface conditions occurs which could be any of the following:

- active freezing precipitation/snow event
- plowing/booming/deicing/sanding

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

- rapidly rising or falling temperatures
- rapidly changing conditions

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. (For example: snow is present on the first two thirds of the runway.)

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.

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.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

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.

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 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.

Conditions include but are 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.

Original Date__10/21/2016__
Revision Date__11/05/2020__

FAA		1	APPROVED
			9:17 am, Nov 06 2020
			Richard Middleton

Appendices

Original Date__10/21/2016__
Revision Date__10/21/2019__

DFW ACM Exhibit 1 A-1

FAA



1 APPROVED

9:17 am, Nov 06 2020

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Snow and Ice Control Plan – Dallas/Fort Worth International Airport

Appendix A - List of Available Snow and Ice Control Equipment

Unit #	Pickup Spreaders/Sprayers with Plows	Airside/ Landside/ General
9127	2003 4x4 1-ton Dodge Pickup with Old Spreader and No Plow	Landside
9154	2005 3/4 Ton Pickup with Old Sprayer and No Plow	Landside
9210	2016 Chevy 1Ton with Sand Spreader and Plow	Landside
9213	2016 Chevy 1Ton with Deicer Sprayer and Plow	Landside
9228	2016 Chevy 1Ton with Sand Spreader and Plow	Landside
9229	2016 Chevy 1Ton with Deicer Sprayer and Plow	Landside
9249	2016 Chevy 1Ton with Sand Spreader and Plow	Landside
9250	2016 Chevy 1Ton with Bed Sprayer and Plow	Landside
9253	2016 Chevy 1Ton with Bed Sprayer and Plow	Landside
Unit #	2.5 Ton Dump Trucks W/7 Yard Spreader / Plow	
9224	2015 Kenworth 2.5 Ton W/Spreader/Snow Plow	Landside
9236	2015 Kenworth 2.5 Ton W/Spreader/Snow Plow	Landside
9245	2015 Kenworth 2.5 Ton W/Spreader/Snow Plow	Landside
9247	2015 Kenworth 2.5 Ton W/Spreader/Snow Plow	Landside
9268	2007 International 2.5Ton W/Spreader[Mount For10' Plow]	Landside
9269	2007 International 2.5TonW/Spreader[Mount For 10' Plow]	Landside
Unit #	Loaders	
9289	2004 New Holland Tractor Loader W/Scraper	General
9310	2018 Cat Skid Steer Loader	General
9349	2008 Bobcat Rubber Track Loader	General
9357	2006 John Deer Loader	General
9371	2005 Cat 924 Wheel Loader	General
9393	2004 Cat 430D Backhoe Loader	General
Unit #	Raiko Ice Brakers	
1410	Raiko T15	General
1420	Raiko T15	General
1430	Raiko T15	General
1460	Raiko T15	General

Original Date 10/21/2016
Revision Date 10/21/2019

DFW ACM Exhibit 1 A-2

FAA	APPROVED
	9:17 am, Nov 06 2020 Richard Middleton

Snow and Ice Control Plan – Dallas/Fort Worth International Airport

Appendix A - List of Available Snow and Ice Control Equipment

Unit #	Quick Attach Front End Loader For Tractors	Airside/ Landside/ General
1	Loader Attachment for Tractor	General
2	Loader Attachment for Tractor	General
3	Loader Attachment for Tractor	General
4	Loader Attachment for Tractor	General
5	Loader Attachment for Tractor	General
6	Loader Attachment for Tractor	General
Unit #	Broom Attachment For Tractors/Trucks	
1	Broom Attachment for Tractors	General
2	Broom Attachment for Tractors	General
1	Broom Attachment for 5-Ton Trucks	General
2	Broom Attachment for 5-Ton Trucks	General
Unit #	Snow Melters	
8522	2016 Trecon Snow Melter #1	Airside
8523	2016 Trecon Snow Melter #2	Airside
Unit #	5 Ton Dump Truck With Spreaders And Plows	
9233	2003 Freightliner Dump Truck Spreader/Snow Plow	Airside
9234	2003 Freightliner Dump Truck Spreader/Snow Plow	Airside
9251	2007 International Dump Truck[SnowPlow]Slide In Spreader	Airside
9252	2007 International Dump Truck[SnowPlow]Slide in Spreader	Airside
9262	2003 Freightliner Dump Truck Spreader/Snow Plow	Airside
9263	2004 Sterling Dump Truck Spreader/Snow Plow	Airside
9264	2004 Sterling Dump Truck Spreader/Snow Plow	Airside
9265	2003 Freightliner Dump Truck Spreader/Snow Plow	Airside
Unit #	Multihogs	
8004	2014 Multihog Multifunction Machine with Sandspreader	Landside
8005	2014 Multihog Multifunction Machine with Sandspreader	Landside
8006	2014 Multihog Multifunction Machine with Sandspreader	Landside
8007	2016 Multihog Multifunction Machine with Sandspreader	Landside
8008	2016 Multihog Multifunction Machine with Sandspreader	Landside
8009	2016 Multihog Multifunction Machine with Sandspreader	Landside

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Snow and Ice Control Plan – Dallas/Fort Worth International Airport

Appendix A - List of Available Snow and Ice Control Equipment

Unit #	Snow Blowers	Airside/ Landside/ General
8055	2014 OshKosh H-Series Blower	Airside
8056	2014 OshKosh H-Series Blower	Airside
8057	2014 OshKosh H-Series Blower	Airside
8058	2016 Oshkosh H-Series Blower W>Loading Chute	Airside
8059	2016 Oshkosh H-Series Blower W>Loading Chute	Airside
8060	2016 Oshkosh H-Series Blower W/ Left Hand Cast	Airside
8061	2016 Oshkosh H-Series Blower W/Left Hand Cast	Airside
8062	2016 Oshkosh H-Series Blower W/ Left Hand Cast	Airside
Unit #	De-Icer Truck	
8010	2016 Oshkosh Runway Deicing Truck 4000 gal.	Airside
8011	2016 Oshkosh Runway Deicing Truck 4000 gal.	Airside
8012	2016 Oshkosh Runway Deicing Truck 4000 gal.	Airside
8013	2016 Oshkosh Runway Deicing Truck 4000 gal.	Airside
8014	2016 Oshkosh Runway Deicing Truck 4000 gal.	Airside
8015	2016 Oshkosh Runway Deicing Truck 4000 gal.	Airside
9239	2016 International Navistar Roadway Deicer 2000 gal.	Landside
9240	2012 International Tyler Roadway De-Icer 3,000 gal.	Landside
9246	2012 International Tyler Airfield De-Icer 4,000 gal.75 Ft Boom	Airside
9248	2012 International Tyler Airfield De-Icer 4,000 gal.75 Ft Boom	Airside
9258	1997 International Batts 4,000 gal. W/75 Ft. Boom	Airside
Unit #	MB Front Mount Broom	
9468	2012 MB Front Mount 30Ft. Snow Broom W/Air Blower	Airside
9485	2012 MB Front Mount 30Ft. Snow Broom W/Air Blower	Airside
9487	2012 MB Front Mount 30Ft. Snow Broom W/Air Blower	Airside
9488	2012 MB Front Mount 30Ft. Snow Broom W/Air Blower	Airside

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Snow and Ice Control Plan – Dallas/Fort Worth International Airport

Appendix A - List of Available Snow and Ice Control Equipment

Unit #	Oshkosh Front Mount Broom	
8016	2016 Oshkosh Front Mount Broom Truck	Airside
8017	2016 Oshkosh Front Mount Broom Truck	Airside
8018	2016 Oshkosh Front Mount Broom Truck	Airside
8019	2016 Oshkosh Front Mount Broom Truck	Airside
8020	2016 Oshkosh Front Mount Broom Truck	Airside
8021	2016 Oshkosh Front Mount Broom Truck	Airside
8022	2016 Oshkosh Front Mount Broom Truck	Airside
8023	2016 Oshkosh Front Mount Broom Truck	Airside
Unit #	Vammas Snow 30Ft. Plow And Broom	Airside/ Landside/ General
9900	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9901	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9902	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9903	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9904	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9905	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9906	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9907	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9908	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside
9909	2012 Vammas PSB 5500 Snow Plow - Sweeper - Blower	Airside

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Revision Date 10/21/2019

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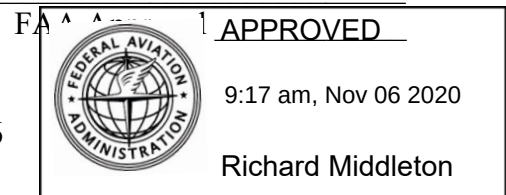
Snow and Ice Control Plan – Dallas/Fort Worth International Airport

Appendix A - List of Available Snow and Ice Control Equipment

Unit #	Oshkosh Tow Behind Multifunction Units	
8024	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8025	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8026	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8027	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8028	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8029	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8030	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8031	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8032	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8033	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8034	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8035	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8036	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside
8037	2016 OshKosh Multifunction Plow - Sweeper - Blower	Airside

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Snow and Ice Control Plan – Dallas/Fort Worth International Airport

Appendix A - List of Available Snow and Ice Control Equipment Contractor's Ramp Equipment

Terminals A, C, E:

<u>Quantity</u>	<u>Type</u>
4	Komatsu 270s with 10-foot blades
3	Skidsteers with brooms
4	Komatsu 270s with 20-foot blades
2	4x4 trucks with plow
1	Skidsteer with 8-foot snow bucket
2	Trucks with spreader and plow
1	Truck with 4000 deicing

*Access to motor-grader equipment in the event of bonded ice

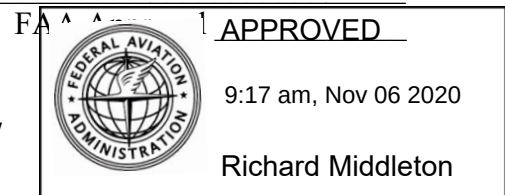
Terminal B:

<u>Quantity</u>	<u>Type</u>
3	Komatsu 270s with 10-foot bucket
1	Skidsteer with brooms
2	Komatsus with 20-foot blades
1	4x4 truck with plow
1	Skidsteer with 8-foot snow bucket
5	Skidsteers with brooms
1	Truck with 4000 deicing
1	Truck with spreader with plow

*Access to motor-grader equipment in the event of bonded ice

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Revision Date__10/21/2019__

DFW ACM Exhibit 1 A-7



Snow and Ice Control Plan – Dallas/Fort Worth International Airport

Appendix A - List of Available Snow and Ice Control Equipment Contractor's Ramp Equipment

Terminal D:

<u>Quantity</u>	<u>Type</u>
5	Komatsu 270s with 10-foot bucket
4	Skidsteer with brooms
4	Komatsu 270s with 20-foot blades
2	4x4 trucks with plow
1	Skidsteer with 8-foot snow bucket
1	Truck with 4000 deicing
2	Trucks with spreader and plow

*Access to motor-grader equipment in the event of bonded ice

Corporate Aviation/General Aviation:

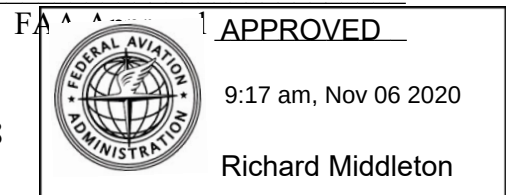
<u>Quantity</u>	<u>Type</u>
4	Komatsu 270s with 10-foot bucket
1	2.5 ton truck with plow and spreader
2	Tractors with brooms

Total number pieces of equipment for ramp clearing operations: **57**

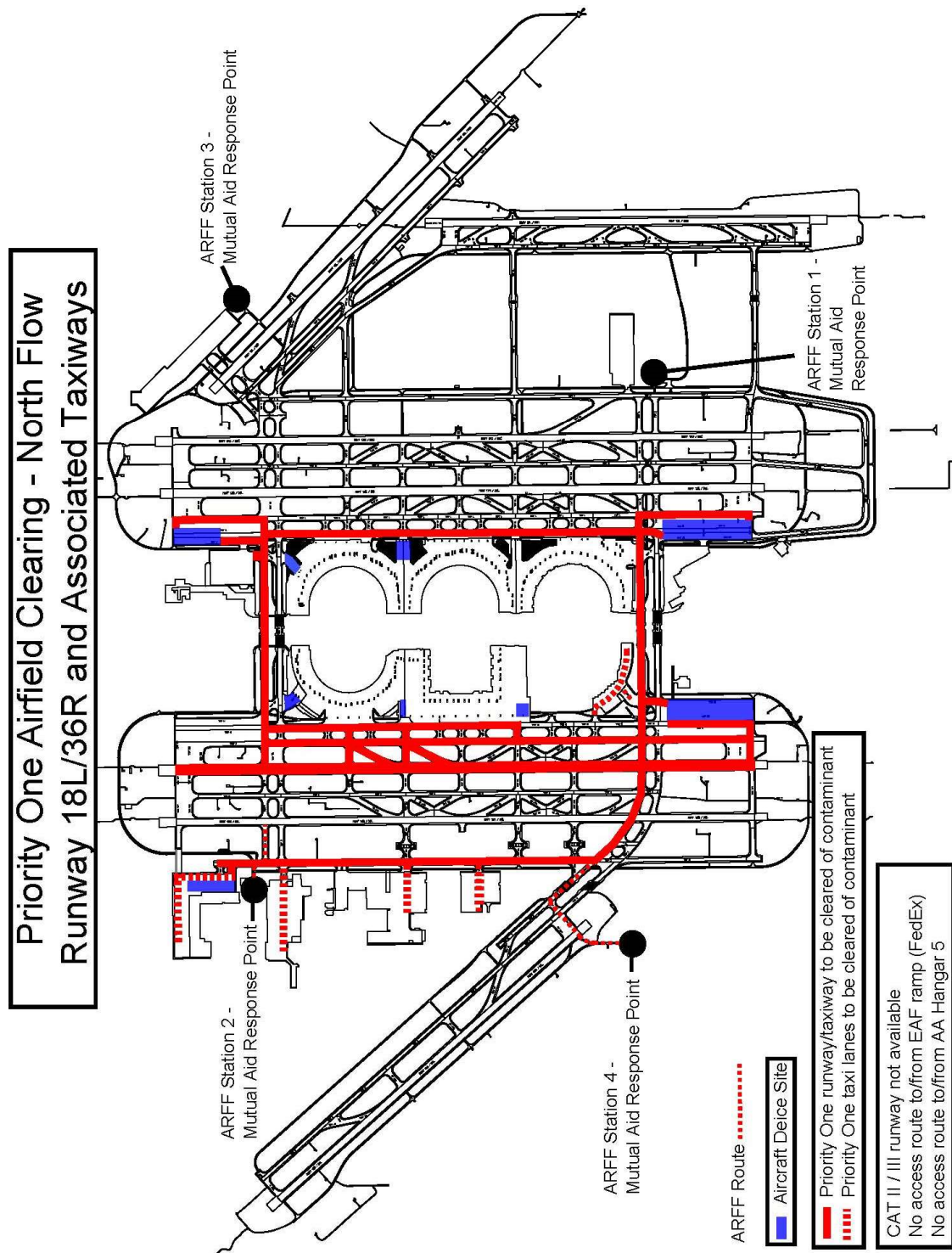
Note: DFW Airport reserves the right to realign resources for ramp clearing operations due to operational needs.

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Appendix B – Priority 1 North Flow Airfield Clearing Map



Original Date 10/21/2016
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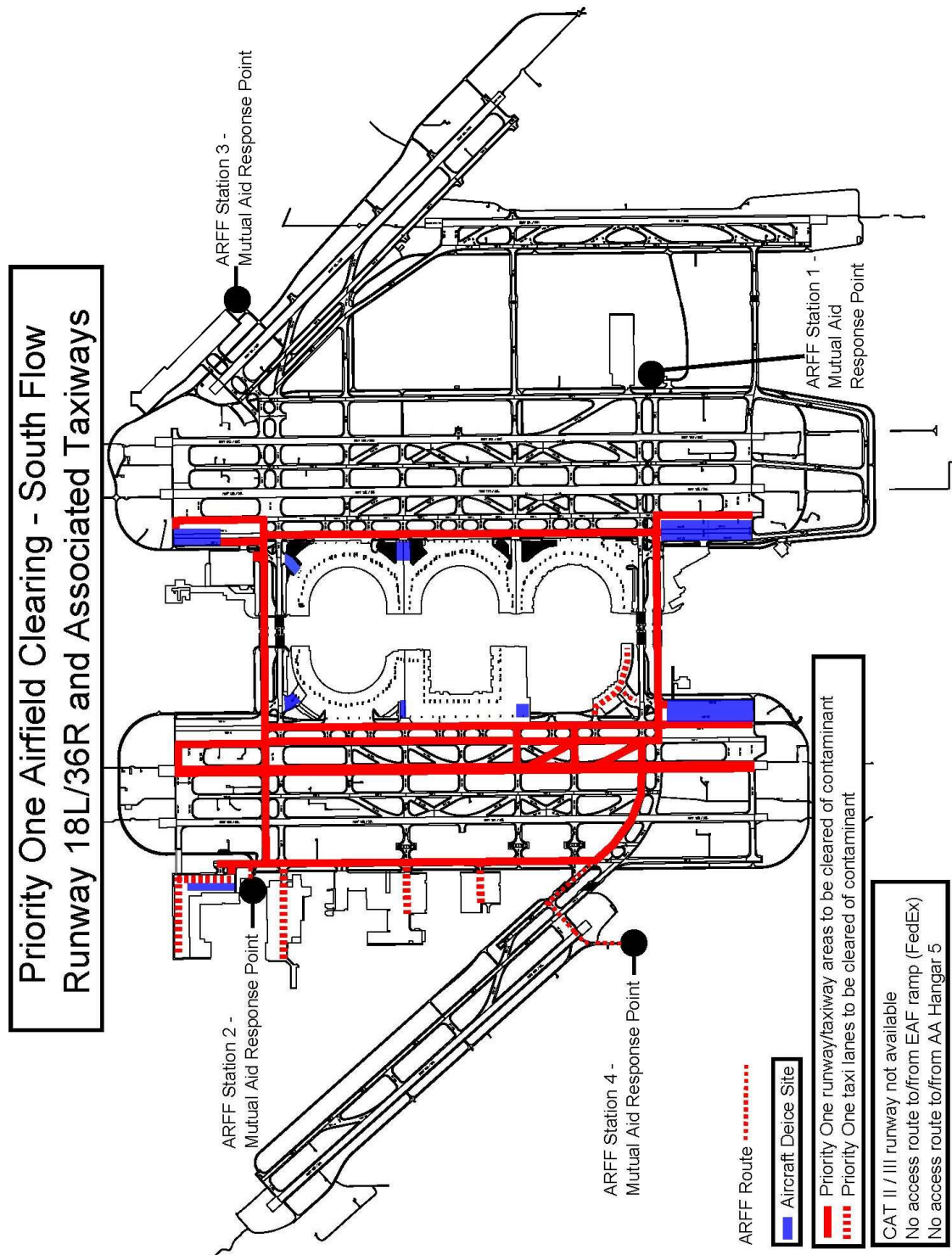


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Appendix C – Priority 1 South Flow Airfield Clearing Map



Original Date 10/21/2016
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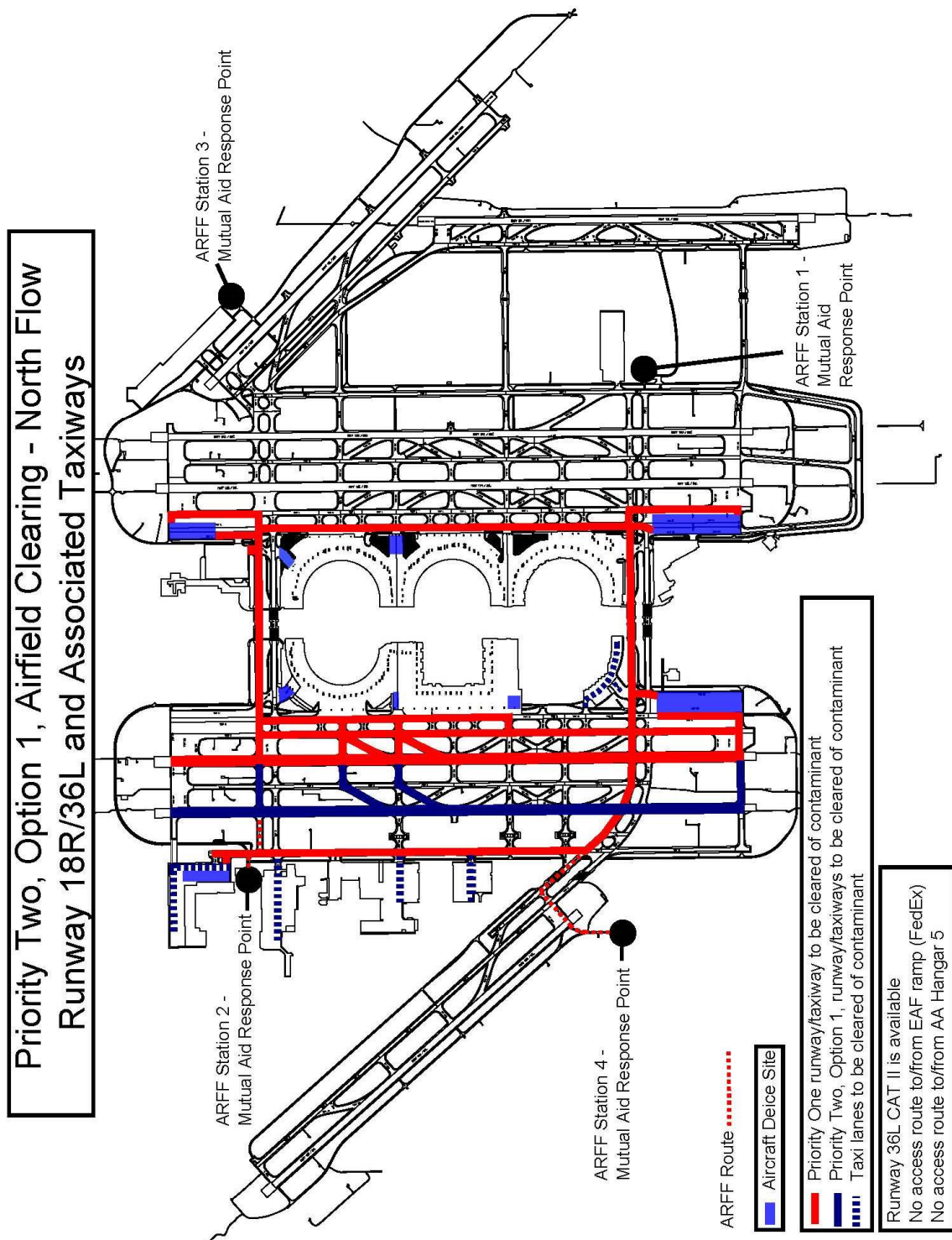


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Appendix D – Priority 2 Option 1 North Flow Airfield Clearing Map



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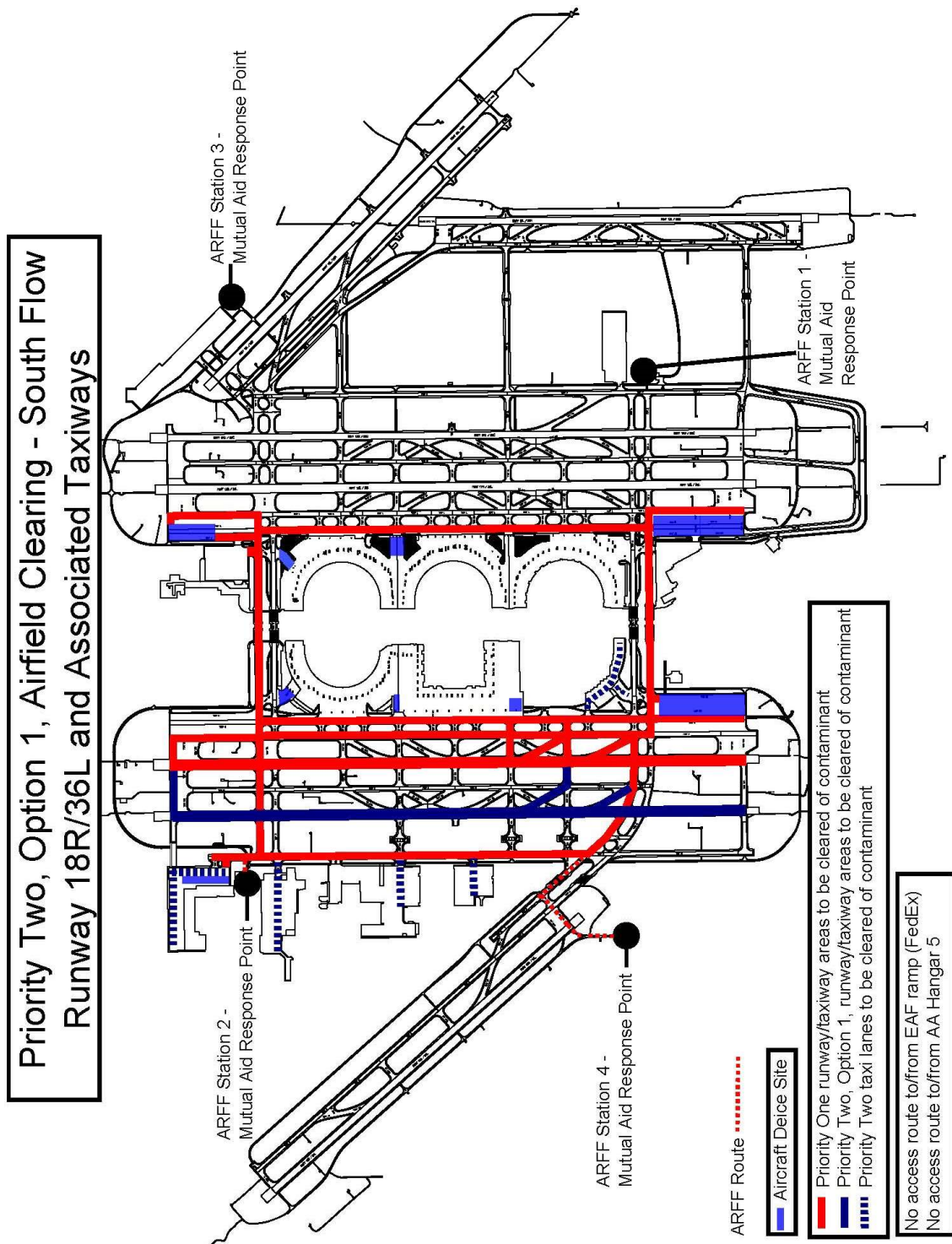


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Appendix E – Priority 2 Option 1 South Flow Airfield Clearing Map



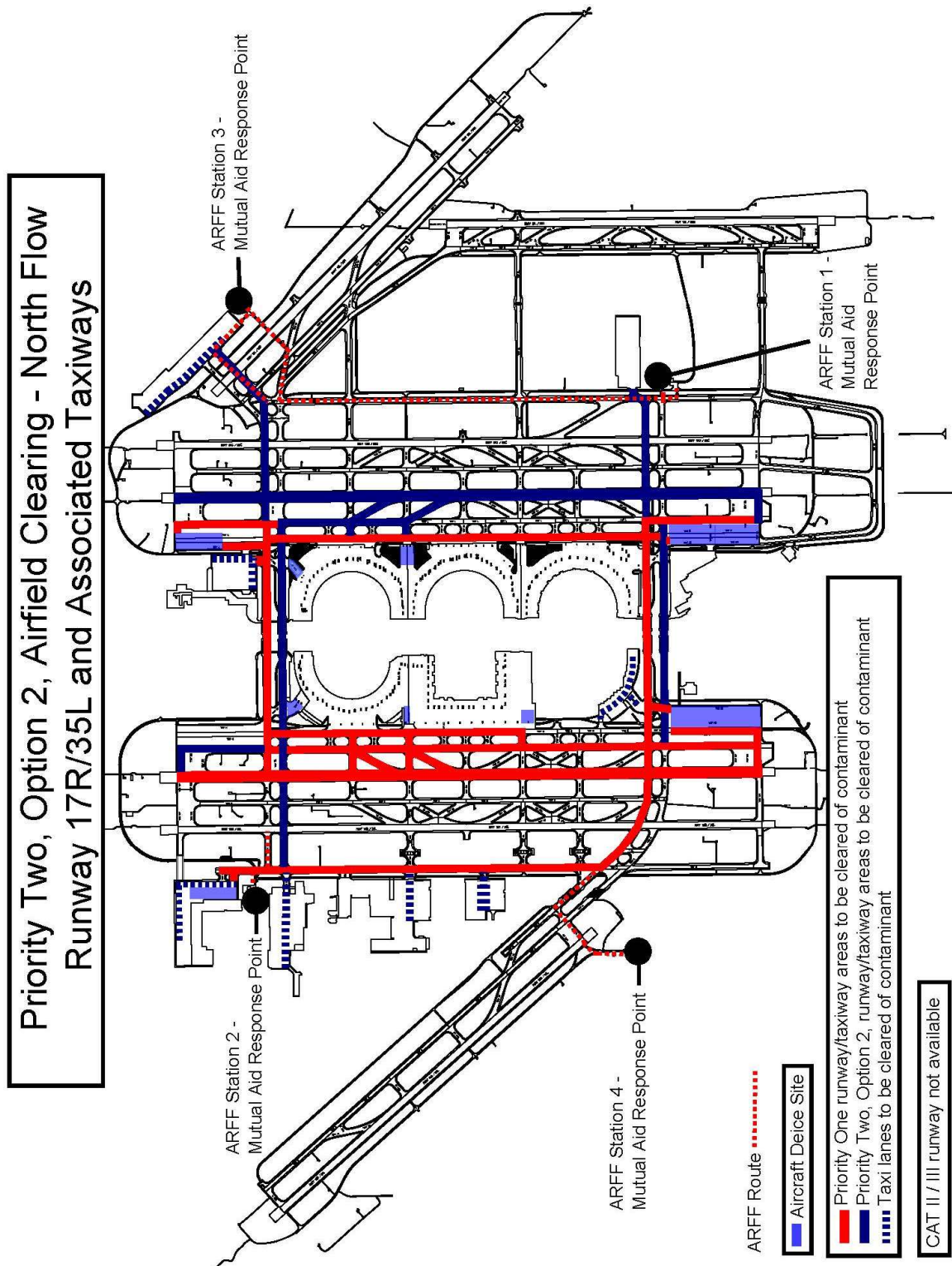
Original Date 10/21/2016
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Appendix F – Priority 2 Option 2 North Flow Airfield Clearing Map



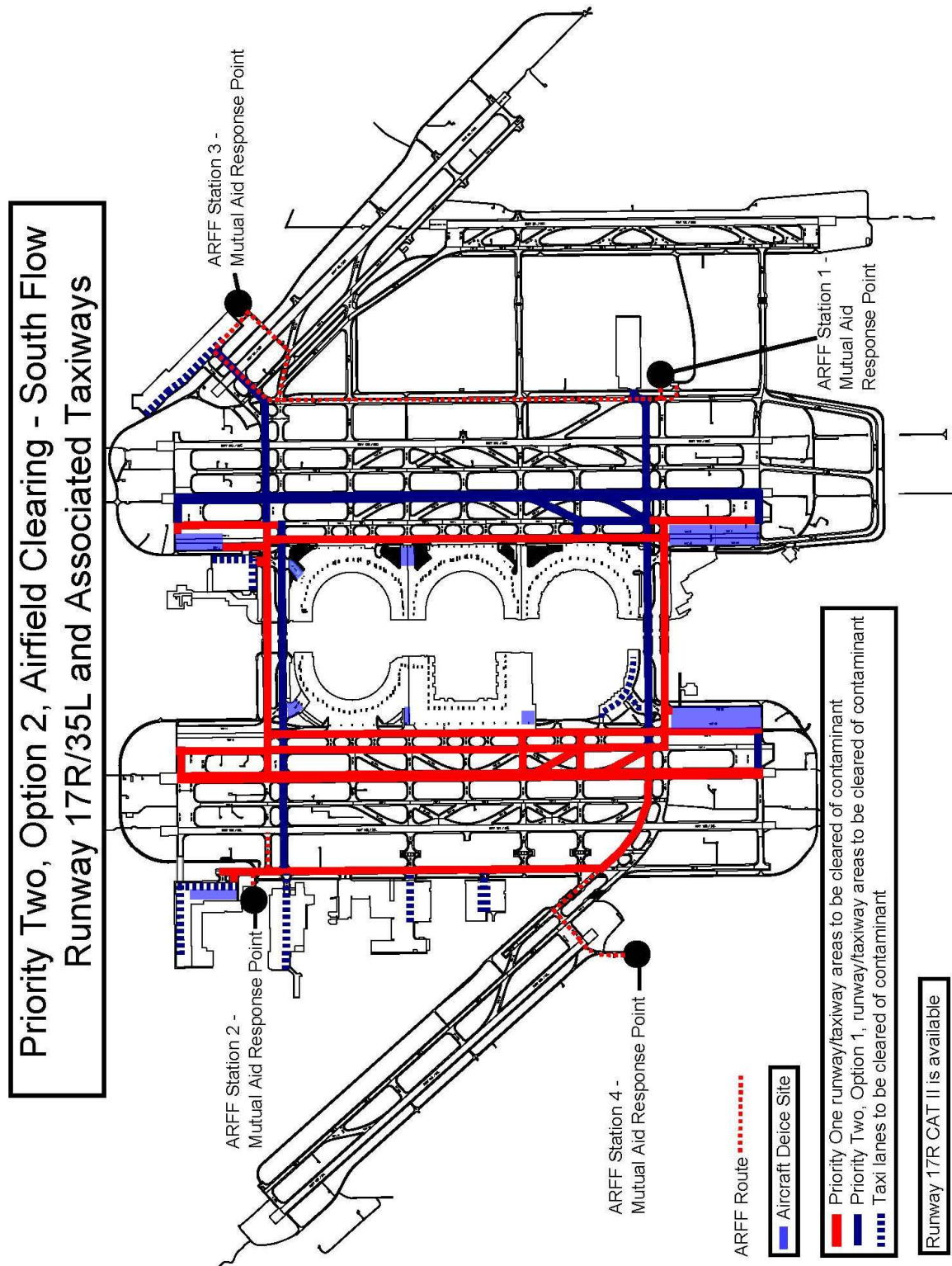
Original Date 10/21/2016
Revision Date 10/21/2019

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Appendix G – Priority 2 Option 2 South Flow Airfield Clearing Map



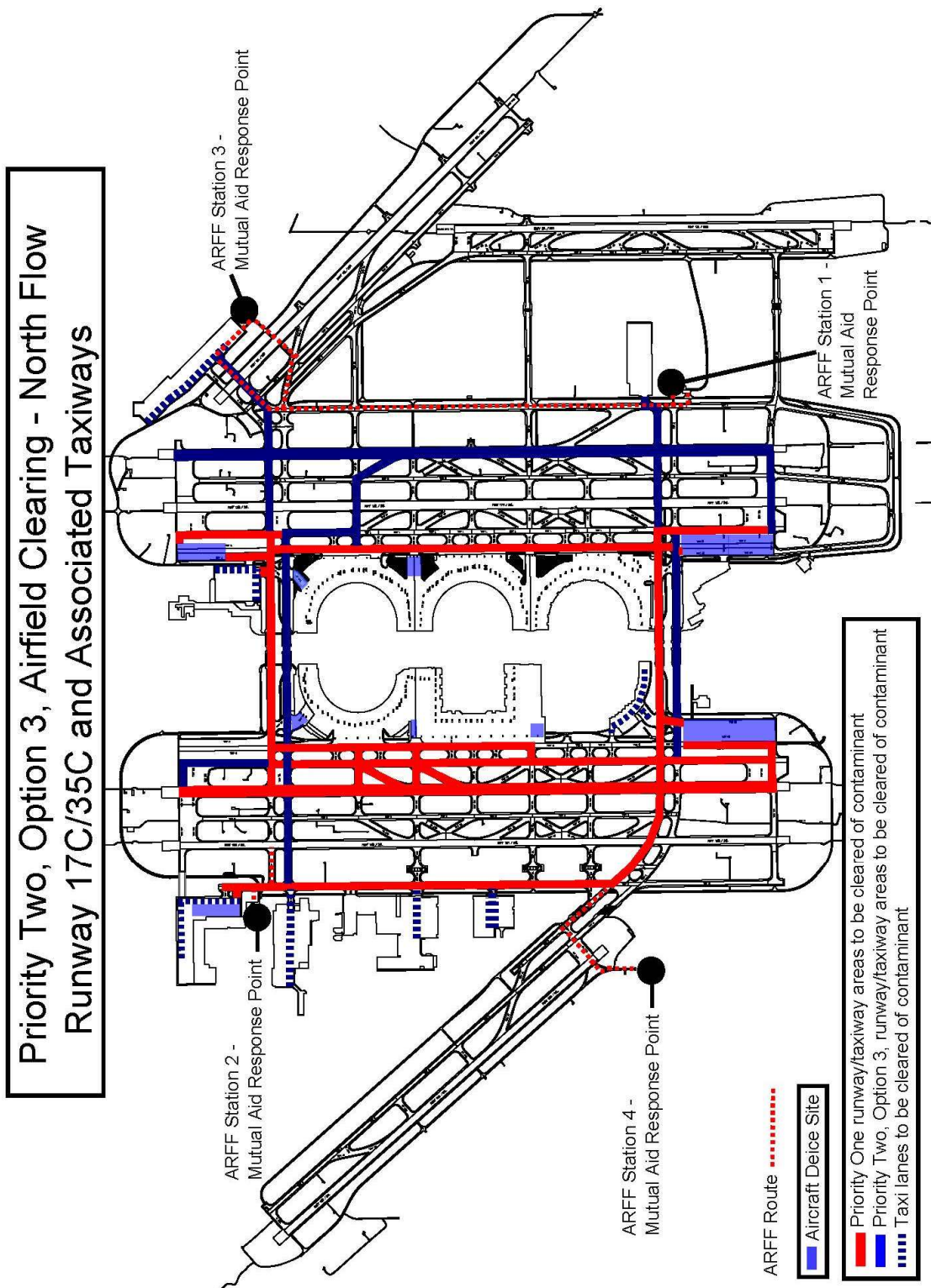
Original Date 10/21/2016
Revision Date 10/21/2019

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Appendix H – Priority 2 Option 3 North Flow Airfield Clearing Map



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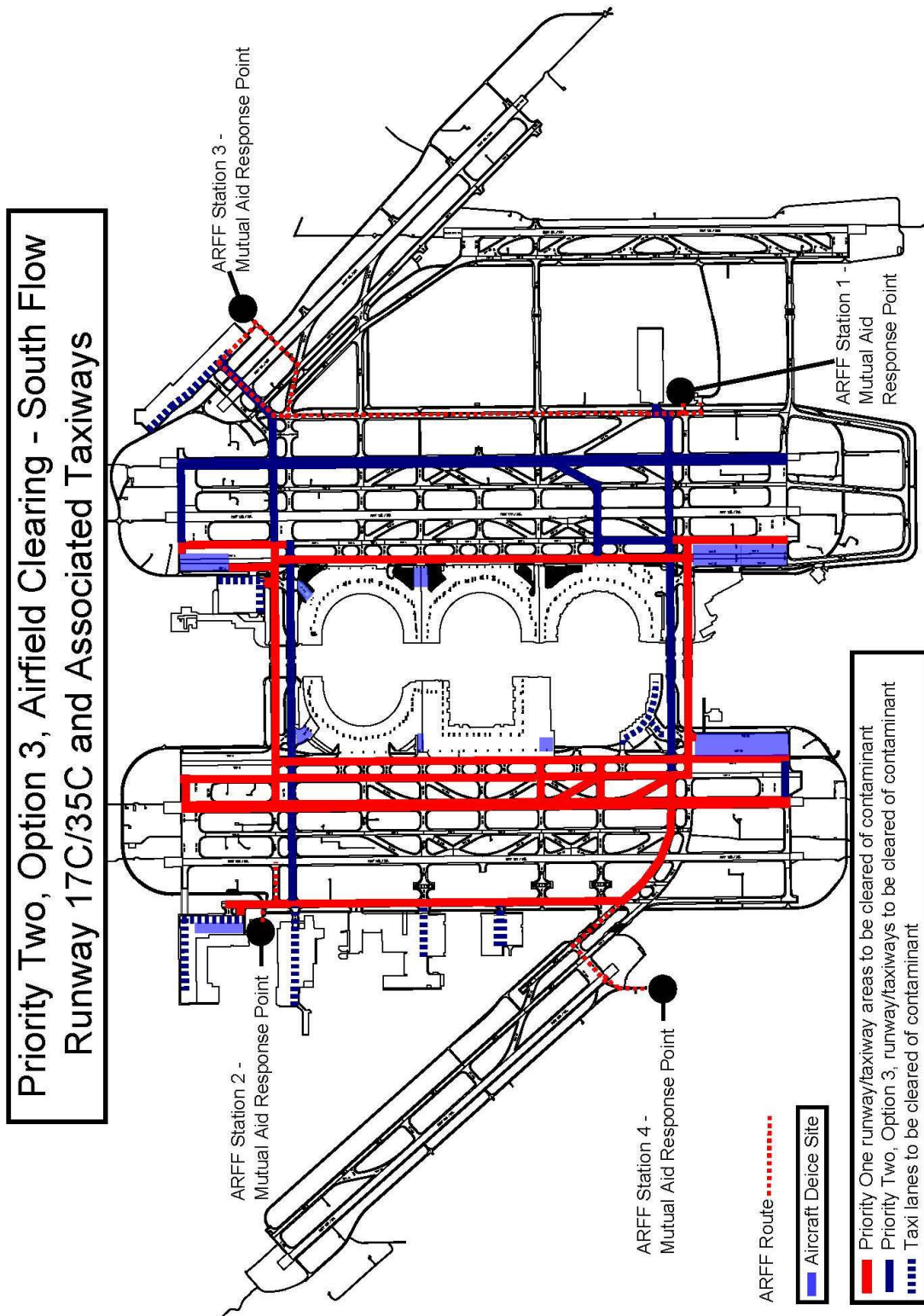


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Appendix I – Priority 2 Option 3 South Flow Airfield Clearing Map



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Appendix J - RCAM Matrix – Advisory Circular 150/5200-30

**APPENDIX F. 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	40 or Higher	---	---
• 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		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	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	30 to 39	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 30	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice ²	1	21 to 29	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.

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Revision Date 10/21/2019

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Appendix K - Snow Bank Profile Limits - Advisory Circular 150/150/5200-30

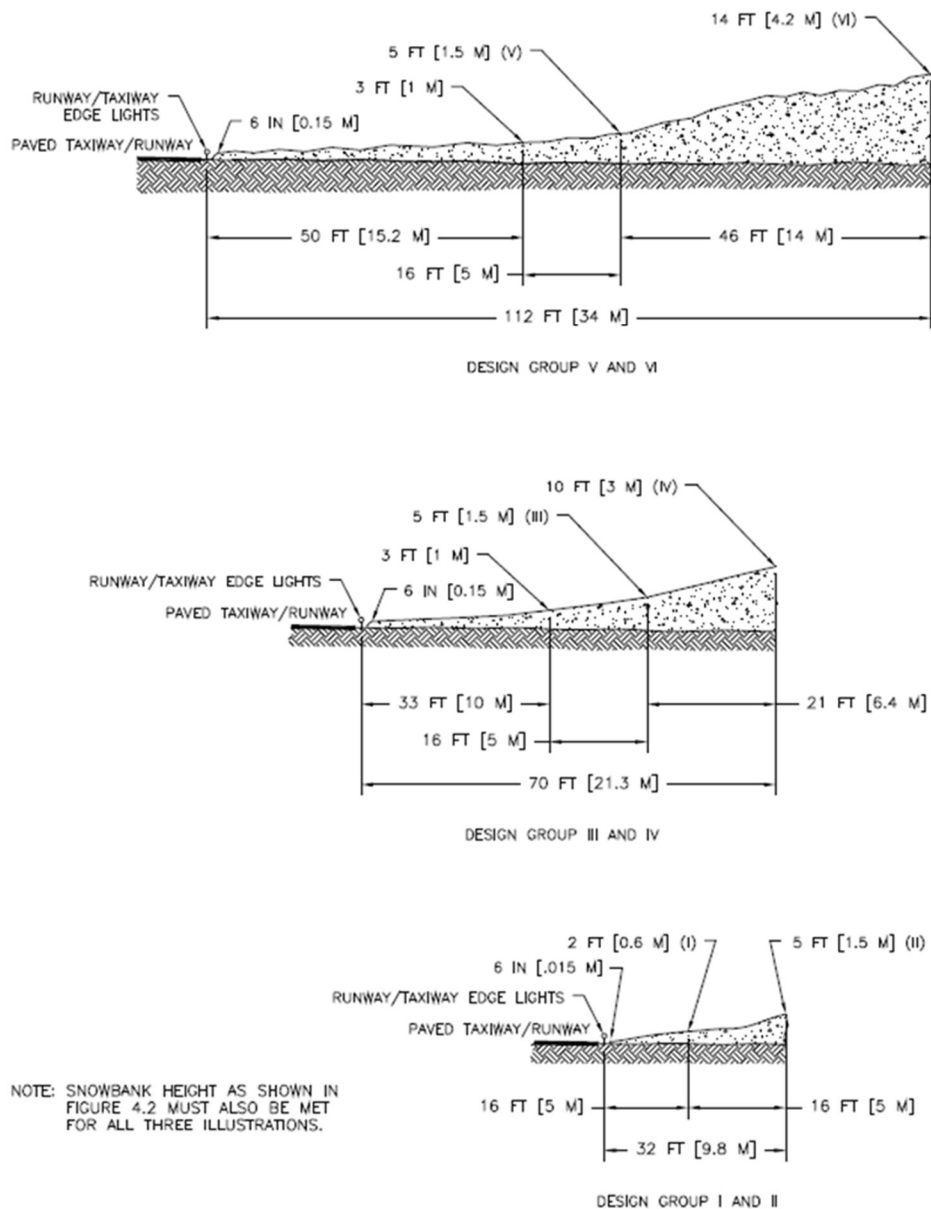


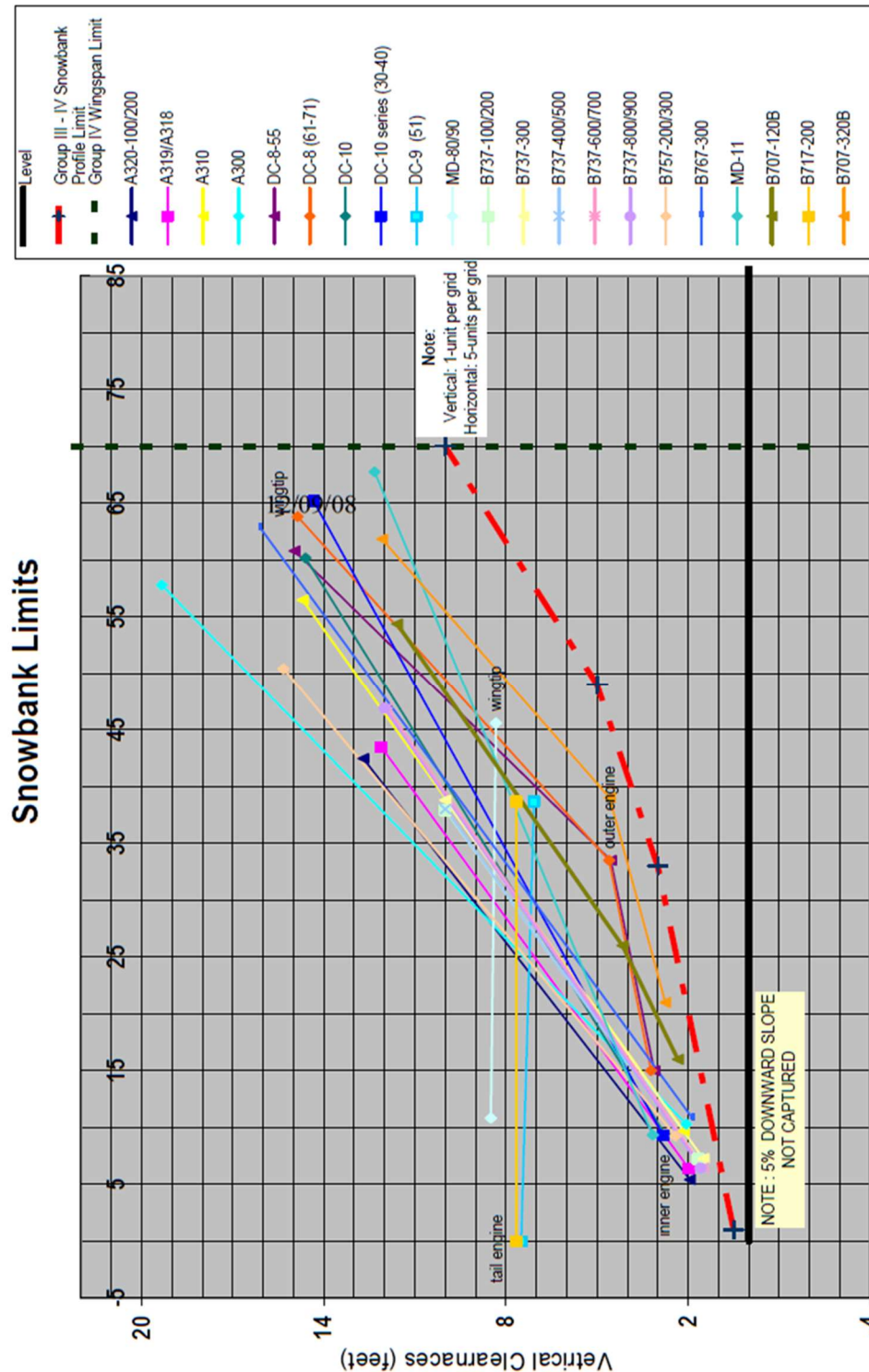
Figure 4-1. Snow Bank Profile Limits Along Edges of Runways and Taxiways with the Airplane Wheels on Full Strength Pavement (see Figure 4-2 guidance)

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Revision Date 10/21/2019

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Appendix L - Snow Bank Limits – Advisory Circular 150/150/5200-30



Graph A1-1. Individual height profiles of airplane wingtips and outer and inner engine nacelles' lower edges for Airplane Design Groups III and IV

Original Date 10/21/2016
Revision Date 10/21/2019

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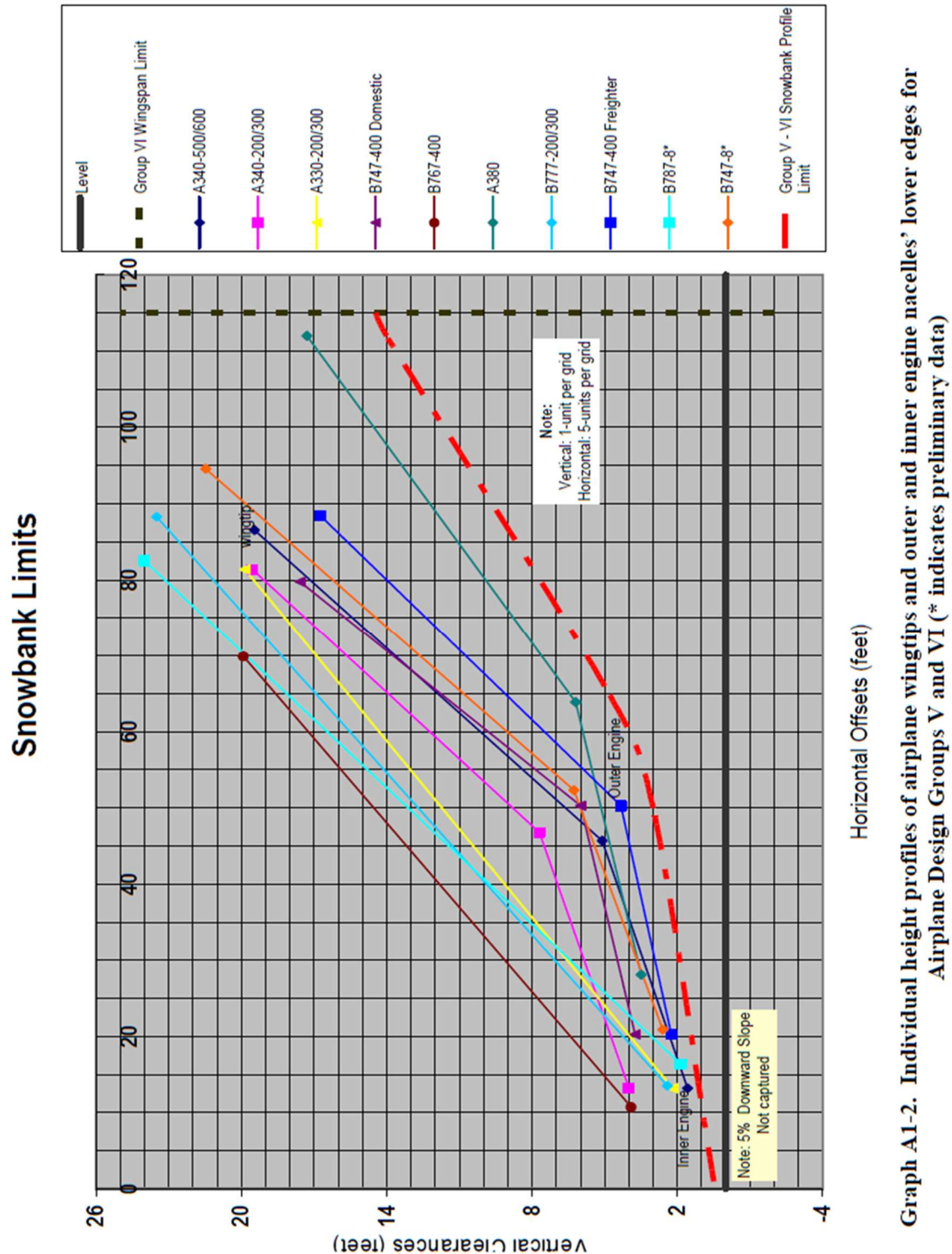


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Appendix L - Snow Bank Limits – Advisory Circular 150/150/5200-30



Graph A1-2. Individual height profiles of airplane wingtips and outer and inner engine nacelles' lower edges for Airplane Design Groups V and VI (* indicates preliminary data)

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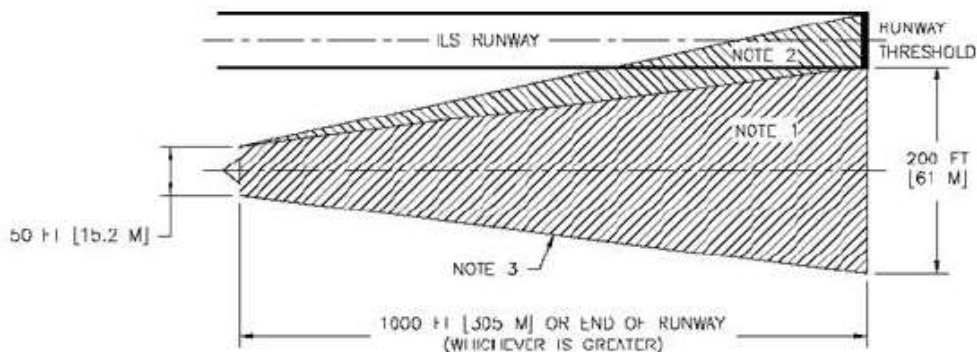
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Appendix M - ILS CAT I and CAT II/III Snow Clearance Area, Advisory Circular 150/150/5200-30

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



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 THAN 2 FEET.

ACTION TAKEN	SNOW DEPTH		
	SBR <6 IN [15 cm] NR. CECS <18 IN [45 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 MARKER. 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 IDENTIFIER) GLIDE SLOPE, MINIMA TEMPORARILY 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 IDENTIFIER) GLIDE SLOPE, MINIMA TEMPORARILY RAISED TO LOCALIZER ONLY.

* NA (NOT AUTHORIZED)

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Glossary

A number of weather wire products are contained in this category. They include:

Winter Storm Watch
Winter Storm Warning
Winter Weather Advisory
Blowing Snow Advisory
Freezing Drizzle Advisory
Freezing Rain Advisory
Sleet Advisory
Snow Advisory
Blizzard Warning
Heavy Snow Warning
Ice Storm Warning

Winter Storm Watch: A winter storm watch is issued when there is a significant threat of hazardous winter weather, but the potential storm's occurrence, location, and time are uncertain. The watch is designed to give as much lead-time as possible.

Winter Storm Warning: This product is issued when one or more of the following conditions are observed or forecast:

Heavy snow, with snowfall rates of at least 4 inches (10 cm) in 12 hours or 6 inches (15 cm) in 24 hours.

Significant freezing rain with accumulations of 1/4 inch (6 mm) or more.

Sleet with accumulations of at least 1 inch (25 mm).

Precipitation type will be specified if possible, and common hazards outlined.

Winter Weather Advisory: A winter weather advisory is issued for winter conditions less serious than those of a winter storm warning. The advisory is used to urge caution due to adverse winter weather.

Blowing Snow Advisory: A blowing snow advisory is issued when observed or forecast wind-blown snow is expected to reduce visibilities at times to 1/4 mile (RVR of 1600') or less. The conditions described in this advisory are less severe than those requiring a winter storm warning.

Original Date__10/21/2016__
Revision Date__10/21/2019__

Freezing Drizzle Advisory: A freezing drizzle advisory is issued when freezing drizzle conditions exist which may cause real inconvenience, such as icy roadways. The conditions described in this advisory are less severe than those requiring an ice storm warning.

Freezing Rain Advisory: A freezing rain advisory is issued when light accumulations of freezing rain make road surfaces and sidewalks hazardous. Light accumulations may also build up on power lines and tree branches.

Sleet Advisory: A sleet advisory is issued when significant amounts of sleet occur or are forecast, but less than one inch is expected to accumulate.

Snow Advisory: A snow advisory is issued when 2 to 4 inches (5 to 10 cm) of snow is forecast. These conditions, while less serious than those requiring a heavy snow warning, could still cause significant inconvenience, especially to travelers.

Blizzard Warning: A blizzard warning is issued when blizzard conditions occur or are forecast. Blizzard conditions are defined as:

Winds gusting to at least 35 mph (40 knots) AND

Snow or blowing snows, which reduces visibility to less than 1/4 mile (1600' RVR).

NOTE: Blizzard conditions can be life threatening, with severe wind chill indices, heavy snow, and very poor visibility.

Heavy Snow Warning: A heavy snow warning is issued when snowfall is expected to be at least 6 inches (15 cm) within a 24-hour period.

Ice Storm Warning: An ice storm warning is issued when an ice accumulation of 1/4 inch (6 mm) is forecast or observed. Damage to power lines and trees are likely to be extensive, and travel is discouraged.

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SNOW & ICE CONTROL GLOSSARY SUPPLEMENT

This Glossary was compiled to promote a common understanding of the terms used by the National Weather Service (NWS) in producing "unscheduled products". The definitions are primarily defined in an operational sense. This Glossary is designed to help in understanding the criteria for issuance of each winter weather unscheduled product and how these products correspond with Winter Weather Condition Levels.

RELATED PUBLICATIONS

Code of Federal Regulation (CFR) Part 139, Certification of Airports.

AC 150/5200-30 (current edition), Airport Winter Safety, and Operations

AC 150/5300-13 (current edition), Airport Design

AC 150/5320-12 (current edition), Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces

Federal Aviation Administration 7930.2 (current version) Notices To Airmen (NOTAM's)

Airman Information Manual -Current Edition (AIM)

Dallas/Fort Worth Airport Certification Manual (Current Edition)

Dallas/Fort Worth Airport Aircraft Deice Operations Plan (Current edition)

Dallas/Fort Worth Airport Surface Movement Guidance and Control System (SMGCS) Plan (current edition)

Media Guide to National Weather Service Weather/Wire Products

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