



Exhibit-15, Snow and Ice Control Plan

# Snow and Ice Control Plan

## Cleveland Hopkins International Airport



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## Phase #1

# PRE AND POST-WINTER SEASON TOPICS



## Chapter 1

### Pre-Season Actions

#### 1.1 Airport Preparation

- a) **Airport Management Meetings.** The Airport Commissioner will typically initiate a meeting during September to discuss equipment and material inventories, repair needs, staffing, budget, training, previous year's issues, and any other topics associated with snow and ice control and its plan.
- b) **Personnel Training.** All Airport Operations and Field Maintenance personnel receive annual, recurrent snow removal training. All training for CLE airport personnel is conducted through the respective department manager. Training records are maintained by the respective department manager. This training includes:
- i) Airport Operations
    - (1) Airport Self-Inspection
    - (2) Friction assessment and equipment orientation for the NAC Dynamic Friction Decelerometer (DFD).
    - (3) Snow and ice control (including snow type and coverage assessment)
    - (4) Post contaminant removal inspection
    - (5) Incursion prevention
  - ii) Field Maintenance
    - (1) Equipment orientation
    - (2) Snow removal and ice control techniques
    - (3) Radio and communications protocol / procedures
    - (4) Airfield familiarization and situational awareness (including: markings, signage, lighting, movement and safety areas)
    - (5) Incursion prevention
- c) **Equipment Preparation.** The airport's NAC Dynamic Friction Decelerometers will be calibrated, updated and certified as necessary during the summer months.
- 30 days prior to the snow season the Vehicle Maintenance department (VMB) will inspect and prepare each piece of snow removal equipment. Required fluids, replacement parts, and snow removal equipment components will be inventoried and stockpiled.
- d) **November 1st.** Staffing levels, training and equipment will be in place for the following sections: Airport Operations, Field Maintenance and Vehicle Maintenance to start the winter season



## 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 CLE. The SICC is chaired by the Airport Commissioner and includes:

Cleveland Hopkins International Airport (as follows):

- Commissioner
- Deputy Commissioner, Airport Operations, Safety, & Security
- Deputy Commissioner, Airport Maintenance
- Airport Operations Manager
- Field Maintenance Manager
- Vehicle Maintenance Manager
- Building Maintenance Manager
- Electrical Maintenance Manager

Federal Aviation Administration Air Traffic Control Manager

Cleveland Airline Managers Association (CAMA) members (as follows)

- American Eagle Station Manager
- Delta Air Lines Station Manager
- Federal Express Station Manager
- Frontier Airlines Station Manager
- Jet Blue Station Manager
- Spirit Airlines Station Manager
- Swissport Station Manager
- Southwest Airlines Station Manager
- United Air Lines Station Manager
- United Parcel Service Station Manager
- USAirways Airlines Station Manager

Fixed Base Operators as follows:

- Atlantic Aviation Manager
- Parker Hannifin Chief Pilot
- Key Corp Chief Pilot
- NASA Flight Ops Manager

AeroMag (deicing contractor)

During the month of September the Airport will begin notifying tenants and airport users to review the snow removal plans and provide comments to be discussed at the next season kick-off meeting to be held during the month of October.

The following topics should be discussed in the SICC:

- Airport Clearing Operations Discussion Topics
  - Areas designated as Priority 1, 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 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
- Any requirements for containment/collection of deicing/anti-icing.

Issues relative to Air Carrier Ground Deicing/Anti-icing Programs are handled through the CLE Airport Deicing Committee, and include:

- 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
- Maximize efficiency of operations during icing conditions by identifying locations for airplane deicing operations and post-deicing inspections; planning taxi routes to minimize ground times; developing rates for deiced departures; allocating departure slots; determination airport deicing crew needs; verifying communications.



## Chapter 2

### Post Event/Season Actions

#### 2.1 Post Event

After each snow event as deemed appropriate, airport management will host a meeting and invite Air Traffic 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 may be held.

During the snow season, winter operations is an agenda item at the Cleveland Airline Managers Association (station manager meeting) which is held monthly.

#### 2.2 Post Season

After each snow season an SICC meeting will typically be held in April to review the snow season issues and recommendations for changes. The same topics as pre-season will be reviewed.

At the end of the winter season, internal work will begin to prepare for the next winter season. This will include:

- Vehicle Maintenance: Inspection, repair, and storage of the snow removal equipment; evaluations of current equipment with recommendations for replacement and/or procurement of new equipment.
- Field Maintenance: Assessment of previous season's snow removal techniques with development of recommendations for modifications to improve the process.
- Airport Operations: Calibration of the NAC DFD decelerometer electronic friction measuring equipment, as necessary.
- Airport Management: Evaluation and update of the Snow and Ice Control Plan.





# Phase #2

## Winter Storm Actions and Procedures



## Chapter 3

### Snow Removal Action Criteria

The snow removal operation at CLE is a highly coordinated procedure which is accomplished through a partnership of several internal and external agencies. For airfield snow removal operations, the CLE internal agencies include the Airport Operations, Field Maintenance, and Vehicle Maintenance Divisions. Each one of these Divisions plays a critical role in the efficiency and safety of this operation.

A color-coded snow deployment plan has been developed which uses information collected from weather forecasting services to guide the Airport Operations and Field Maintenance sections in staffing for winter events. The code assignments are based on weather conditions forecasted for the next twelve hour period and were designed to quickly establish what personnel and equipment are needed to perform snow removal operations under the given conditions. The color codes are characterized as follows:

- **Green** .... Estimate of up to 1 inch of dry or wet snow.
  - 4 Airport Operations employees
  - 18 Field Maintenance employees (16 operators & 2 unit leaders)
- **Yellow** .... Estimate of greater than 1 and up to 4 inches of dry or wet snow.
  - 4 Airport Operations employees
  - 22 Field Maintenance employees (20 operators & 2 unit leaders)
- **Red** ..... Estimate of greater than 4 inches of dry or wet snow, or freezing rain.
  - Snow events:
    - 5 Airport Operations employees
    - 29 Field Maintenance employees (26 operators & 3 unit leaders)
  - Freezing Rain Events:
    - 8 Field Maintenance employees (6 operators & 2 unit leaders)

#### Snow Emergency Protocol:

If weather conditions are determined to pose a potential safety threat to airport operations, the Airport Commissioner has the authority to require employees in the Airport Operations and Maintenance Sections to report to work immediately or be held over to ensure proper staffing levels throughout the event.

### **3.1 Activating Snow Removal Personnel**

#### Airport Operations

Airport Operations has been designated as the Snow Command and monitors weather forecasts and pavement conditions, collecting information that is used in the decision for activation of snow removal personnel. Airport Operations is staffed 24/7 with three shifts



per day. Staffing includes a minimum of a supervisor and three agents for winter events, with additional personnel added as conditions warrant. When the Snow Desk is activated, an additional supervisor may be called in order to manage snow removal operations.

#### Field Maintenance

Field Maintenance has the primary responsibility for airfield snow removal, including runways, taxiways and ramps. The snow team, which includes Building Maintenance personnel, has been created to provide a minimum staffing level for both Airside and Landside operations, with the ability to augment these teams with additional personnel as dictated by weather conditions. Based upon weather conditions, Field Maintenance resources are deployed to primary areas such as runways, taxiways, and ramps, as well as areas of secondary importance.

During the snow season, the regular full-time staff at Field Maintenance will be supplemented by the hiring of additional seasonal employees to allow for adequate staffing to accomplish the snow removal objectives. The personnel will be assigned to three shifts with overtime staffing to provide 24/7 coverage. When necessary, personnel will be held over to supplement the core shift staffing to maintain adequate staffing levels. In extreme snow situations, the Commissioner may declare a Snow Emergency, causing additional employees to be brought in to assist in snow removal operations.

#### Vehicle Maintenance

The Vehicle Maintenance section will operate a day shift (seven days) during the winter season. When snow code operations are implemented outside of the scheduled hours of Vehicle Maintenance, additional personnel will be called in to accommodate any repair needs. A mobile VMB crew will accompany any runway and taxiway snow removal operations when needed.

#### Management Oversight

During air carrier operations in snow code Yellow and Red events, one management/supervisor member of the Airport Operations section will be assigned to the FAA Air Traffic Control Tower to coordinate the snow removal process, and one management/supervisor member of the Field Maintenance section will be assigned to the Airport Operations Tower to coordinate the snow removal process. The Snow Command in the Airport Operations Tower will be responsible for decisions based on when and where the SICP should be focused, and the Field Maintenance Boss will determine how and how much of his staffing and equipment resources will be needed, in accordance with Chapter 3 of the SICP.

#### **a) Weather Forecasting**

- The Airport Operations office is responsible for monitoring the current weather conditions, and for obtaining weather forecast information at least once per shift. Additional updated forecasts will be obtained as weather conditions dictate.



- The Airport Operations office obtains weather forecast information from the National Weather Service, as well as through contracted weather forecasting services (WSI Pilot Brief and Schneider Electric Mx Vision Weather Sentry).
- The Airport also utilizes the SSI surface sensor system to obtain surface condition information and surface condition forecast information.

**b) Chain of Command**

- The Airport Operations office is responsible for monitoring the airfield surface conditions. Pavement monitoring begins with the onset of any type of winter precipitation. Operational field condition inspections are made as soon as possible, at least during the first ninety minutes of each Airport Operations shift, when existing conditions of ice, snow, or freezing precipitation are present. During rapidly changing conditions (ice, snow, or freezing precipitation) the inspections will take place hourly at the minimum. When conditions do not require an hourly inspection, follow-up or subsequent inspections/reports shall be conducted on contaminated AOA surfaces at multiple times per shift until it has been determined that the surface has returned to a no worse than wet condition.
- The Airport Commissioner or his designee is responsible to initiate a Snow Emergency, which in turn activates the call out of personnel.
- The Airport Operations office is responsible for making the initial notifications of a Snow Emergency via electronic notification. The department manager or his designee is responsible for ensuring required staffing of their respective department to meet the needs of the snow emergency. Contact with individual employees for call in is made by phone or by electronic means.
- Staffing may be accomplished by holding over employees on duty and/or calling in of additional personnel as necessary.

**c) Triggers for Initiating Snow Removal Operations**

- The determination for commencement of a snow removal operation is based upon the evaluation of the existing field conditions, with present and forecast weather conditions taken into consideration. Generally, a snow removal operation shall commence with the accumulation of snow on the movement surface as follows:

<u>Precipitation</u>	<u>Depth in Inches</u>
Slush	1/8"
Wet Snow	1/8"
Dry Snow	1/8"
Ice or Freezing Rain	any

- Commencement of snow removal using the above triggers is based on the consideration that any contamination affects the operational characteristics of the aircraft using the subject runway.



### 3.2 Personnel Responsibilities

A significant level of pre-planning precedes any snow event. The Commissioner and Deputy Commissioners consult with Managers from Field Maintenance, Building Maintenance, Vehicle Maintenance, and Airport Operations in order to examine their staffing levels for an event, and to modify staffing in order to address specific events. Vehicle needs are discussed and the necessary equipment is prepared and staged. Field Maintenance ensures that their chemical and sand supplies are sufficient for the forecasted event. Airport Operations monitors the forecasts and tracks the storm, providing forecast updates to all concerned parties. Forecast information is discussed with CLE ATCT and United Air Lines to evaluate deployment prior to an event.

#### Airport Operations

During snow event conditions, Airport Operations is responsible for:

- Conducting surface condition inspections
- Conducting airfield pavement friction tests
- Determining and assigning the appropriate color snow code to classify the snow event
- Determining the priority and order in which the pavement will be cleared
- Dissemination of pavement surface condition information
- Communication of the airfield status information to the airport administrative personnel
- Activation and management of the Snow Desk.
- Monitoring weather conditions
- Collection and dissemination of weather forecast information
- Collection and dissemination of pavement surface forecast information

#### Field Maintenance

During snow event conditions, Field Maintenance is responsible for:

- Inspection and preparation of snow removal equipment prior to a snow event to ensure readiness for use
- Conducting snow removal from the airfield pavement surfaces
- Conducting chemical and sand treatment of the airfield pavement surfaces
- Material loading into chemical and sand dispersion vehicles
- Fueling of snow removal equipment
- Coordination of any snow removal performed by contractors
- Monitoring chemical and sand supplies and ordering additional quantities as necessary
- Hauling of piled snow

#### Vehicle Maintenance

During snow event conditions, Vehicle Maintenance is responsible for:

- Adjustment and preparation of snow removal equipment prior to a snow event
- Repairing and maintaining the snow removal equipment
- Responding to recover disabled vehicles
- Reporting equipment status to the airport administrative personnel



### 3.3 Snow Control Center (SCC)

Airport Operations functions as the Snow Control Center for winter operations at CLE. This is accomplished by using a Snow Desk, physically located in the Airport Operations office, comprised of representatives from CLE ATCT, United Air Lines Operations, and CLE Airport Operations. This committee may or may not convene physically due to staffing needs as well as the demand of the weather conditions, but will maintain constant communications and collectively coordinate the snow plan for the current event. The Snow Desk will be activated with an impending or ongoing storm that will adversely affect airport operations. All snow removal activities are coordinated through the Snow Desk by phone and/or radio communications. Regular conference calls are conducted prior to and during snow events, with CLE ATCT, United Air Lines Operations, and CLE Airport Operations participating. In the event the conditions do not require the activation of the Snow Desk, the CLE Airport Operations Supervisor will handle the responsibilities for command of the snow removal activities.

The SCC at CLE functions as the coordination and command center for all snow removal operations at the airport. Activities include:

- Dissemination and collection of weather forecast information
- Coordination of runway closure times for snow removal
- Making a collaborative decision on the snow route to be used
- Transfer of information regarding flight banks, air traffic flow rates, and air traffic demands
- Transfer of information regarding aircraft deicing activities
- Dissemination of information on intended snow removal activities
- Coordination of snow removal service requests
- Coordination of any other snow removal related information.

### 3.4 Airfield Clearing Priorities

#### a) **Snow Removal Routes**

During a significant snow event, there are a limited number of runways and taxiways that will be utilized, depending on several factors. A series of snow removal routes have been developed that identify the priority runways and taxiways to be cleared based on the landing and takeoff configuration. Graphics of these routes can be seen in the attachments to Exhibit-19 of the CLE Airport Certification Manual containing the CLE Airport Operations Letter of Agreement with the CLE ATCT on snow removal operations. The use of the snow removal routes provides the Snow Team with a well-defined, predictable, and coordinated plan designed to remove snow efficiently with minimal impact to aircraft operations during snow events.

#### b) **SICP Pavement Prioritization Plan**

In addition to the snow removal routes, CLE has established a priority for the clearing of airfield pavement as noted below. A graphic of that prioritization can be seen in Appendix-A, SICP Pavement Prioritization Plan.

- Priority-1
  - The active instrument runway(s)
  - Associated turnoffs



- Entrance and exit taxiways
- ARFF station access
- ARFF mutual aid access point
- ARFF mutual aid gate operability check
  
- Priority-2
  - Secondary runway
  - Crosswind runway
  - Associated turnoffs and taxiways
  - Terminal ramps
  - Cargo ramps
  
- Priority-3
  - Remaining aircraft movement areas

### 3.5 **Winter Pavement Management Process**

The Winter Pavement Management Process is designed to close runways and taxiways that cannot be treated in a timely manner during winter operations. The benefits of this process include tools to better utilize removal resources during rapidly changing conditions and the ability to restore signage and lighting to active pavement after winter events.

The Tier-1 and Tier-2 level closures of the Winter Pavement Management Process will be implemented prior to all winter weather events when snow codes YELLOW and RED have been established. When the Tier-1 closure is not in place and the weather starts to degrade, any indication of "MEDIUM" (FAIR) braking by an airfield inspection vehicle or a pilot report will trigger the Tier-1 and Tier-2 closures of untreated pavement. If runway 10/28 and its associated taxiways are not being treated they also need to be closed.

NOTE: Heightened surveillance should be used during any freezing precipitation event, particularly when the Winter Pavement Management Process and/ or Snow Code Assignments have not been implemented. During these conditions, if any untreated pavement is determined to have a braking condition of "NIL" by either an aircraft or vehicle, or a Mu of .21 or less, the pavement location shall be immediately closed.

#### **Tier-1 Closures**

Closes Taxiways: B (between Twy C & Twy R), C, H, G1, K (between Ry 6L/24R & Twy L), L1, T & U

- ISSUE: This group NOTAM will be issued prior to initiating the snow removal routes.
- CANCEL: These taxiways should remain closed until the following associated items on the Snow Removal Priority List have been completed, barring circumstances that prevent their completion.
  - 1 Obstructed Guidance
  - 2 Taxiway lights and Signs
  - 3 Snow banks and Ridges
  - 4 Opening other sections of closed pavement
  - 5 FAA NAVAID Roadways
  - 6 Snow Piles



**Tier-2 Closures**

Closes Runway 10/28

Closes Taxiways: B (between Ry 10/28 & Twy S) D, K1, Q

- ISSUE: This group NOTAM will be issued when surface conditions are such that the operational status of Ry 10/28 cannot be maintained.
- CANCEL: The runway and taxiways should remain closed until the following associated items on the Snow Removal Priority List have been completed.
  - 1 Obstructed Guidance
  - 2 Taxiway lights and Signs
  - 3 Snow banks and Ridges

**Tier-3 Closures**

Closes Runway 6R/24L

Closes Taxiways: A, L (between Ry 6R/24L & Twy P), N (between Ry 6L/24R & Twy G), W (between Ry 6R/24L & Twy L)

- ISSUE: This group NOTAM will be issued when the weather conditions dictate the need to conduct a one-runway operation.
- CANCEL: The runway and taxiways should remain closed until the following associated items on the Snow Removal Priority List have been completed.
  - 1 Obstructed Guidance
  - 2 Taxiway lights and Signs
  - 3 Snow banks and Ridges

**3.6 Airfield Clearance Times**

The CLE goal is to maintain a 30-minute airfield clearance time in accordance with the guidance as recommended in Table 1-1 from FAA Advisory Circular 150/5200-30C, *Airport Winter Safety and Operations*, as follows.

**Table 1-1. Clearance Times for Commercial Service Airports**

<i>Annual Airplane Operations (includes cargo operations)</i>	<i>Clearance Time<sup>1</sup> (hour)</i>
<i>40,000 or more</i>	<i>½</i>
<i>10,000 – but less than 40,000</i>	<i>1</i>
<i>6,000 – but less than 10,000</i>	<i>1½</i>
<i>Less than 6,000</i>	<i>2</i>

*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<sup>2</sup> (400 kg/m<sup>2</sup>) from Priority 1 areas within the recommended clearance times.*





### 3.7 Snow Equipment List

CLE operates and maintains the following equipment for the purpose of snow and ice control:

Qty	Description
13	24' plow / 22' broom multi-purpose high speed Oshkosh / MB-Companies snow removal vehicles
15	22' and 24' plows on Oshkosh, Volvo, and International 6X6 trucks with 15 yard dump bodies.
2	20' self-propelled front mounted runway brooms.
10	Runway Snow Blowers: 2 Oshkosh, 6 Schmidt Wausau, and 2 MB Companies Blowers with 5'-75' at a rate of 3000 to 7000 tons per hour.
6	Material spreader trucks: 3 Ford tandems and 3 International tandems spreader trucks.
8	Wheel loaders with 3-5 yard buckets with various size pusher boxes.
1	Caterpillar grader with 14 foot blade
3	Runway deicer trucks with 4000 gallon capacity and 50' spray bar coverage with throttle and vehicle speed coverage.
3	Bombardier parking lot plows
4	Parking lot single axle plow trucks, 3 with material spreaders
1	John Deere 310 backhoe with 12' pusher box
2	Trecan snow melters with 160 tons per hour capacity
4	Trecan snow melters with 80 tons per hour capacity
1	Light and sign plow mounted on Ford Bi-directional tractor.

### 3.8 Storage of Snow and Ice Control Equipment

The primary snow removal equipment at CLE is stored on the west side of the airfield at the Consolidated Maintenance Facility (CMF), inside a heated indoor structure. Secondary snow removal equipment is stored in the Snow Barn structure on the east side of the airfield, also a heated facility. Equipment non-essential to the snow removal operation is stored outdoors.

### 3.9 Definitions

- a) **Contaminant.** Any substance on a runway, for the purpose of this SICP contaminant is snow, slush, ice or standing water.
- b) **Dry Snow.** Snow that has insufficient free water to cause cohesion between individual particles. If when making a snowball, it falls apart, the snow is considered dry.
- c) **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.



- d) **Compacted Snow.** Snow that has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up.
- e) **Slush.** Snow that has water content exceeding its 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.
- f) **Patchy Conditions.** Areas of bare pavement showing through snow and/or ice covered pavements.



## Chapter 4

### Snow Clearing Operations and Ice Prevention

#### 4.1 Snow Clearing Principals

The objective at CLE is to remove ice, snow, and slush as completely as practicable from the air carrier movement areas. Special attention will be given to ensure that all airfield signs and lighting are not obscured and remain clearly visible. It is the intention of the snow removal crews to position snow off of movement area surfaces so that all air carrier aircraft propellers, engine pods, rotors, and wing tips will clear any snow drift and snow bank as the aircraft's landing gear traverses any full strength portion of the movement area. Off-pavement snow bank depths should be in accordance with the guidance in Figure 4-1a from FAA Advisory Circular 150/5200-30C, *Airport Winter Safety and Operations*, shown in Appendix-C. Occasionally, excessive snowfall makes this consideration impractical. When such conditions exist, Airport Operations shall employ the NOTAM system to alert aircraft to the presence and location of hazardous drifts, ridges, and windrows.

##### a) **Ramp and Terminal**

The CLE Field Maintenance department will conduct the snow removal activities in the ramp and terminal areas when able. Should the snow event produce conditions that exceed the Field Maintenance department's capability to adequately maintain snow removal in these areas, the Field Maintenance Manager will call in the contracted snow removal company to assist as necessary. Field Maintenance will retain the responsibility for coordination and control of the contractor snow removal activities.

CLE Field Maintenance personnel are responsible for snow removal around the terminal from the Vehicle Service Road (VSR) out to the movement area, inclusive of the VSR. The airline tenants are responsible for snow removal between the building and the VSR. The tenants accomplish snow removal by piling snow near the gates in an area that is accessible and will not impact their operations, and moving snow out to an area where the Field Maintenance personnel can collect it as part of their ramp snow removal operation. The tenants closely coordinate that activity with Field Maintenance personnel in order to obtain efficiencies in clearing the adjoining areas.

Field Maintenance personnel use a combination of plows, brooms, and blowers to clear snow from these areas. Heavy snow events may also involve the use of front-end loaders equipped with a push box to quickly move large quantities of snow into piles. Hauling of snow is accomplished using a combination of dump trucks and front-end loaders. In most operations, the snow is worked to the edge of the pavement and is deposited in a windrow or ridge. A plow or blower is used to back-cut the pavement edge and prevent spillover. A blower then collects the snow ridge and casts it over lights and guidance signs, depositing the snow in grass areas clear of the pavement edges.



**b) Runway and Taxiways**

CLE Field Maintenance personnel use a combination of multi-purpose snow removal units (plow/broom/blower), plows, brooms, blowers; chemical trucks, and sand trucks for snow removal operations on the runways and taxiways. This same crew clears and treats the pavement on the high-speed turn-offs in the same manner as the runway surfaces. Existing field conditions, with present and forecast weather conditions, dictate which pieces of equipment will be used, and in what combination they will be deployed. A change in conditions will effect a change in the removal operation.

The standard snow removal procedure at CLE is to clear and treat pavement full width. The typical snow removal operation involves a snow removal crew comprised of a combination of multi-purpose snow removal units, snow blowers, chemical trucks, and sand trucks with a lead vehicle. The equipment operates in a close-wing formation, working the snow with the plows and brooms towards the edge of pavement and depositing it into ridges, and blowing the snow ridge with the blowers as necessary. Using the blowers to cast the snow up and over the airfield signs and lights into the adjacent grass areas helps to avoid damage to and obscuration of them.

**c) NAVAIDs**

The PAPI and Glide Slope NAVAID equipment at CLE is owned and maintained by the FAA, and are not normally affected by the usual accumulation of snow at CLE. FAA Maintenance personnel are responsible for the inspection of the NAVAID equipment to determine if any of the equipment is being affected by snow accumulation, and issuance of a NOTAM if appropriate.

Glide Slope snow depth clearance limitations are listed in Figure 4-2 from FAA Advisory Circular 150/5200-30C, *Airport Winter Safety and Operations*, shown in Appendix-D.

**4.2 Controlling Snow Drifts**

CLE does not currently employ any type of method for the control of drifting snow.

**4.3 Snow Disposal**

Depending on the type of snow event, it may be necessary to pile snow at tenant gate areas, or other designated areas to facilitate snow removal operations. Any snow that has been piled is disposed of by use of snow melting units or by hauling to a designated snow dump area. This is accomplished by either Field Maintenance personnel or the contracted snow removal company using front end loaders and dump trucks. The primary and secondary designated snow dump areas are located west of Twy K1, accessible from the perimeter vehicle road. These areas are depicted in the map in Appendix-B of this plan



**4.4 Methods for Ice Control and Removal-Chemicals**

Strategic chemical application is a key component to easy and effective snow removal operations. The selection and application of approved materials for snow and ice control is based upon an evaluation of the existing field conditions. The application is performed in such a manner as to ensure that the material will adhere to snow and/or ice sufficiently to minimize engine ingestion. Only non-corrosive materials shall be used for ice and snow removal on movement areas. At CLE the chemicals used on the airfield for anti-icing and de-icing are Potassium Acetate (PA) and Sodium Formate (SF).

PA is a liquid chemical used on runways, taxiways, and ramps in both anti-icing and de-icing operations. PA is effective from 0° to -75° F and is commonly used in anti-icing operations. The PA is applied using tanker trucks equipped with liquid spray bars. Preparations should be made to anti-ice surfaces when freezing precipitation has been forecasted. Pretreating active airfield surfaces with PA prior to a freezing precipitation event will reduce the opportunity for ice to bond on pavement surfaces.

The SF is a granular solid, also used on runways, taxiways, and ramps. SF is effective from 0° to -18° F and is commonly used in de-icing operations. SF can also be used in anti-icing operations, but must react with a liquid in order for it to be effective. The SF is applied using material trucks equipped with broadcast-type material spreading equipment.

**4.5 Sand**

Sand is also an effective substance to help create friction on the runways, taxiways, and ramps. It may be used alone or in conjunction with the SF and PA applications, depending on pavement conditions. Sand is applied to improve friction when snow removal and/or chemical treatments do not produce the desired friction measurement readings.

CLE uses Mortar Bank Sand (#30 Sieve) that meets the FAA specification in compliance with the guidance as recommended in Table 4-3 from FAA Advisory Circular 150/5200-30C, *Airport Winter Safety and Operations*, below.

**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

All surface incidents and runway incursions at CLE are documented and investigated, including those that may involve snow removal operations. All persons granted airfield driving privileges by the Department of Port Control in accordance with the Airport Operations Area Ground Vehicle Operator/Pedestrian Policy are subject to the rules and regulations identified in that policy. CLE personnel are also subject to disciplinary action under the Department of Port Control Incursion Policy.

CLE has bolstered the airfield driver training program, adding additional materials specific to the prevention of surface incidents and runway incursions. All persons with airfield driving privileges and movement area access are required to undergo annual recurrent training.

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

##### a) **Radio Communication**

All snow removal and ice control vehicles operating on aircraft movement areas must be equipped with a two-way radio, or be under the direct control of a vehicle so equipped, capable of direct radio communication with CLE ATCT. Radios must be capable of monitoring the ground control frequency (or such other frequency assigned by the airport traffic control tower) at all times. Initial contact with CLE ATCT is made by contacting CLE Ground Control on frequency 121.7 MHz.

The standard operating procedure for CLE snow removal operations is for a radio-equipped vehicle in a snow removal crew to act as the lead vehicle and handle all communications with CLE ATCT.

##### b) **Failed Radio Communication**

CLE equips all of the lead vehicles involved with snow removal operations with city two-way radios that may be used to contact CLE Airport Operations in the event of a failure of the aviation radio in the vehicle.

##### c) **Low Visibility and Whiteout Conditions**

All of the CLE snow removal equipment operating in the movement area is under direct control of the CLE ATCT. Lead vehicles may request from CLE ATCT to hold the snow removal equipment at any location, should conditions prevent the operators safely continuing the snow removal operation due to diminished visibility.

##### d) **Driver Fatigue**

CLE snow removal equipment operators work a maximum of 12 consecutive hours on duty. Drivers who report feeling fatigued are relieved of equipment operating responsibilities.



## Chapter 5

### Pavement Surface Assessment Reporting

#### 5.1 Runway Condition Reporting

##### **a) Runway Condition Report**

A runway condition report is provided whenever the pavement condition is worse than bare and wet. Conditions covered by the condition report will include the following:

i) Type of contamination.

The type of contamination will be defined as one, or a combination of, the following:

- Water
- Ice
- Frost
- Snow
- Slush

ii) Depth of Precipitation.

In reporting depth of precipitation, depths will be expressed in terms of thin (less than one quarter inch), one quarter inch, one half inch, and one inch. For depths over one inch, accumulations will be reported in terms of whole inches without fractions.

iii) Braking Action.

The primary method is to provide Mu values obtained by use of the NAC DFD decelerometer.

iv) Chemical and/or Sand (if applicable)

If applicable, notification will include information on the application of anti-icing/de-icing agents or sand to aircraft movement areas.

CLE Airport Operations uses the FAA Digital NOTAM System for the collection of surface condition information. Reports are extracted from that system periodically, and are kept for a minimum of 12 months in the operations office in accordance with Part 139.327.

Surface conditions along the edges of a runway may vary from those closer to the runway centerline due to the effects of aircraft operations on pavement conditions. When this is encountered, the surface condition will be reported in terms of area by identifying the area down the center of the runway and providing conditions for the remainder of the pavement (i.e., BARE 100' WIDE, RMNDR PTCHY SIR).

##### **b) Updating Runway Conditions**

Runway conditions are updated any time a change to the runway condition occurs, including whenever the field condition inspection reveals a change in



surface conditions. Operational field condition inspections are conducted at the times as stated in paragraph 3.1, b) above. Surface condition changes should be anticipated during or following:

- An active snow event
- Plowing, brooming, deicing, or sanding operations
- Rapidly rising or falling air or pavement temperatures
- Rapidly changing weather conditions
- A change in the trend of PIREPs

Runway surface condition information, inclusive of contaminant information, is disseminated immediately following the receipt of updated surface condition information.

- To support the updating process and provide a redundant perspective on changing surface conditions, a second airfield pavement inspection vehicle will be dispatched in declared snow codes YELLOW, RED or when the snow fall rate is one inch per hour or greater. The second inspector will assist the primary inspector in making timely inspections on all active surfaces within the AOA.

**c) Field Condition Dissemination**

Field condition information is disseminated by CLE Airport Operations utilizing the FAA Digital NOTAM System. To ensure timely communication of information, ATCT may be notified by direct telephone communication or by radio on frequency 121.70 MHz, but must be backed up utilizing the FAA Digital NOTAM System as soon as time permits. Additionally, the various airline operations offices will have web-based access to the PASSUR system. Field conditions are also available electronically to all airport users via the FAA's web site.

The following guidelines are used for disseminating Field Condition NOTAMs:

- The content of the NOTAM report will include operating surface (runway, taxiway, and ramp), conditions (amount, depth, and type of cover), and NAC DFD Friction Meter readings for runways (or other approved friction measurement method and readings).
- NOTAMs will be precise and accurate, issued in accordance with the guidance contained in FAA Advisory Circular 150/5200-28 (current revision), *Notices to Airmen (NOTAMs) for Airport Operators*. They will be brief and present an accurate picture of the field condition or changes in the field condition.

**5.2 Runway Friction Surveys and Equipment**

CLE utilizes NAC DFD decelerometer electronic friction measuring equipment to conduct runway friction surveys.

**a) Conditions**

The decelerometer friction measuring equipment may be used to conduct friction tests when the pavement surface is contaminated under the following conditions:





- Ice or wet ice. Wet ice is a term used to define ice surfaces that are covered with a thin film of moisture caused by melting. The liquid water film deposit is of minimal depth of 0.04 inch (1 mm) or less, insufficient to cause hydroplaning.
- Compacted snow at any depth.
- Dry snow 1 inch or less.
- Wet snow or slush 1/8 inch or less.

It is not acceptable to use decelerometers or continuous friction measuring equipment to assess any contaminants outside of these parameters.

**b) When to Conduct**

In general, friction tests should be conducted on a periodic basis during any time that airfield pavement is contaminated with snow, ice or slush. If pilots report consistent favorable braking conditions, this interval may be extended. In addition, certain other conditions and events may trigger a need for testing. 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)
- Immediately following any aircraft incident or accident on the runway.
- Immediately following a pilot braking report of "NIL" or after several pilot braking reports of "POOR."
- Any other time airport management believes friction measurement data would be useful, either for aircraft operational use or for airport maintenance purposes.

**c) Friction Measuring Procedures**

**i. Calibration**

Airport Operations ensures that the NAC DFD decelerometer calibration is completed as required.

**ii. How to Conduct**

Technical operation of the NAC DFD decelerometer is described in Exhibit-5 of the CLE Airport Certification Manual containing the instructions for use of the NAC Dynamic Friction Decelerometer.

When conducting the friction survey on the runway, the vehicle should be travelling in the same direction as arriving aircraft whenever possible, and should be located approximately 10'-20' off of the runway centerline. The friction survey should be completed in one pass whenever possible, and will include a minimum of three braking tests in each of the runway operation zones (touchdown, midpoint, and rollout) to determine the average friction value for each zone.



**d) Friction Assessment Reporting**

Friction assessments are disseminated using the FAA Digital NOTAM System. The information is recorded on the NOTAM with values provided for each runway operation zone in order of the direction of runway operation.

Friction values will be reported when:

- Compacted snow and/or ice are present on the center portion of the runway, and friction values are 40 or below on any zone of the runway.
- Values rise above 40 on all zones of any active runway that previously had a friction value below 40.

**e) Out of Service Equipment**

A NOTAM will be issued whenever the decelerometer electronic friction measuring equipment is out-of-service. This NOTAM will remain in effect until the decelerometer electronic friction measuring equipment is available for service.

**5.3 Requirements for Runway Closures**

CLE, after consulting with the CLE Airline Station Managers regarding their respective company operating procedures, determined that when one of the following criteria is reached, the priority-1 (one) runway will be immediately closed to aircraft operations for a runway inspection or treatment.

- Dry snow depth greater than 2 inches
- Wet snow or slush depth greater than ½ inch
- Friction value of .21 or lower
- Pilot Report (PIREP) of NIL
- Two (2) consecutive POOR PIREPs

If during the course of a surface condition inspection the Operations Agent conducting the inspection determines that the braking action on any runway is "NIL," they are required to immediately notify CLE ATCT on their current radio frequency, advising that the runway is closed. CLE ATCT will suspend aircraft operations on the reported runway. CLE Airport Operations will:

- Initiate immediate action for treatment.
- Open the runway after it is determined to be acceptable for use.

Exhibit-20 of the CLE Airport Certification Manual containing the CLE Airport Operations Letter of Agreement with the CLE ATCT on the exchange of runway braking action reports addresses the CLE ATCT responsibilities for this section of the plan.

**5.4 Requirements for Taxiway and Ramps Closures**

Taxiways and Ramps receiving a NIL braking (either a PIREP or by a braking action assessment by the airport operator) are unsafe for aircraft operations. CLE determined that a Mu value of .21 would close the subject pavement to aircraft operations. In the event a Mu value of .21 or less is verified, that surface will automatically be closed.



Upon receiving a pilot report PIREP of "NIL" braking action, CLE ATCT will notify CLE Airport Operations. CLE Airport Operations will:

- Immediately close the surface.
- Conduct an operational field inspection of the surface to determine the condition and Mu value
- Close associated surfaces when Mu values of .21 or less are verified.
- Initiate immediate action for treatment,
- Open the surface after it is determined that the Mu values are acceptable for use.

If during the course of a surface condition inspection, the Operations Agent conducting the inspection determines that the braking action is "NIL," they are required to immediately notify CLE ATCT on their current radio frequency, advising that the surface is closed. CLE ATCT will suspend aircraft operations on the reported surface. CLE Airport Operations will:

- Initiate immediate action for treatment.
- Open the surface after it is determined that the Mu values are acceptable for use.

## 5.5 **Continuous Monitoring**

Continuous runway monitoring procedures at CLE involve a combination of obtaining regular PIREP braking action reports from CLE ATCT and conducting physical inspections of the surface, inclusive of friction measuring. CLE Airport Operations will commence continuous runway monitoring procedures at the onset of winter precipitation. Inspections will continue during changing weather conditions, and whenever braking action reports via PIREP or vehicle inspections indicate a variance in the quality of the braking action.

When previous PIREPs have indicated "GOOD" or MEDIUM (FAIR) aircraft braking action and subsequently two consecutive "POOR" PIREPs are received, CLE ATCT will immediately suspend aircraft operations and notify CLE Airport Operations of those reports. CLE Airport Operations will:

- Conduct an operational field inspection to determine the condition.
- Initiate immediate action for treatment,
- Open the runway after it is determined to be acceptable for use.

## 5.6 **Clean-up Operations**

At the conclusion of every snow event and the cancelation of the snow code, a thorough cleanup is required. The objective of the clean-up operation shall be to treat all remaining movement area surfaces as quickly as possible in preparation for the next winter operation event.

Clean-up operation will include:

- Clearing all remaining airfield signs
- Repair lights and signs damaged during snow removal
- Clear all remaining snowbanks



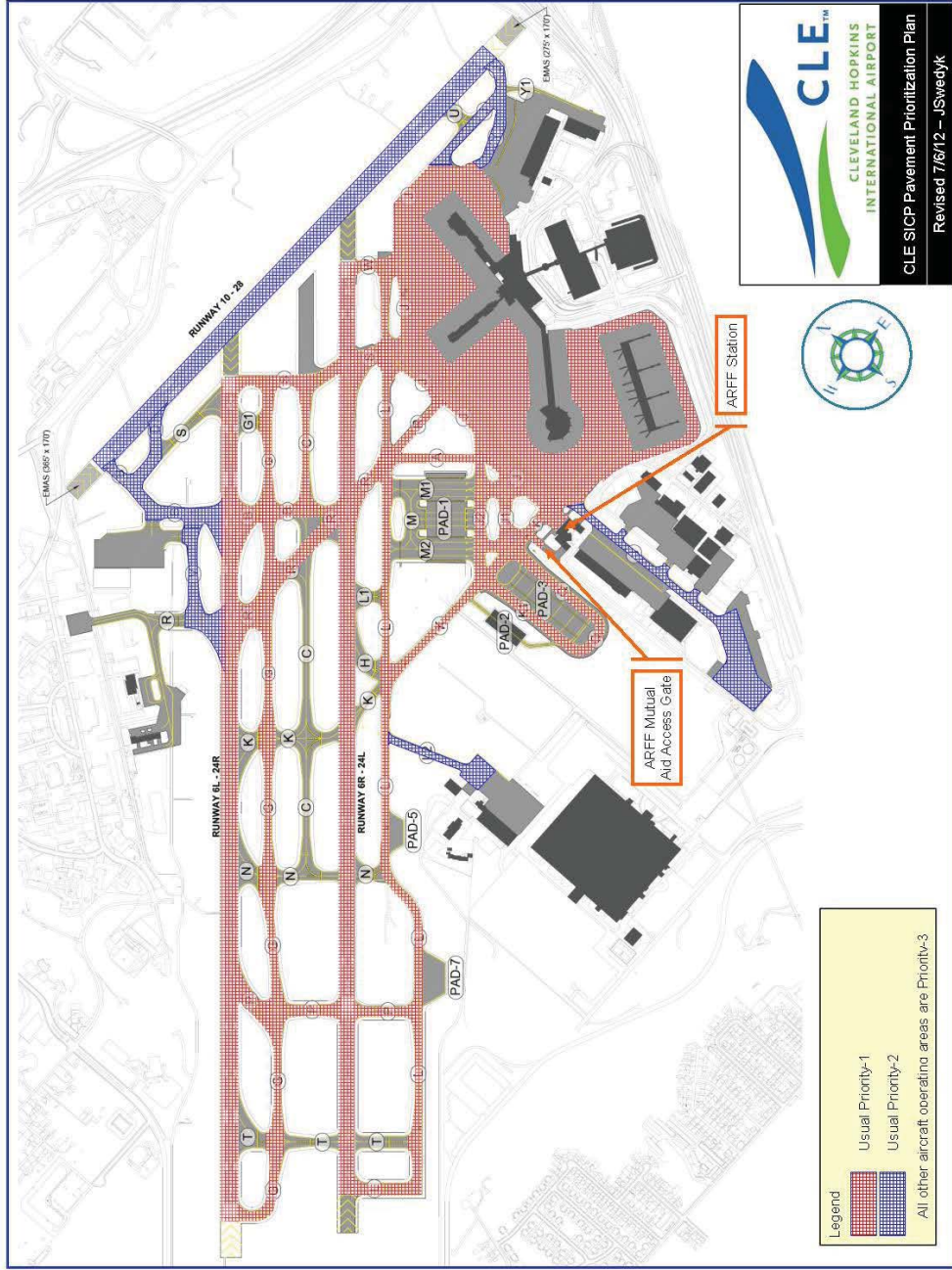
The Airport Operations section will coordinate the clean-up operation process with the Field Maintenance section and ATCT, and continue to update or cancel NOTAMs as appropriate.

As melting occurs, the Airport Operations section will monitor pavement temperatures to ensure surfaces do not freeze. This generally occurs in the late afternoon when pavement temperatures drop below freezing. Surfaces will be treated. The effects of ponding water will be mitigated by utilizing brooms.



City of Cleveland  
Cleveland Hopkins International Airport

### Appendix-A SICP Prioritized Pavement Plan



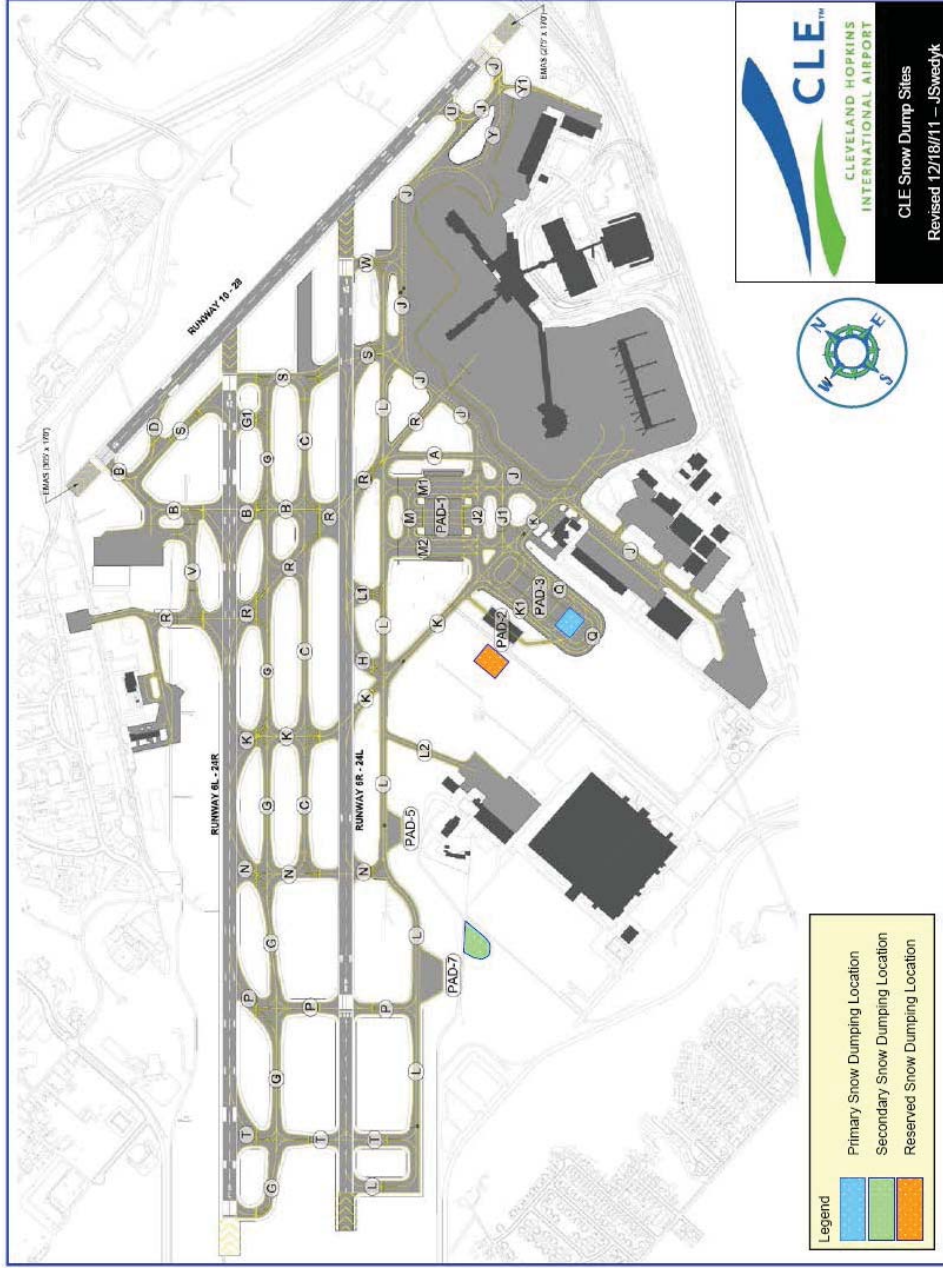
CLEVELAND HOPKINS INT'L AIRPORT  
REVISION DATE: 1/21/2016  
ORIGINAL DATE: 8/14/2009

AIRPORT CERTIFICATION MANUAL  
FAA APPROVAL Original signed by Michael Stephens  
DATE 1/26/2016 and held by Ops Mgr



City of Cleveland  
Cleveland Hopkins International Airport

## Appendix-B Designated Snow Dump Locations



CLEVELAND HOPKINS INT'L AIRPORT  
REVISION DATE: 1/21/2016  
ORIGINAL DATE: 8/14/2009

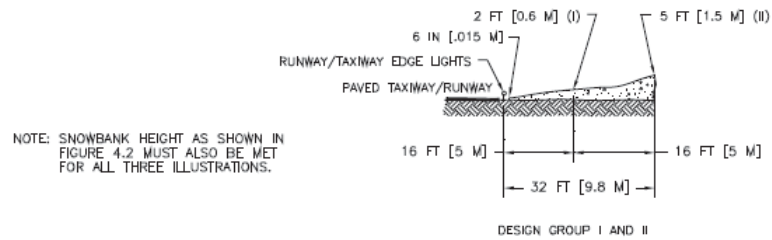
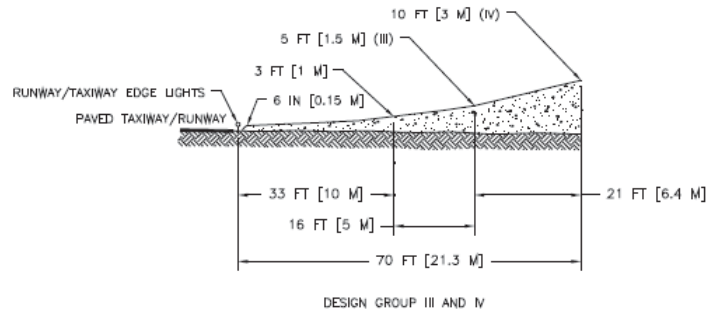
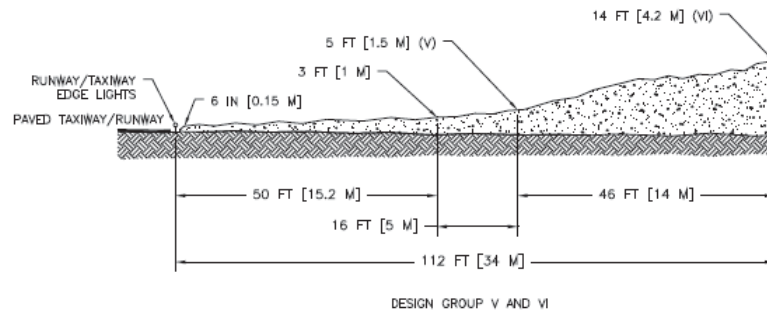
AIRPORT CERTIFICATION MANUAL  
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DATE: 1/26/2016 and held by Ops Mgr



## Appendix-C FAA Advisory Circular 150/5200-30C, Figure 4-1a Snow Bank Profile Limits

AC 150/5200-30C

12/9/08



NOTE: SNOWBANK HEIGHT AS SHOWN IN FIGURE 4.2 MUST ALSO BE MET FOR ALL THREE ILLUSTRATIONS.

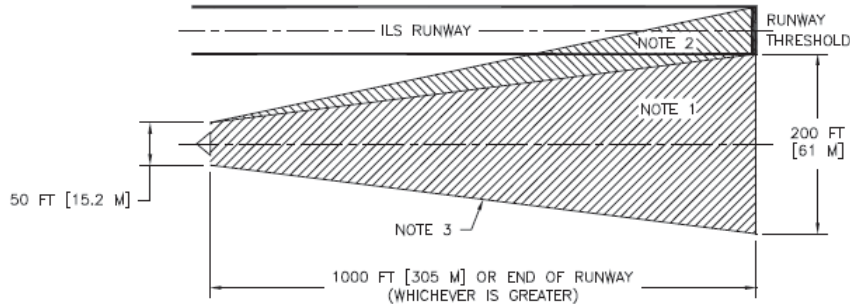
Figure 4-1. Snow Bank Profile Limits Along Edges of Runways and Taxiways with the Airplane Wheels on Full Strength Pavement (see Figure 4-2 guidance)



## Appendix-D FAA Advisory Circular 150/5200-30C, Figure 4-2 Glide Slope Snow Depth Clearances

12/09/08

AC 150/5200-30C



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 [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)

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