139.313 SNOW AND ICE CONTROL

Snow and Ice Control Plan

ST. LOUIS LAMBERT 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 Deputy Director of Operations & Maintenance, with the assistance of the Assistant Director Operations & Maintenance will typically initiate a series of meetings during the months of September, October and November in order to organize and prepare the Airport community, staff and tenants for the upcoming winter season.

An example of the typical pre-season meetings are as follows:

Snow Team Supervisors - With Airport Operations Supervisors and Airfield Maintenance Supervisor and Foremen to discuss the STL SICP, snow team personnel and equipment staffing & assignments, and snow control techniques.

Airport Authority - All internal Airport Authority departments to discuss equipment and material inventory, repair needs, staffing, budget, training, previous years issue's, and any other topics associated with snow and ice control and its plan.

Airport Operations - Airport Operations training and review meeting will be held by the Assistant Director of Ops & Mx with Airfield Operations Specialist as part of their annual required training requirements to discuss the STL SICP, AC 150/5200- 30D Airport Field Condition Assessments and Winter Operations Safety, relevant CertAlerts and industry best practices.

Air Traffic Control - With local FAA Air Traffic Managers, Supervisors and Technical Operations staff to discuss snow clearing Priorities, dissemination of Runway Condition Code (RCC), NOTAMs, and procedures for closing and opening a runway or taxiway. St. Louis TRACON staff, located in St. Charles, are also invited.

Tenants - A winter season kick off meeting will be held by the Airport Deputy Director Operations & Maintenance, or designee, with all available tenants.

Deicing - A deicing meeting will be held with the airlines, deicing contractors and ATCT, to discuss aircraft deicing locations and procedures, coordinated by the Airport Planning Department, with input from the Operations & Maintenance and Environmental Departments.

b) Personnel Training

All Airport Operations staff, Airfield Maintenance supervisory personnel, and Auto Shop supervisory personnel receive annual, recurrent snow and ice control training. All training for personnel is conducted or verified by the Assistant Director of Operations & Maintenance and/or designees.

Training records are maintained by an Airport Operations Supervisor tasked with maintaining all Part 139 training records.

Training typically consists of a combination of at least one of the following: AAAE Interactive Employee Training (IET), classroom discussion, and/or hands on practical training and review.

i. Airfield Operations Specialists, Lead Airfield Operations Specialists and Airport Operations Supervisors are all required to:

1) Take and pass the IET Snow and Ice Control module every 12 consecutive calendar months (CCM).
2) Attend an all department Winter Ops training and review staff meeting prior to the start of the winter season.
3) Observe and practice operational procedures during an annual mock snow call prior to the start of the winter season.
4) As annual operating budgets permit, the Airport Authority attempts to send at least one department representative to an AAAE conference which focuses on snow and ice control. The person selected to attend the conference will conduct a briefing to the other department staff.

ii. Airfield Maintenance Foremen and the Airfield Maintenance Supervisor are all required to:

1) Take and pass the IET Snow and Ice Control module every 12 consecutive calendar months (CCM).
2) Attend the AFM Winter Ops review meeting prior to the start of the winter season.
3) Observe and practice operational procedures during an annual mock snow call prior to the start of the winter season.
4) As annual operating budgets permit, the Airport Authority attempts to send at least one department representative to an AAAE conference which focuses on snow and ice control. The person selected to attend the conference will conduct a briefing to the other departmental supervisory staff.

iii. Airfield Maintenance Workers (heavy equipment operators) are required to:

1) Take and pass the IET Snow and Ice Control module every 12 consecutive calendar months (CCM).
2) Practice operational procedures and techniques during an annual mock snow call prior to the start of the winter season.

iv. Fleet Maintenance Technicians, Fleet Maintenance Foremen and the Fleet Maintenance Manager are required to:

1) Take and pass the IET Snow and Ice Control module every 12 consecutive calendar months (CCM).
2) Observe and practice operational procedures during an annual mock snow call prior to the start of the winter season.
3) As annual operating budgets permit, the Airport Authority attempts to send at least one representative to an AAAE conference which focuses on snow and ice control. The person selected to attend the conference will conduct a briefing to the other departmental supervisory staff.

v. Ramp Contractor Supervisory staff confined to the Non-Movement Area / are required to:

1) Take and pass the IET Snow and Ice Control, Airline Ramp Safety (non-movement area) modules every 24 consecutive calendar months (CCM).

c) Equipment Preparation

An Airport Operations Supervisor responsible for 139 certification shall coordinate with the Fleet Maintenance Manager to ensure the airports Halliday Technologies RT3 will be calibrated, updated and certified annually prior to the winter season. This Airport Operations Supervisor shall ensure the Airport's Bowmonk Decelerometer is factory calibrated annually, prior to the snow season.

The Fleet Maintenance Manager will inspect and prepare each piece of snow removal equipment by November 1 of each year. Required fluids, replacement parts, and snow removal equipment components will be inventoried and stockpiled and reported to the Assistant Airport Director Operations & Maintenance.

He/she shall ensure Out of Service equipment will be kept up to date on the Snow Removal Asset Status page located on the local Intranet.

1.2 Airport Authority and Tenant Snow and Ice Control Meetings.

Prior to the start of the winter season, which begins November 1 and ends April 15, the Operations senior management will host an Airport Authority Departmental meeting, to plan for personnel mobilization, equipment and supplies in order to meet the expected winter events.

Attendees at the Airport Authority Departmental meeting general consist of the Airport Deputy Director Operations & Maintenance, Assistant Director Operations & Maintenance, Airfield Maintenance Supervisor, Airport Operations Supervisors, Safety Management System Coordinator, Fleet Maintenance Manager, Airport Construction & Maintenance Manager, Building Maintenance Supervisor, Electrical Supervisor, Procurement & Purchasing Manager, as well as a representative from Environmental/Engineering Department that have funtions related to the upcoming Snow Season, and the Airport's Non- Movement Area & Landside Contractor.

The Airport Authority departmental meeting shall discuss and review the following:

1. Preparation of operational procedures and plans for snow removal contractors;
2. Preparation to ensure that the essential supply contracts are in force;
3. Inventory of snow removal equipment and ensure completion of pre-season preventive maintenance programs on snow removal equipment;
4. Preparation of plans for erection and placement of snow fencing in designated sites, if any, and snow stakes where appropriate;
5. Development of snow removal plan for haul roads and landside, and evaluation of the condition of these roadways;
6. Selection of sites to be used as snow dumps conveniently located and accessible;
7. Evaluation and publication of appropriate airport security procedures and driving rules and regulations for use during snow and ice emergencies;
8. Review and revision of snow removal plans and procedures;
9. Review and discuss ongoing equipment operator training;
10. Assessment of snow removal staffing needs and new equipment purchases.

The Airport host a season kick off meeting with tenants, and routinely meets at the monthly tenant manager meeting, to enable tenants to provide feedback and make recommendations to snow and ice removal operations and Snow and Ice Control Plan (SICP) at STL. The tenant kickoff meeting is chaired by the Airport Deputy Director Operations & Maintenance and includes, Federal Aviation Administration (Air Traffic and/or Technical Operations) representatives, and airline, fixed based operator and other tenants.

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 occurs prior to the winter season.

The following topics will be discussed, when applicable and in the appropriate meetings described previously in this Chapter:

- Airport Clearing Operations Discussion Topics
    - Areas Designated as Priority I area, any new airfield infrastructure
    - Clearing operations and follow-up airfield assessments
    - Potentials for pilot or vehicular runway incursions or incidents
    - Staff requirements and qualifications (training)
    - Update training program
    - Streamline decision making process
    - Response time to keep runways, taxiways and ramp areas operational.
    - Communication, terminology, frequencies, and procedures
    - Monitoring and updating of runway surface conditions
    - Issuance of NOTAMS and dissemination to ensure timely notification
    - Equipment inventory
    - Status of procurement contracts, including storage of materials
    - Validation of deicer certification letters from vendors (if applicable)
    - 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
    - Air Carrier Ground Deicing/anti-icing programs
- Air Carrier Ground Deicing/anti-icing programs
    - Assessing all air carriers deicing programs by reviewing airport surface flow strategies; reviewing ground time and takeoff clearances after deicing; analyzing and adjusting airplane deicing plans
    - Maximizing efficiency of operations during icing conditions by identifying locations for airplane deicing; planning taxi routes to minimize ground times; developing rates for deiced departures; allocating departure slots; determination airport deicing crew needs; verifying communications.
- Requirements for collection of deicing/anti-icing.

Chapter 2. Post-Event/Season Actions

2.1 Post Event.

After each significant snow event, Operations senior management may host a meeting with the tenants 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 post storm debriefing meeting will take place amongst the applicable Airport Authority departments, and/or ATC, to discuss lessons learned and ways to conduct continuous quality improvement.

During the snow season, winter operations is an agenda item at Tenant Manager meetings which are held monthly.

2.2 Post Season.

After the snow season, when needed, winter operations is an agenda item at Operations & Maintenance meetings which are typically held monthly.

Departments discuss their section's post season responsibilities, such as Fleet Maintenance-inspecting and repairing equipment, Airfield Maintenance-training new and current equipment operators on equipment, maintaining movement area driving proficiency, ordering supplies, Airport Operations – calibrating friction tester and maintaining proficiency, Digital NOTAM Manager entries and Airport Condition Report usage, and Operations senior management – updating the SICP and participating in airline snow and deicing meetings.

Phase #2

Winter Storm Actions and Procedures

Chapter 3. Snow Removal Action Criteria

3.1 Activating Snow Removal Personnel.

At STL, both the Airport Operation Department and the Airfield Maintenance Department are staffed 24/7. The Airfield Maintenance department maintains enough Airfield Maintenance Workers on each shift to provide for an un- forecasted anti-icing/deicing operation or plow/brooming operation with a portion of our Multi- Tasking Equipment (MTE) fleet on a single impacted runway and associated Priority 1 taxiways.

a) Weather Forecasting

- The senior most most Airfield Operations Specialist is responsible for monitoring both current and forecasted weather on a continuous basis during their assigned shift and notifying both on duty staff and the Assistant Director Ops & Maintenance of inclement or impactful weather.
- A contracted meteorological service provides weather updates at least three time a day, with additional updates via phone, email, or text as conditions change, and is available by phone to discuss the forecast and expected conditions.
- Ops Specialists also monitor the National Weather Service (NWS) website for current conditions, hourly weather forecast graphs, Terminal Area Forecasts, subscribe to iNWS text alerting and have the ability to call the St. Louis NWS forecaster, if necessary.
- The Ops Specialists also utilize a 3rd party subscription service that provides for radar imagery, current conditions and regional forecasts.
- Vaisala in-pavement surface sensors provide for current surface temperature monitoring. A separate sensor on RWY 12R also provides for runway surface temperature forecasting.
- Ops vehicles are also equipped with mobile vehicle mounted surface/ambient temperature probes with in vehicle displays.

b) Chain of Command & Mobilization Procedures Chain of Command

- **Snow Coordinator (SC)** – The Assistant Director of Ops & Mx serves as the overall Snow Coordinator and as a Snow Crew Leader when needed. The SC shall interface with the SCLs and the Ops Center.
- **Snow Crew Leader (SCL)** – Typically for a full snow call, the Snow Teams are divided into two Teams. An Airport Operations Supervisor shall serve as the Snow Crew Leader for each Team and the Assistant Director of Ops & Mx shall serve as a backup Snow Crew Leader when needed. Responsible for the execution of the SICP and the oversight of the snow & ice operation. Provide direction to and coordinate primarily with the Runway Team Snow Crew Maintenance Foremen. Communicate

& coordinate the snow and ice control efforts with the ATCT Supervisors. The SCL shall also direct the Runway Inspector and Ramp Inspector.

- **Snow Crew Maintenance Foreman (SCF) (or Supervisor)** – Supervise and act as a team leader for each separate snow removal team (runway, taxiway, etc.) and provide direction and have oversight of the snow team equipment operators. Coordinate with the Airport Operations staff and the SCL. The Runway Team SCF provides the Runway Inspector and/or SCL the accountability for all other SCF teams.
- **Airfield Operations Specialists (AOS)** – Typically for a full snow call, Airfield Operations Specialists fill the following positions: A) Runway Inspector, B) Ramp Inspector, and C) Operations Center. Responsible for maintaining FAA Part 139 compliance, winter operations surface assessment and NOTAMs. Coordinates concerns and conditions to the Snow Crew Leader. In the event the Ramp Inspector position is unfilled by Ops, an additional Operations and Maintenance employee that participates in Snow Call will cover this position.

c) Mobilization Procedures

- The senior most Airfield Operations Specialist monitors the airfield during the course of their shift. They are staffed 24/7.
- Typically an inspection is completed near the beginning of each shift, after peak traffic volume decreases, or as conditions change in order to be aware of and report accurate surface conditions.
- If runways and Priority 1 surfaces need immediate attention, the senior most Airfield Operations Specialist will coordinate a response plan with the on-duty Airfield Maintenance Foreman or the Lead Airfield Maintenance Worker, to begin treatment or clearing operations as soon as practical. A briefing shall immediately be given to the Assistant Director Ops & Mx, who shall then brief the Deputy Director Ops & Mx.
- If runways and Priority 1 surfaces do not require immediate attention, but inclement weather is forecasted, the senior most Airfield Operations Specialist (AOS) shall initiate a conference call with the Deputy Director, Assistant Director, Airfield Maintenance Supervisor, Fleet Maintenance Manager and the Airport Operations Supervisors. The call shall start by the AOS giving a full weather briefing, by utilizing the sourced previously mentioned, describing current and forecasted conditions to include, time, temperature trends, precipitation potential & rate of accumulation, winds, visibility and moisture consistency to determine the expected type of snow (dry or wet).
- Whenever advanced timing and the forecast allows, the Assistant Director Ops & Mx will direct the designated snow crew to be placed on Standby status, typically 12-24 hours in advance of an estimated call in time, in order for staff to plan and rest accordingly.

- The Assistant Director Ops & Mx will coordinate with the supervisors in the Ops & Mx departments and the Airport Deputy Director and determine the appropriate time to initiate a snow team (and contractor, if required) call in.
- The AOS staffing the Ops Center will utilize the Everbridge Mass Notification system to disseminate the snow crew call in information, to include the assigned snow team and time to report.
- Airfield Maintenance Foreman will review the Everbridge report status and directly call any Airfield Maintenance Worker that has not acknowledged the mass notification.
- Employees and contractors are required to respond and be available to commence snow removal operations within 2 hours of initial notification.
- For short notice staff recalls (less than a 2.5 hour notice) employees can receive a bonus if they report in for duty in 90 minutes or less.
- Select Employees that fall within the Operations and Maintenance Departments are on call snow call during the months from November 1 – April 15th and
- Foreman/Supervisors have the flexibility to require staff to hold over until an appropriate level of personnel have reported back for duty.
- The Ops Center is responsible for additional notifications for both Standby and Alert statuses:

  a) Appropriate Snow Crew Leader;

  b) Airport Fleet Maintenance Manager will be notified while on-duty or at home if off-duty;

  c) Field Maintenance on-duty Supervisor;

  d) Building Maintenance on-duty personnel;

  e) Housekeeping on-duty Supervisor;

  f) Climate Control: Sand dryer operations for runway operations.

  g) Airport Police Dispatcher;

  h) Snow Removal Contractor (private contractor) using airport or home phone numbers;

i) Boeing Groundhog, using airport or home phone numbers;

j) Boeing Groundhog: Boeing Groundhog will be notified to have their personnel remove all of the arresting gear cables from the runways.

Note: When ice control operations only are anticipated, Boeing Groundhog and outside contractors may not be mobilized. This decision will be the responsibility of the Snow Coordinator.

k) Store Room, using airport or home phone numbers;

l) Electric Shop on-duty Supervisor.

Note: Airport Authority on-duty personnel shall be responsible for further notifications or follow up verification to the respective snow crew personnel once the Ops Center has notified the on-duty personnel.

The same is applicable to other parties notified. The Ops Center will have the primary responsibility to make the initial notification to departments, which will then be responsible for notifying their personnel and following up on the Everbridge report status.

Personnel and departments shall be required to remain on a stand-by alert or until such time as they are called into the airport for snow removal duties.

Snow Removal Contractor: As determined in the Pre-Season Planning Meeting, the Airport Authority-hired outside contractor has been assigned to specific ramp and roadway areas and is required to provide appropriate personnel and equipment relative to whether the call-out is initial, partial, or a full scale call-out. A separate document, the Contract for Snow Removal Services, outlines all of the snow contractor's obligations, personnel and equipment requirements, assignments, entrance points and snow dump areas. In addition to being responsible for all the airline ramp areas (see illustrations 1A and 1B) the contractor shall be responsible for cleaning all areas as seen in illustration I through XI.

d) Triggers for Initiating Snow Removal Operations

Snow removal operations will begin when contaminants begin accumulating on pavement surfaces. Snow, Ice, Slush should be removed as expeditiously as possible. **STL's goal is to maintain available runways, high speed turnoffs and taxiways, in a no worse than wet condition.**

The SCL shall ensure Airfield Operations Specialists are monitoring surface conditions frequently enough in order for them to notify the Airfield Maintenance Foremen to begin commencing removal operations as soon as accumulations are noted.

The Airfield Maintenance Foremen shall have equipment ready for prompt commencement of operations. The Fleet Maintenance Manager shall have equipment calibrated and ready for prompt commencement of operations.

3.2 Personnel Responsibilities

1. AIRPORT DEPUTY DIRECTOR OF OPERATIONS & MAINTENANCE

a) Promulgates Airport Authority policy and formats SICP so that it is in compliance with FAA standards. Revises and amends same, as required.
b) For significant storms, host conference calls with Airlines & tenants to communicate snow plan and to receive updates on their operations.
c) Brief Director of Airports on snow & ice control efforts.

2. SNOW COORDINATOR (Assistant Director Operations & Maintenance) RESPONSIBILITIES

a) Participate or host conference calls with internal key Ops & Mx department staff to determine the optimal time to initiate a snow alert and/or response.
b) Organize and host pre-season department and ATCT meetings.
c) Determine alert levels based on weather forecasts and current conditions reported by Operations or weather contract services;
d) Monitor snow removal operations on all airport facilities to ensure they are in compliance with the SICP and safety procedures;
e) Provide direct supervision to Snow Crew Leaders, Foremen and Operations;
f) Cancel alerts;
g) Debrief snow committee members after cancellation of alerts in order to continuously improve snow removal operations; and
h) Make policy & snow plan recommendations to the Airport Deputy Director for review.

3. AIRPORT OPERATIONS RESPONSIBILITIES

- Maintain continuous weather watch during all periods of active inclement weather and awareness of forecast inclement weather utilizing:

  a) A privately contracted meteorological service providing weather updates at least three times daily with additional updates as conditions dictate;

  b) TAF, N.O.A.A. and NWS (iNWS, NWSchat, etc.) services;

  c) Airport Authority access to weather monitor with radar system which provides continual updates.

  d) Runway in-pavement surface sensors and mobile vehicle mounted surface sensors reporting surface temperatures and pavement conditions.

  e) Atmospheric sensors measuring air temperature, dew point, wind direction, wind velocity and precipitation.

- Keep all all key personnel advised of weather changes and updates directly, via Everbridge, or through a conference call, as requested by the Snow Coordinator;

- Notify key personnel of alerts and changes in alerts;

- Notify personnel and departments for mobilization of snow removal crews;

- Notify outside contractors to mobilize for ramp and roadway snow removal;

- Prepare and issue NOTAMs via the Digital Notam System amendments to the Airport Condition Report (ACR) detailing airfield conditions to the airlines and airport users;

- Coordinate closures between snow crew leaders and ATCT supervisor. Make an all frequency announcement when runways reopen after snow removal ops.

- In addition to staffing the Ops Center, personnel from Airport Operations will be assigned the following positions during snow removal operations:

a) **Ramp Inspector –**

a) Monitoring of snow removal operations and conditions by Ramp contractor or City personnel on airline ramp areas, service roads, and airline tug roads.
b) Maintains situational awareness of deicing pad operations.
c) May assist with the inspection and coordination of taxiways, when needed.
d) As time allows, monitors ARFF access roads.

b) **Runway Inspector –**

a) Perform runway condition assessments utilizing the Runway Condition Assessment Matrix (RCAM).
b) Report the Runway Condition Code (RCC) to the Air Traffic Control Tower and Ops Center.
c) Conduct friction testing, as stated in this plan, utilizing the Airport CFME or decelerometer and transmit surface conditions and Mu data to the Snow Crew Leader, and the Ops Center.
d) Open and Close the runway with Air Traffic Control over Ground Frequency when the snow team is operating on the runway.

- Report the RCC to the Ground Controller when opening the runway over Ground Control Frequency.

- Notify all personnel of alert cancellation;

- Notify Snow Committee Members after cancellation of alerts;

- Prepare reports and keep logs on snow removal operations;

4. SNOW CREW LEADER'S RESPONSIBILITIES

- Decides on airfield snow removal procedures, in accordance with this plan, experience and the expertise of the SCF;

- Communicates plan and provides general supervision to runway snow crew foreman team leader;

- Monitors other areas of airport grounds that are under snow removal operations;

- Inspects runways and taxiways and determine when additional measures are necessary

- Debriefs snow coordinator and/or Airport Deputy Director for determination of alert status and enforces policy.

5. SNOW CREW AIRFIELD MAINTENANCE SUPERVISOR RESPONSIBILITIES

- Responsible for overseeing the training of snow team operators.
- Responsible to oversee the call out of snow team operators and to properly manage fatigue issues and on duty time.
- Coordinates with the Snow Crew Leader a rotating system of breaks so that there is always a snow removal presence on the airfield when needed, unless otherwise approved by the Snow Crew Leader.
- Follows up with appropriate procedures and correction action for staff under his/her jurisdiction.
- Orders supplies and materials through the storeroom to ensure proper inventory on hand during and after a snow event.

6. SNOW CREW AIRFIELD MAINTENANCE FOREMEN RESPONSIBILITIES

- Assign and and facilitate recurrent training and cross training opportunities during routine shifts and at times extra personnel are on duty during snow operations.
- Create a crew assignment list before each storm to coordinate with and receive approval from the SC.
- Ensure personnel pre-check, start and have equipment ready for deployment when called upon.
- Act as team leader for each separate snow removal team (Runway Team, Taxiway Teams, and Deicing Team, if necessary, etc).
- The Runway Team SCF will provide general supervision to the Taxiway Team SCF.

7. FLEET MAINTENANCE MANAGER RESPONSIBILITIES

- Responsible for the proper maintaining, calibrating and availability of snow removal equipment and assets.

- Assigns a mobile repair unit to travel with the snow team, or to wait in a nearby pad, to make immediate repairs to critical pieces and perform calibrations when necessary.

- Tracks, repairs, and reports when snow removal assets are out of service and schedules immediate repairs.

- Ensures supplies are on hand or quickly available to maintain the fleet.

- Follows up with appropriate procedures and correction action for staff under his/her jurisdiction.

8. ROAD STAFF RESPONSIBILITIES

- Designated Operations and Maintenance staff that are part of Snow Call will supervise operations of outside contractor on parking lots, roadways, crosswalks, sidewalks and direct personnel and equipment to areas requiring attention. They will brief the Ops Center when needed of conditions, who will log information and relay issues to the contractor's supervisors.

- They also fill the position of Ramp Inspector when needed.

9. SUPERVISION OF LANDSIDE AND ROADWAY SNOW OPERATIONS

- The Ops. Center will notify and maintain on-going communications with specific personnel from Operations and Maintenance who are responsible for supervising landside and roadway snow operations during a snow call event.

- Airport Police monitor roadways when the above are not on duty.

10. PRIVATE CONTRACTORS RESPONSIBILITIES

- All private contractors utilized by the Airport Administrative Office, any carrier or other tenant or agency on the Airport shall be subject to all Airport Rules and Regulations, the direction of the ATCT and/or the Airport Administrative Office. At no time will private contractors, their vehicles and/or equipment be permitted to operate beyond the limits of the existing ramp areas without first being cleared by the appropriate agencies and accompanied by radio-equipped vehicles. All such vehicles must have the necessary lights and warning signals for night operations as required by Airport Vehicle Rules and regulations and are required to give the right-of- way to all

taxiing aircraft. Contractor communications will be through an assigned channel on the Airport Authority 800 MHz radio system or through the use of telephone/cell phone.

11. AIRPORT POLICE RESPONSIBILITIES

- Airport Police will assist in monitoring the condition of all roadways and employee parking areas and notify the Ops. Center Supervisor accordingly. The Ops. Center will call the Airport Police for extra security guards and to notify checkpoints to expedite the snow contractor's dump truck operations.

3.3 SNOW CONTROL CENTER (SCC)

The Airport Operations Center serves as the Snow Control Center during winter operations and is staffed by at least one Airfield Operations Specialist during times of a snow team call in and shall serve as the central location for unified communications.

The Airfield Operations Specialist staffing the Ops Center shall perform the following functions:

A. Serves as the prime source for disseminating RwyCCs, FICONS & NOTAMS, coordinating advance closures and openings with ATCT & updating same on NOTAM Manager and the Airfield Condition Report (ACR).
B. Informs ATCT, Air Carriers and other users of the airport with conditions.
C. Will receive and transmit requests for snow removal, deicing, or sanding of areas to the Snow Crew Leader or applicable Snow Crew Foremen.
D. Serves as the coordination center for the airport during all snow removal operations.

3.4 AIRFIELD CLEARING PRIORITIES

It is impractical and infeasible for airports to simulatenously clear all airside pavement and support facilities of all snow, slush, and ice. The airport established a minimum level of service by establishing a priority classification system. This targeted approach places focus on critical areas of the airfield that will allow aircraft operations in a safe and efficient manner at an acceptable level of service given environmental conditions. Efforts to clear areas of lower importance can be delayed until the higher priority areas are fully functional or to low aircraft activity hours. See Appendix 1 – Snow Removal Priority Maps.

The Primary runways are 12L-30R and 12R-30L. Due to its Cat III approaches, 12L-30R is the preferred runway of choice when only single runway operations are possible.

The STL Airport Authority, in consultation with the STL ATCT, has established a system of snow and ice control priorities for St. Louis International Airport. Snow and ice control priority surfaces are graphically depicted as an appendix to this this document. This reference list of priorities shall serve as a general guide, and may be deviated from, through communication with the STL ATCT and the Snow Coordinator, based on actual storm conditions, winds and intensity. Airfield snow and ice control priorities shall be as follows:

Two Runway Operations (Easterly flow):

- Runways 12R, 12L.
- ARFF station and ARFF emergency access roads.
- Mutual Aid Gates 71N, 17S, 7S, 3S.

1st Priority:

- Taxiways D, D3, D4, E1, Q, R full length
- Taxiways C between Runway 12R and Taxiway D
- Taxiways G and H, between Taxiway D and Taxiway E
- Taxiway E between Taxiway H and the Approach End of Runway 30R
- Taxiway L between Runway 12R and Taxiway D
- Taxiway S between Runway 12L and Taxiway E

2nd Priority:

- Taxiways C, F, F4, K1, full length
- Taxiway E between Taxiway S and Taxiway H
- Taxiway S between Taxiway B and Taxiway C, and Runway 12L and Taxiway F
- Taxiway V between Taxiway C and Taxiway F
- Taxiway P between Runway 12R and Taxiway F
- Taxiway K between Haith Cargo and Taxiway F
- Taxiway B between Taxiway T and Taxiway S
- Taxiway H between Taxiway F and Runway E

Snow Removal for Two Runway Operations

- Runway 30L, 30R (Westerly flow)
- ARFF station and ARFF emergency access road
- Mutual Aid Gates 71N, 17S, 7S, 3S

Priority 1

- Taxiways D, D3, D4, E2, Q, R, full length
- Taxiway C between Runway 30L and Taxiway D
- Taxiway S between Taxiway E and Runway 30R
- Taxiway P between Runway 30L and Taxiway E
- Taxiway G between Taxiway D and Taxiway E
- Taxiway E between Runway 30R and Taxiway G

Priority 2

- Taxiways C, F, F4, K1, H, full length
- Taxiways P between Taxiway E and Taxiway F
- Taxiway S between Runway 30R and Taxiway F, and between Taxiway B and Taxiway C
- Taxiway E between Taxiway S and Taxiway G.
- Taxiway K between Haith Cargo and Taxiway F
- Taxiway B between Taxiway T and Taxiway S
- Taxiway V between Taxiway C and Taxiway F

In the event the severity of a winter weather storm exceeds the airport resource capabilities to maintain two runways, then snow and ice control priorities shall focus on single runway configuration, as follows:

Snow Removal for One Runway Operations

- Runway 12L (Easterly flow)
- ARFF station and ARFF emergency access road
- Mutual Aid Gates 71N, 17S, 7S, 3S

Priority 1

- Taxiway D, D3, D4, full length
- Taxiway G, between Taxiway E and Taxiway D
- Taxiway H, between Taxiway E and Taxiway D
- Taxiway C between Runway 12R and Taxiway D
- Taxiway L between Runway 12R and Taxiway R full length
- Taxiway S between Taxiway E and Runway 12L
- Taxiway E between Taxiway H and Approach of Runway 30R
- Taxiway E1 full length.
- Taxiway R full length.

Priority 2

STL's Priority 2 for a single runway configuration scenario would be to conduct snow removal operations on and re-open Runway 30L, with the aforementioned Priority 1 surfaces.

Secondary Runways (RWY 11-29 & RWY 6-24)

Priority 3

Due to the limited use during a winter event, STL has designated RWY 11-29 and RWY 6-24 and some of their associated taxiways as Priority 3 surfaces, and snow removal operations on these secondary runways will commence at some point after Runways 12R-30L & 12L-30R Priority 1 & 2 surfaces are satisfactorily cleared, serviceable and additional accumulation is expected to be minimal.

If wind shifts or other operational reasons dictate a higher priority to be placed on these secondary runways, particularly the crosswind runway, the Snow Coordinator, or designee, will coordinate with the ATCT Supervisor to **substitute** a primary runway that is Priority 1 for one of the secondary Priority 3 runways. The SCL shall inform the Snow Coordinator if / when this occurs. Maintaining 3 runways, during an active, accumulating snow event is not feasible.

3.5 Airfield Clearance Times (40,000 or more annual airplane operations)

STL has sufficient equipment to clear 1 inch of falling snow weighing up to 25lb/ft from single runway Priority 1 areas within 30 minutes. Typically, clearing efforts will last longer than 30 minutes, in order to give back (open) the runway in a condition above this minimum benchmark.

Table 1-1. Clearance Times for Commercial Service Airports

Annual Airplane Operations (includes cargo operations)	*Clearance Time[1] (hour)*
40,000 or more	*½*
10,000 – but less than 40,000	*1*
6,000 – but less than 10,000	*1½*
Less than 6,000	*2*

General: Commercial Service Airport means a public-use airport that the U.S. Secretary of Transportation determines has at least 2,500 passenger boardings each year and that receives scheduled passenger airplane service [reference Title 49 United States Code, Section 47102(7)].

Footnote 1: These airports should have sufficient equipment to clear 1 inch (2.54 cm) of falling snow weighing up to 25 lb/ft^3 (400 kg/m^3) from Priority 1 areas within the recommended clearance times.

3.6 Snow Equipment List

**** These units are equipped with a Vehicle Movement Area Transponder (VMAT)*

Multi-Tasking Equipment unit (MTs) Broom/Plow/Air Blast
** These MTE units also include a 1,250-gallon liquid chemical deicer.*

Unit #	Year	Make	Model	Description
225*	2019	MB	MB-5	Broom 22ft/plow 24ft w/deicer 1,250g ***
224*	2018	MB	MB-5	Broom 22ft/plow 24ft w/deicer 1,250g ***
223*	2017	MB	MB-5	Broom 22ft/plow 24ft w/deicer 1,250g ***
221*	2016	MB	MB-5	Broom 22ft/plow 24ft w/deicer 1,250g ***
222*	2016	MB	MB-5	Broom 22ft/plow 24ft w/deicer 1,250g ***
212*	2018	MB	MB-5	Broom 22ft/plow 24ft w/deicer 1,250g ***
204	2015	MB	MB-5	Broom 22ft/plow 24ft ***
220	2015	MB	MB-5	Broom 22ft/plow 24ft ***
216	2014	MB	MB-5	Broom 22ft/plow 24ft ***
205	2012	MB	MB-5	Broom 22ft/plow 24ft ***

206	2012	MB	MB-5	Broom 22ft/plow 24ft ***
219	2012	MB	MB-5	Broom 22ft/plow 24ft ***
210	2011	MB	MB-5	Broom 22ft/plow 24ft ***
211	2011	MB	MB-5	Broom 22ft/plow 24ft ***
218	2011	MB	MB-5	Broom 22ft/plow 24ft ***
208	2009	International	MB-5	Broom 22ft/plow 24ft ***
Total	**16 MTEs**			

Snow Blowers

Unit #	Year	Make	Model	Description
226	1997	Oshkosh	HB2718	Blower ***
227	1999	Oshkosh	HB2718	Blower ***
228	1997	Oshkosh	HB2718	Blower ***
229	1997	Oshkosh	HB2718	Blower
230	2016	Oshkosh	XRS H2926B	Broom/Blower, Plow ***
231	2018	MB	MB4	Blower***
232	1997	Oshkosh	HB2718	Blower
Total	**7 Snow Blowers**			

Front Mounted Brooms

Unit #	Year	Make	Model	Description
207	2010	Oshkosh	HB2723	Broom ***
209	2005	Oshkosh	HB2718	Broom ***
214	1998	Oshkosh	HB2718	Broom ***
217	1998	Oshkosh	HB2718	Broom ***
213	1997	Oshkosh	HB2718	Broom ***
215	1997	Oshkosh	HB2718	Broom ***
Total	**6 Front Mounted Brooms**			

Large De-Icers

Unit #	Year	Make	Model	Description
170	2000	Oshkosh	P2546	Deicer Truck 4000 ***
173	2000	Oshkosh	P2546	Deicer Truck 4000 ***
174	2000	Oshkosh	P2546	Deicer Truck 4000 ***
175	1999	Oshkosh	P2546	Deicer Truck 4000 ***
172	1997	Oshkosh	P2546	Deicer Truck 4000 ***
176	1997	Oshkosh	P2546	Deicer Truck 4000 ***
171	1996	Oshkosh	P2546-sp	Deicer Truck 4000 ***
Total	**7 Large De-Icers**			

Small De-Icers

Unit #	Year	Make	Model	Description
177	2015	Ford	F650XLT	Tanker Truck w/Spray Bars 1500g
178	2007	GMC	C5500	Tanker Truck w/Spray Bars 1500g
Total	**2 Small De-Icers Large**			

Dump Trucks w/Plow

Unit #	Year	Make	Model	Description
131	1998	Oshkosh	P2526-5	Dump Truck / Hauling ***
132	1998	Oshkosh	P2526-5	Dump Truck / Plow
119	1999	Oshkosh	P2526-5	Dump Truck / Plow
111	1995	Oshkosh	P2546	Tandem Dump Truck / Hauling ***

Large Dump Trucks w/ Plow & Spreader (Sand)

Unit #	Year	Make	Model	Description
120	2016	International	P2526-5	Tandem Dump Truck/Spreader, (rollover plow) ***
121	1997	Oshkosh	P2526-5	Dump Truck/Spreader, plow***
123	1997	Oshkosh	P2526-5	Dump Truck/Spreader, plow ***
124	1997	Oshkosh	P2526-5	Dump Truck/Spreader, plow ***
125	1997	Oshkosh	P2526-5	Dump Truck/Spreader, plow***
127	1997	Oshkosh	P2526-5	Dump Truck/Spreader, plow ***
128	1997	Oshkosh	P2526-5	Dump Truck/Spreader, plow ***

Large Dump Trucks w/Plow & Spreader (Solid De-Icer)

Unit #	Year	Make	Model	Description
129	1998	Oshkosh	P2546	Tandem Dump Truck/spreader ***
130	1998	Oshkosh	P2546	Tandem Dump Truck/spreader ***
Total	**9 Dump trucks with plows(7 w/sand spreaders & 2 w/Solid deicer spreader)**			

Large Dump Truck w/Spreader (No Plow) (Sand)

Unit #	Year	Make	Model	Description
116	2011	Oshkosh	P2546	Tandem Dump Truck/Spreader ***
Total	**1 Dump Truck Sand Only (no low)**			

Roadway Dump Trucks w/Spreader (No Plow) (Salt)

Unit #	Year	Make	Model	Description
112	1999	Oshkosh	P2546-5	Dump Truck/Spreader ***
122	1997	Oshkosh	P2546-5	Dump Truck/Spreader ***
Total	**2 Roadway Dump Trucks w/ Salt Spreaders**			

All Equipment is subject to change during the snow season

3.7 Storage of Snow and Ice Control Equipment

Until the FAA Central Region provides AIP funding for a Snow Removal Equipment Storage (SRES) building at STL, all equipment will be stored outside.

3.8 Definitions

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

Under no circumstances are corrosive chemicals, such as Salt, used airside at STL.
*****See section 4.4 for a description of the current approved chemicals in use at STL.**

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

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

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

Contaminant.
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.

If the RWY 1/3rd contains a single contaminant that is less than or equal to 25%, the RwyCC for that 1/3rd shall be 6. (6 being considered "normal" conditions)

- Example: 10% ice and 10% 1 in. dry sn, 50% ice, 50% ice = RwyCC 6/1/1 (Touchdown area correctly shown as "normal")
- Example: 100% ice, 100% ice, 20% ¼ in dry sn = RwyCC 1/1/6

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 .44** for the Halliday Technologies Runway Friction Tester 3 (HTI RFT3)

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.

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.)

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

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

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

Frost.
Frost consists of ice crystals formed from airborne moisture that condenses on a surface whose temperature is below freezing. Frost differs from ice in that the frost crystals grow independently and therefore have a more granular texture.

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

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

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

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

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

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

Mud.
Wet, sticky, soft earth material.

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

- Single contaminant and Layered contaminant.
  'Wet' and 'Wet Snow over Compacted Snow'
- Single contaminant and Single contaminant.
  'Wet Snow' and 'Slush'
- Layered contaminant and Layered contaminant.
  'Dry Snow over Compacted Snow' and 'Dry Snow over Ice'

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

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 will not occur until Priority 1 & 2 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.

Following the overrun accident of a Boeing-737 in December of 2005, the FAA found that the current state of the industry practices did not have adequate guidance and regulation addressing operation on non-dry, non-wet runways, i.e., contaminated runways. As such, the FAA chartered an Aviation Rulemaking

Committee (ARC) to address Takeoff and Landing Performance Assessment (TALPA) requirements for the appropriate parts 23, 25, 91 subpart K, 121, 125, 135, and 139. In formulating recommendations, it became clear to the ARC that the ability to communicate actual runway conditions to the pilots in real time and in terms that directly relate to expected aircraft performance was critical to the success of the project. While researching current NOTAM processes numerous significant short comings were discovered that hampered this communication effort. This document provides NOTAM reporting procedures intended for a digital communication process that would support this major safety initiative and resolve the identified shortcomings. Without accurate real time information pilots cannot safely assess takeoff or landing performance.

At the core of this recommendation is the concept of using the included **Runway Condition Assessment Matrix (RCAM)** (shown on page 49) as the basis for performing runway condition assessments by airport operators and for interpreting the reported runway conditions by pilots in a standardized format based on airplane performance data supplied by airplane manufacturers for each of the stated contaminant types and depths. The concept attempts, to the maximum extent feasible, to replace subject judgments of runway conditions with objective assessments which are tied directly to contaminant type and depth categories, which have been determined by airplane manufacturers to cause specific changes in the airplane braking performance.

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

RwyCCs are reported based on the direction of the assessment and may be read in reverse when aircraft are operating from the opposite direction.

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

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

Slush over Ice.
See individual definitions for each contaminant.

Slippery When Wet Runway.
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.

Chapter 4. Snow Clearing Operations and Ice Prevention

4.1 Snow Clearing Principles

Contaminants on a runway impede airplane acceleration by absorbing energy in compaction and displacement, and by impinging on parts of the airplane after being kicked up by the tires. For airplanes decelerating, slush, snow, and standing water- covered pavements and, especially iced surfaces, hamper deceleration rates due to a reduction in the friction coefficient of the runway and the potential for hydroplaning. Large chunks of ice, from refreezing snow or slush, or deposits from aircraft gear created during landings, can cause severe damage to tires, engines, and airframes. Wet snow, slush, and standing water can cause structural damage from spray impingement or by engine ingestion, which can affect acceleration capability. The recommended maximum depth of takeoff operations for slush and water is ½ inch (13mm) unless the airplane's AFM shows greater depths to be safe (see AC 25-31), *Takeoff Performance Data for Operations on Contaminated Runways).* Consequently, these runway surface contaminants should be minimized to maintain safe landing, takeoff, and turnoff operations. For these reasons, snow clearing operations for Priority 1 runway(s), taxiway connectors, and taxiways to the terminal(s) should start as soon as practicable after snowfall or icing begins. One prime goal is to take the appropriate measures so snow in its various forms, such as slush or frozen water, does not bond to the pavement. Dry snow falling on cold dry pavement will generally not adhere and may be blown off by wind or airplane operations or removed by brooming operations. In such conditions, only brooming may be needed to prevent the formation of compacted snow tracks. Wet snow, however, cannot be blown off the pavement and will readily compact and bond to it when run over by airplane wheels. Consequently, different clearing and/or preventive measures are used for wet snow than those used for dry snow conditions. When measures are taken, the SCL and Ops Center shall stay in close coordination with the ATCT to ensure prompt and safe responses to winter storm events and inform the users of the airport when less than satisfactory conditions exist.

a) Ramp and Terminal

That Airport Authority is responsible for snow and ice control on the ramps, except for pedestrian clearance, as per the Airline Use and Lease Agreement. The Signatory air carriers at Lambert are responsible for snow and ice control in order to accommodate worker and passenger pedestrian traffic, at their preferential use gate positions and the portions of the aircraft parking and ramp areas they utilize. They may contract out for additional snow removal equipment which shall be a direct responsibility of, and under the supervision of, the individual air carrier entering into the contract or agreement for such equipment. Contractors will be required to obtain a SIDA badge and take the Non-Movement Area training through Operations or via IET before initial duties and every 24 consecutive calendar months.

The airlines are responsible for snow removal operations on their respective hangar and cargo ramps. Upon request of the individual airline Manager on Duty, the Airport Authority will apply deicer or FAA sand on ramps, and/or gate positions. Efforts shall be made to accommodate these requests, when men and equipment are available and if doing so will not impact other, more critical

operations. Any request that cannot be accommodated shall be reported to the Snow Coordinator or Snow Crew Leader for follow-up.

A. A private snow contractor, under contract with the Airport Authority, is responsible for all plowing and hauling of snow from the airline ramp areas. Contractor equipment moves very slowly and is not radio controlled. All drivers are warned of the traffic in their ramp areas, and at all times are to give way to aircraft and emergency vehicles. Contractor equipment shall start snow removal from the gate areas and work outward to the pile locations noted on Illustration I. Continuous hauling of snow from the airline ramp to a designated snow dump, shall begin shortly after piles are formed, continuing until all piles are removed or placed in ramp location not being used for aircraft operations.

1. Dump Trucks, provided by the snow contractor are filled by contractor Loaders and transported to the Snow Dump.
2. The Primary Snow Dump shall be on the north & west side of the old MoANG ramp, through Gate 18, just south of the Charlie Pad.
3. The Secondary Snow Dump shall only be used if the MoANG ramp becomes unavailable, and is located on the west side of Banshee Road, across from and west of the Airport Office Building at 11495 Navaid Rd, Bridgeton Mo 68044.

B. Any air carrier requiring exclusive snow removal equipment from the Airport's contractor for their preferential use gates shall (at the air carrier's expense) have their Duty officer only, contact the Snow Desk with such request. The Snow Desk will contact the Contractor with such requests and relay the information to the Carrier and the Snow Coordinator. Date and time will be logged.

C. If it is the decision of the air carrier not to use the Airport Authority contractor, but to use another, the contracting air carrier will be held responsible for the outside contractor observing all Airport and Security Rules and Regulations including security background requirements. The carrier will so notify the SCL and the Snow Desk. Other Airport Authority snow removal equipment may be utilized on the airline ramp at the discretion of the SCL.

b) Runway and Taxiways

Runways:

Runway Team Leader – Managed by an Airfield Maintenance Foreman, directs the lead MB-5, the rest of the operators assigned to the Runway Team and the Foremen responsible for the Taxiway Teams

Techniques listed in AC 150/5200-30D are available for the Runway Snow Team to utilize. Below describes the typical formation and techniques most often utilized at STL for runways:

Perpendicular wind/Crosswind operations (or otherwise) -

Approximately 7-8 MB-5 Multi-Tasking Equipment units, aligned in tandem in a closed wing position, start with the lead MB-5 in front, near the threshold of the runway on the upwind edge. The 7-8 units, with a 1.5' overlap on each unit, will plow & broom between 94'-101' in width, respectively. The plow & broom head operate in coordinated directions so that the broom follows the angled direction of the plow. In this configuration they are angled downwind, and the single windrow created is cast over the downwind light line with the use of a Class 5 snow blower. The lead MB-5 and team will proceed at approximately 15 MPH to the end of the runway, turn off at the end taxiway, turnaround, and proceed back down the runway with the plow turned in the opposite direction, so that the lead operator picks up where the last MTE left off, and continues to angle all snow downwind. The snow blower will continue to cast downwind, over the edge lights and using caution for signs, and one or two of the unneeded MB-5's will clean any residue that is left behind the blower.

Sometimes, typically during light wind, parallel wind, or for a third pass or quick cleanup, the open V formation may be utilized. For an odd number of units, the lead MB-5 will line up and straddle the centerline, the next 3 operators in tandem will angle plows downwind and the next 3 operators in tandem will angle blows upwind. The snow blower will typically blow the windrow upwind, opposite of normal edge, in order to limit the snow buildup at one particular edge of the runway. If the wind is too strong, and the snow will blow back on the clean runway, the snow blower will line up behind the last downwind MB-5 and plow the windrow downwind. In an open V formation, if an even number of units are used, the lead MB-5 will overlap the centerline by 3-4', and all of the above remains the same.

Primarily, STL conducts two passes for full width clearing. On the rare occasion if only one pass is completed, regardless of the formation, the minimum width for clearing the center section of the runway will be 100' wide. The remaining width could still be utilized by an aircraft, however, the conditions should not present a hazard, and will be reported by the Runway Inspector to the Snow Desk for a FICON and ACR entry.

Taxiways

Taxiway Team Leader(s) – Managed by an Airfield Maintenance Foreman, directs the lead taxiway unit and the rest of the operators assigned to the Taxiway Team(s). Typically, two Taxiway Teams will be utilized to plow and broom the Priority 1 or Priority 1 & Priority 2 taxiways associated with the runway being maintained by the Runway Team.

The extra MB-5 MTE units will be split equally between the two Taxiway Teams mentioned above, and if needed, extra plow trucks, followed behind by front mounted brooms, and a snow blower if needed, will be utilized to staff each team.

If MTEs are not available, typically the taxiway teams consist of 2-4 large plows, followed by 2-3 front mounted brooms, along with a snowblower when needed.

High Speed Taxiway Turnoffs – Require the same attention for snow and ice control and removal as the primary runway(s). These should offer sufficient directional control and braking action for aircraft under all conditions. Should inspections by the Runway Inspector or Pilot Reports (PIREPS) indicate there is not a sufficient level of directional control and braking action, the taxiway shall be closed until directional control and braking action improves.

Supervisory staff are aware, through training and/or reviewing this SICP, that aircraft accident data indicates poor attention to High Speed Taxiway Turnoffs contributes to aircraft veer offs.

Local Factors contributing to snow removal operations:

a) Through pre-season planning meetings during the past seasons, ATCT and Airport Management agree that when anti-icing operations are conducted, they should focus on 12L-30R and 12R-30L and their associated Priority 1 and Priority 2 taxiways. The SCL may conduct anti-icing efforts on other areas based on a distinct need and safety considerations. Typical example, the SCL may opt to anti-ice RWY 11-29 and associated Priority 1 taxiways to prevent a bond from forming and allow for quicker and easier recovery of that secondary runway when it is time to remove snow and ice contaminants.

b) Through pre-season planning meetings during the past seasons, ATCT requests when feasible, to prioritize the snow clearing efforts to 12L-30R and 12R-30L, and associated Priority 1 taxiways, so that when able, the parallels are available for aircraft use. The snow crew leader shall make the determination, and inform the Tower Supervisor if the snow crew can keep up with both Priority 1 and Priority 2 taxiways off the parallels based on precipitation type and intensity. Based on the conditions of the runways, the SCL may determine that only Priority 1 or less taxiways are feasible to be maintained, along with the primary runway or both parallel runways.

c) As discussed in pre-season meetings during the past season, when the intensity of the storm is such that it is not safely feasible to keep both parallels open, snow removal efforts shall focus on maintaining the Primary runway, 12L or 30R, and their associated Priority 1 taxiways.

d) As discussed in pre-season meetings during the past season, to prevent incidents between aircraft and snowbanks, ATCT has agreed to limit through taxi on Taxilane Charlie, as much as feasible. When through taxi is necessary, the Ground controller should contact the Ramp Inspector to verify safe passage.

c) Snowbanks

Snow Bank Height profiles – See Figure below for Design Group IV.

a) The objective is to minimize snow bank heights on taxiways and runways to prevent incidents by avoiding the introduction of hazardous snow banks, drifts, windrows, and ice ridges that could come into contact with any portion of the airplane wing or nacelle (engine housing) surface.

b) Additionally, the Runway Inspector and Ramp Inspector shall be monitoring snow piles on the movement area that could obstruct the view of the pilot.

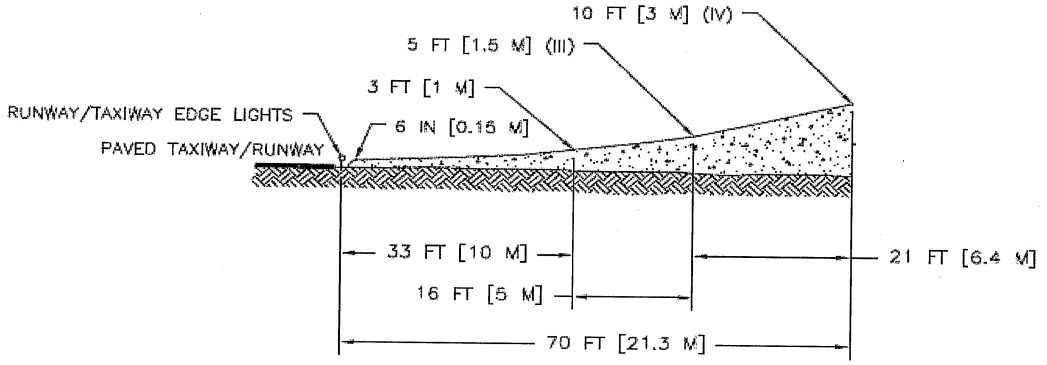
c) Visibility of signs (legibility) and lights should be maintained by proper and careful clearing techniques or by performing post-clearing maintenance from the Electrical Department and/or Airfield Maintenance.

d) The Ramp Inspector monitors contractor snow banks & piles in the non-movement area.

e) The Runway Inspector monitors snow banks in the movement area.

f) If necessary, the Ops Center will coordinate and direct the Electrical crew on advising which signs and lights need to be cleared around.

g) An ACR update and NOTAM will be issued when the below standards are exceeded and alternate techniques, tools and equipment will be utilized to further minimize the issue.



DESIGN GROUP III AND IV

d) NAVAIDs

Clearing around FAA Lights –

STL FAA Tech Ops personnel are responsible for clearing snow around PAPI and Threshold Lights that are part of the FAA ALS.

Monitoring snow depth heights -

STL FAA Tech Ops monitors the height limits of snow in the GSA critical areas and will provide the Snow Coordinator with advanced notice of the potential to exceed limits so a plan can be formulated for getting the snow depth within limits. Maps describing critical areas are available as an appendix to this plan.

Additionally, Tech Ops has the ability to stake out the limits of the Glide Slope antenna critical area, if a reduction in snow height efforts are required by the Airport Authority, on behalf of the FAA. See Critical Area Map – Appendix 3.

Clearing NAVAID roads –

After snow and ice control has been completed for all runway and taxiways, Airport Authority personnel shall clear the snow on the roads to/from the NAVAIDs.

- Snow removal required, FAA Navigational Aids (to be accomplished after all runways and taxiways are completed).

  a) Runway 6

     a. Snow Removal

        1) GS – Blacktop access road to glide slope building off of TWY Tango. While plowing operations are in effect, the drivers must ensure that they pick up and angle plows and blowers as to not damage the glide slope.

        2) LOC – Gravel access road off of perimeter road starting at Approach end 24 to antenna and shelter.

  b) Runway 24

     a. Snow Removal

        1) LOC – Gravel access road off the perimeter road just W of 34S and following the approach lights to the antenna and shelter.

2) GS – Blacktop access road 100' S of RWY 24 end to the glide slope shelter.

c) Runway 11

a. Snow Removal

1) LOC – Shelter along perimeter road near 34S.

2) GS – Blacktop access road off of perimeter road just W of 40S to glideslope.

d) Runway 29

a. Snow Removal

1) LOC – Blacktop access road off of perimeter road starting from RWY 11 and along approach lights.

2) GS – Blacktop access road from perimeter road W of 34S to glide slope shelter.

e) Runway 12R

a. Snow Removal

1) LOC – Gravel access road starting at the perimeter road around the Approach end of 30L to the localizer shelter.

2) GS – Concrete access road starting at Taxiway Victor just N of 12R to the glideslope shelter.

f) Runway 30L

a. Snow Removal

1) LOC – Gravel access road from perimeter road starting at the Approach of 12R to the localizer antenna and shelter.

2) GS – Blacktop access road starting at TWY Echo W of TWY Hotel to the glideslope shelter.

g) Runway 12L

a. Snow Removal

1) LOC – Gravel access road from perimeter road starting at Approach end 30R to the localizer shelter.

2) GS – Concrete access road starting at TWY Echo to the ILS glideslope shelter E of TWY Sierra.

h) Runway 30R

a. Snow Removal

1) LOC – Blacktop access road starting at the Approach end 12L, W side of 6/24, along the approach light stations to the localizer antenna. Snow removal around localizer antenna systems should be coordinated through the FAA ATCT.

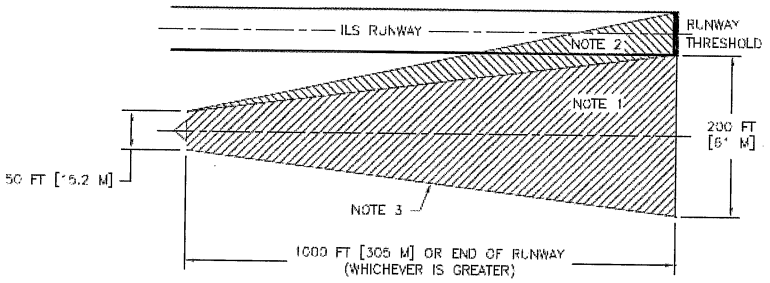
2) LOC – Blacktop access road starting at TWY Victor and TWY Foxtrot to the localizer shelter.

3) GS – Blacktop access road starting at TWY G to the glideslope shelter.

i) DVOR

a. Snow Removal

1) Gravel access road starting at Papa Pad to the DVOR shelter.



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

* NA (NOT AUTHORIZED)

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

4.2 Controlling Snow Drifts.

Significant snow drifts are typically not a factor affecting STL. However, means and methods listed in AC 150/5200-30D Ch.1 (or most current circular) are available should we need to implement them.

4.3 Snow Disposal.

Typically, snow is relocated and disposed of at the Snow Dump, as mentioned in section 4.1a. Additionally, STL has significant ramp space that is unused by aircraft, and snow could be stacked in these locations, after receiving permission from the Snow Coordinator.

4.4 Methods for Ice Control and Removal-Chemicals.

Liquid Runway Deicer – AMS 1435 Certified Primary anti-icing / de-icer:

1) CRYOTECH E36 – Typically used for ant-icing and de-icing when temperatures are 24□ F and above, or 32.5□F and falling. It should not be used with a dry snow, as it will cause the snow that would otherwise blow off the runway by the wind or by the use of the MTE air blast to stick and create slush and possible refreeze issues.

   - **Cryotech E36** is a potassium acetate-based liquid deicer that is certified for airside use on pavements such as runways, and ramps.

   Application rates:

   - Anti-icing: 0.5 gallons/100 ft2 (25 g/m2)
   - Deicing: 1 gallon/100 f2 (50 g/m2) near 32□ F (0□C) on thin ice

Solid Runway Deicer (2) – Both AMS 1431 Certified

1) CRYOTECH NAAC (Sodium Acetate) – Primarily used during cold conditions, below 24° F and/or to penetrate compacted snow and ice. Primarily used as a standalone product, or could be applied directly behind a liquid chemical truck for severe icing and better adhesion. Can also be applied over thick compacted snow and ice first, and used to penetrate holes in bonded compacted snow and ice, followed by an application of liquid chemical to travel through the holes and break the bond of compaction at the pavement.

   - Manufactured as a round pellet to be less dusty than irregularly shaped deicers
   - Gives off heat as it dissolves – Exothermic
   - Penetrates directly to the pavement due to spherical shape; irregular shaped deicers penetrate laterally, inefficiently expending energy before reaching the pavement
   - Active to low temperatures: 0° F

   Application Rates:

   - Near 32° F (0° C) on thin ice = 5-7 lbs./1000 ft^2 (25-35 g/m^2)
   - Less than 10°F (-12° C) on 1" (2.5 cm) ice = 10-25 lbs./1000 ft^2 (50- 75 g/m^2)

2) NASi SF is an advanced, environmentally friendly, granulated solid sodium formate deicing product that is certified to the latest edition of SAE AMS1431E. It is specifically engineered to allow for efficient removal of snow and ice from airport runways, aprons, parking lots, and access roads and is designed to maintain adequate friction between aircraft tires and runway. NASi SF is also effective in landside areas that are sensitive to corrosion such as parking decks, stadiums, institution grounds, parks, bridges, and roadways. In these applications, NASi SF helps avoid/reduce the chloride load in waterways when compared to traditional salt.

Application Rates:

Recommended Application rates in **pounds per 1000 square feet of pavement:**

De-icing situation	Ambient temperature 20 to 32 degrees F	Ambient temperature 10 to 20 degrees F	Ambient temperature 0 to 10 degrees F
Packed snow, ½" to 1"	4 to 5.5	5.5 to 7	7 to 8.4
Packed snow, Less than ½"	1.4 to 3	3 to 4.6	4.6 to 6.1
Black ice, <1/10"	4.5 to 6.1	6.1 to 7.7	7.7 to 9.2

IceCare Anti-icing:
When expectations of freezing rain or wet snow, use 22.5 to 45 grams per square meter (4.5 to 9.2 pounds per 1000 square) of pavement.

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

STL keeps an adequate supply of FAA spec sand on hand, and also has the ability to utilize the sand dryer, through Climate Control, which heats and loads the sand into designated dump trucks with material spreaders.

Sand is a lower option, but could be effective for severe low temperatures with extremely high winds where solid deicer keeps blowing away. Can be mixed in with solid deicer, or applied directly behind liquid deicer trucks.

Table 4-2. Standard Gradation for Sand

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

4.6 Surface Incident/Runway Incursion Mitigation Procedures.

A. Runway incursion prevention is a critical component of the snow and ice control plan. All snow team members that drive on the movement area are required to watch and pass the Airfield Movement Area training module on an annual basis.

B. As part of this effort to minimize runway incursions, when the snow team needs to broom, plow or treat the runway, the runway inspector shall close the runway over the Ground Control Frequency so that all snow team members listening can hear. All airfield maintenance equipment operators are required to monitor Ground Control Frequency. The runway inspector will notify the runway team foreman who will then immediately call for clearance on the closed runway. The runway inspector will notify the Snow Desk who will issue the appropriate ACR update and NOTAM.

C. The Runway Inspector and/ or SCL shall also monitor Local Control frequency to be aware and have information of arriving or departing aircraft.

D. The snow crew leader will request and receive positive confirmation from the runway snow crew foreman that personnel are clear of the runway when snow operations are complete.

E. When a runway is ready to be opened, the runway inspector will be the last vehicle off the runway, and will call the runway open, along with the RwyCC, to the ground controller over the frequency. More detailed surface assessment information shall be passed along from the Runway Inspector to the Ops Center for dissemination.

F. Typically, only call signs Ops 19, Ops18, Ops 17, Ops 16, Ops 15, Car 36, Car 6 and Car 2 will call a runway open that has previously been closed. If there is a change to the call signs, the SCL shall notify the ATCT Supervisor in advance.

G. So that all snow team members are informed of a runway opening, the Ops Center will then make a runway open announcement over all applicable frequencies, update the ACR and the Digital NOTAM System.

H. As much as feasible, the SCL will coordinate the specific plan and tactic with the senior crew airfield maintenance foreman / SCF in advance, and attempt to stick to the plan that is set in place. If plans needs to change, another briefing will commence.

I. During a pre-season meeting, past surface incidents during snow removal operations will be reviewed as learning tool.

J. As an additional aid to prevent surface incidents, a majority of the snow removal fleet is equipped with Vehicle Movement Area Transponders (Squitters) so that the ATCT can readily determine the location and identify the call sign of each vehicle. The Snow Crew Airfield Maintenance Foremen shall construct individual snow removal team assignments so that at least the first and last vehicle in the convoy have transponders.

a) Radio Communications

See Appendix 2 on Radio Communications Plan matrix.

b) Low Visibility and Whiteout Conditions

Infrequently, the Airport may experience "white out" conditions. To improve visibility for operators, during these times the snow team may proceed plows or brooms up to the upwind location, and perform clearing operations with the wind to improve visibility against the windshield. If true white out conditions exist and operations become unsafe, the snow crew leader has the ability to alter the plan and briefly suspend clearing operations.

c) Driver Fatigue

The Airfield Maintenance Supervisor is responsible to properly manage fatigue issues and on duty time, and keep the SCL updated in advance. In general, employees work a 12 hour shift, and are limited to working 16 hours or less in a 24 hour period.

Chapter 5. Surface Assessment and Reporting

5.1 Conducting Surface Assessments:

The Airport Operations Department and the SCL will remain aware and monitor all paved surface conditions in order to plan and request the SCF carry out appropriate maintenance actions in accordance with the Snow and Ice Control plan. The airport strives to maintain a 'no worse than wet' surface condition.

The airport, in complying with Part 139.339, will utilize the NOTAM Manager system and the Airfield Condition Report (ACR) at www.flystl.com/acr for collection and dissemination of airport information to air carriers, and other airport users.

See below

5.2 Applying the Runway Condition Assessment Matrix (RCAM)

The RCAM is the method approved by the FAA that STL uses to report a runway surface assessment when contaminants are present. Once the SCL or Runway Inspector perform the assessment, the RCAM defines the format STL reports and receives a runway condition "Code" via the NOTAM and ACR systems. The reported information allows a pilot to interpret the runway conditions in terms that relate to airplane performance.

a) Determining Runway Conditions

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 to 30	Braking deceleration OR directional control is between Good and Medium.	Good to Medium
• Slippery When Wet (wet runway) • Dry Snow or Wet Snow (Any depth) over Compacted Snow *Greater than 1/8 inch (3mm) depth of:* • Dry Snow • Wet Snow *Warmer than 5° F (-15°C) outside air temperature:* • Compacted Snow	3		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
Greater than 1/8 (3mm) inch depth of: • Water • Slush	2	29 to 21	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice [2]	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice [2] • Slush over Ice [2] • 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

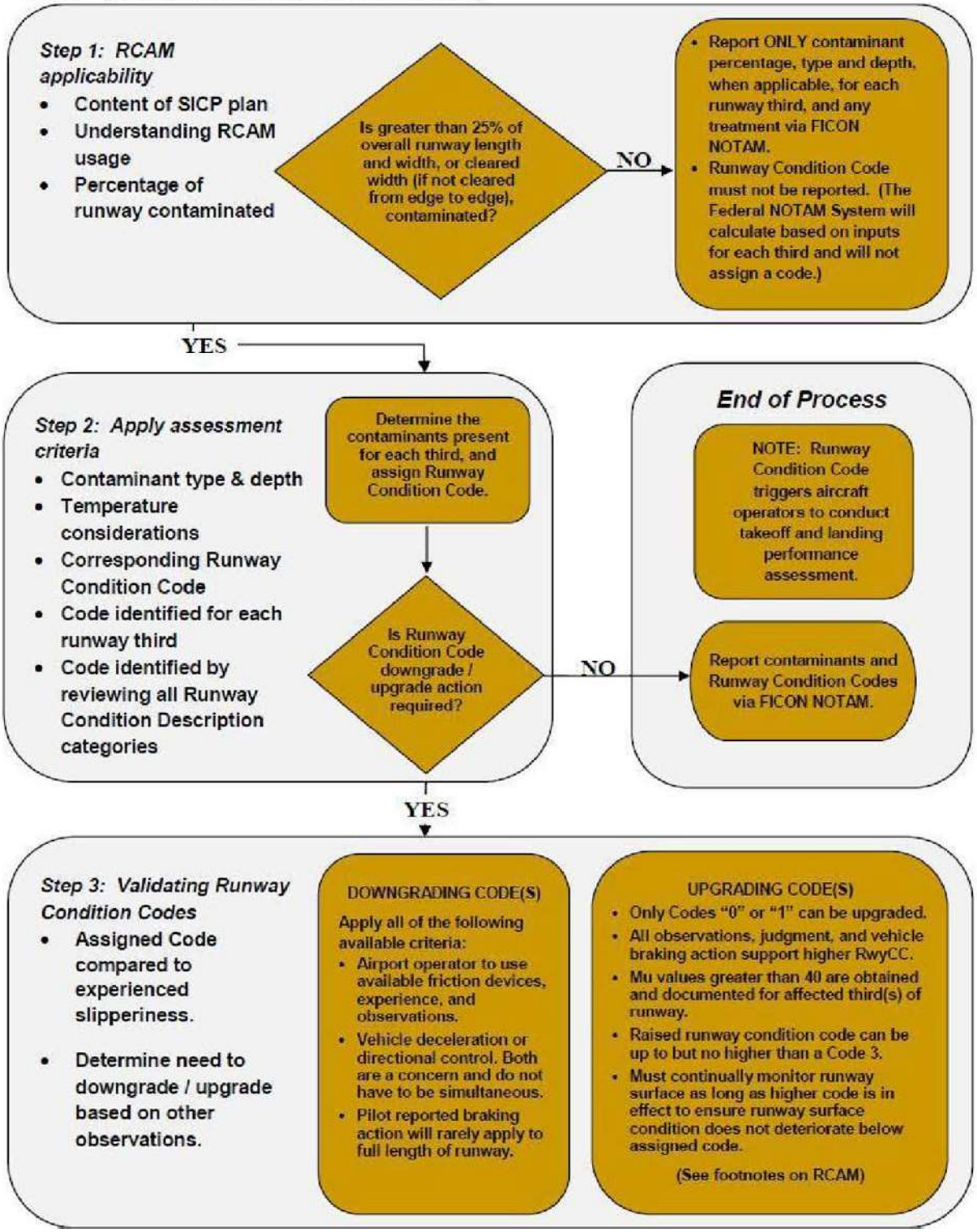
[1] The correlation of the Mu (μ) values with runway conditions and condition codes in the Matrix are only approximate ranges for a generic friction measuring device and are intended to be used only to downgrade a runway condition code; with the exception of circumstances identified in Note 2. Airport 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.

5.3.2 Overview of the Basic RCAM Process.



5.2.0 RCAM Components

5.2.1 Assessment Criteria.

This section of the RCAM consists of a Runway Condition Description and a Runway Condition Code. This section includes contaminant type and depth categories which are objective assessments that have been determined by airplane manufacturers to cause specific changes in the airplane braking performance. These contaminants correspond to a reportable "shorthand" Runway Condition Code when applicable.

5.2.2 Runway Condition Description

The Runway Condition Description column of the RCAM provides contaminants that are directly correlated to airplane takeoff and landing performance. The description sections, ranging in terms of slipperiness, are categorized based on type and depth of contaminant and temperature.

Figure 5.1. Runway Condition Description Column of the RCAM

Assessment Criteria
Runway Condition Description
• Dry
• 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° F (-15°C) and Colder outside air temperature: • Compacted Snow
• 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
Greater than 1/8 (3mm) inch depth of: • Water • Slush
• Ice [2]
• Wet Ice [2] • Slush over Ice [2] • Water over Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]

5.2.3 Code (Runway Condition Code – RwyCC

Runway Condition Codes Format: X/X/X) represent the runway condition description based on defined terms and increments. Use of these codes

harmonizes with ICAO Annex 4, providing a standardized "shorthand" format for reporting RwyCC (which replaces Mu values), and are used by pilots to determine landing performance parameters when applicable. Runway Condition Codes are disseminated by Airport Operations via the following methods:

1. Federal NOTAM System, preferable through NOTAM Manager or equivalent system(s);

2. Airport Traffic Control Tower (ATCT) (as applicable);

Figure 5.2 Runway Condition Code (RwyCC) Column of the RCAM

Assessment Criteria	
Runway Condition Description	**Code**
• Dry	6
• Frost • Wet (Includes Damp and 1/8 inch depth or less of water) ***1/8 inch (3mm) depth or less of:*** • Slush • Dry Snow • Wet Snow	5
5° F (-15°C) and Colder outside air temperature: • Compacted Snow	4
• 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
Greater than 1/8 (3mm) inch depth of: • Water • Slush	2
• Ice [2]	1
• Wet Ice [2] • Slush over Ice [2] • Water over Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]	0

5.2.4 Downgrade Assessment Criteria (Runway Inspector, In Consultation with SCL).

When data from the shaded area in the RCAM (i.e., CFME/deceleration devices, pilot reports, or observations) suggest conditions are worse than indicated by the present contaminant, the airport operations staff should exercise good judgment and, if warranted, report lower runway condition codes than the contamination type and depth would indicate in the RCAM. While pilot reports (PIREPs) of braking action provide valuable information, these reports rarely apply to the full length of the runway as such evaluations are limited to the specific sections of the runway surface in which wheel braking was utilized. It is not appropriate to use downgrade assessment criteria to upgrade contaminant based assessments of condition codes (e.g., from 2 to 3). There are specific rules and perimeters governing when the RwyCC may be upgraded from Code 0 or 1 to Code 3. See Note for Table 5-2.

5.2.5 MU (u) (Friction Assessment).

The correlation of the Mu (u) values with runway conditions and condition codes in the RCAM are only approximate ranges for a generic friction measuring device and are intended to be used for an upgrade or downgrade of a runway condition code. Airport operations should use their best judgment when using friction measuring devices for downgrade assessments, including their experience with the specific measuring devices used.

Figure 5-3. Friction Assessment Column of the RCAM

Assessment Criteria		Downgrade Assessment Criteria
Runway Condition Description	Code	Mu (μ) [1]
• 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	
5° F (-15°C) and Colder outside air temperature: • Compacted Snow	4	39 to 30
• 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	
Greater than 1/8 (3mm) inch depth of: • Water • Slush	2	29 to 21
• Ice [2]	1	
• Wet Ice [2] • Slush over Ice [2] • Water over Compacted Snow [2] • Dry Snow or Wet Snow over Ice [2]	0	20 or Lower

5.2.6 Vehicle Deceleration or Directional Control Observation.

Column is used to correlate estimated vehicle braking experienced on a given contaminant.

Figure 5-4. Vehicle Deceleration or Directional Control Observation Column of the RCAM

Assessment Criteria		Downgrade Assessment Criteria	
Runway Condition Description	Code	Mu (μ) [1]	Vehicle Deceleration or Directional Control Observation
• 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.
5° F (-15°C) and Colder outside air temperature: • Compacted Snow	4	39 to 30	Braking deceleration OR directional control is between Good and Medium.
• Slippery When Wet (wet runway) • Dry Snow or Wet Snow (Any depth) over Compacted Snow ***Greater than 1/8 inch (3mm) depth of:*** • Dry Snow • Wet Snow ***Warmer than 5° F (-15°C) outside air temperature:*** • Compacted Snow	3		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.
Greater than 1/8 (3mm) inch depth of: • Water • Slush	2	29 to 21	Braking deceleration OR directional control is between Medium and Poor.
• Ice [2]	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.
• Wet Ice [2] • Slush over Ice [2] • 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.

5.2.7 Pilot Reported Braking Action

This is a report of braking action on the runway, by a pilot, providing other pilots with a degree/quality of expected braking. The braking action experienced is dependent on the type of aircraft, aircraft weight, touchdown point, and other factors.

1. **Good:** Braking deceleration is normal for the wheel braking effort applied, and directional control is normal.
2. **Good-to-Medium:** Braking deceleration or directional control is between good and medium braking action.
3. **Medium:** Braking deceleration is noticeable reduced for the wheel braking effort applied, or directional control is noticeably reduced.

4. **Medium-to-poor:** Braking deceleration or directional control is between medium and poor.
5. **Poor:** Braking deceleration is significantly reduced for the wheel braking effort applied, or directional control is significantly reduced.
6. **Nil:** Braking deceleration is minimal to non-existent for the wheel braking effort applied, or directional control is uncertain.

Figure 5-5. Pilot Reported Braking Action Column of the RCAM

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 to 30	Braking deceleration OR directional control is between Good and Medium.	Good to Medium
• Slippery When Wet (wet runway) • Dry Snow or Wet Snow (Any depth) over Compacted Snow ***Greater than 1/8 inch (3mm) depth of:*** • Dry Snow • Wet Snow ***Warmer than 5° F (-15°C) outside air temperature:*** • Compacted Snow	3		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	Medium
Greater than 1/8 (3mm) inch depth of: • Water • Slush	2	29 to 21	Braking deceleration OR directional control is between Medium and Poor.	Medium to Poor
• Ice [2]	1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	Poor
• Wet Ice [2] • Slush over Ice [2] • 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

5.3 Applying the RCAM to a Runway Assessment

To use the RCAM, airport operations will assess surfaces, report contaminants present, and the NOTAM system (NOTAM Manager) will generate the RwyCCs based on the RCAM when applicable. The RwyCCs may vary from each third of the runway if different contaminants are present. However, the same RwyCC may be applied when a uniform coverage of contaminants exists.

Note: A RwyCC of "0" denotes minimal or non-existent braking deceleration, which the FAA has determined to be an unsafe condition. The NOTAM system does not accept "0" for RwyCC and, if attempted, prompts Airport Operations to close the surface and perform mitigating actions until the unsafe condition no longer exists.

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 Runway Inspector in this case, will simply 1) report the contaminant percentage, type and 3) depth for each third of the runway to ATCT over the Ground Frequency, and will include any associated treatments, improvements or details to the Ops Center for the NOTAM / ACR.

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 by the Runway Inspector, 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 Runway Inspector determine that RwyCCs assigned accurately reflect the runway conditions and performance, no further action is necessary, and the RwyCCs generated, along with the opening of the impacted runway, will be reported to the ATCT over Ground Control frequency by the Runway Inspector. The RwyCCs, and any associated treatments, improvements or details will be passed on from the Runway Inspector to the Ops Center, for further dissemination, via the NOTAM and ACR systems.

b) Downgrade Assessment Criteria

When observations indicate a more slippery condition than generated by the RCAM, the Runway Inspector, in consultation with the SCL, may downgrade the RwyCC(s). When necessary, use of the RCAM Downgrade Assessment Criteria (grey columns) may assist in making the determination.

Note: The criteria in the grey columns of the RCAM may only be used to downgrade the RwyCCs.

5.3.1 Step 3A: Mu (u).

When conditions are acceptable for the airport operator to use available friction devices, the airport operator may utilize Mu readings as a means to assess runway slipperiness for downgrading or to validate the RwyCCs generated by the RCAM.

5.3.2 Step 3B: Vehicle Control

Vehicle deceleration or directional control may cause concerns for the airport operations. These concerns could be for either deceleration or directional control issues. However, they need not occur simultaneously for concern to exist.

5.3.3 Step 3C: Pilot Reported Braking Action.

Pilots, reports, which provide valuable information, rarely apply to the full length of the runway. As such, these reports are limited to the specific sections of the runway surface in which wheel braking was applied.

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 operations should exercise a heightened awareness of airfield conditions, and should downgrade the RwyCC if appropriate as stated above.

c) Upgrade Assessment Criteria Based on Friction Assessments.

RwyCCs of 0 or 1 may only be upgraded by the Runway Inspector, after consultation with the SCL, 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 Runway Inspector must also continually monitor the runway surface as long as the higher code is in effect to ensure that the runway surface condition does not deteriorate below the assigned code.
    a. The extent of monitoring must consider all variables that may affect the runway surface condition, including any precipitation conditions, changing temperatures, effects of wind, frequency of runway use, and type of aircraft using the runway.

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

5.4 Condition Reporting

The Runway Inspector should carefully monitor changing airfield conditions and disseminate information about those conditions in a timely manner to airport users. Section 139.339 requires that airport operators provide for the collection and dissemination of accurate airport condition information (movement areas or loading ramps and parking areas) to all airport users when any pavement condition is worse than bare and dry. Additionally, any condition that may affect the safe operations of aircraft must be reported to all users. Critical information to airplane operators for the purpose of takeoff and landing performance includes the contaminant type, depth, and associated RwyCCs when applicable. The determination of dry versus wet snow or slush is another key element in the report because of its potential for significant impact on airplane performance.

Note: STL Airport Operations report "Wet" conditions (1/8th inch (3mm) or less of water) when it is the only condition present on the runway on a year round basis. The same applies to taxiways, aprons, and holding bays. "Wet" reporting is largely due to differences in airplane performance on surfaces that are wet, dry, or have water greater than 1/8 inch (3mm) in depth. Airport Operations must report "Wet" conditions when associated with or as a result of other winter contaminants when present in any third of the runway. Additionally, when a runway has been treated with chemicals to mitigate a specific contaminant and the resulting surface is now "Wet", this condition should also be reported." The requirement to report "Slippery When Wet" has not changed and must be reported anytime the condition exists. (See sections on Slippery When Wet Runway).

5.5 How to Report Surface Conditions:

5.5.1 The Airport Operations department is responsible for reporting current runway surface conditions whenever a runway is contaminated by ice, snow, slush, or water.

5.5.2 A single runway surface condition is generated for each runway, based on the direction of assessment and typically correlates with the runway end in use.

5.5.3 The assessment applies to the entire runway, and can be read in reverse by pilots, the Airport, ATCT. The associated thirds do not change if reported in reverse.

5.5.4 Reporting from both runway ends can cause pilot confusion and also clutters the NOTAM system unnecessarily.

5.5.5 Do not report depths for compacted snow and ice. When reporting depth for standing water or slush, the depths are either 1/8 inch (3mm) or less or greater than 1/8 inch (3mm).

5.5.6 When the cleared runway width is less than the full runway width, also report the conditions on the uncleared width (runway edges) if different from the cleared width. In the event the full width of the runway is not cleared, the runway condition code will be generated based on the contaminants present in the cleared portion of the runway (typically center 100 feet). Additionally, the Runway Inspector must keep in mind that the entire width of the runway is still usable and available to the aircraft and must be safely maintained. This means that while contaminant depths may vary from the center cleared portion of the remaining portions or edges of the runway, the condition of the outlying portions must not present any operational hazard.

5.5.7 When to Issue New Runway Condition Reports

5.5.8 Runway condition reports must be updated any time a change to the runway surface condition occurs. Changes that initiate updated reports include weather events, the application of chemicals or sand, or plowing or sweeping operations. Airport Operations should not allow airplane operations on runways after such activities until a new runway condition assessment has been completed identifying the changed condition(s) and the effectiveness of mitigations and treatments and ensuring no new hazards have been inadvertently introduced. This assessment should be reported via the NOTAM system, reflecting the current surface condition(s) of affected runways.

5.5.9 The RwyCC will be reported to Ground Control over the frequency upon opening any runway that has been closed, prior to an aircraft utilizing that runway.

5.5.10 Whenever any of the previously identified circumstances apply, the Snow Crew Leader can use mitigation to improve runway conditions, which in turn may lead to a higher RwyCC. For example, on first assessment of the runway conditions, an airport operator may determine the identified

contaminants generate an RwCC of "0". A RwyCC of "0" is equivalent to Nil braking conditions, which requires the runway be closed until mitigation actions are performed and the unsafe conditions no longer exist. After the mitigation actions are completed, the Snow Crew Leader or Runway Inspector would reassess the runway conditions and determine whether a different runway condition applies. Based on the contaminants now present (type, depth, and percentage), the runway condition code may change or no longer be reported if the amount of contamination is 25% or less of the overall runway length and width or cleared width (if not cleared from edge to edge). This process differs from the upgrade process, which is based on improvement of friction within the existing contaminants versus the mitigation or removal of those contaminants (see paragraph 5.4.3.2).

5.5.11 Changes to the runway surface condition must be updated and appropriately disseminated so airplane operators are aware of the current conditions before continuing with their operations. During active snow events or rapidly changing conditions (e.g., increasing snowfall, rapidly rising or falling temperatures), the Runway Inspector should maintain a vigilant runway inspection process to ensure accurate runway condition reports. While pilot braking action reports provide valuable information, these reports may not apply to the full length of the runway as such evaluations are limited to the specific sections of the runway surface in which the airplane wheel braking was used. In addition, the runway condition reports should be updated at least at the beginning of each shift of airport operations personnel, when conditions are not changing but contaminants are present (e.g., following a snow event where frozen contaminants remain after an airport's mitigating actions).

5.6 Runway Friction Surveys, Equipment, and Procedures

Runway Friction surveys are a valuable tool for the Snow Team and will be deployed to help determine effectiveness of Snow Team treatments, in that it can show trend of a runway as to increasing or decreasing friction. Results of friction surveys will be given to the Snow Coordinator and Snow Crew Leader, and logged in the CityWorks log by the Ops Center. They will not be disseminated via the NOTAM system or other informal methods. Nor will they be used to attempt to correlate Mu values to braking action (Good, Medium, Poor, Nil).

STL has two 2016 Halliday Technologies Runway Friction Testers HTI RT3 CFMEs, and as a backup, one Bowmonk Decelerometer. The HTI RT3s are deployed as follows:

#17 2016 Chevy Silverado 2500 dry tester (winter only)
#18 2016 Chevy Silverado 3500 wet tester (winter & summer)

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

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

It is not acceptable to use decelerometers or CFME to assess any contaminants outside of the below parameters.

The FAA prohibits the dissemination of Mu values to aircraft operators formally and informally.

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

b) When to Conduct

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

- When the central portion of the runway, centered longitudinally along the runway centerline, is contaminated 500 feet or more.
- After any type of snow removal operations or chemical application (including sanding)
- At least once during an 8 hour shift, while contaminants noted above are present.
- Immediately following any aircraft incident or accident on the runway.

c) How to Conduct

Procedures for conducting a friction test using CFME:

- Notify ATCT that an uninterrupted run is required.
- Lateral location of the CFME test shall be 10' from centerline.
- CFME tests are completed at 40 MPH.
- The test run shall be uninterrupted.
- For the purposes of using the information to upgrade or downgrade a Rwy CC, the direction of the test shall be the same direction as arrival aircraft.
- Friction tests are completed in one pass, on the right side of the centerline.
- Runway zones are touchdown, midpoint and rollout zones.

Procedures for conducting a friction test using the Decelerometer:

- Lateral location of the Bowmonk test shall be 10' from centerline.
- Tests are conducted at 20MPH.
- If possible the test should be uninterrupted, but tests may be interrupted and broken into 3rds.
- For the purposes of using the information to upgrade or downgrade a Rwy CC, the direction of the test shall be the same direction as arrival aircraft.
- Friction tests are completed in one pass, regardless of the side of the centerline.
- 3 frictions tests are conducted on the Runway zones in the touchdown, midpoint and rollout zones for a minimum of 9 tests.

d) Calibration

An Airport Operations Supervisor responsible for 139 certification shall ensure the airports Halliday Technologies HTI RT3s will be calibrated, updated and certified annually prior to the winter season. This person coordinates with the Fleet Maintenance Manager, who coordinates directly with the manufacturer on the factory calibration. This Airport Operations Supervisor is also responsible for ensuring the Bowmonk receives annual factory calibration, prior to the winter season.

5.7 Taxiway, Apron, and Holding Bay Assessments.

The Runway Inspector and Ramp Inspector shall coordinate and complete assessments to these surfaces when contaminants are present, and surfaces will be monitored on a regular, continual basis.

5.8 Surface Condition Reporting.

The SCL is responsible for implementing the SICP and ensuring Airfield Operations Specialists are carefully monitoring changing airfield conditions and disseminating information about those conditions via the NOTAM & ACR System in a timely manner to airport users.

Runway: Runway condition reports will occur when contaminants are present on a runway surface via the NOTAM & ACR Systems. 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 & ACR Systems. They will be updated as necessary whenever conditions change, such as a contaminant type, depth, percentage or treatment/width change.

Airfield Operations Specialist's ensure accurate and timely reporting of surface conditions. Their procedures for Surface Condition Reporting are as follows:

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

- Active accumulating snow event
- After plowing/brooming/deicing/sanding
- Rapidly rising or falling temperatures that may change the nature of the surface contamination
- Rapidly changing conditions
- When contaminants are present, at the minimum a surface condition report shall be updated no later than 0500L so that airlines can plan their morning departures.

5.9 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.

5.10 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 of .44 mu, Airport Operations Specialists will report, via the NOTAM & ACR systems 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. The Airport will not report a "Wet" runway when a "Slippery When Wet NOTAM" is in effect. When a "Slippery When Wet" NOTAM is in effect, the Airport will report the runway condition "Slippery When Wet" instead of "Wet" for the relevant thirds.

If it is determined by the SC/ Assistant Director of Ops & Mx 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 Airport will discontinue the use of this NOTAM when the runway friction level has been met or exceeded.

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

5.11 Requirements for Closures.

Surfaces (Runways & Taxiways) 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.

A Letter of Agreement entitled "Procedures and Responsibilities for Coordinating and reporting Runway Surface Conditions " describes some of the procedures between the Airport and ATCT. Procedures contained herein provide further detail.

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 Runway Inspector has not already instituted its continuous monitoring procedures, an assessment by the Runway Inspector or SCL should occur before the next operation.

If the Runway Inspector is conducting continuous monitoring procedures, and if there are no changes to continuous monitoring observations, a runway assessment will occur as soon as air traffic volume allows. In this case, the Ops Center will immediately coordinate closely with ATC, and ATC will begin making plans to create space and time for a runway assessment to be made as a matter of priority, unless the snow crew leader needs the runway sooner.
When POOR PIREPs are occurring, the Snow Crew Leader shall coordinate and formulate a high priority plan to treat the runway, using all reasonable steps and available equipment and materials that are appropriate for the condition to improve the braking action.
If treatment efforts do not improve the runway braking conditions, the Runway Inspector will continuously monitor the runway to ensure braking action does not further degrade and become NIL. **NIL assessments or PIREPs require the Runway Inspector or SCL to NOTAM and report the runway (or surface) as closed.**

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.

Additionally, a runway, taxiway or ramp area surface may be closed if the accumulated coverage on the surface reaches 2 inches of dry snow, ½ inch of wet snow or slush or covered with a layer of black ice with NIL braking action.

5.12 Continuous Monitoring and Deteriorating Conditions.

Under deteriorating conditions, the Snow Crew Leader 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 Runway Inspector

and the Ramp Inspector will continually monitor the runways, taxiways, aprons and holding bays to ensure braking does not become NIL.

Conditions to pay particular attention to, including but not limited to:

- Frozen or freezing precipitation (freezing rain).
- 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 and become slick due to the thin layer of water over frozen contaminant.
- Removal of abrasives previously applied to the runway due to wind or airplane effects.
- Frozen contaminants blown onto the runway by wind.

Implementation of continuous monitoring procedures is triggered by:

- Two consecutive reports of POOR PIREPs.
- Significant active snow / ice events.
- Freezing rain events.

Continuous monitoring procedures shall 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.

5.13 Surface Conditions Not Being Monitored/Reported

The Airport Operations Department is manned 24/7 and STL will not be unmonitored or unreported.

5.14 Additional Procedures and Responsibilities

a. The Airfield Maintenance Supervisor shall schedule personnel, detail areas, make inspections, issue and return all tools, foul weather gear, and be responsible for the proper functioning of all mechanical equipment during snow season. He shall maintain at all times adequate supplies (shovels, pellets, scrapers, chippers, etc.) to combat the most unusual conditions for the protection and welfare of the public in the assigned areas. He shall submit a personnel schedule, in writing, to the Snow Coordinator before each winter season.

b. Electrical Staff

The Ops Center will notify the Electrical Supervisor of when to call in the Electrical maintenance Snow Removal crews. The electrical Supervisor will have one (1) Foreman, and four (4) Electricians available for snow call. Under the direction of the Airport Construction and Maintenance Manager, the Electrical Supervisor will be responsible for coordinating the following Airfield Snow Removal Activities:

1) Preparation

a. The Electrical Supervisor is responsible for training Electrical Maintenance personnel, equipment readiness, issuing and returning of supplies, scheduling of personnel, and ensuring adequate inventory levels and making inspections.

2) Communication

a. Electrical Maintenance personnel snow removal communications will be through the 800 MHz Trunking System on the Electric Shop Radios.

3) Equipment

a. Air Compressor
b. Deicing liquid filled tank and sprayer (available from Field Maintenance)
c. Bobcat front end loader (available from Field Maintenance)
d. Shovels
e. Brooms

4) Supplies

a. An adequate inventory of runway, taxiway, centerline, touchdown zone, semi-flush edge light fixtures, lamps, transformers and blank covers shall be maintained to cover all contingencies.

5) Snow Removal

a. The Electrical Maintenance section shall remain in contact with the Snow Crew Leader and the Ops. Center during snow removal operations. The electrical departments mobile repair unit will repair damaged lights and clear snow from obstructed signs and lights during and after significant snow events, and/or when requested. Particular attention should be given to runway lighting, taxiway lighting, hold position signs, runway guard lights and lighted windsocks. The Electricians may be required to install flags on runway and taxiway edge lighting.

c. Store Room

Provides materials and equipment for Airport Authority personnel on routine as well as emergency basis. Manned from 7:30 am to 4:30 pm local, Monday through Friday, as well as during and for the duration of all snow and ice emergencies.

d. Building Maintenance and Climate Control Staff

The Ops. Center will notify the on-duty Building Maintenance personnel and the on-duty Climate Control Supervisor of when to call in snow removal crews and when snow and ice removal operations are expected to begin. Under the direction of the Airport Construction and Maintenance Manager, the Building Maintenance Supervisor and all department Foremen will be responsible for coordinating the following snow and ice removal activities for both the Building Maintenance and Climate Control departments.

1) Preparation

a. The Building Maintenance Supervisor and the Climate Control Manager are responsible for equipment readiness, training of personnel, issuing and returning of supplies, ensuring adequate inventory levels, making inspections, scheduling personnel necessary for snow removal operations.

2) Communication

a. All Building Maintenance and Climate Control snow removal radio communications will be through the Building Maintenance Talk Group on 800 MHz Trunking System on the Building Maintenance and Climate Control Radios.

3) Equipment
   a. Truck 703 with snow plow with drop in spreader
   b. Truck 705 with 8' snow plow, drop in spreader and hand shovel
   c. Truck 706 with 8' snow plow, drop in stainless spreader
   d. Truck 715 with 8' snow plow, drop in spreader and hand shovel
   e. Truck 708, 709, 711 are used as back up for hand tools and chemical
   f. Walk behind spreaders
   g. Hand shovels

4) Ice Melting Chemicals

   a. Sodium Acetate (NAAC)
   b. Sodium Formate (NASi)
   c. Calcium Chloride
   d. Sodium Chloride (Salt)

   Note: NAAC will be the primary chemical used for ice control. Snow crews may be instructed to use Calcium Chloride or salt on some occasions.

   CALCIUM CHLORIDE OR SALT SHALL NOT BE USED ON OR NEAR THE AIRFIELD.

5) Snow and Ice Removal Area

   Note: All vehicles shall have their Amber Beacon and flashers on during snow removal operations.

1) **WHEN SNOW CONTRACTORS ARE PRESENT**

   Contractor is responsible for the following Mutual Aid Gates:
   - **Mutual Aid Gates 17S, 7S, 3S (NAAC/NASi ONLY – NO SALT)**
   - **Mutual Aid Gates 71N Airside (Airfield Maintenance)**

TRUCK 708/709/711/715 (Laborers in Truck with hand tools and chemical products)

- Terminal 1 sidewalks and crosswalks
  - Stair and pedestrian ramp between Ticketing and Baggage Claim drive
  - Ticketing Drive sidewalks and crosswalks
- Terminal 2 sidewalks and crosswalks
  - Stair and pedestrian ramp between Ticketing and Baggage Claim drive
  - Ticketing Drive sidewalks and crosswalks
- Airport Office Building sidewalks and steps
- Crosswalk from garage to loading dock
- Sidewalk from E lot to Terminal 2
- K-9 Facility
- Bus Port sidewalks
- Taxi Cab stand and sidewalks (Peartree Lot)
- Metro Link Terminal 1 & 2 platform and exit stairs

Truck 703

- Chemical truck loaded and on reserve for being dispatched

Truck 705

- Salt truck loaded and on reserve for being dispatched

2) **WHEN CONTRACTORS ARE NOT PRESENT**

TRUCK 708/709/711/715 (Laborers in Truck with hand tools and chemical products)

- Terminal 1 sidewalks and crosswalks
    - Stair and pedestrian ramp between Ticketing and Baggage Claim drive
    - Ticketing Drive sidewalks and crosswalks
- Terminal 2 sidewalks and crosswalks
    - Stair and pedestrian ramp between Ticketing and Baggage Claim drive
    - Ticketing Drive sidewalks and crosswalks
- Airport Office Building sidewalks and steps
- Crosswalk from garage to loading dock
- Sidewalk from E lot to Terminal 2
- K-9 Facility
- Bus Port sidewalks
- Taxi Cab stand and sidewalks (Peartree Lot)
- Metro Link Terminal 1 & 2 platform and exit stairs
- **Mutual Aid Gates 17S, 7S, 3S (NAAC/NASi ONLY – NO SALT)**
- **Mutual Aid Gates 71N Airside (Airfield Maintenance)**

TRUCK 701/704/715

- Will be used as secondary vehicles in reserve

TRUCK 703

- East/West Triturates
- Gate 17S
- Gate 7S
- Terminal 1 Lower and Upper Drive
- Terminal 1 Landside Ramp A
- Terminal 1 Landside Ramp B
- Terminal 1 Landside Ramp C
- Terminal 1 Landside Ramp D
- Terminal 1 Landside Ramp E

- Terminal 1 Landside Ramp F
- Terminal 1 Landside Ramp G
- Terminal 1 Landside Ramp H

TRUCK 705

- Bus Port
- Cell Phone Lot 1
- Cell Phone Lot 2
- Taxi Lot
- K-9 Facility
- Airport Office Building Parking Lots

This Vehicle is not to be used on the airfield due to Salt in Truck

TRUCK 706

- Terminal 2 Lower and Upper Drive
- Terminal 2 Landside Ramp A
- Terminal 2 Landside Ramp B
- Terminal 2 Landside Ramp C
- Terminal 2 Landside Ramp D

a) Climate Control:

The Snow Coordinator will determine if there is a need for Sand Dryer activation, based on the forecast. After notification of a need to staff the sand dryer, Climate Control will follow the procedures as written.

Sand Dryer:

Supervisor will assign two (2) personnel to operate the systems. One additional person is assigned by the A or B directive, and will operate the sand loading.

The sand dryer is normally used for freezing rain/ice conditions and extremely low temperatures. It shall be the Snow coordinator's and/or the Snow Crew Leader's determination to activate the sand dryer.

5.15 Contractor Equipment:

The SC shall coordinate with the Airport Deputy Director and the Airport's snow Contractor to determine the appropriate level of commencement and staffing for the Non-Movement Area and Landside Operations snow control. Typically, either a "skeleton crew" or "full crew" is scheduled with the Contractor, when needed. However, specific equipment may be modified depending on the actual and forecasted conditions and level of anticipated air traffic operations.

Typical Example:

"Ramp Crew Required Equipment"			
	Level 1	Level 2 (Total)	
Skid Steer Loader/Snow Bucket and/or 8 ft. plow	6	10	
12 ft. Ramp Pusher Plow	1	3	
16 ft. Ramp Pusher Plow	1	2	
24 ft. Ramp Pusher Plow	1	2	
28 ft. Ramp Pusher Plow	5	6	
Supervisor	3	4	
Snow Pile Crew Equipment			
	Level 1	Level 2 (Total)	Snow Dump
12 ft. Ramp Pusher Plow	0	0	1
Front End Loader with minimum 4.2 cu.yd. bucket	3	5	1
Tandem Dump truck with 12 cu.yd. capacity	15	30	0

Road Crew Equipment	Level 1	Level 2	Level 3 (Total)
Truck with minimum 2.1 cu.yd. spreader and 8 ft. plow	2	4	4
Truck with minimum 8 cu.yd. spreader and 10 ft. plow	1	2	3
Skid Steer Loader/Snow Bucket and/or 8 ft. plow	0	2	3
Supervisor	0	1	1

5.16 Aircraft Deicing Collection System:

After notification of the start of aircraft deicing by an airline(s); Airport Operations Center, Climate Control, and Environmental/Health and Safety Departments will perform procedures outlined in Section 4.1 and 4.2 of Airport Environmental Control Procedure 024 (AECP): *Management of the Airport Deicing Collection System – Deicing Collection Tank/Effluent Monitoring and Testing. These sections are summarized as follows:*

1.0 Placing and deicing collection system (system) into collection

The process for placing the deicing system into collection requires collaboration and communication between the Operations Center (Ops. Ctr.), Environmental Health and Safety (EHS), and West Climate Control (WCC). The decision to place the deicing system in collection is made by EHS based on weather information from WCC. The procedure is as follows:

- An airline(s) notifies the Ops. Ctr. of the intent to deice an aircraft.
- Ops. Ctr. shall contact Airport EHS Manager to determine if the system should be placed in collection.
- The EHS Manager shall contact WCC with instructions to place the system into collection or leave the system out of collection.

2.0 Procedure for System Operations while in Collection

The WCC Stationary Engineer on duty has the responsibility to monitor the deicing effluent Collection Tank when the system is in deicing collection. The Stationary engineer should make hourly observations and log entries for tank level (in inches), tank flow rate (gallons per minute), and effluent BOD (milligrams per liter).

If the high tank level alarm alerts, the Stationary Engineer must notify the Ops. Ctr. The Ops. Ctr. then notifies the EHS Manager or designee, who determines if the system should remain in collection. The EHS Manager contacts WCC with instructions to remove the system from collection or to leave the system in collection.

WCC Stationary Engineer should also notify the Ops. Ctr. if communication is lost with the collection tank controls or if there are any issues effecting the system's operation. The Airport EHS Manager shall determine and communicate to the Ops. Ctr. and WCC the decision to remove the system from collection for the non-deicing season.

5.17 Additional Best Practices & Information

1. ICE CONTROL

- General/Runway Sensor

a) In general, icing conditions occur when air temperatures are between 29F and 34F, and surface temperatures drop to 32F or lower. As the temperature approaches this range, the runway sensor system (located in the Ops. Center) should be monitored frequently. This will give an accurate measure of air and surface temperatures, as well as the moisture content at twenty-one points on RWYs 6-24, 11-29, 12L-30R, 12R-30L and TWY Foxtrot. When icing conditions occur, it will give a visual and/or audible indication. The use of the runway sensor monitor should be augmented with physical checks and checks with the contracted weather service. Airport personnel and contractors will be alerted to changing conditions. Significant changes will be disseminated by ACR and Digital NOTAM System.

- Ice Control Operations

a) The critical time for ice control operations begins just before or right at the start of icing conditions. Anti-icing fluid should be applied to runway surfaces in the same manner as previously discussed in snow removal operations. Anti-icing operations should follow generally the same pattern as snow removal and will warrant a NOTAM while solution / product is present and effective. This information shall also be recorded on the ACR & NOTAM.

Ice Control

1) Liquid deicer is applied on the runways, taxiways, and ramps by tank trucks each having hydraulic operated spray booms. The spray is adjustable via on- board computer. Dry deicing chemicals may be used in conjunction with or in lieu of liquid deicer. Dry chemicals are applied with dump trucks and material spreaders.

2) Deicing chemicals are used for two purposes:

a. To prevent the formation of ice or snow when there is precipitation and the temperature is forecasted to drop below the freezing point.

b. Most commonly, deicer is used to prevent bonding, reduce ice and bring snow or hard packed snow to a consistency that will enable it to melt or be removed from surfaces by mechanical means.

c. Repeated applications of deicer may be necessary to prevent the formation of ice on the surface. If freezing rain or snow continues, the efficiency of deicer is reduced.

d. Factors closely monitored during deicing operations are:

1. Taxiway turn-offs: Liquid deicer tends to accumulate on the surface of the runway edge across the taxiway.

2. Wet Snow Conditions: When liquid or dry deicer is used to melt ice, snow or hard packed snow, resultant wet snow must be removed from the runway surfaces as soon as it reaches a ¼" wet snow condition.

3. Temperatures drop: When the temperature drops below 20F or after dark, caution is exercised in the application of deicing chemicals in areas with little or no aircraft traffic or solar action.

4. Extreme icing conditions: During extreme icing conditions or when there is compacted snow with temperatures at or below 24F, hot dry sand may be applied in conjunction with deicer. The decision is to apply deicer or sand "first" is based on the current conditions.

- Hot Sand may also be used to improve RwyCC numbers of 0 and 1 when deicer chemicals are ineffective.

5. High winds and low temperatures: During a condition with high winds and low temperatures, use of deicer is limited or restricted to avoid the reverse action of snow building up on deicer. Once winds diminish and there are areas with aircraft movement or bright sun, deicing may occur.

- <u>Roads</u>

a) During periods of icing conditions, it should be remembered that bridges, viaducts and culverts freeze before roadways. Contractor and/or Airport maintenance crews shall make initial distribution of deicing chemicals on these areas while progressing to their operations starting point. Salt will not be applied to the Terminal 1 or Terminal 2 roadways. Other control materials (NAAC, sand, etc.) shall be used in lieu of salt. A solution of not more than 10% calcium chloride may be used if necessary. The vehicle proceeding to the off ramp of Highway 70 and leading into the airport at the southeast corner should make a distribution at traffic signal locations.

b) Information on roadway conditions, when warranted, be transmitted on the Airport Condition Report under the heading "Miscellaneous."

- Cargo City Areas

a) Cargo public roadways and parking areas shall be plowed and treated with deicing chemicals as conditions dictate.

b) Cargo City common use interior roads shall be plowed and treated with deicing chemicals as conditions dictate.

- Airlines

a) Airlines are to call the Ops Center when they begin aircraft deicing. The Ops Center will then notify the following agencies: ATCT, Airline Tenants and West Climate Control. The Ops. Center will not make notifications on routine frost deicing.

2. WET SNOW

- General

  a) Of all problems encountered during the winter season, the most critical and damaging to both aircraft and vehicles is the accumulation of wet snow. Wet snow melts and creates pods of standing water between snow banks and freezes on wheels, gears and gear wells, flaps, etc., and it may conceivably become a weapon of frozen ice in the form of balls, rocks, or other such instruments inflicting damage and/or injury. It is exceedingly difficult to manage and should be worked with certain types of equipment. Wet snow on roadways is generally moved to the sides of the road by progressive traffic. On airport runways, taxiways and ramps, this is not the situation as wheels of aircraft have a tendency to jam up by ridging and cross ridging wet snow on operational areas.

- Removal Operations

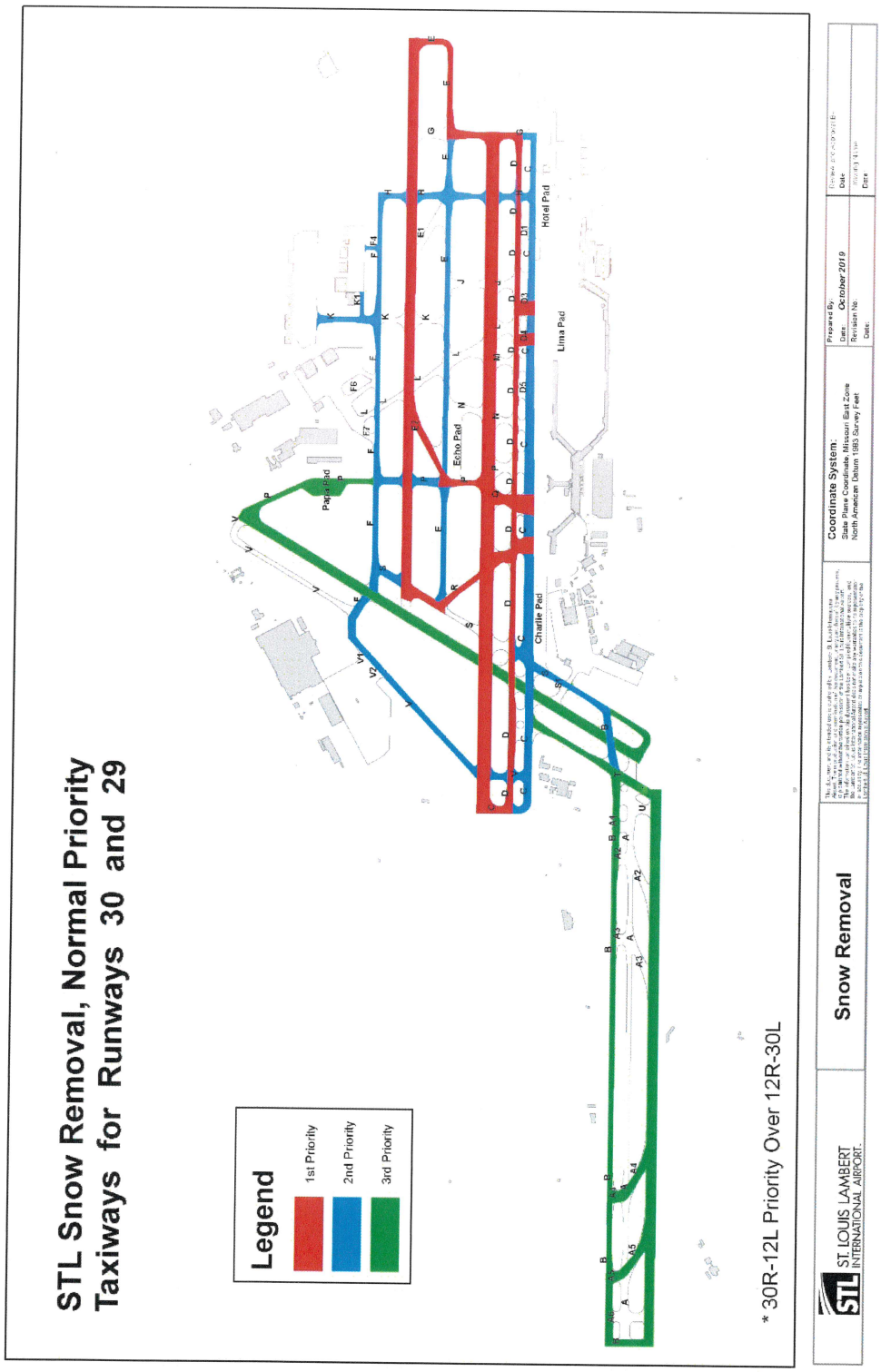
  a) Wet snow occurs after a snowfall or icing condition with a quick rise in temperature over a short period of time or a slow rise in temperature over a longer period of time. While there is very little advance planning for wet snow removal, the operations are much the same as those of snow removal. The SCL should use equipment with rubber and/or polyurethane blades, to effect a squeegee action on hard surfaces. Trucks engaged in wet snow removal will be able to move very rapidly in clearing operational areas and in all likelihood, will be able to operate between aircraft movements.

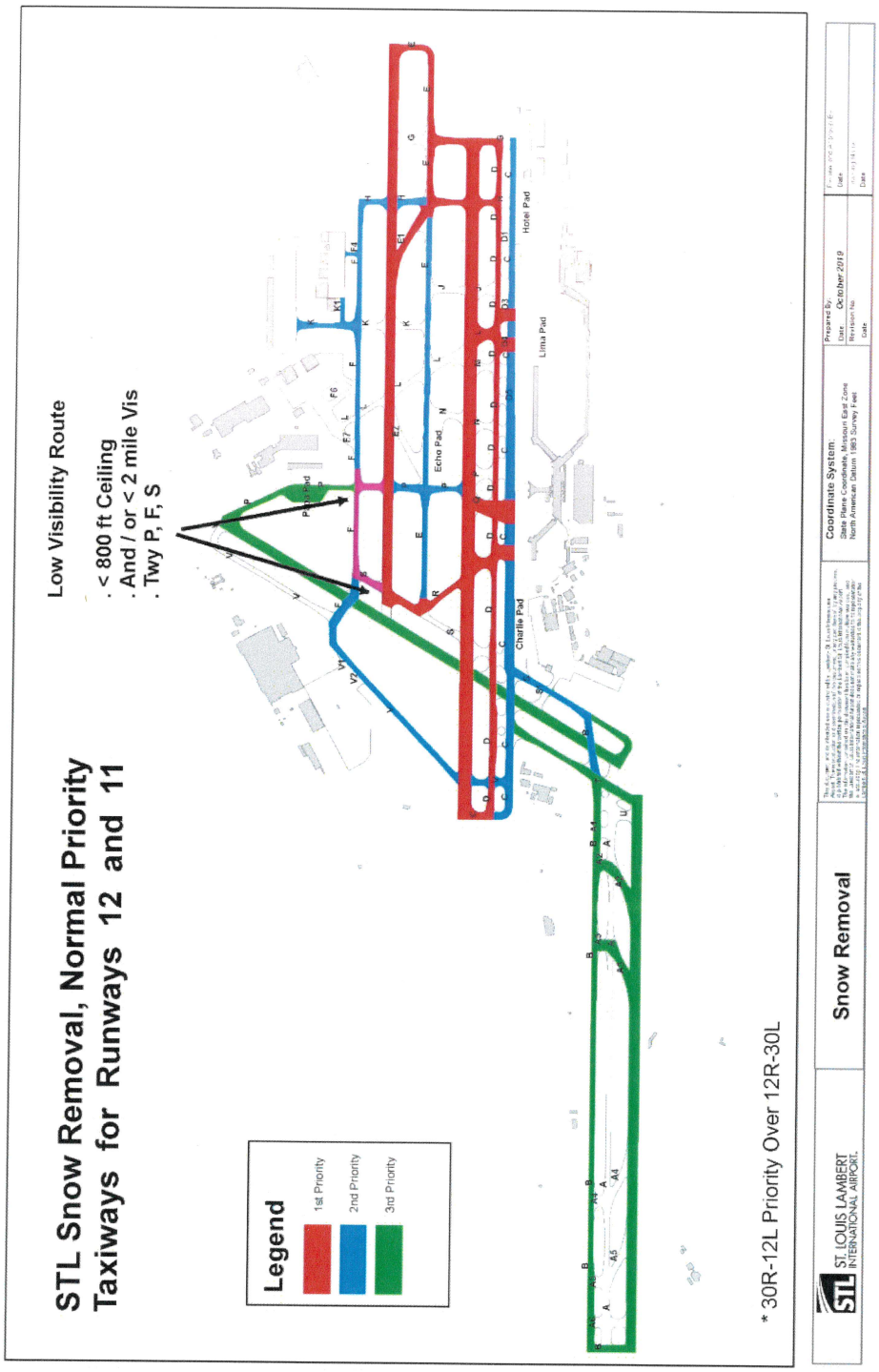
  NOTAMS should be issued as frequently as required in the same manner as snow removal operations, and this information placed on the ACR. Runway brooms may be used in place of blades if conditions so warrant.

- Cleanup

  a) The Ops Center should make a constant visual check on the progress of wet snow removal, dispatching vehicles to any area/areas on the runways which may be hazardous to aircraft. Critical roadway areas may also require some chemical application operations.

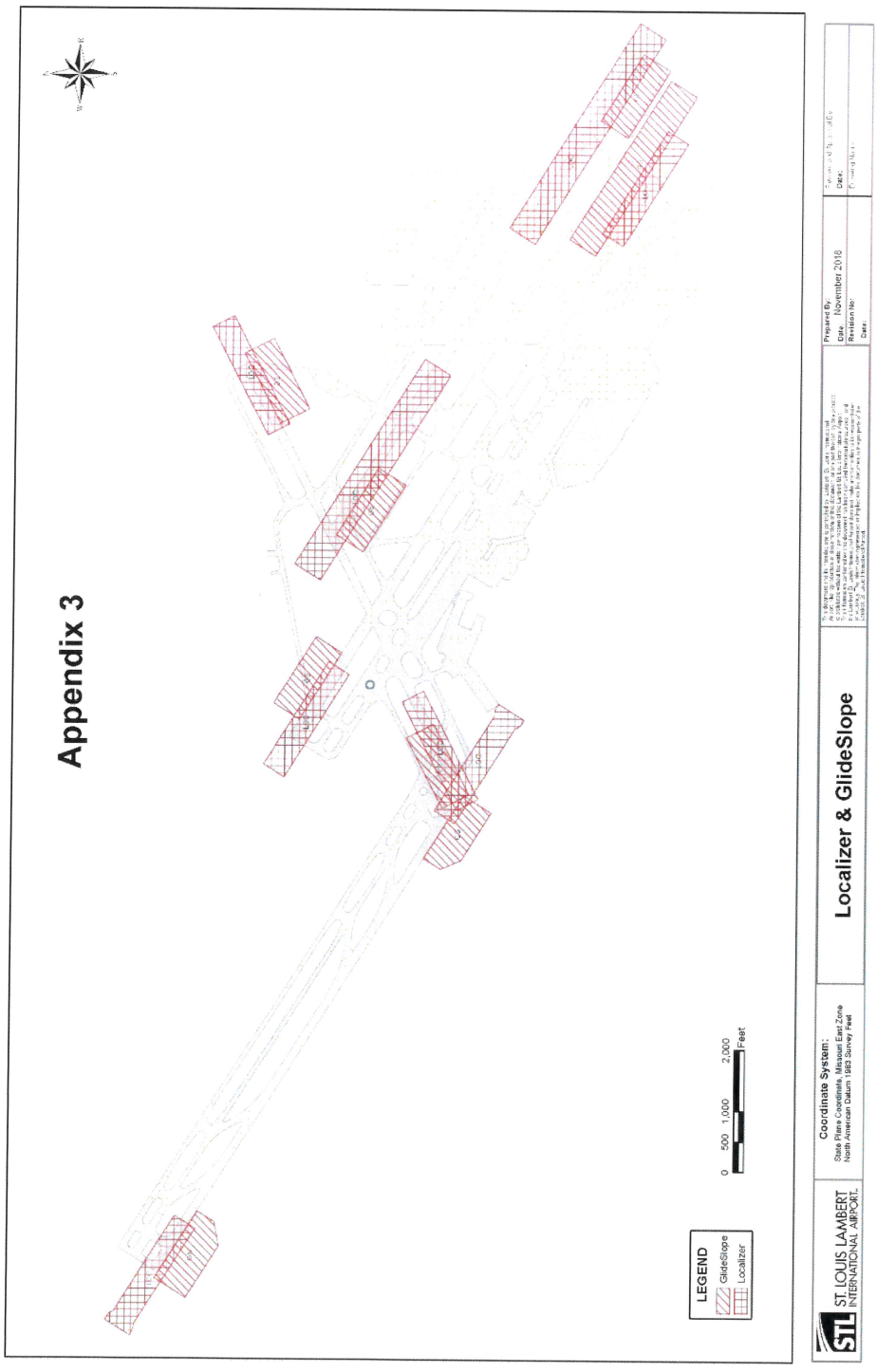
  b) The SCL must remember that wet snow accumulations should be rectified when it starts. Accumulation of one fourth (1/4") or more may seriously hamper or halt airport operations until such time as wet snow accumulation has been eliminated.

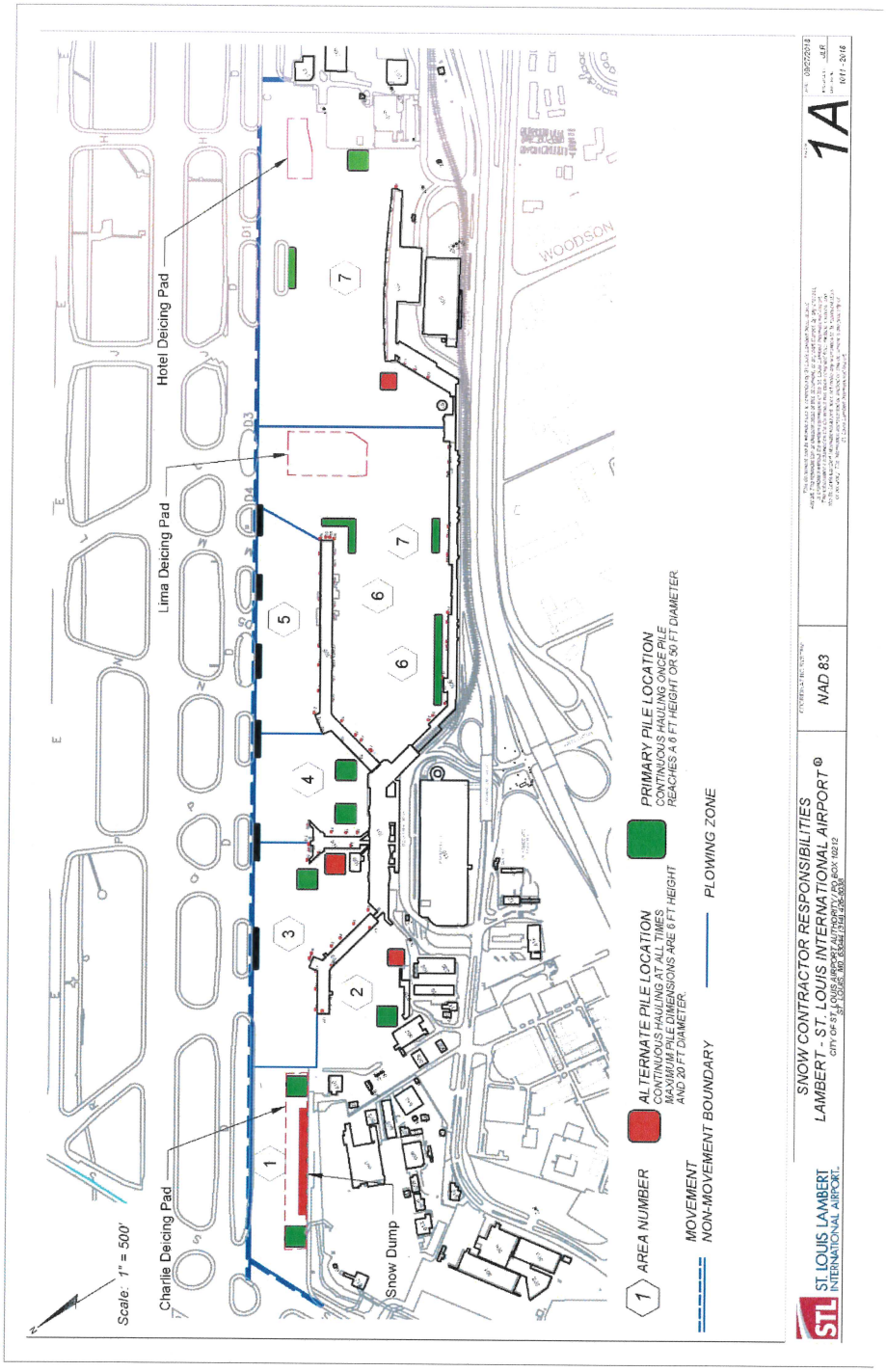

STL Snow Removal, Normal Priority
Taxiways for Runways 30 and 29
Legend
1st Priority
2nd Priority
3rd Priority
Papa Pad
Echo Pad
Charlie Pad
Lima Pad
Hotel Pad
* 30R-12L Priority Over 12R-30L
ST LOUIS LAMBERT INTERNATIONAL AIRPORT
Snow Removal
Coordinate System:
State Plane Coordinate, Missouri East Zone
North American Datum 1983 Survey Feet
Prepared for:
Date: October 2019
Revision No:
Date:

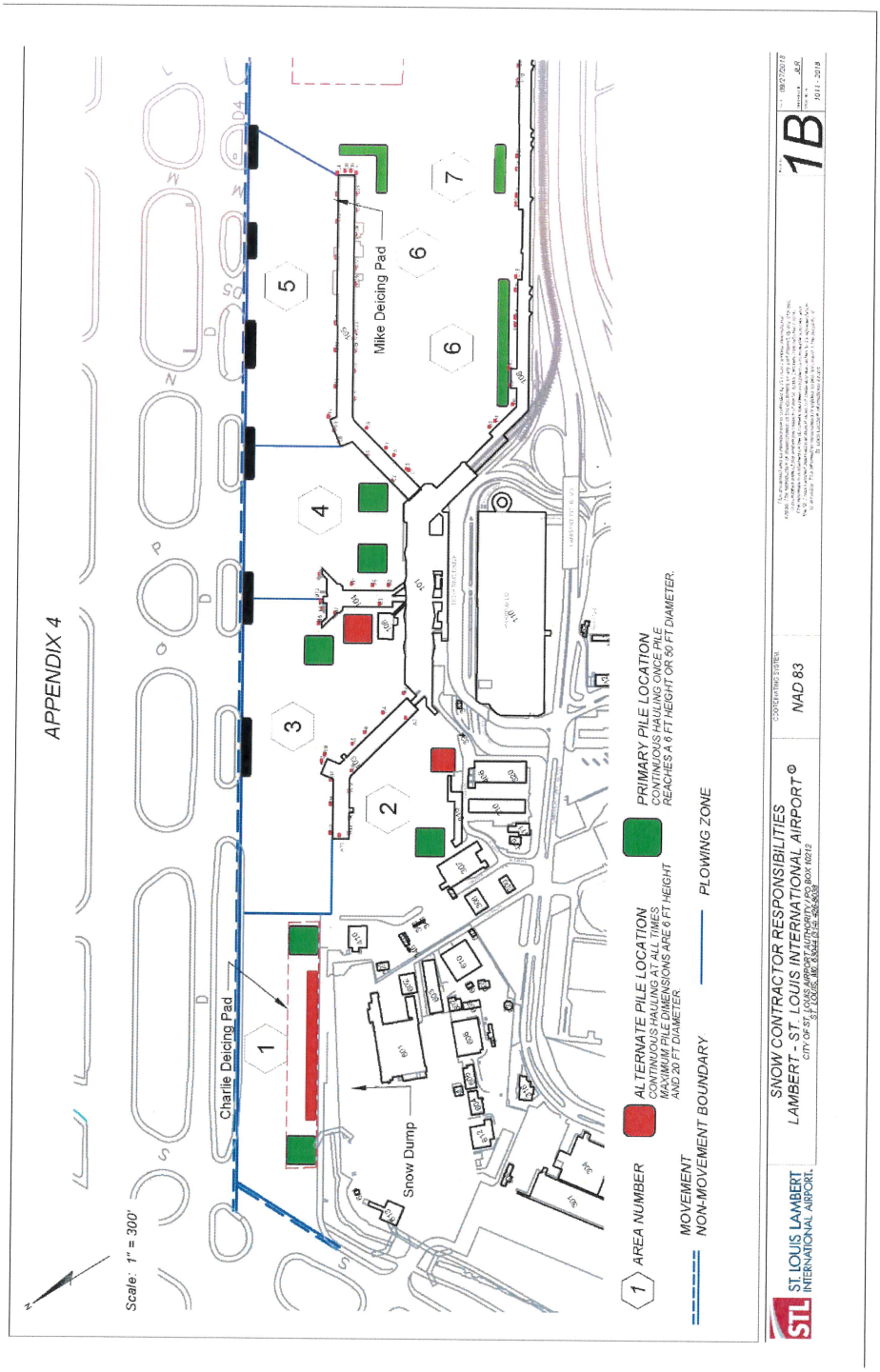

STL Snow Removal, Normal Priority
Taxiways for Runways 12 and 11
Low Visibility Route
. < 800 ft Ceiling
. And / or < 2 mile Vis
. Twy P, F, S
Legend
1st Priority
2nd Priority
3rd Priority
Echo Pad
Charlie Pad
Lima Pad
Hotel Pad
* 30R-12L Priority Over 12R-30L
ST. LOUIS LAMBERT INTERNATIONAL AIRPORT
Snow Removal
Coordinate System:
State Plane Coordinate, Missouri East Zone
North American Datum 1983 Survey Feet
Prepared By:
Date October 2019
Revision No
Date

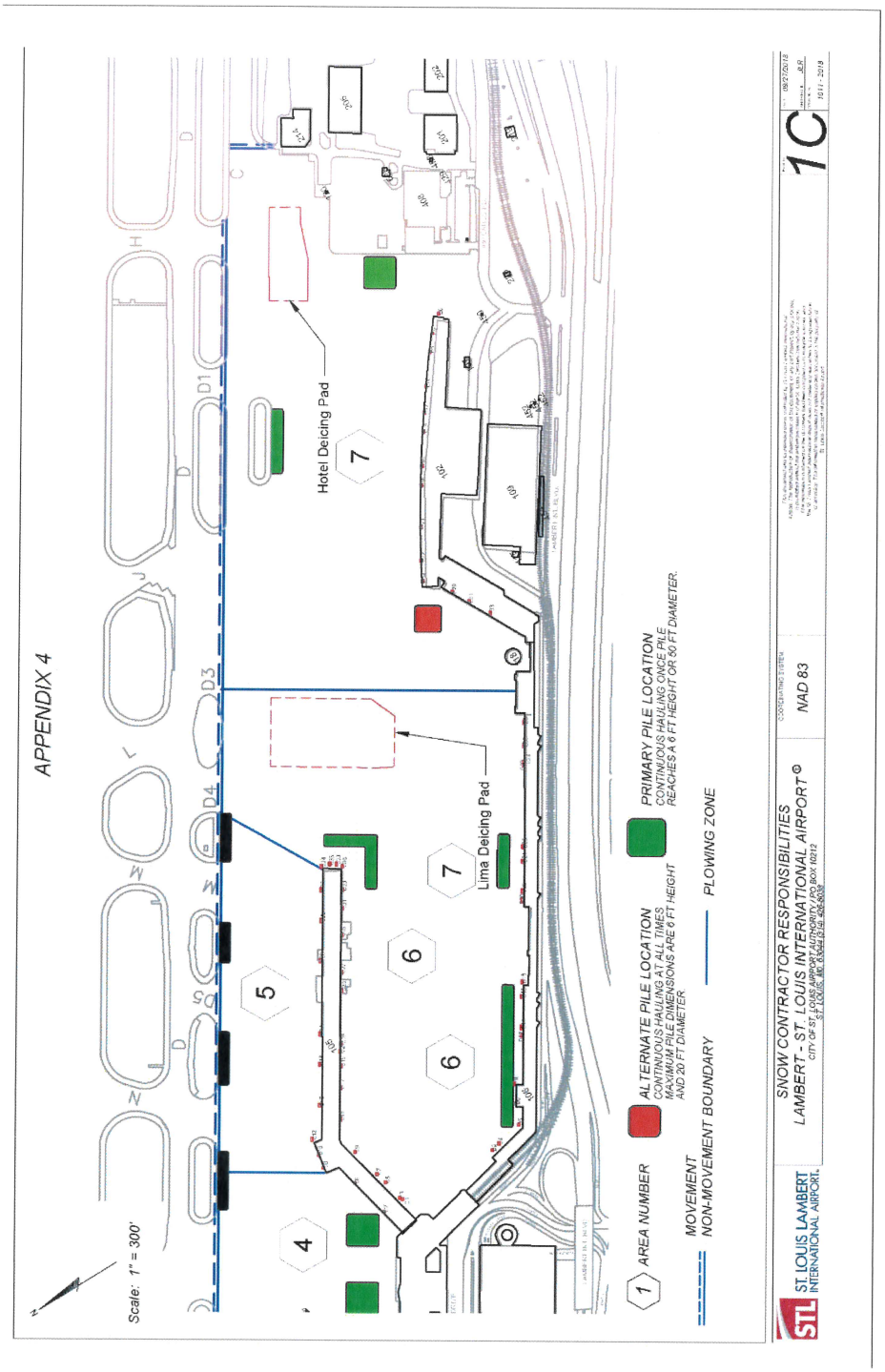
Radio Communications Plan 2018-2019 - Snow Team (Appendix 2) v2

Snow Crew Leader (SCL) & Runway Inspector (RI)	•<u>Ops Freq</u> - 1) SCL & RI communicate with Ops Center on Ops Freq. 2) SCL communicates with Runway Foreman (RF) on AFM Freq. 3) RI communicates with RF on Ops Freq, if needed. •<u>Airfield Maint Freq</u> - 1) Primary channel for SCL to direct Runway Foremen, and the RF to direct TWY Foremen and RWY Team. •If ATCT is staffed with an Airport Liaison (AL), the AL shall only primarily communicate with the SCL in the field, the SCL shall commicate to RF & RI. RF to communicate to TF 1 & 2.
Runway Foreman (RF) & Runway Team (RT)	•<u>**Airfield Maintenance Freq**</u> – 1) Communication & coordination between each Snow Team Foremen. 2) Primary channel for Runway Foreman to direct Runway Team and TWY Foremen. 3) Foreman and SCL communications. •<u>Operations Freq</u> – 1) Runway Foreman monitors, communicates and coordinates with Runway Inspector and/or Ops Center on Ops.
Taxiway Foreman 1 (TF1) and TF2 & Taxiway Teams 1 and 2 * (If only one TWY Team in use, then only Snow 1 in use)	•<u>**Snow 1 Freq**</u> – 1) Taxiway Foreman 1 to TWY Team 1 communication & coordination. 2) Taxiway Foreman direct their respective Taxiway Team. •<u>**Snow 2 Freq**</u> – 1) Taxiway Foreman 2 to TWY Team 2 communication & coordination. 2) Taxiway Foreman direct their respective Taxiway Team. •<u>Airfield Maintenance Freq</u> – 1) Runway Foreman briefs & communicates w/ Taxiway Foremen, passes on clearances and hold short instructions and briefings from Ops. 2) Runway Foreman to Taxiway Foremen communication.
Deicer Teams (Liquid or Solid)	•<u>**Airfield Maintenance Freq**</u> – 1) Runway Deicers assigned to the Runway Team communicate to Runway Foreman on AFM Freq. **2) Runway Deicers report numbers to Snow Desk on Snow 1 Freq.** •<u>**Snow 1 & 2 Freq**</u> – 1) Taxiway Deicers assigned to Taxiway Team(s) communicate to Taxiway Foremen on Snow 1 Freq or Snow 2 Freq. **2) Taxiway Deicers report numbers to Snow Desk on Snow 1 Freq.** ***** Deicers will switch frequencies depending on what Team they are assigned to*** During an all deicer event – communicate on AFM freq.** *** Ramp Deicers (small & large) – monitor AFM Freq.
Turn Out Team	•<u>**Airfield Maintenance Freq**</u> – 1) Truck to Truck when needed. 2) monitor AFM for situational awareness. 3) Coordinate with Runway Foreman when needed.
Snow Desk	•<u>**Airfield Maintenance Freq**</u> – 1) record critical snow team activities from the AFM freq. •<u>Snow 1 & Snow 2 Freq</u> – 1) record critical Taxiway Team activities from Snow 1 Freq. 2) record taxiway deicer readings.
Auto Shop	•<u>**Airfield Maintenance Freq**</u> – 1) Respond to calls from foremen or operators. 2) Report to Runway Foreman if equipment adjustments are needed. •<u>Snow 1 or Snow 2 Freq</u> – 1) Respond to calls from foremen or operators assigned to those frequencies. *** **Switch frequencies to which Team they are servicing in order to communicate with operator.** *** Switch to Auto Shop Freq temporarily when needed to communicate back to the shop.
All	• Zone C has been reprogrammed in a majority of vehicles. Zone C contains – ops ctr, AFM, auto shop, building, climate, electrical, snow 1, snow 2, snow 3, storeroom, housekeeping, director, managers, airport fire. **Use portable as second radio NO SCAN.** • <u>All vehicles need to monitor ATCT Ground Frequency on 121.9 in addition to above to maintain situational awareness.</u> • No cell phones, texting, emailing. • No FM/AM radio, No TVs. • **Be Safe! Report on frequency when exiting vehicle and wear proper PPE when out of the vehicle.**


Appendix 3
LEGEND
GlideSlope
Localizer
0 500 1,000 2,000
Feet
Localizer & GlideSlope
Coordinate System:
State Plane Coordinate, Missouri East Zone
North American Datum 1983 Survey Feet
ST. LOUIS LAMBERT INTERNATIONAL AIRPORT
Prepared By:
Date: November 2018
Revision No:
Date:


Hotel Deicing Pad
Lima Deicing Pad
Charlie Deicing Pad
Snow Dump
WOODSON
Scale: 1" = 500'
1 AREA NUMBER
ALTERNATE PILE LOCATION
CONTINUOUS HAULING AT ALL TIMES
MAXIMUM PILE DIMENSIONS ARE 6 FT HEIGHT AND 20 FT DIAMETER.
PRIMARY PILE LOCATION
CONTINUOUS HAULING ONCE PILE REACHES A 6 FT HEIGHT OR 50 FT DIAMETER.
MOVEMENT
NON-MOVEMENT BOUNDARY
PLOWING ZONE
SNOW CONTRACTOR RESPONSIBILITIES
LAMBERT - ST. LOUIS INTERNATIONAL AIRPORT®
NAD 83
ST. LOUIS LAMBERT INTERNATIONAL AIRPORT
1A


APPENDIX 4
Scale: 1" = 300'
Charlie Deicing Pad
Mike Deicing Pad
Snow Dump
1
2
3
4
5
6
7
AREA NUMBER
ALTERNATE PILE LOCATION
CONTINUOUS HAULING AT ALL TIMES
MAXIMUM PILE DIMENSIONS ARE 6 FT HEIGHT AND 20 FT DIAMETER.
PRIMARY PILE LOCATION
CONTINUOUS HAULING ONCE PILE REACHES A 6 FT HEIGHT OR 50 FT DIAMETER.
MOVEMENT
NON-MOVEMENT BOUNDARY
PLOWING ZONE
SNOW CONTRACTOR RESPONSIBILITIES
LAMBERT - ST. LOUIS INTERNATIONAL AIRPORT ©
CITY OF ST. LOUIS AIRPORT AUTHORITY, P.O. BOX 10212
ST. LOUIS, MO 63145-0212
COORDINATES ENTER:
NAD 83
1B
ST. LOUIS LAMBERT
INTERNATIONAL AIRPORT.
STL



Original Date
Revision Date DEC 09 2019

FAA Approval J. Fotiades

ST. LOUIS AIRPORT TRAFFIC CONTROL TOWER,
LAMBERT – ST. LOUIS INTERNATIONAL AIRPORT

LETTER OF AGREEMENT

EFFECTIVE: 10/01/2016

SUBJECT: Procedures and Responsibilities for Coordinating and Reporting Runway Surface Conditions

1. **PURPOSE:** Prescribes responsibilities and procedures for the coordination of pilot braking action reports, runway condition assessments, field condition reports and cessation of operations for reports of "Nil" conditions.

2. **CANCELLATION:** St. Louis Airport Traffic Control Tower, Lambert-St. Louis International Airport Authority Letter of Agreement, Airport Braking Action Reports, dated February 27, 2009.

3. **SCOPE:**

   a. The City of St. Louis, Owner & Operator of Lambert-St. Louis International Airport.

   b. St. Louis Air Traffic Control Tower.

4. **DEFINITIONS:**

   a. AA – The City of St. Louis Airport Authority.

   b. FICON (Field Condition Report) – Is a Notice to Airmen (NOTAM) generated to reflect pavement surface conditions on runways, taxiways, and aprons Runway Condition Codes if greater than 25% of the overall runway length and width or cleared width of the runway is contaminated.

   c. Ops Center - Lambert Airport Operations/Communications Center.

   d. STL ATCT - St. Louis Airport Traffic Control Tower.

   e. RwyCC - Runway Condition Code

   f. Pilot Reported Braking Action – This is a report on the runway, by a pilot, providing other pilots with a degree/quality of expected braking. The braking action experienced is dependent on the type of aircraft, aircraft weight, touchdown point, and other factors.

   g. Good – Braking deceleration is normal for the wheel braking effort applied, and directional control is normal.

   h. Good-to-Medium – Braking deceleration or directional control is between Good and Medium braking action.

   i. Medium – Braking deceleration is noticeably reduced for the wheel braking effort applied, or directional control is noticeably reduced.

   j. Medium-to-Poor – Braking deceleration or directional control is between Medium and Poor.

k. Poor – Braking deceleration is significantly reduced for the wheel braking effort applied, or directional control is significantly reduced.

l. Nil – Braking decoration is minimal to non-existent for the wheel braking effort applied, or directional control is uncertain.

5. **RESPONSIBILITIES:**

a. STL ATCT must be responsible for forwarding braking action reports received from pilots to the AA through the Ops Center during periods of deteriorating pavement conditions.

b. The AA must be responsible for forwarding Runway Condition Codes, Runway Condition Assessments to the STL ATCT, and will only report vehicle braking action reports on surfaces other than runways.

6. **PROCEDURES:** Communication of Runway Condition Codes, Runway Condition Assessments and Braking Action Reports.

a. STL ATCT must:

(1) Solicit pilot reports of braking during adverse weather conditions.

(2) Immediately inform the Ops Center on Ground Control frequency (or telephone if unavailable on Ground) of braking action reported as or containing any remarks of "NIL" or "POOR" and include the following information:

(a) Runway number, specifying the section of runway if appropriate;

(b) Braking action report per the Definitions;

(c) Type of aircraft reporting the braking action.

(3) If a pilot elects to report braking action on a surface other than a runway, the STL ATCT will also inform the Ops Center of braking action reported as "NIL" or "POOR."

(4) Immediately cease operations on surfaces reported as "Nil" braking action until the runway has been assessed and/or treated by STL AA.

EXAMPLE-

"OPS CENTER, ST. LOUIS GROUND CONTROL, RUNWAY 12R BRAKING ACTION POOR FIRST HALF OF RUNWAY, REPORTED BY A 737-700."

(5) Inform the Ops Center on ground control frequency when the braking action reports improve from "NIL" or "POOR."

(6) Notify Ops Center when runway braking action reports indicate runway braking conditions have deteriorated to "good to medium", "medium", "medium to poor", "poor", or "nil" or have improved to "good."

b. The AA/Ops Center must:

(1) Notify STL ATCT whenever a Runway Condition Code for any runway segment is measured as less than 6.

(2) Monitor the Ground Control frequency as much as feasible during periods of deteriorating pavement conditions.

(3) Conduct runway assessments as detailed in the STL Airport Snow and Ice Control Plan (SICP).

(4) Inform STL ATCT of Runway Condition Codes, and runway openings & closings, primarily over ground control frequency, or as a backup, over the ATCT recorded phone, as follows:

(a) Upon satisfactory completion of snow/ice removal and/or treatment.

(b) Prior to opening the runway for aircraft operations.

(5) Call the STL ATCT recorded line to inform them of runway FICON information details.

(6) Inform the STL ATCT of further FICON information, primarily by fax, or as a backup by phone or internet, by an updated Airfield Condition Report (ACR).

(7) Conduct a runway assessment immediately upon receipt of a single pilot report action of NIL.

(8) Coordinate a runway assessment when two (2) consecutive pilot braking action is reported as POOR for the same runway, or at the AA's discretion. See section 5.9 Continuous Monitoring and Deteriorating Conditions STL SICP.

(9) Notify STL ATCT when runway conditions codes are no longer reportable.

Duane D. Fant
St. Louis ATCT
Air Traffic Manager

Rhonda Hamm-Niebruegge
Director of Airports
Lambert - St. Louis International
Airport