



Edmonton International Airport

2007/2008
Airside Winter
Operations Program

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1 GENERAL INFORMATION

1.1 Introduction

Airside Operations at Edmonton International Airport (EIA) maintain and monitor all runways, taxiways, aprons and airside roads to ensure safe and continuous operation of the airport during winter conditions. Operations include snow removal and ice control on all airside surfaces and surface condition reporting.

The effective management of snow and ice requires clear communication protocols to ensure all airside tenants and operational people understand existing/changing conditions and potential impacts to business. The airport Duty Manager is the central point of contact for daily operational issues. Airside Operations will communicate through the airport Duty Manager for all winter operations and directly with Nav Canada for access to the airfield.

It is integral that airside tenants cooperate with Airside Operations by ensuring work areas are clear of equipment in order to expedite snow removal. Effective communication lines between airside tenants and the Duty Manager will make snow and ice management a much more efficient process.

1.2 Regulations / Standards

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

TP312: Aerodrome Standards and Recommended Practices, Versions 3 and 4

TP659: Airports Winter Surface Maintenance Manual

1.3 Contacts

Title	Phone	Cell
Manager, Airside Operations	890-8597	887-9716
Superintendent, Airside Operations and Maintenance	890-8479	934-6889
Manager, Environment, Safety and Operational Compliance	890-8530	914-5285
Field Maintenance Foreman	890-8340	(forwarded to cell)
Airside Safety Co-ordinator	890-8313	914-2808
Duty Managers	890-8327	

2 RESPONSIBILITIES

2.1 Field Maintenance

Field Maintenance is responsible for ensuring the safe and continuous operation of airside activities during the winter season. This includes the regular monitoring and reporting of runway conditions, snow removal and ice control. The Superintendent, Airside Operations and Maintenance has responsibility for winter operations; however, the Field Maintenance Foremen direct daily activities.

2.2 Airlines and Ground Handlers

Airlines and Ground Handlers are responsible for the preparation of their work areas prior to snow or ice conditions become prevalent. Airlines and Ground Handlers must ensure they are aware of current and forecasted conditions and ensure they maintain their work areas in such a manner to expedite snow and ice control by Field Maintenance. Airlines and Ground Handlers must also maintain clear line of communication with the Duty Manager.

Airlines and Ground Handlers are also responsible for regularly inspecting all airside areas utilised by airline passengers to ensure safety during the loading or unloading of aircraft. When necessary, airline and ground handler personnel should apply sand or chemical to the pedestrian walkways using the materials supplied by Edmonton Airports.

2.3 Airside Safety Co-ordinator

The Airside Safety Co-ordinator is responsible for all airside safety related programs, AVOP and incident investigation. It is the responsibility of the Airside Safety Co-ordinator to do morning apron safety inspections and to co-ordinate the safety inspections with tenant safety representatives. During severe weather the Airside Safety Coordinator may assist with clearing lead in lines.

2.4 Duty Managers

The Duty Manager is the main point of contact for all operational requirements. Tenants & airlines must contact the Duty Manager for up to date information and or conditions. Field Maintenance will update the Duty Manager at the beginning of every shift change or as conditions change. In the event of an incident, the Duty Manager is responsible for completing or obtaining an Airport Incident Report. The Duty Manager, in conjunction with the Emergency Response Services, is also responsible for completing visual runway checks when Field Maintenance Staff are not on duty.

2.5 Emergency Response Services

In conjunction with the Duty Manager, Emergency Response Services are responsible for completing visual runway checks when Field Maintenance Staff are not on duty.

2.6 Environment & Operational Compliance Department

The Environmental Department of Edmonton Airports is responsible for ensuring that all airport operations meet existing environmental standards and regulations. The use of all chemicals and dangerous goods falls under their control, including the sand and chemicals used on airside surfaces and for the removal of glycol.

3 RESOURCES

3.1 Equipment

The mobile fleet at Edmonton Airports consists of a wide variety of equipment to meet our winter operational needs. Under normal operations... four runway sweepers, 2 ramp hogs and 2 snow blowers will be used in addition to a number of other condition specific units. Due to expansion we have increased our personnel and fleet accordingly. Edmonton Airports continues to evaluate new technology and snow removal methods to improve our service levels in all areas.

A detailed list of all equipment is available from the Superintendent Mobile Fleet Maintenance.

3.2 Personnel

During the winter season, from November to March, the full-time staff is supplemented by the hiring of seasonal operators. Staff is divided into crews, each with a Foreman. The Superintendent is on duty during standard working hours. Part-time workers are also retained for the winter season for apron clearing. Full-time staff provides standby coverage during the months of October and April.

During normal operations each crew is made up of 8 full time staff, 2 groundside labourers, supplemented by part time assistance if required.

Additionally, a full time crew working Monday thru Friday during the day (hours to be determined by weather requirements) will be added to provide services to Apron II and other areas as required. This crew will report to the Foreman on shift during the day and will be an extension of the main crew, but their main priority will be Apron II.

Resources will be allocated into specific working crews per shift, the breakout is as follows:

- Runway's / Taxiway's.
- Apron I.
- Apron II, III, IV.
- Groundside.

Crew staffing levels will be dictated by weather requirements.

In severe weather additional resources will be called upon from Airside Operations Group and possibly other parts of the organization.

3.2.1 Schedules

Snow Removal Crew:

Beginning November 1st until March 31st Operators are on site from 07:00-16:00 and 19:00-04:00 In the event of storm conditions, shifts are extended to provide 24 hour coverage.

3.3 Ice Control Agents

The chemicals used for ice control on airside surfaces are potassium acetate, an anti-ice agent, and sodium formate, a de-icing agent. Due to its environmental impact, the regular use of urea for ice control on airside has been eliminated. All de-icing and anti-icing chemicals in use have been approved by Transport Canada and Edmonton Airports' Manager, Environment & Operational Compliance. **No salt** can be used on any airside surface since it is a potential hazard to aircraft.

3.4 Sand

To minimise damage to aircraft, all sand used by Edmonton Airports on airside meets the Transport Canada specifications outlined in *TP659, Appendix A*.

Boxes containing sand for use on sidewalks and walkways are placed at various locations around the airport and tenant buildings to ensure easy use, when required. See Appendix C.

4 SNOW REMOVAL PROCEDURES

Snow removal must be carried out in a manner that will maintain the continuous and safe operation of the airport. It should not interfere with normal airport operations unless approved by the Superintendent, Airside Operations and Maintenance or the Field Maintenance Foreman. Removal should begin as soon as conditions warrant and continue, uninterrupted, throughout the snowfall. The use of all equipment by Edmonton Airports staff and the Groundside Snow Removal Crew and Contractor must follow Standard Operating Guidelines for safety.

4.1 Priorities

Priorities are determined to ensure the continuous and safe operation of the airport and meet Transport Canada's Airport Regulation requirements for safe operations at the airport. Priority areas are outlined on the drawing *Airside Snow Removal and Ice Control Priority Areas* (Appendix A).

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

- Active Runway (Generally Runway 12-30);
- Sufficient area on Apron I to accommodate aircraft, cargo and related activities using the active runway, including de-icing pads, lead in lines and working areas around bridges;
- Taxiways accessing Apron I from the active runway. If Runway 12-30 is active taxiways A, A1 and A4 are cleared first, followed by A2, A3 and Q;
- Access Road from Firehall;
- Apron II & Sierra;
- De-icing pads;
- Bridges where a unit load device is being used, as determined by gate plot.

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

- Alternate Runway (Generally Runway 02-20);
- Taxiways associated with Alternate Runway. If the alternate runway is Runway 02-20, taxiways B, B1 and B4 are cleared first, followed by B2, B3, N, T, U and S;
- Sufficient area on Apron I to accommodate aircraft and cargo using alternate runway, if different than above;
- Sufficient area on Apron II to accommodate aircraft and cargo, if required;
- Access road to Cargo Facilities, as required.

Priority III: The remainder of airside areas are to be cleared after the snowfall:

- Remaining Apron areas, as required;
- Remaining Airside Access Roads;
- Security Fence Perimeter Road;
- Edge lights, VASIS, PAPIs, RILs and Runway End Identification lighting, as required;
- Pre-threshold areas, as required;
- Glide Path Sites, as required;
- Tenant Areas, as contracted.

Priorities may be altered, if conditions warrant, by the Manager, Airside Operations or the Superintendent, Airside Operations and Maintenance. The Field Maintenance Foreman may make decisions related to immediate operations. As mentioned, the Priority I runway is generally Runway 12-30; however, Runway 02-20, and associated taxiways, may be used if conditions such as prevailing winds warrant.

Snow is also removed from several service routes and areas used by Edmonton Airports staff, but not by the public. These areas are cleared on request and include:

- Airside access routes to Edmonton Airports storage sites;
- Baggage Inspection Facility;
- Navigational and guidance installation areas.

4.2 Allowable Accumulations

Generally, snow removal on the active (Priority I) runway begins when snow begins to accumulate. Clearing begins on the alternate (Priority II) runway when clearing of the Priority I areas is complete, regardless of snowfall. Priority III areas are cleared after the snowfall, unless immediate access is required (as determined by the Field Maintenance Foreman).

4.3 Runway

Whenever possible, runways are cleared to a bare and dry surface for their full width. The Priority I runway is cleared throughout the storm, before all other surfaces. The Priority II runway is also cleared throughout the snowstorm, after all Priority I areas have been cleared. If at any time the cleared width falls below full width, Field Maintenance advises the Control Tower. If possible, clearing takes place in a manner that allows for the continuous operation of the runway during snow removal.

If, in the opinion of the Field Maintenance Foreman, efficiencies could be gained by the closure of a runway the following actions (also stipulated in Edmonton International Control Tower Operations Letter #97/04) will take place:

1. The Field Maintenance Foreman may close a runway by advising the Duty Manager, then contacting the Control Tower;
2. The tower will comply with the request unless precluded by extenuating operational considerations;
3. The closure will be in effect for a maximum of 59 minutes. If a longer duration is required a NOTAM will be requested
4. The runway surface will be swept during the 59 minutes; turnoffs will be addressed after the closure is completed. While turnoffs are being swept NAV Canada will have the runway and may request the Field Crew to move off the area.
5. The closure will be advertised by voice advisory (ATIS) issued by the tower personnel;
6. Tower personnel will confirm the re-opening of the runway with the Field Maintenance Foreman;
7. The Field Maintenance Foreman will advise the Duty Manager of the closure of a runway and its subsequent re-opening. The Duty Manager will advise the airline and ground handlers SOCC's.

4.4 Apron

The preparation of a safe operating environment on the apron areas is the responsibility of Edmonton Airports; the safe conduct of airline operations, including the safety of passengers, is the responsibility of the airlines. Snow is removed from the Apron area in a manner that reflects the amount of accumulation. If light snow conditions exist, (less than 5 cm), the snow is swept off the area. If greater accumulations are present or if a windrow begins to develop, large apron areas are cleared using appropriate equipment. Smaller equipment is used to clear areas around the bridges and walkways.

The work area around bridges and airline parking areas, de-icing pads, apron entrances/exits, lead-in lines and commuter aircraft areas are to be cleared first, followed by the other main aircraft manoeuvring areas. De-icing pads should be cleared before de-icing begins. These areas will be inspected Monday thru Friday @ 08:30 hrs by the Airside Safety Coordinator, Superintendent Airside Operations and Field Maintenance and participating airlines.

Removal of snow in close proximity to the terminal building normally requires close co-ordination between the snow removal crew and the airlines and ground handlers. In order to remove snow in these areas, they must be clear of parked aircraft and equipment. Field Maintenance will monitor the weather reports and if snow is predicted, the Field Foreman will contact the Duty Manager. The Duty Manager will advise the airline and ground handlers to move their equipment prior to the snow. This will expedite Field Maintenance's ability to react during snow events.

During normal operations when snow is falling, the Field Maintenance Foreman will co-ordinate the removal and return of this equipment with the appropriate airline or ground handling personnel. It is essential that the Field Maintenance Foreman have the complete co-operation of all airline and ground handling management and staff if this work is to be completed in a timely manner. Occasionally the operators will also require assistance in this regard, particularly when the situation is dynamic and difficult to plan in advance.

4.5 Edge Lights, Glide Path Areas & Pre-Threshold Areas

These areas are cleared to Transport Canada standards to provide for safe winter operations at the airport.

4.6 Visual Aids

Snow is removed from these areas when it provides an obstacle to a correct approach slope reading. Removal is usually done during clean-up operations.

4.7 Windrows

Windrows are not permitted on any airside surface where they may pose a potential hazard to aircraft engines. Windrows may be permitted on airside roads, at the discretion of the Superintendent, Airside Operations and Maintenance or the Field Maintenance Foreman.

5 ICE CONTROL

It is preferable to control the formation of ice rather than try to remove ice that has already formed. To do this, careful monitoring of weather and runway conditions is required. Once ice has formed, it is vital that it is removed as quickly as possible. There are two forms of ice control used at EIA: chemical ice control and sanding.

5.1 Chemical Ice Control

The chemicals used for runway ice control are potassium acetate and sodium formate. To prevent the build-up of ice, potassium acetate is spread on surfaces before ice forms. If ice has already formed, sodium formate is used to soften the ice so it can be easily removed by either plows or sweepers. The effectiveness of these chemicals depends on temperature and wind conditions. Their application is at the discretion of the Field Maintenance Foreman. Since these chemical substances may impact the environment, Edmonton Airports conducts ground water monitoring in the spring to ensure that run-off meets environmental standards. Edmonton Airports has eliminated the use of urea for runway de-icing.

5.1.1 Severe Weather

During normal operations the above process is reasonable, however during a ice storm where freezing rain is continuous, the application of chemical becomes futile. During such events chemical application may be suspended until conditions improve and chemical application can once again be effective. If chemical application is suspended the Duty Manager will be informed, who will in turn inform the airlines, Nav Canada and ground handlers. Runway sand will continue to be applied during severe weather to all priority 1 surfaces during this time. Conditions will be monitored and communicated to Nav Canada and the Duty Manager. The Duty Manager will inform the airlines and ground handlers.

5.2 Sanding

Sand is normally used to improve braking and traction when temperatures fall below -10 C and de-icing chemicals becomes ineffective. The sand/ice is removed as quickly as possible using a plow truck and sweeper. Sanding is used on airside road surfaces at the discretion of the Field Maintenance Foreman. When sand is used on any aircraft manoeuvring surface, the Field Maintenance Foreman provides notification to the Control Tower and other users.

To prevent damage to aircraft the type of sand used on all aircraft manoeuvring surfaces is strictly controlled. All sand conforms to Transport Canada specifications. No salt may be mixed with the sand. All airside sand is stored separately from sand used on groundside and equipment used for the spreading of sand on groundside cannot be used to spread sand on airside.

5.3 Passenger Walkways

Passenger walkways are swept by Edmonton Airports. When required, sand is also applied to these areas. Airline personnel should regularly inspect all airside areas utilised by airline passengers to ensure safety during the loading or unloading of aircraft. When necessary, airline personnel should apply sand or chemical to the pedestrian walkways using the materials supplied by Edmonton Airports. Both sand and sodium formate are provided in containers located in various positions around the bridges and walkways. (See Appendix C)

6 SURFACE CONDITION REPORTING

6.1 Runway Surface Condition Reports

During the winter months, Surface Condition Reports are issued and updated at the beginning & end of each shift, or as necessary when runway conditions change. The Condition Reporting system automatically faxes a report (Appendix B) to the EIA Flight Services Station, the EIA Control Tower, Airport Duty Manager and other appropriate users through the Security Operations Command Centre (staffed 24 hours per day, 7 days per week). A copy is also maintained at the Airside Operations Maintenance Centre. Voice advisory of runway conditions is provided to the Control Tower after every runway check or change in runway conditions. Surface Condition Reports are also issued to the Manager Risk Management, after every incident or accident on airside surfaces.

6.2 Visual Inspections

Visual inspections of the runway and apron surfaces are done in conjunction with regular airfield inspections. These inspections are done at the beginning and end of each shift, normally at 06:30 & 14:00 and 19:00 & 02:00. Weather dependent additional inspections will be made. During adverse weather conditions, Runway / CRFI Reports will be completed hourly. Field Maintenance staff is responsible for checks during normal working hours, and the Airport Duty Manager and Emergency Response Services are responsible for inspections during off-hours. Any abnormalities are reported to the Control Tower and rectified as quickly as possible.

6.3 Friction Testing

Friction testing is done on a runway, and the Canadian Runway Friction Index (CRFI) is included in the Surface Condition Report, if the runway surface has any patches of:

- ice;
- compacted snow;
- slush/ice combination;
- loose snow (less than 2.5 cm);
- chemical on ice.

Testing is not done if the runway surface is wet, with no indication of ice build-ups, or has loose snow exceeding 2.5 cm.

Airside Operations / Field Maintenance currently have two vehicles equipped with the Friction Testing technology, Unit #26 and #36.

7 COMMUNICATION

The Airport Duty Manager is the main point of contact for day to day airport operations. All communications regarding airport conditions, parking and gate assignments, and other related issues must be relayed through the Duty Manager.

The Field Maintenance Foreman is responsible for the completion and distribution of Surface Condition Reports and for the co-ordination of snow removal and ice control activities. When snow removal is necessary, the Field Maintenance Foreman contacts the Control Tower to determine which runway is active, given the weather and wind conditions. In conjunction with the Control Tower, the Field Maintenance Foreman determines an appropriate action plan for snow removal/ice control, to ensure the safe, continuous operation of the airport during the winter season.

Surface condition reports will be forwarded to the Duty Manager at the beginning of every shift and as conditions significantly change. These reports will include the action plan for that shift. The Duty Manager will relay the plan to the airlines and ground handlers.

The Field Maintenance Foreman provides the Duty Manager with a surface condition report for all airside and groundside surfaces. The airside surfaces to be reported on are runways, taxiways, aprons (I, II & III) and airside roadways. The groundside surfaces to be reported on are all groundside roadways, parking facilities and sidewalks.

7.1 Severe Weather Conditions

During severe weather conditions such as ice, large accumulations of snow of prolonged periods, fog or any other weather conditions that significantly impacts airport operations, additional communications may be implemented.

Edmonton Airports will review the need for the ECC to open as a severe weather coordination centre. The Manager Airside Operations in conjunction with the Director, Airport Operations would make this decision. If this occurs representatives from each airline, ground handler, and Nav Canada would be invited to participate in the ECC. Regardless of who participates in the ECC, all airside operations would be coordinated out of the ECC for the duration of the severe weather event or until deemed no longer necessary.

Appendix A
Snow Removal Priorities

Appendix B
Surface Condition Report

Appendix C
Sand Locker Locations - Airside

Appendix D
Groundside Snow Removal and Ice Control Contract