MANCHESTER AIRPORT

Airport Inclement Weather Plan

Winter Season 2022-23 V 2.0

Title:	Manchester Airport Inclement Weather Plan 2022 – 2023 v 2.0
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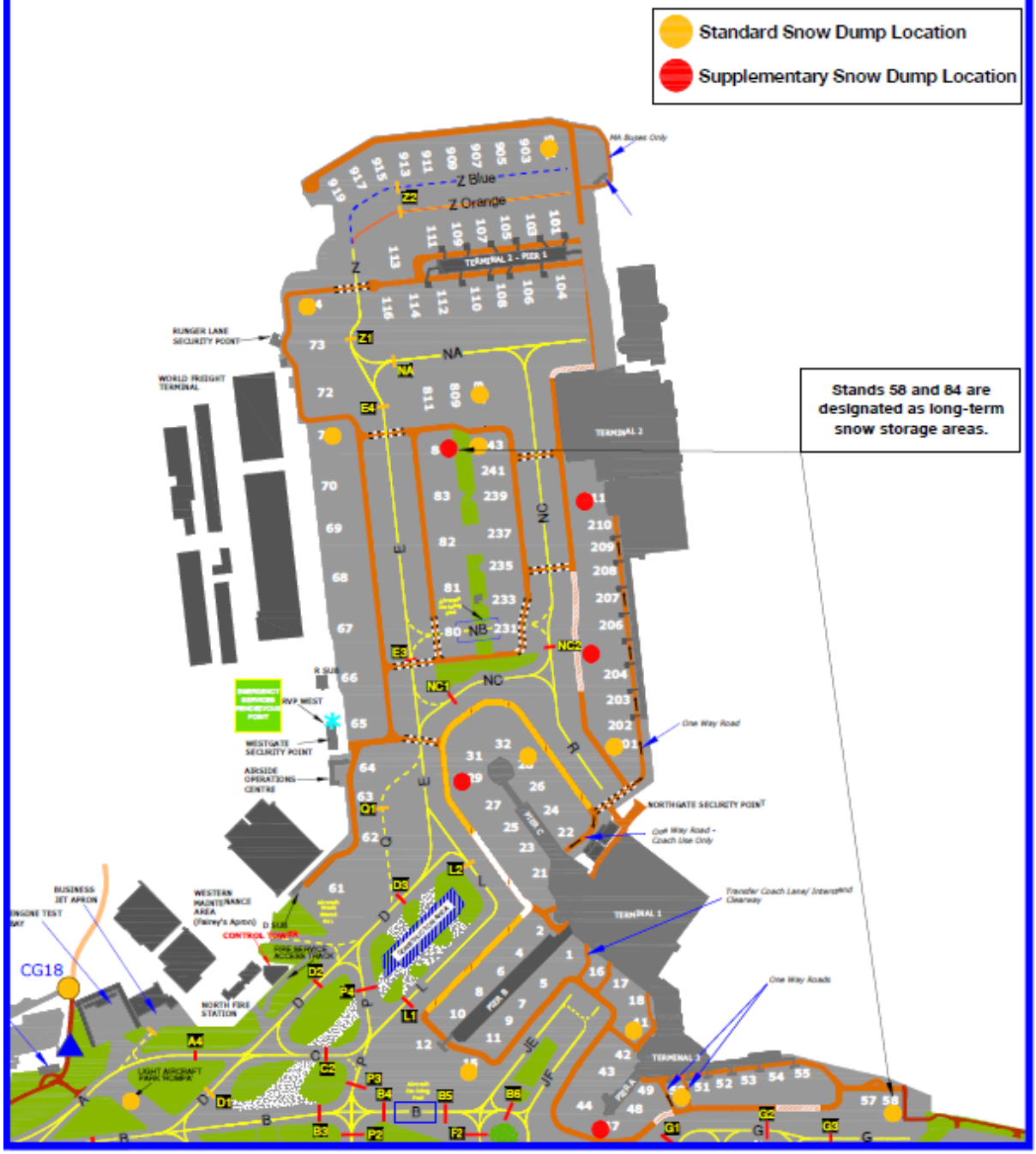
Manchester Airport
Operational Resilience
Department

MAG Manchester Airport

Contents

AIRFIELD SNOW DUMP LOCATIONS - WINTER 2021/22.

- *Do not brush snow towards the head of stand, as this can prohibit the movement of airbridges, and impede access to FEGP and equipment bays.*
- *Snow should be brushed to the rear of stands towards taxiways and then ploughed to an allocated snow dump location.*
- *Snow may be brushed onto grass areas at the head of Stands 233-241 and 81-83.*



GLOSSARY

ACC	Airport Control Centre
AODM	Airfield Operations Duty Manager
ADM	Airport Duty Manager
ASCO	Airfield Safety and Compliance Officer
MAFRS	Manchester Airport Fire & Rescue Service
AIS	Aeronautical Information Service
ASB	Airside Safety Bulletin
ASTM	Airfield Security Team Manager
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
BMS	Building Management System
CAP	Civil Aviation Authority Publication
CCTV	Closed Circuit Television
CFME	Continuous Friction Monitoring Equipment
DSP	Departure Sequencing Protocol
DWC	Disruptive Weather Cell
EGCC	ICAO Code for Manchester Airport
ERC	Emergency Response Radio Channel
EBDM	Engineering and Baggage Duty Manager
FEGP	Fixed Electrical Ground Power
FM	Facilities Management
GMC	Ground Movement Controller - ATC
GMP	Greater Manchester Police – Manchester Airport
HOAO	Head of Airfield Operations
ICAO	International Civil Aviation Organisation
IATA	International Air Transport Association
IMC	Incident Management Centre
LDM	Landside Duty Manager
MAN	IATA Code for Manchester Airport
MA PC	Manchester Airport Priority Controller
METAR	Aviation Routine Weather Report
mm	Millimetres
MO	Meteorological Office
MT	Motor Transport
NATS	National Air Traffic Services Ltd.
NOTAM	Notice to Airmen
OiC	Officer in Charge
OPMET	Operational Meteorological
RTF	Radio Telephony

RTHP	Runway Taxiway Holding Point
RVP	Emergency Rendezvous Point
S&B	Schiedt & Bachmann
SNOWTAM	Snow Notice to Airmen
TAF	Terminal Aerodrome Forecast
VHF	Very High Frequency

1. Introduction and Terms of Reference

1.1 Purpose Statement

The Inclement Weather Plan details the measures to be taken by Manchester Airport ahead of and during any period of potentially disruptive weather.

1.2 Objectives

This plan should accomplish the following:

- Provide a clear policy for prior notification of inclement weather allowing for an effective and combined landside and airside community preparation phase.
- Define and specify the actions to be taken by all relevant parties in the response and recovery phase of an inclement weather.
- Provide clear structures for constant review and feedback of processes supporting a continuous improvement culture.
- Include all reference data pertaining to assets and resource available during inclement weather conditions.

1.3 Regulatory Relevance

This document is published in accordance with the requirements of the CAA UK Regulation (EU) 139/2014 GM1 ADR.OPS.B.035 Operations in winter conditions and is therefore consistent with the UK National Snow Plan.

1.4 Document Background

Inclement weather conditions introduce potential hazards to airport and aircraft operations.

Whilst snowfall is often the most widely recognised inclement weather condition, significant disruption can be realised from other weather conditions. Strong winds, heavy rain or ice can impose equally as significant restrictions on the availability of capacity whether this be on the road network, airfield or car park operations and can lead to the disruption of normal flight operations.

Whilst Manchester Airport makes every effort to minimise disruption, the approach must be a collaborative one which recognises the shared goal of limiting the overall impact. Therefore, all airport users must take adequate precautions when notified of potential inclement weather. General safety guidance is made available to all personnel in the format of an Information Notice or Airside Safety Bulletin, issued annually in conjunction with the Inclement Weather Plan. It is the responsibility of operational managers to ensure this information are made available to all employees working or driving in airside or landside areas.

This plan therefore concentrates on the planning, organisation and response to any major weather event including specific procedures pertaining to the clearance of contaminants such as snow, ice, and flooding.

The plan also incorporates the procedures for activating the Incident Management Centre (IMC) and the processes for notifying airline customers and service partners of the airport operational status in the event of a disruption scenario.

1.5 On-going Review and Planning

Planning for the winter season is an ongoing process within Manchester Airport. However, owing to the general prevalence of inclement weather during the Winter season the following steps will be taken in readiness for the onset of Winter:

- Between April and September, the Head of Airfield Operations will host meetings with the internal response teams including Terminal Operations, Monitoring & Control, Landside Operations and Asset Maintenance to set resource and equipment plans and agree any required changes.
- Training will commence over each summer season for staff operating snow and ice clearing equipment.
- Table-top exercises will be conducted from September onwards and throughout the season to test and review various components of the Inclement Weather Plan.
- 'Live' testing will be carried out in November to simulate inclement weather events. This will be conducted jointly across Airfield Operations, Assets Maintenance, MAFRS and Air Traffic Control.
- Consultation will take place with Airlines & key Service Partners on an ongoing basis throughout the season.
- The annual Inclement Weather Plan will be published in November, following which all operators must ensure that their staff are conversant with its content, and feedback any comments or requested alterations.

- Manchester Airport teams will complete a readiness check at the start of each shift during the Winter season to confirm the status of respective assets (including snow fleets) and anti-icing media and grit. This shall be reported in respective logs, thus appraising senior management of the airport readiness state.

- At the end of each winter season, the Head of Airfield Operations will organise an 'internal wash-up' review, the purpose of which will be to review the Inclement Weather Plan in the light of experience. As part of this process, airlines and handling agents will be invited to provide MA with feedback.

The Inclement Weather Plan will be updated on a minimum of an annual basis, with any changes effective from November. A more frequent seasonal review will take place throughout the year to ensure learning and best practice from prior events is adopted going forward.

2. Disruptive Weather Status

The Disruptive Weather Status Matrix (DWSM) provides a clear gateway decision-making process with which pertinent weather information can be disseminated to the Community.

Disruptive Weather Status (DWS)	Criteria	Communication	Actions to be taken upon DWS declaration
DWS 72	Disruptive weather in 72hr forecast • Snow/Sleet • AODM to use discretion to declare based on other disruptive weather deemed to be potentially disruptive	<u>Airside</u> • AODM to communicate information via Community App (DWS 72 – Disruptive weather warning [snow/high winds/flooding] over the 3-day period between [DAY] to [DAY] • AODM to update ADM • ADM to consider holding a Community conference call based on severity and available intelligence <u>Landside</u> • ADM receives update from AODM and updates LDM • LDM provides regular updates to ADM on landside status as required • LDM to update MAG FM	<u>Airside</u> • AODM to ensure AOps vehicles and equipment fuelled and serviceable • AODM to ensure adequate stock for both Aircraft/Apron available via de-Icing providers and Asset Maintenance • AODM will continually monitor for possible change in status <u>Landside</u> • AODM to continually monitor DWS and liaise with ADM for possible status change and update the LDM • LDM to obtain report from Mitie o Vehicles and equipment fuelled and serviceable o Adequate stock for both grit bins and vehicles

DWS 48	Disruptive weather in 48hr forecast
	
	• Snow/Sleet
	• AODM to use discretion to declare based on other disruptive weather deemed to be potentially disruptive
		<u>Airside</u>
		• AODM to communicate information via Community App (DWS 48 – Disruptive weather warning [snow/high winds/flooding] over the 2-day period between [DAY] to [DAY])
		• AODM to update ADM
		• ADM to consider holding a Community conference call based on severity and available intelligence
		<u>Landside</u>
		• ADM receives update from AODM and updates LDM
		• LDM provides regular updates to ADM on landside status as required
		• LDM to update MAG FM and S&B service delivery manager.
			<u>Airside</u>
			• AODM to ensure vehicles and snow equipment fuelled and serviceable.
			• AODM to re-check adequate stock for both Aircraft/Apron available via De-Icing providers and Asset Maintenance
			• AODM will continually monitor for possible change in status.
			<u>Landside</u>
			• LDM to obtain report on following from Mitie
			  ○ Vehicles and equipment fuelled and serviceable
			  ○ Adequate stock for both grit bins and vehicles
			• ADM to continually monitor DWS for possible status change and update the LDM

DWS 24	Disruptive weather in 24hr forecast
	
	• Snow/Sleet
	• AODM to use discretion to declare based on other disruptive weather deemed to be potentially disruptive
		<u>Airside</u>
		• AODM to communicate information via Community App (DWS 24 – Disruptive weather warning [snow/high winds/flooding] over the next day on [DAY])
		• AODM to update ADM, EBDM, ATCWM, Fire Chief as required
		• Conference call with the community to be arranged. ADM to chair.
		<u>Landside</u>
		• LDM initiates Landside Operations Incident Management Hub
		• ADM receives update from AODM and updates LDM
		• LDM provides regular updates to ADM on landside status as required
		• LDM to update MAG FM and S&B service delivery manager
		• ADM and LDM to participate in conference call if held, as terminals and landside representative
			<u>Airside</u>
			• AODM to ensure vehicles and weather equipment are in preparatory state for mobilisation
			• AODM to ensure sufficient personnel are available for call-in if required to provide snow cell/snow clearance/adverse weather clearance
			• AODM to re-check adequate stock for both Aircraft/Apron available via De-Icing providers and Asset Engineering
			<u>Landside</u>
			• LDM to obtain report on following from Mitie and advise of 'standby position'
			  ○ Vehicles and equipment fuelled and serviceable
			  ○ Adequate stock for both grit bins and vehicles
			• ADM to continually monitor DWS and liaise with ADM for possible status change then update LDM
			• LDM to ensure sufficient personnel are available for call-in if required to provide enhanced presence in the Landside areas (including the Control Room), to provide cover if the DW restricts staff availability and to ensure a constant presence on the road network of FCM.

DWS 12	Disruptive weather in 12hr forecast
	
	• Snow/Sleet
	• AODM to use discretion to declare based on other disruptive weather deemed to be potentially disruptive
		<u>Airside</u>
		• AODM to communicate information via Community App (DWS 12 – Disruptive weather warning [snow/high winds/flooding] over the next 12hr period between XXX times)
		• Conference call with the community to be arranged. ADM to chair
		• LDM to join
		• AODM to update ADM, EBDM, ATCWM, Fire Chief as required
		<u>Landside</u>
		• ADM receives update from AODM and updates LDM
		• LDM provides regular updates to ADM on landside status as required
		• ADM and LDM to participate in conference call if held, as terminals and landside representative
		• LDM continues to chair Landside Operations Incident Management Hub
		• LDM to update MAG FM and S&B service delivery manager
		• Update the Landside Events group
			<u>Airside</u>
			• AODM will activate personnel call out to initiate snow disruptive weather clearance teams including snowman apron
			• AODM to ensure vehicles and weather equipment are in preparatory state for mobilisation
			• AODM to re-check adequate stock for both Aircraft/Apron available via De-Icing providers and Asset Maintenance
			• DSP activation to be considered (last resort only)
			<u>Landside</u>
			• LDM to activate Mitie disruptive weather personnel and equipment
			  ○ Vehicles and equipment activated
			  ○ Adequate stock for both grit bins and vehicles restocked
			• ADM to continually monitor DWS and liaise with AODM for possible status change
			• LDM to activate personnel call out to provide enhanced Landside presence (including the Control Room) and ensure strategic staff deployment
			• LDM to advise Social Media Team that a disruption letter could be needed. Particularly important if the event is occurring over the weekend

DWS Level 1	Disruptive weather evident	Airside
		• AODM to communicate information via Community App (DWS Level 1 – Disruptive weather [snow/high winds/flooding] expected between [TIME] – [TIME]
		• Conference call with the community to be arranged. ADM to chair (or suitable deputy)
		• 'IMC Standby' initiated but not active
		Landside
		• ADM receives update from AODM and updates LDM
		• LDM provides regular updates to ADM on landside status
		• ADM and LDM to participate in conference call if held, as terminals and landside representative
		• LDM to update MAG FM and S&B service delivery manager and update the Landside Events group
			Airside
			• Personnel are allocated to disruptive weather equipment
			• Snow Cell fully operational
			• Airside disruptive weather treatment in progress
			Landside
			• LDM to activate Mitie disruptive weather personnel and equipment
			  ○ Vehicles and equipment activated
			  ○ Adequate stock for both grit bins and vehicles restocked
			• LDM will instruct the Landside Operations team to commence surface treatment operations of the CTOC, MA road network and associated Car Parks
			• LDM to obtain status information on local road network and liaise with ADM, CTOC, GMP, MA road network and associated Car Parks
			• ADM to continually monitor DWS and liaise with AODM for possible status change.
			• If a roadway or car park floods, assess the danger to staff / guests and block road / car park area off if safe to do so. Contact the airport fire brigade to attend to understand if they can assist in pumping the water away
			• If a car park cannot be accessed due to bad weather a Traffic Marshal will need to be positioned at the car park to intercept guests / staff and direct to the alternative car park
			• LDM to strategically deploy personnel to provide adequate cover for the Landside operation
			• If flights are cancelled the LDM will notify the Social Media Team to issue an email to all car park bookings outlining any known disruption and potential options.

DWS Level 2	Significant disruptive weather occurring	Airside • AODM to communicate information via Community App (DWS Level 2 – Major disruption due to [snow/high winds/flooding] expected) • Conference call with the community to be arranged. ADM to chair • ADM to activate IMC (1hr response time) Landside • ADM receives update from AODM and updates LDM • ADM and LDM to participate in conference call if held, as terminals and landside representative • LDM to update MAG FM and S&B service delivery manager • LDM to chair Landside Operations Incident Management Hub • Update the Landside Events group.	Airside • Airside disruptive weather treatment in progress • Community communications managed by IMC Landside • Community communications managed by IMC • LDM to provide IMC with status information on local road network • LDM to liaise with CTOC, GMP, MA and local road network and associated car parks • Landside disruptive weather treatment in progress • ADM to continually monitor DWS and liaise with AODM for possible status change • If a roadway or car park floods, assess the danger to staff / guests and block road / car park area off if safe to do so. Contact the airport fire brigade to attend to understand if they can assist in pumping the water away • If a car park cannot be accessed due to bad weather a Traffic Marshal will need to be positioned at the car park to intercept guests / staff and direct to the alternative car park. • LDM to strategically deploy personnel to provide adequate cover for the Landside operation • If flights are cancelled the LDM will notify the Social Media Team to issue an email to all car park bookings outlining any known disruption and potential options.

DWS Level 3	Operational suspension due to disruptive weather*	Airside • AODM to promulgate communicate via Community App (DWS Level 3 – Major disruption due to [snow/high winds/flooding] expected) • Conference call with the community to be arranged. ADM to chair (IMC Manager to chair when IMC is active). • IMC active Landside • ADM receives update from AODM and updates LDM • ADM and LDM to participate in conference call if held, as terminals and landside representative • LDM to update MAG FM and S&B service delivery manager and update the Landside Events group • LDM continues to chair Landside Operations Incident Management Hub	Airside • Airside disruptive weather treatment in progress • Community communications managed by IMC Landside • LDM to provide IMC with status information on local road network • LDM to liaise with CTOC, GMP, MA road network and associated Car Parks • Landside disruptive weather treatment in progress • If a roadway or car park floods, assess the danger to staff / guests and block road / car park area off if safe to do so. Contact the airport fire brigade to attend to understand if they can assist in pumping the water away. • If a car park cannot be accessed due to bad weather a Traffic Marshal will need to be positioned near to the car park to intercept guests / staff and direct to the alternative car park. • If flights are cancelled the LDM will notify the Social Media Team to issue an email to all car park bookings outlining any known disruption and potential options. • LDM will be responsible for deploying personnel to provide adequate cover for the Landside operation

* This status may be initiated outside of the prescribed sequence on occasions whereby winter conditions may not be affecting Aerodrome infrastructure and/or services but the ability to clear aircraft of contamination is compromised, resulting in delays and disruption. This may occur where the DWS triggers have not been met and the DWC may not be operational. Aircraft de-icing providers are required to liaise directly with the AODM and raise any concerns over capability against forecast predictions. Initiation will be made via the Airfield Operations Duty Manager and communicated via the Community App.

3. Airport Response Initiation and Notification

3.1 Forecasting Tools and Accountability

The AODM shall be the primary weather assessor for airport-wide weather and will agree the associated inclement weather status with the ADM.

Manchester Airport uses the following meteorological services to assess the threat to airport operations during the winter period.

- A bespoke Weather Forecasting Service procured from StormGeo which provides an airfield specific prediction of frost, ice or snow through the provision of a rolling 24-hour forecast, and a 2-5-day outlook
- Aviation Weather Warnings issued by the Met Office (TAF – Terminal Aerodrome Forecast)
- Telephone briefings with the Aviation Forecaster at the StormGeo HQ in Aberdeen
- Actual runway surface temperature data acquired from sensor devices

The following postholders are responsible for coordinating departmental response plans and keeping each other informed of significant changes or concerns which could affect the airport operation

- ADM - Overall Airport Management
- AODM - Airfield Operations
- CSDMs - Terminal Operations
- EBDM - Asset Maintenance
- LDM - Landside Operations

3.2 Notification Cascade

The Head of Airfield Operations shall remain appraised of the inclement weather forecast and provide regular updates to the Aerodrome Director who shall escalate as required. These shall be in addition to the Community App updates and community conference calls.

At the onset of DWS Level 1 or as required the following notification cascade shall occur in addition to that included in the DWS matrix.

- AODM to brief Head of Airfield Operations
- Head of Airfield Operations to brief Aerodrome Director
- ADM to brief Airport Control Director
- Aerodrome Director to brief Chief Operating Officer
- Chief Operating Officer to brief Managing Director
- Managing Director to brief MAG ExCo (as required)

3.3 Communication

3.3.1 Immediate Actions

Following the initial receipt of an inclement weather forecast (irrespective of the applicable DWS), the AODM shall initiate communication by completing the following actions (detailed in the DWS matrix):

1. Brief key postholders of the forecast
2. Publish a summary of the forecast using the Community App (format in the DWS matrix)
3. Contact key postholders to ascertain asset serviceability/availability

3.3.2 Community Conference Calls

Conference calls are recognised as an effective method to:

- Provide detailed updates to the community of specific risk periods to aid planning
- Discuss potential operational risks and prepare appropriate responses ahead of inclement weather

The ADM shall chair the community conference calls and use the Microsoft Teams platform to do so. Invites shall be sent to all relevant individuals. The ADM will use discretion when deciding to hold a conference call ahead of inclement weather. It is recognised that there is likely to be an optimum time to hold such a call once a reasonable likelihood of inclement weather is forecast, and at a time which will provide the most value to the community. However, a conference call shall be held no closer to forecast inclement weather than DWS24 to enable effective planning.

The following postholders shall ensure they are present on the call to provide an update to the community on their respective areas, if required:-

- AODM - Airfield operations
- CSDMs - Terminal operations (incl. security)
- LDM - Landside (car parks, road network, rail, bussing and forecourts)

StormGeo will wherever possible provide a forecaster on each call to aid decision-making and refine the forecasted disruptive period to areas of key risk.
The ADM will follow community conference calls with an email update detailing key points covered and operational readiness of key areas.

3.3.3 Customer Notification

- Upon confirmation from AODM that status is DWS 12, MAN social media team will be advised by ADM to update all our social media channels with pre-notification of predicted inclement weather at the airport. If this notification occurs OOH, the on-duty emergency press office will be contacted to update all contact channels.
- CAVU are to be advised to update the notification ticker on MAN website at DWS 12 with notification that we are expecting inclement weather at the airport.
- At DWS Level 1, the on-duty LDM is to arrange distribution via email of guidance regarding adverse weather conditions to all customers with car park bookings arriving within the next 24 hours. This email will advise all upcoming guests to the airport to expect adverse weather conditions at the airport, to allocate additional time to travel to the airport and to take additional care upon arrival to the site.

3.3.4 Downgrading of DWS

In order to ensure the community are conversant with the latest threat status, the AODM and ADM must ensure messages are issued to confirm any downgrade in threat status.

For example, if DWS Level 1 is in force, snowfall has ceased, and airport operations are normal a message should be issued via the Community App confirming the most relevant DWS (appreciating there may be a further inclement weather forecast. The message should include a plain English statement of the latest position.

3.4 Liaison with Highways Agency and Adjoining Highways Authorities

MAG recognises that MAN airport is a key destinations in the North-West and as a result a significant amount of vehicular traffic travels to and from the site across the region and beyond each day. Given this, the availability of the local, regional and inter-city highway network is paramount to the continued operation of the airport.

Hence, during periods of severe weather – particularly heavy snowfall – contact will be maintained with both National Highways and Greater Manchester Police (GMP) and adjoining highway authorities regarding the condition and availability of the road network in the Greater Manchester region and beyond. This will be particularly important in assessing whether it is likely significant numbers of customers and staff are likely to be unable to travel to their intended destination and may therefore require assistance from MAN or their employers.

In order that a strategic view of the situation can be obtained, it is suggested that all contact with the HA and adjoining authorities be done through the IMC.

GMP Control Room	-	0161 856 0250
National Highways Regional Control Centre number	-	01925 298 083
National Highways customer contact centre	-	0300 123 500

4. Incident Management Centre (IMC)

4.1 Activation

The IMC will be activated by the ADM when deemed necessary to declare DWS Level 2. The IMC is responsible for the airport wide response strategy and managing overall communications with internal and external stakeholders. Access to the IMC will be restricted to MAG personnel who have been appointed to carry out a substantive management or supporting role within the IMC Organisation Structure. Initially the IMC will be chaired by the ADM until such time management representatives from key operational areas are present on site.

Upon notification of an IMC event, the duty IMC manager will make use of the QRH impact matrix to assess the initial IMC response required. They will contact key postholders in operational areas and confirm a call schedule for the disruptive weather period. This will ensure regular operational updates but avoid operational overload of the duty management teams.

As soon as is reasonably practicable, the IMC team will establish a 'Recovery Time Objective' to estimate when the airport operator believes normal operations will resume. This will likely be beyond the time at which the inclement weather ends and will aid stakeholders' strategic planning.

4.2 Leadership & Attendance

Management representatives from MAG will attend the IMC and maintain communications with the Airport Community. Details of this will be sent via the Community App or email where applicable.

4.3 Community Briefings

When the IMC is active, customer and service partner enquiries and requests relating overall airport operational disruption should be routed via the IMC. The contact telephone numbers for IMC will be promulgated to airport users via the Community App or email where applicable. The DWC may be contacted for specific airside operational issues.

During periods of prolonged snowfall or severe inclement conditions, the IMC will establish a schedule of community briefing calls via email or conference call, details of which will be communicated via the Community App. These will include details pertaining to the airport status, response and recovery timelines. Questions will be taken on request and answers returned when information is available if not immediately so. In the event of DWS 2 & 3 a debrief will be conducted by the Resilience Team, this will be by Microsoft Forms. The actions and recommendations from the debrief will be shared at the relevant Safety and Resilience Forums for action and escalation.

4.4 Landside Operations Incident Management Hub (LIH)

4.4.1 Activation

The Landside Incident hub will be activated when the LDM deems it necessary to declare the Disruptive Weather Status at DWS 24 (significant disruptive weather occurring) The incident hub is responsible for the Landside operational response, strategy and managing communications with internal and external stakeholders. Access to the LIH will be restricted to MAG personnel who have been appointed to carry out a substantive management or supporting role within the Landside Organisation Structure. The LIH will be chaired by the LDM.

4.4.2 Purpose

The LIH will be responsible for directing the Landside operation response and recovery from significant disruptive weather. The main stakeholders it will communicate with are MCC, Mitie, National Highways, GMP and Fire Service.

Internal communication will continue with the ADM, CTOC, CPTM, CPOM, Head of Landside Operations, Aerodrome & Landside Operations Director and IMC.

The Landside Incident hub will be de-activated once normal Landside Operations are resumed.

4.5 Priority Ground Movement

During severe disruption and in the interests of passenger welfare and management of ground capacity, individual inbound aircraft may be directed by IMC, via ATC, to alternative parking positions.

These specific instructions will only be made in the event that passengers are likely to be held on-board an aircraft for an unacceptable length of time and/or current positioning of the aircraft on the taxiways is causing ground capacity constraints.

Due to the nature and criticality of the movement, all decisions made by IMC will be final and must be complied with.

5. Reporting

Following a period of inclement weather, the HOAO or a nominated deputy shall create a report for MAN senior leadership which details the impact of the affected period.

The report shall be produced with the support of Landside and Terminals teams and represent an overall airport-wide summary of the measures deployed and operational impact. The report shall include reference to the following (not exhaustive):

- Asset availability
    - Runways
    - Taxiways
    - Aircraft stands
    - Car parks
    - Forecourts
    - Terminals
- Performance (key business metrics)
    - OTP
    - Last bag performance
    - Delays (AM and AF-attributable)
    - Remotes (unplanned)
    - NPS
- Weather
    - Actual vs. forecast conditions
- Response
    - DWS category
    - Communication timeline
    - Response deployed with cost incurred
- Continuous Improvement
    - Learnings and best practice to carry forward

6. Environmental Considerations

6.1 Drainage System Requirements

Prior to the instigation of anti-icing procedures in the airside environment, the AODM should obtain positive confirmation from the EBDM that the drainage system has been placed into 'containment' in the relevant Catchments Areas.

This is to prevent anti-icing materials from contaminating local watercourses, a mandatory requirement of the Environment Agency. During the winter months, following a review of the midday weather forecast, the AODM should advise the EBDM of the likelihood of anti-icing action.

6.2 Runway 05R/23L

It should be noted that the grass areas surrounding the final 750 metres of Runway 23L (i.e. west of the drainage lagoons) cannot be contained. Therefore, brushing contaminated snow onto the grass should be avoided wherever possible.

6.3 Western Maintenance Area (Fairey's Apron)

Similarly, Fairey's Apron cannot be contained, and therefore the distribution of anti-icing materials is not permitted in this area.

West side of slot drain (non-containment)

- No treatment permitted exception to rock salt as per 6.3 below.

East side of slot drain (containment)

- No treatment is preferred and should be avoided where possible.
- Prills can be deployed when there is operational justification.

However, a moderate distribution of rock salt along pedestrian walkways is acceptable, subject to tenants being notified of this action in advance. The agents concerned are:

- The Hut Group (THG)
- Jet2 Engineering

6.4 Stand Clearance

Rock salt cannot be used to treat airside roads due to its highly corrosive nature. Tractor mounted brushes and ploughs will be used on airside roads, supplemented by the use of liquid and solid anti-icing chemicals. The chemicals permitted for use on the airfield are known to be less effective at thawing ice deposits; therefore, it is essential that airside drivers take extra caution when using the airside road system and during aircraft turnaround.

7. Key Postholder Responsibilities

7.1 Airport & Landside

The **Airport Duty Manager (ADM)** is responsible for:

- To initiate the required landside and terminals actions as per this Inclement Weather Plan if the forecast indicates that the airport is to experience weather conditions in line with the DWS matrix.
- To instruct the Operations Manager of MA's Winter Operations Service Partner (WOSP) to commence pre-treatment or snow clearance operations.
- To activate the Incident Management Centre (IMC) if required, or requested to do so by the AODM.
- In the event of a severe and/or prolonged snow event, to act as the principal link between the landside snow clearance teams and the IMC.
- To receive and disseminate regular updates to the IMC regarding the progress on snow/ice clearance.

The **Landside Duty Manager (**LDM**)** is responsible for

- Instigating LIH from DWS 24
- Serve as primary internal landside contact for disruptive weather responses, gaining reports from all key landside managers and provide this to the TDM when a change to the DWS occurs or as requested.
- Responsible for the management of the Control Room, Traffic Marshals and the associated supervision of the forecourts, CCTV system, exit barriers, road network and car parks ensuring safety and efficiency.
- Liaise with external network providers including MCC, National Highways, GMP or Fire Service to update on airport-related network concerns.
- Serve as the primary contact for the WOSP (Mitie) including responsibility to initiate the WOSP response when air temperatures are predicted to be 3 degrees or less. To provide a minimum of 2 hours' notice to Mitie with instruction to complete full site gritting.
- Contact to be made to Mitie as follows:
    - FOH Duty Manager – 07384 238326
    - Duty Manager T1 – 07884 734825
    - Duty Manager T3 – 07884 734344

- Provide landside updates on scheduled conference calls to the Community, including IMC
- Update the landside page of the Community App with all pertinent information.
- Provide instruction to initiate the disruption email to all customers with car park bookings via Social Media Team
- Arrange dynamic workplace inspections of all forecourt areas, including taxi feeder park and private hire waiting areas

The **Facilities Manager – Soft Services** is responsible for:

- Ownership of the landside elements of the Inclement Weather Plan including processes and procedures, ensuring that the document is circulated to all relevant parties and any changes are communicated to affected or responsible parties.
- To regularly monitor the on-site stock of rock salt and arrange for supplies to be replenished as and when necessary.
- To ensure that accurate records of all pre-treatment activities are produced by MA's WOSP and to maintain these for a period of three years.
- In the event of a severe and/or prolonged frost / ice/ snow event:
    - Manage the landside snow clearance or ice treatment operations in conjunction with other MA units (i.e. Car Parks Operations, Customer Transport, LDM).
    - Act as the principal link between the landside snow clearance teams and the LDM.
- In the event of a severe and/or prolonged snow event, to act as the principal link between the landside snow clearance teams and the IMC.
- Ensure salt containers across Landside estate are full prior to Winter season and replenished as required

The **Winter Operations Service Partner (WOSP)** is responsible for:

- On instruction from the LDM, to ensure that the Landside Winter Operations team are informed of mobilising plans and the network is treated in accordance with the agreed priorities.
- To ensure that the landside winter operations equipment is properly maintained, and the vehicles always have an adequate fuel supply.
- To ensure that all winter operations equipment has been subject to a full service prior to the start of the winter season.
- Conduct serviceability checks on all winter operations equipment after each use.
- To ensure that all staff employed in winter operations duties are adequately trained and qualified to use the plant.

- To ensure that regular checks are made on the remaining stock in each rock salt bin
- Ensuring that rock salt storage bins are re-filled as and when required.
- To provide MA with accurate and timely records of all winter operations activities undertaken by them on MA's behalf.

The **Customer Transport Team Manager (CTTM)** is responsible for:

- Attend LDM LIH calls as requested. Update of all decisions taken which apply to weather response in reference to the below points including any support required, problems encountered or likely to be encountered with the transport operation. Continue to provide Landside Incident Management live updates when required.
- Ensure CTOC & CTAC vehicles, roadways, manoeuvring area & walkways are planned accordingly.
- All equipment required is available.
- Confirm resource plan meets weather response requirement across all areas.
- Inform Customer Transport Team of adverse weather conditions and manage areas accordingly. Provide team with regular updates.
- Arrange dynamic workplace inspections of CTOC and CTAC

The **Car Park Team Manager (CPTM)** is responsible for:

- Attend LDM LIH calls as requested. Update of all decisions taken which apply to weather response in reference to the below points including any support required, problems encountered or likely to be encountered within the car park operation
- Make assessment of likely risk to car park operation at the start of each shift during which a DWS has been declared (self-park or assisted parking).
- CPTM to inform all Meet & Greet/Drop & Go drivers of adverse weather condition warnings, monitor situation during shift, obtain regular updates from drivers regarding current conditions in car parks. Ensure all staff have correct PPE, de-icing equipment etc.
- Ensure the passenger arrivals areas are gritted, making the request directly to the LDM.
- Ensure salt containers are full prior to November each year and monitor levels throughout the season.

- Monitor surface condition of car parks (including decking) and close if unsafe for vehicles or pedestrians. Mid Stay, Short Stay and top level of all MSCP's are areas of importance
- Ensure that all staff employed in winter operations duties are adequately trained and qualified to use equipment.
- Arrange dynamic workplace inspections of all self-park car parks in addition to all Meet & Greet products as well as Drop & Go and surrounding areas

All Landside Users are responsible for:

- Drivers must advise Control room of road, car park, terminal forecourts and bus stops conditions.
- Control room provide pertinent updates on surface weather conditions and potential safety concerns to LDM.

7.2 Airside

The Head of Airfield Operations is responsible for the planning, organisation and annual review of the Inclement Weather Plan, and is responsible for the aerodrome response under the Inclement Weather Plan and for ensuring that key post holders and Airfield Operations staff are fully conversant with their roles, operational procedures and regulatory requirements.

The Engineering and Baggage Duty Manager (EBDM) is responsible for:

- Provision of equipment and resources for anti-icing and snow clearing on the airfield.
- Mobilisation of snow fleet to its designated forward holding area. (Seasonal holding for November to March only).
- Ensuring the readiness of the Engineering Team by 1st November each winter.
- Ensuring that arrangements are made for suitable supplies of anti-icing/de-icing materials throughout the winter period.
- Ensuring that snow clearing and anti-icing equipment is checked and serviceable for use by 1st November each winter.
- Ensuring that sufficient stocks of anti-icing and de-icing materials are maintained throughout the winter season.
- The training of all MA staff using the specialist snow and ice clearing equipment.
- Out of hours re-ordering of anti-ice media stock.

- Taking appropriate actions to contain drainage systems and thereby prevent contamination of watercourses.
- Providing assistance to the Snow Cell in supplying resources to support contingencies in the event of unexpected failures of essential infrastructure.
- Out of hours re-ordering of anti-ice media stock.

The Airfield Operations Duty Manager (AODM) is responsible for:

- Monitoring meteorological conditions, forecasts and warnings and disseminating them as necessary. Continual assessment of surface temperatures to determine treatment priorities.
- Identify any requirement to increase anti ice media stock on site to an enhanced quantity as per MA De-icing strategy document.
- Determine the need for activating staff call-out procedures according to the threat of snow and ice and activating the Snow Cell.
- Advising the EBDM of the use of anti-icing chemicals on the airfield and the locations to be treated (records to be maintained by the EBDM).
- Directing the snow or ice clearance operation and overseeing allocation of equipment and personnel.
- Coordinating stand availability and the operational status of aircraft parking stands between Snowman Aprons and Airfield Control.
- Communicating tactical activity and decisions within the Snow Cell.
- Determining resource needs in conjunction with the Snow ETM and coordinating allocation of resources.
- Providing regular airfield status reports to Snowman Terminals, and/or IMC (if active).
- Maintaining detailed logs of clearance and treatment activities, taxiway closures and ATC flow restrictions.
- Ensuring that information relating to the operational status of the airfield is promulgated to airline customers and service partners via the Community App, in conjunction with the IMC or Snowman Terminals. Such messages should include details of snow closures and ATC flow restrictions. The IMC will perform this function when active.
- Promulgating any change in operational status of the airfield via SNOWTAM and NOTAM.
- General welfare of staff engaged on standard shift duties.

- Ensuring that Airfield Operations staff have been deployed in accordance with operational needs.
- Triggering the Excess Traffic Plan as required.
- Ensuring the Airfield Operations Controllers are conversant with their responsibilities under the Inclement Weather Plan, to include Departure Sequencing Protocol.
- Initiating airside snow clearance or ice treatment operations.

Snowman Airfield (OPS6) is responsible for:

- Initiating airside snow clearance or ice treatment operations.
- Conducting assessments of runway surface state in accordance with CAA requirements and ensuring accurate reports of contaminated runway surface state are promulgated to pilots.
- Ensuring surface inspections of the Manoeuvring Area are conducted and conditions monitored to ensure that ongoing aircraft operations are conducted safely.
- Ensuring surface inspections of the Perimeter track and crash gate access point are conducted and conditions monitored to ensure safe access and egress can be conducted safely.
- Promulgating any change in operational status of the airfield to the Airfield Operations Duty Manager.

The Airfield Liaison Manager (ALM) is responsible for:

- Reviewing stand allocation plans during periods of prolonged snowfall and operational disruption.

Snowman Terminals is responsible for:

- Initiating and managing the Landside snow clearance or ice treatment operations.
- Liaising with Car Parks Operations to determine priorities for gritting operations.
- Ensuring that ongoing Terminal forecourt and Car Park operations are conduct
- safely.
- Communicating information regarding the airport's operational status and predicted disruption to the Airlines, Service Partners and MA Press Office. Activation of Call Informer messages in conjunction with the AODM.
- Activating the IMC if required, or requested by the AODM.
- Triggering the internal communications process during severe snowfall situations, therefore ensuring the entire MA workforce is conversant with proceedings.

- Triggering the Passenger Welfare Plan as required.

The Snow EBDM is responsible for:

- Calling in additional staff resources to supplement the snow clearing operation (EMT Admin Assistant between 07:00-16:00 Mon-Fri).
- Allocating staff resources to available equipment.
- Allocating call signs to staff operating snow clearing equipment
- Provision of and filling of "yellow bins" on aircraft stands with appropriate solid de-icing material.
- Coordinating the snow clearing or anti-icing teams in operation as requested by the AODM.
- Keeping logs of areas treated and quantities of materials used.
- Conducting and recording routine surface inspections of airside roads, equipment areas and green passenger walkway areas.
- Ensuring that any equipment faults are reported to MT (Snow Fitter) and maintaining a log of equipment plant that is in/out of service.
- Taking regular measurements of anti-icing and de-icing materials and reporting stock levels to the AODM.
- General welfare of staff driving snow and ice clearing vehicles.

Snowman Aprons is responsible for:

- Conducting and recording regular checks of the operational status of aircraft parking stands.
- Informing the Snow Cell & Airfield Control of stand availability and the operational status of parking stands.
- Agreeing priorities for treatment of parking stands with Airfield Control.
- Aid ATC in moving inbound taxying aircraft to forward holding points off-stand to ease taxiway congestion.
- Inspecting stands prior to use, ensuring sufficient clearance has taken place to facilitate turnaround of the maximum size aircraft intended to use that stand.

The Airfield Operations Controllers are responsible for:

- Liaising with Snowman Aprons to determine stand clearance and treatment priorities, providing advance notification of aircraft movement schedules.
- Updating the stand allocation plan to reflect the availability of aircraft parking facilities.

- Issuing Community App updates, at the request of Snowman Terminals or the AODM.
- Ensuring an appropriate area is made available as a parking area for the snow fleet, at the request of the AODM.
- Ensuring that agreed stands are closed to facilitate the implementation of snow dumps.

The Aircraft de-icing providers are responsible for:

- At the onset of DWS 12, report to the AODM who will assess the current threat of snow under DWS 12 and will advise if the Snow Cell should be populated.
- Maintain attendance until such time as the specific winter threat has passed.
- Liaise with Snow cell management and provide regular operational performance updates.
- Communicate any operational difficulties to the AODM immediately. Where necessary, advise the ADM of an emerging need for implementation of DWS 3 out of sequence.
- Maintain communications with your respective base of operations.
- Should the Departure Sequencing Protocol (DSP) be activated, provide information to determine estimated outbound flow limitations.
- Respond to published sequencing as per the DSP and manage resource accordingly.
- Communicate any change to status or operational capability to the AODM and/or Snow cell.

The Head of Motor Transport is responsible for:

- Ensuring that snow clearing and anti-icing equipment is properly maintained and has an adequate fuel supply.
- Ensuring that all winter operations equipment has been subject to a full service prior to the start of the winter season.
- Conducting of serviceability checks for all snow clearing and anti-icing equipment after each use.
- Provision of trained staff for attending to running repairs to snow clearing and anti-icing equipment when in operation.

The ATC Watch Manager is responsible for:

- Switching on airfield ground lighting when snowfall commences
- Coordinating with the ADM to establish priorities for snow clearing and to determine the tactical operational capability and flow restrictions to aircraft movements.
- Coordinating with the Scottish Control Centre concerning disruption to aircraft movements during snow clearing operations.
- Communication of accurate airfield status information to aircrew using ATIS and Essential Aerodrome Information via RTF.
- Providing meteorological reports through the OPMET system.
- Ensuring SNOWTAMS prepared by Airfield Operations are suitably promulgated.

The MAFRS Station Manager (Fire Chief) is responsible for:

- Ensuring Fire Station forecourts remain clear of snow and ice contamination, requesting assistance via Snow Cell if necessary.
- Ensuring access to Emergency RVP sites remain clear of snow and ice contamination, requesting assistance via the Snow Cell if necessary.
- Requesting regular updates of the airfield status from the Airfield Operations Duty Manager, with specific attention to emergency access routes and holding locations.
- Calling in additional staff resources to supplement the snow clearing operation as directed via the AODM.
- Ensuring the Fire Service provide personnel available for snow calls if required.

The Airfield Security Team Manager is responsible for:

- Ensuring Snow & Ice Clearing Vehicles are given priority at North and West Gate Security Entrance Points. Priority will also be given to Airfield Operations & Motor Transport personnel.
- Conducting regular inspections of North Gate, West Gate, South Side and Western Maintenance Area Security entrance points to ensure surfaces remain safe for vehicles and pedestrians, requesting assistance via the Snow Cell if necessary.
- Providing extra Hand Working resource and call out process to be allocated to the Snow Cell.

Aircraft Fuelling companies are responsible for:

- Ensuring equipment, materials and resources are available to clear snow and ice contamination from the west site fuel farm compound.

- Dispersing solid anti-icing granules in the airside fuelling vehicle parking area at Stand 65.
- Ensuring a system to maintain staffing resources is in place during periods of major disruption.

Airlines and Handling Agents are responsible for:

- Ensuring the Winter Operations 'Airside Safety Bulletin' issued by Manchester Airport at the beginning of each winter season is circulated amongst all 'front-line' airside workers and incorporated in daily shift briefings and tool-box talks.
- Ensuring operational teams are continually briefed with details of weather warnings disseminated by Manchester Airport.
- Verifying that aircraft parking stands are suitable for use immediately prior to an aircraft arriving on stand.
- Reporting observed snow or ice contamination on aircraft parking stands to Snow Cell (or IMC if active).
- Advising Asset Support Team (x3776 / x3678) in advance of carrying out any aircraft de-icing activity.
- Ensuring that passengers are not exposed to undue hazards whilst being escorted across the apron for boarding or disembarking, including safety of passenger steps, requesting support from MA if necessary.
- Advising passengers of inclement conditions and the presence of snow deposits where snow is falling or has recently fallen.
- Making use of de-icing materials stored in yellow bins to support the snow and ice clearance effort.
- Ensuring that ground service equipment is parked in marked equipment areas. Prepositioned equipment on vacant and occupied stands can impede snow-clearing operations.
- Supporting snow clearance activities by providing resources to push back aircraft, thus providing access to parking stands by snow clearing machinery.
- Where possible, assist in the clearance of snow on passenger walkways and access / egress routes.
- Inputting accurate time stamps always

All **Airside Staff** are responsible for:

- Taking extra precautions when snow and ice conditions are present.
- Adhering to the guidance and procedures contained in the Inclement Weather Plan and Airside Safety Bulletin issued at the beginning of each winter season, and periodically throughout the season.
- Reporting any areas that are potentially unsafe to Snow Cell (x8371) or via their operations office.
- Driving with extreme caution at speeds that take into account the surface conditions and the proximity of aircraft and personnel.
- Minimising vehicle movements over fresh snow as far as practicable. This prevents compaction of snow and thereby helps to make treatment and removal easier to achieve.
- Making use of de-icing materials stored in yellow bins to support the snow and ice clearance effort.
- Where possible, assist in the clearance of snow on passenger walkways and access / egress routes.
- Ensuring that ground service equipment is parked in marked equipment areas. Prepositioned equipment on vacant and occupied stands can impede snow-clearing operations.

8. Snow Conditions

8.1 Structure and implementation of response plans

The AODM shall use the TAF to determine the presence of snow conditions in a 12hr forecast. Snow conditions shall include anything up to and including a 30% probability forecast in the TAF. Is there where I put the contact numbers for LDM to call for gritting and escalation numbers if required?

8.1.1 Disruptive Weather Cell (DWC) – Snow and Ice conditions

The purpose of the DWC is to provide primary management and oversight of the snow clearing and aircraft de-icing operation. DWC will also coordinate the distribution and exchange of information to IMC on airfield operational matters during periods when the airport is affected by snow or ice. The DWC will become active at DWS12 and be based at the Airfield Operations Unit on stand 64 or remotely as required.

The following structure and processes apply to snow and ice conditions and should be instigated in both scenarios. DWC will consist of key airfield-related stakeholders (dependent on the inclement weather threat) including:

- AODM (chair)
- Aircraft de-icing provider representatives
- Snow EBDM
- Snowman Airfield
- Snowman Apron
- Snowman Terminals

During a snow event specifically, the DWC shall perform the following tasks:

- Allocate snow clearing teams as per the priority clearance lists
- Coordinate aircraft de-icing operations (in accordance with section 8.4.2)
- Coordinate tactical aircraft tows from areas (particularly T2) which may not have been treated in accordance with the Priority listing.
- Provide a single, airfield update to IMC (if active) or via the Community App/CHROMA and/or conference calls as required

The contact number for the Snow Cell is +44 (0)161 489 8371 (or Airport Extension x8371).

In addition, Snowman Apron will be allocated to liaise directly with Airfield Control from the airfield, providing a link which enables coordination of the clearance of snow from aircraft parking stands according to operational needs. Snowman Apron will also be responsible for updating the DWC on the overall status of aircraft parking stands.

In order of priority Snowman Airfield maybe one of the following:

- Airfield Operations Duty Manager called in for the purpose

In order of priority the Snow EBDM may be one of the following:

- Engineering and Baggage Duty Manager
- Any member of Engineering Management Team

In order of priority Snowman Aprons maybe one of the following:

- Airfield Operations Safety and Compliance Officer called in for the purpose
- Airfield Operations Duty Manager called in for the purpose

In order of priority Snowman Terminals may be one of the following:

- Airport Duty Manager
- Customer Services Duty Manager (T1, T2 or T3)
- Customer Liaison Manager (T1, T2 or T3)

8.1.2 Surface Inspection Regime

Upon notification of potential Snow conditions, an inspection of airport (airside and landside) surfaces will take place. These inspections will take place at regular intervals and logs will be kept. Whilst it is not practicable to carry out a continuous monitoring of all areas, the programme of inspections is determined to be suitable for aiming to keep as many of the accessible surfaces as possible free from the accumulation of snow. At the onset of DWS12 (or greater), the agreed inspection regimes are below:

- Airside areas - at least every 2 hours
- Landside areas - as required

A 'Loggist' may be deployed in the landside or airside operation to assist in the recording of accurate logs of all operational decisions taken (i.e. runway/taxiway/road/car park closure and reinstatement, details of areas cleared and treated, records of surface inspections etc.).

Areas of concern that are identified during the inspection process will be relayed to the Snow Cell and/or Snowman Aprons for clearing/treatment action to take place. If necessary, areas will be closed to pedestrians or traffic until treatment has taken place. Inspection frequency may be altered at the discretion of the Snowman Airfield if conditions are rapidly changing.

8.1.3 Airport Snow Closure Policy (SNOCLO)

8.1.3.1 Initiation and Notification

The presence of even small accumulations of wet snow can significantly affect the performance of aircraft and vehicles. A plan to clear runway(s), taxiways and major airside and landside roads will be initiated when the depth of accumulation is expected to exceed 3mm of slush or wet snow. Due to the nature of the operation, the AODM (and therefore the airfield operation) will make the decision to initiate a SNOCLO. A SNOCLO will last for a published minimum of 90 minutes and any improvement on this will be notified by the AODM.

The time of any SNOCLO will be notified to ATC and the airport community as far in advance as possible thus enabling operators to manage passenger communications, aircraft procedures and de-icing activities in the most efficient manner. The landside and terminal operation will continue to operate despite the suspension of flight operations. It is imperative that passenger welfare is prioritised and communications (most likely managed by the IMC) are frequent and accurate. Flight operations may continue until such time that the runway is formally closed for snow clearance however once snow has started to accumulate, continued operations will necessitate frequent inspections of the runway to ensure accurate surface state reports are available to pilots. Where possible, advanced notifications and coordination will take place between Snowman Airfield and ATC to prioritise and manage any imminent inbound or outbound movements.

Surface State reports will include the coverage, type(s) and depth of contaminant present in each third of the runway. The decision to close a runway will account for the need to remove contaminants from the runway, taxiway and road surfaces in a manner which minimises operational impact, but considers the risk that any accumulations of slush, standing water or wet snow may freeze if left untreated.

8.1.3.2 Light Snowfall

During or after a light snowfall, experience has demonstrated that a period of approximately 90 minutes is required to clear and anti-ice each runway. In these circumstances a SNOCLO message will be issued by SNOWTAM & NOTAM with an expected duration of 90 minutes. Landside areas and roads will also be treated during this closure time but there is a recognition

that passengers may continue to arrive or leave during a SNOCLO; teams will therefore use the procedures in section 7.2 of this plan to manage the clearance of snow across the estate.

This will be accompanied by a message to the Community App and displayed on the Chroma Fusion system. The IMC or ADM (dependent on the declared DWS) shall chair regular conference calls with the Community to keep them briefed on the situation.

8.1.3.3 Prolonged or Heavy Snowfall

During or after heavy snowfall, a longer duration of snow closure may be necessary. In these circumstances, a SNOCLO message will be issued by SNOWTAM & NOTAM promulgating the expected duration of closure. If circumstances dictate, the AODM and Snowman Airfield will consider the need to extend the estimated closure duration. This decision will be agreed between the AODM and IMC (if active) who will communicate this extension with the ADM, LDM and airport community via conference call, email, and the Community App. The 'SNOCLO Matrix' (refer to Appendix 12) details any estimated period of airfield closure dependant on the depth of snow accumulation present on airfield surfaces.

Landside areas and roads will also be treated during this closure time but there is a recognition that passengers may continue to arrive or leave during a SNOCLO; teams will therefore use the procedures in section 7.2 of this plan to manage the clearance of snow across the estate.

This will be accompanied by a message to the Community App and displayed on the Chroma Fusion system. The IMC or ADM shall chair regular conference calls with the Community to keep them briefed on the situation.

8.1.3.4 Runways – Possession

Whilst snow clearance is in progress on a runway, the runway will be closed by ATC and will remain under the control of Snowman Airfield. The remainder of the airfield manoeuvring area will continue to be under ATC control. The runway will remain closed until sufficient clearance of the Priority 1 Areas detailed in Section 11.1 and Appendix B have been completed to allow safe operations to resume.

Contaminated runway surface states will be reported to Air Traffic. The transmission will be made on the relevant VHF frequency. Runway surface states will never be passed to ATC by telephone. ATC are responsible for ensuring accurate runway surface states are passed to flight crews via Essential Aerodrome Information (RTF). This is particularly important when conditions are rapidly changing and the latest ATIS broadcast or SNOWTAM become quickly outdated.

The AODM is responsible for ensuring SNOWTAMS are updated or cancelled as and when necessary. When conditions become more stable, runway surface state information may be reported via ATIS & SNOWTAM.

8.1.3.5 Runways – Return to Service Procedure

A runway will only be returned to operational service once the removal of snow and ice contamination has taken place and the surface has been treated with ant icing materials. Any remaining minor deposits of snow or slush in isolated places will be notified to aircraft operators by SNOWTAM and/or ATIS. Assessments using Continuous Friction Monitoring Equipment (CFME) can provide inaccurate readings when undertaken on contaminated runways and when the air temperature is below +2 degrees centigrade. Additionally, there is no recognised correlation between CFME readings and the effects on aircraft braking. Therefore, UK regulation prohibits airport operators from providing CFME readings to pilots. ATC will be permitted to broadcast braking action reports provided by the pilots of previous aircraft movements. Such broadcasts will include the time of the observation and the aircraft type concerned. However, such information should be treated with caution.

The AODM/Snowman Airfield will adopt the following procedure when reinstating a runway for operational use under the control of ATC.

- Ensure that the runway surface has been inspected for FOD and is safe for use by aircraft.
- Ensure that all snow-clearing vehicles have vacated the runway. The AODM & Snowman Airfield will confirm that all Airfield Operations and snow-clearing vehicles are aware of the operational status of the runway by making a general broadcast on the CAPMAX snow and Airfield Operations talk groups. Appropriate read-backs must be obtained to confirm the information has been received and understood by all parties.
- Ensure when necessary that the aerodrome has been safeguarded for Category 3 operations and that all personnel are aware of the LVP state in force.
- Undertake a confirmatory runway inspection to verify the points 1-3 are in order.
- Confirm that an appropriate level of Fire Category is available.

Following the above actions, Snowman Airfield will complete the Runway Surface Condition Report PowerApp which will generate a GRF RCR to ATC. Consideration must be given to submit

a Situational Awareness Report to ATC in order to trigger a SNOWTAM if a runway remains contaminated.

This process must be followed by Snowman Airfield (OPS6) and must be completed via the relevant PowerApp (not to GMC, Watch Manager, or any other ATC personnel unless they are acting as Air Controller at the time of transmission). This message must not be made by telephone.
Upon closure MAFRS may deploy personnel to undertake snow clearing duties and therefore the MAFRS Fire Chief will liaise with the AODM/DWC to determine the available Fire Category before allowing operations to continue.

Subject to the schedule of movements (i.e. the maximum size of aircraft expected), the AODM and RFFS Fire Chief may elect to declare a reduced Fire Category to allow a limited number of RFFS personnel to continue snow-clearing duties. Any reduction in Fire Category must be promulgated to operators via RTF and NOTAM. During snow (and for consideration) the RFFS may be restricted to responding to domestic and medical calls due to access into areas which are yet to be cleared of snow.

8.2 Landside Procedures

8.2.1 Organisation

- LDM to activate Mitie disruptive weather personnel and equipment; Vehicles and equipment activated. Checks for adequate stock for both grit bins and vehicles.
- LDM will instruct the Landside Operations team to commence gritting if required on the CTOC, MA road network (See Appendix 7 for specific road responsibilities) and associated Car Parks.
- LDM to activate personnel call out to provide enhanced Landside presence (including the Control Room) and ensure strategic staff deployment.
- LDM to alert the Social Media Team to issue a disruption warning to all car park bookings.
- Consideration will be taken with regards to if car parks or forecourts have to be closed and what the alternatives would be (see Appendix 6).

8.2.2 Clearance Priorities

The following areas are prioritised for clearance.

- Footpaths, beginning with terminals working outwards of the estate

- 4 vehicles focusing on the road network (including forecourts and GTI), each prioritising the MA landside estate as per the following areas
    - T1
    - T2
    - T3
    - Up ramps of T1 MSCP/T1 Shorty Say/Mid-Stay/T2 East/T2 West
    - All on site car parks
    - Off-site car parks
    - Western Maintenance

- If a car park cannot be accessed due to snow a Traffic Marshal will need to be positioned at the car park to intercept guests / staff and direct to the alternative car park.
- CAVU are to be alerted of sending out a disruption warning letter to car park bookings. OOH the LDM will be responsible for issuing the letter.
- The alternative car park list is listed in Appendix 6.
- If the Forecourts are closed the alternatives are:
    - T1 Lower Forecourt closed – use T1 Upper Forecourt, followed by T1 Short Stay
    - T1 Upper Forecourt closed – use T1 Lower Forecourt, followed by T1 Short Stay
    - T2 Upper Forecourt closed – use T2 Lower Forecourt, followed by T2 West MSCP
    - T3 Forecourt closed – use T1 Lower Forecourt, followed by T3 MSCP
    - GTI closed – use GTI bays (if TFGM agree) if not use Palma Avenue

8.3 Airside Procedures

8.3.1 Organisation

When snowfall is expected within 12 hours (DWS12) and circumstances allow, the AODM will chair an operational briefing alongside the Snowman Airfield to brief airside clearance teams on any variation to Clearance Priorities, the location of Snow Dumps (if different to those detailed in sections 7.2 and 7.3.2 of the Inclement Weather Plan) and methods of communication. The ADM will also provide an overview of the weather forecast, and procedures for the mobilisation and forward holding of the snow fleet. The AODM is responsible for ensuring the appropriate communications channels are established and monitored in readiness for snowfall.

Whenever possible, a hard copy 'SNOW BRIEF' will be prepared in advance of snowfall. A copy of the brief will be issued to all staff engaged in snow clearing operations.

Snowman Apron will hold a telephone briefing with Airfield Control to discuss the stand allocation plan for the risk period and determine the priorities for inspecting, clearing and treating stands. The Snow EBDM will allocate personnel to snow clearing teams and equipment.

All personnel standing by for snow-clearing duties will remain in situ at the External Engineering Unit (Building 30) in anticipation of a request from the ADM to initiate snow clearance operations. Personnel will not be permitted to leave this location unless they have the express permission of the ADM.

8.3.2 Radio Communications

The ADM will ensure all airside snow clearance staff are transmitting on the appropriate digital radio frequencies as follows:

- Runway teams – CAPMAX Snow talk group
- Stand teams – CAPMAX Snow talk group
- Snowman Apron – CAPMAX Snow & Airfield Operations talk groups

The AODM will hold their usual mobile telephones and will be responsible for manning the DWC phone (x8371). The ADM will monitor CAPMAX Snow talk group and the Airfield Operations talk group.

- Snowman Airfield – 0161 489 3331 (option5)
- Snowman Aprons – 07958 877847
- The Snow EBDM – 07958 876164

8.3.3 Clearance Priorities

The following is a basic clearance plan, which may require adaptation to suit prevailing weather conditions.

Whenever a threat of snow with accumulation is forecast, the stands listed in the table below will be closed to aircraft and reserved for storing cleared snow, which in turn may result in an increase in remote aircraft parking. The stands will remain closed until such time a natural thaw occurs, or snow dumps can be moved to an alternative storage location. These areas may be adjusted according to the severity and longevity of snowfall.

In the event a severe snowfall scenario is forecast, snow dump locations will be dynamically managed by the AODM in coordination with Airfield Control to ensure stand capacity is maximised. Refer to Appendix 10 where snow dumps are permitted.

Storage of cleared snow on grass areas is avoided and is positively swept into drainage systems that collect run-off and contaminants for containment.

In accordance with CAA guidance, any contamination of surfaces with snow or slush will only be reported according to the percentage coverage, the depth and type of contaminant present on the runway(s). Measurements will be taken over each third of the runway, between 5-10 metres either side of the centreline (and away from any effects of wheel rutting). Conditions will be reported for each third of the runway length (i.e. Touch Down Zone, Mid-Point and Stop End). Contamination will be described as Ice, Dry Snow, Compacted Snow, Wet Snow, Slush or Standing Water. Measurement and the reporting of surface conditions will be carried out frequently during changing conditions to ensure pilots are in receipt of an accurate runway surface state report. This may require increased gaps in the traffic sequence in order to facilitate access to the runway by Airfield Operations personnel. The height and location of any snow banks will be reported as soon as these are likely to affect safe manoeuvring by the most critical aircraft operating.

8.3.3.1 Manoeuvring Area Clearance Priorities

Priority 1

- Runway 05L/23R (R1)
- Runway 05L/23R links at A, AE, B/BZ, BD, J, M, H & NA
- Small number of remote stands (due increased likelihood of remote parking)
- Taxiways A, D, J, B, L, P, JE, JF, G, R
- Access route to Runway 05L/23R from South Fire station via RET VD. Stand 61 Ground Equipment Assembly Point
- Key airside roads and taxiway crossings, incl. T2 Bussing Lounge access & PremiAir airside road
- Priority stands and other stands according to demand
- Emergency access to Fire Stations and Crash Gates (1, 13, 16, 19, & 20)
- Access to Emergency RVP1. Northside Fire Station
- Access to Emergency RVP South
- Access road to South Fire station off A538
- Airfield perimeter track to South Fire station and Pump Station access
- Access tracks to Crash Gates (14 & 15) in Bollin Valley
- CTAC

Priority 2

- Taxiways E, NA, NC, K & P, Z
- Additional aircraft parking stands according to demand
- Airside roads and access to Sub Stations B & C
- Cargo Lane to West Gate Security
- T2 service yard (following introduction to CP from 22/12/20)
- Airfield perimeter track from South Fire station to Midpoint turning circle
- Emergency access to Crash gates (6, 7, 8, 9 and 10)

Priority 3

- Taxiways C, Q
- Runway 05L/23R access/exit links at AF, AG, and H
- Maintenance Hangar areas, Signature Aviation Apron and ancillary areas

Priority 4

- Runway 05R/23L (R2)
- Runway 05R/23L access/exit links at T, VA, U, VB, VC Taxiways S, T, V and W, Y if required
- Runway crossings at DZ/D, FZ/F, HZ/H
- Access roads to Sub Stations
- Engine Test Bay – cleared if demand exists

As a principal the priorities depicted in Appendix 9 will be followed. However, due to specific operating conditions and movements rates, a decision may be made by the AODM, in conjunction with ATC WMGR and the DWC, to deviate from the priorities and direct resources to areas that may provide greater tactical opportunities at any given time. Taxiways will be cleared in accordance with the plan detailed in Appendix B. MA will endeavour to clear taxiways to full pavement width, although it is possible that some operational taxiways will remain contaminated with snow as the clearing operation continues. Where contamination is such that AGL is not visible to pilots, or the surfaces are contaminated with ice, the taxiway will remain closed until such time they have been cleared and treated.

Priority will also be diverted to ensuring pavement areas between the taxiway and apron stands are clear of snow and ice to improve traction for tugs conducting pushback and towing manoeuvres.

8.3.3.2 Apron Clearance Priorities

Clearance Plan: Terminal 1

- Stands 1-15 (Pier B North) - Brush to Stand 1
- Stands 2-12 (Pier B South) - Brush to Stand 100
- Stands 21 to 31 (Pier C South) - Brush to Stand 100
- Stands 22-32 (Pier C North) - Brush to Stand 28 & 201
- Stands 60-64 - Brush to Stand 100
- Taxiway JE - Brush to Stand 1
- Taxiway L - Brush to Stand 100
- Taxiway R - Brush to Stand 28 & 201

Clearance Plan: Terminal 2

- Stands 101-116 - Brush to Stand 74
- Stands 201-211 - Brush to Stand 201
- Stands 233-241 - Brush to Stand 243
- Stands 81-83 - Brush to Stand 84
- Taxiway NA - Brush to Stand 74
- Taxiway NC - Brush to Stand 243
- Taxiway R - Brush to Stand 201
- Taxiway E - Brush to Stand 71
- Taxiway Z (blue and orange) - Brush to Stand 74

Preferred Clearance Plan: Terminal 3

- Stands 47-58 - Brush to Stand 44/44R
- Stands 41-44L - Brush to Stand 44/44R
- Stands 16-18 - Brush to Stand 1
- Taxiway G - Brush to Stand 58
- Taxiway JF - Brush to Stand 44R or 1

Clearance Plan: Other Areas

- Stands 66-70 - Brush to Stand 71
- Stands 72-86 - Brush to Stand 71
- Stands 807-811 - Brush to Stand 243
- Stands 901-917 - Brush to Stand 901

- Signature Apron - Brush to ROMPA
- Engine Test Bay - As required
- WMA - As required

8.3.3.3 Stand Clearance Access

During heavy or prolonged snowfall, it may be necessary to clear occupied stands of night stopping aircraft to ensure serviceability ahead of the next departure wave(s). The most effective method to achieve this is to remove parked aircraft from a row of adjacent stands by pushing them into the Taxiway to allow for a complete sweep and treatment of all stands within a given area. Once completed, aircraft will be towed back onto the treated stands.

This strategy would only be employed when operational conditions are met and adequate GHA resources are available. Co-ordination would be done by the DWC, ATC and relevant GHA.

Where practicable, aircraft parking stands will be cleared of snow after departure. A member of the Airfield Operations team will be appointed to specifically manage the clearance and treatment of apron parking stands in accordance with stand allocation plans and airfield capacity needs.

All stands will be checked for suitability for use in advance of aircraft arrival and additional treatment may take place before the aircraft is parked. Where steps are to be used, a clear area must be provided to allow safe disembarkation of passengers along marked walkways or to waiting bus transport. A supply of de-icing granules, and/or silica sand, will be provided at the head of each stand therefore enabling Handling Agents and Service Partners to treat isolated patches of ice and create safe passenger routes. As far as reasonably practicable, stands will be cleared to full width for the maximum size aircraft, therefore minimising hazards during aircraft turnaround.

Several apron stands have been designated as “snow dump” areas, therefore ensuring adequate space can be created to store snow cleared from apron stands and taxiways. As far as possible, snow will be brushed from the head of stand, towards the rear of stand and then ploughed forward to a designated ‘snow dump’. The purpose of this strategy is to minimise the impact of snow banks on the movement of airbridges, maintain access to FEGP units and equipment parking areas. The locations of designated snow dump areas are detailed in Appendix C.

Stand 200 will be utilised as a designated forward holding and mobilisation point for the snow fleet from 01st November – 31st March. At all other times, this stand will remain in use as an equipment parking area. The AODM & EBDM will coordinate the use of this stand and manage access and egress for the snow fleet users.

8.3.4 Diversions and Capacity Management

Widespread winter weather conditions across the UK can result in flight diversions due to airport snow closures or reduced airfield capacity and air holding delays.

Subject to availability, Manchester Airport is prepared to accept diversions, up to and including Airbus 380 aircraft. Diversionary aircraft will normally be allocated a remote parking stand, except in exceptional circumstances. Priority will normally be given to commercial operations, over Military and private flights.

To protect our normal schedule of flights, Airfield Operations will closely monitor the operational capability of UK Airports and determine the number of parking stands available for diversionary aircraft. This assessment will be made at intervals of not less than 12 hours between the months of November and March inclusive. This will be in addition to Plan 39.

The AODM will set an “inbound diversion cap” and notify ATC of any capacity limitations. The “cap” is intended to identify the number of inbound aircraft which can be accepted without impacting upon stand allocation plans associated with our normal schedule of flights.

In the event of significant disruption at Manchester Airport and limited availability of parking stands, a decision may be taken not to accept inbound diversions. Such decisions will be promulgated by NOTAM, Community App and Chroma Fusion. Requests from Manchester Airport airline customers to accept inbound diversions and extra flights will be considered on a case-by-case basis by the IMC, subject to the provision of a Ground Handling service.

Further information concerning the procedures for handling excess traffic can be found in the Aerodrome Manual Part 2.

8.3.5 ATC Flow Management

During periods of reduced airfield capacity and adverse weather, it may be necessary to implement ‘ATC flow control’ measures to ensure the number of arriving aircraft does not exceed

airfield capacity. This will usually occur when the number of available parking stands is reduced due to the presence of winter contaminants, or runway capacity is reduced due to the availability of associated taxiway infrastructure. In such cases, the level of flow to be implemented will be determined by the IMC, in conjunction with Air Traffic Control. If the IMC is not active, the level of flow to be applied will be determined by the ATC Watch Manager and ADM.

ATC flow measures will not be implemented if the available airfield capacity exceeds demand. ATC do not impose outbound flow restrictions; however, an expected outbound rate will be calculated by the Snow Cell based on any known restrictive parameters such as weather avoidance, ATC network restriction or de-icing capabilities. This figure will be considered when applying any tactical inbound flow restrictions. Flow measures will be notified to the airport community via the Community App and/or Conference calls.

9. Ice Conditions (including aircraft de-icing plan)

9.1 Structure and implementation of response plans

The AODM shall use the TAF to determine the presence of ice conditions in a 12hr forecast. There is recognition that freezing temperatures often occur prior to or around snow events therefore the procedures in both sections 7 and 8 may be undertaken simultaneously to minimise overall airport disruption. This section deals with the airport response to this specific inclement weather condition.

As frost or ice can form quickly over a large surface area, it is not possible to guarantee that all areas will be treated, particularly when a ‘flash-freeze’ scenario occurs. All airport users should be alert to the presence of ice hazards and take appropriate care. ‘Flash-freezing’ is a common feature of UK winter weather and usually occurs following a rapid decrease in surface temperature as precipitation dissipates and the sky clears. A ‘flash-freeze’ scenario can occur within a period of minutes, providing only a short window of opportunity to carry out anti-icing as precipitation ceases and the temperature falls. Airport users should also be aware that the temperatures will often subside during the period immediately following daybreak, posing a greater risk to operations during the busy morning peak period.

The accountable postholders shall respond in accordance with the DWS Matrix, putting into action plans and procedures to effectively mitigate the risk that ice conditions can present.

9.2 Pre-Treatment

The key factor in ensuring the success of pre-treatment is providing sufficient notice so that these activities can be completed well in advance of the onset of freezing temperatures.

In deciding the optimum moment to commence pre-treatment activities, due consideration needs to be made of the following factors across the landside and airside environments:

- Anti-icing team response times (WOSP and MA Engineering): This is defined as the time taken from the decision to begin precautionary treatment until the winter maintenance vehicles are loaded, manned and ready to commence anti-icing activity.
- Treatment Time: This is defined as the time as the time taken from beginning treatment of the surface area through to its completion. Depending on the time of day, this may vary, so due regard should be taken of this when deciding to initiate any pre-treatment activities.

9.3 Landside Procedures

9.3.1 Organisation

LDM shall activate the Mitie disruptive weather personnel and equipment. Vehicles and equipment will be called to action. The LDM will request an update to ensure adequate stock for both grit bins and vehicles. LDM will instruct the Landside Operations team to commence surface treatment operations of the CTOC, MA road network and associated Car Parks. The LDM will activate the personnel call out to provide enhanced landside presence (including the Control Room) and ensure strategic staff deployment.

9.3.2 Road Network

Ensure surrounding MCC road network is clear then address inner single-track roadways to ensure safe movement of vehicles on MAG site ie Ringway Road, Palma Ave, roadway between A1 & A2 car parks. The specific road network responsibilities can be seen in Appendix 7.

9.3.3 Car Parks

- If a car park cannot be accessed due to ice a Traffic Marshal will need to be positioned at the car park to intercept guests/staff and direct to the alternative car park
- Social Media Team are to be alerted of sending out a disruption warning letter to car park bookings.
- The alternative car park list is listed in Appendix 6.

- If the Forecourts are closed the alternatives are:
- T1 Lower Forecourt closed – use T1 Upper Forecourt, followed by T1 Short Stay
- T1 Upper Forecourt closed – use T1 Lower Forecourt, followed by T1 Short Stay
- T2 Upper Forecourt closed – use T2 Lower Forecourt, followed by T2 West MSCP
- T3 Forecourt closed – use T1 Lower Forecourt, followed by T3 MSCP
- GTI closed – use GTI bays (if TFGM agree) if not use Palma Avenue

- The priority list for Car Parks not to be treated as a priority or not to be treated at all forms part of the gritting plan as agreed by the LDM and MAG FM.

9.4 Airside Procedures

9.4.1 Frost and Ice Control Frost and Ice Control

Compared to snow events, the prevention of frost or ice on airfield runways, taxiways and aprons is more frequent but requires a less extensive response. This resource will be drawn from the Engineering Unit. No further activation of the Inclement Weather Plan is normally required.

9.4.1.1 Stand De-icing Granules

Yellow bins containing solid de-icing granules are provided on all apron areas for the purpose of enabling treatment of specific ice or snow hazards (see also Section 5.2 – Responsibilities of All Airfield Staff). Solid de-icing granules are intended for use on Passenger Walkways, paved surfaces and Apron areas. The solid de-icing granules are permitted for use on Apron parking stands and within the vicinity of aircraft. Protective gloves should always be used when handling granules/scoops.

9.4.1.2 Airfield Anti-icing Strategy

Whenever ice conditions are likely the AODM should undertake pre-emptive airfield anti-icing to prevent the accretion of ice. The following factors should be considered when taking a decision to anti-ice.

- The amount of surface water present on the manoeuvring area and the potential for anti-icing chemicals to become diluted
- Actual and forecast surface temperatures
- The current weather, and likelihood of precipitation in the form of sleet/rain in advance of snowfall
- Practicality of undertaking anti-icing from an operational perspective

- The application rate at which anti-icing chemicals should be applied (see Appendix 16)

MA holds an internal policy relating to on site media provision, stock levels and re-order triggers. A stock of liquid media for treating paved surfaces and runways, will be held on site with an estimated contingency capacity for continued operations of seven days.

During peak risk periods, stock levels will be replenished to remain above 200,000 litres of Isomex 3 liquid media. However, should a significant risk of prolonged snowfall and/or ice be forecast, the ADM in conjunction with the EBDM has the ability to increase on site stock levels to a maximum of 500,000 litres.

Anti-icing operatives should be instructed to treat the full runway and taxiway widths. Particular attention should be paid to treating taxiway turns and intersections where it is likely an aircraft bogey will deviate from the central portion of the taxiway during any ground swing or taxi manoeuvre.

Hard-standing areas between the minimum taxiway width and parking stands should be treated comprehensively. Successful treatment of these areas will prevent loss of traction and grip during pushback, and whilst aircraft are turning onto stand. Early treatment of non-critical areas (i.e. the Perimeter Road) with Rock Salt is recommended.

Manufacturer guidelines will be used as a guide for determining the application rates. Application rates will be increased when surface temperatures fall below prescribed threshold levels, or when treating ready formed ice, as per the guidance in Appendix 16.

9.4.1.3 Critical Frost Cover

During forecast weather conditions that fall outside of a threat of snow, are likely to require prolonged and simultaneous use of all pavement surface treating vehicles, the AODM has the ability to activate a 'Critical Frost Cover' that will be initiated via Engineering and Baggage Duty Manager.

9.4.1.4 Holdover Considerations

The ADM should remain alert to the potential for significant dilution of anti-icing media during and after precipitation. It is possible further applications of anti-icing media will be required to prevent

the formation of ice. However, this will largely depend on prevailing and forecast surface temperatures, and the intensity of snowfall.

The AODM will remain alert to the weather conditions and the extent of any precipitation post anti-icing in order that an assessment of the likely holdover time can be made. This information will be passed across subsequent shifts to ensure well balanced decisions can be taken over a period of several days.

9.4.2 Aircraft De-icing Coordination

Following reviews of operations at MAN and throughout industry demonstrates that a central point of management that provides strategic and coordinated guidance to aircraft de-icing providers, and airline operators, is essential to support the winter resilience plans and subsequent operation.

The 'Disruptive Weather Cell' (DWC) (referred to in section 7.1.1) will serve this function during ice conditions. This will provide increased collaboration and visibility of aircraft de-icing operations. The aim of this will be to introduce an enhanced level of control and coordination between the DWC decision makers and de-icing providers.

The structure and processes detailed in section 7.1.1 should also be followed at the on onset of DWS12 for ice conditions, with each de-icing provider contacting the AODM and attending the DWC at their request (or dialling in via a conference call provided by the AODM). During an ice event specifically, the DWC shall perform the following:

- Coordinate the de-icing activity on airfield (1x representative from each provider must attend – priority desk space will be made available)
- Provide a single, airfield update to IMC (if active) or via the Community App/CHROMA and/or conference calls as required

9.4.2.1 De-icing Provider Responsibilities

All de-icing providers must adhere to the below when the DWC is initiated for an ice event

- At DWS12 contact the AODM and attend the DWC (or dial into a conference call provided) at their request.
- If requested to attend in person, populate the DWC with the requested personnel.
- Maintain attendance until such time as the specific winter threat has passed (as directed by the AODM).

- Liaise with AODM and provide regular operational performance updates including any operational difficulties ahead of time.
- Maintain communications with your respective base of operations.
- Should the Departure Sequencing Protocol (DSP) be activated, provide information to determine estimated outbound flow limitations.
- Respond to published sequencing as per the DSP and manage resource accordingly.
- Communicate any change to status or operational capability.

9.5 Departure Sequencing Protocol (DSP)

9.5.1 Purpose and Initiation

The DSP is a recovery tool with the aim of optimising the prioritisation of departing flights following a period of closure. It will be initiated when deemed necessary by the ADM following the initiation of DWS Level 3. It should not be initiated outside of these parameters unless agreed between the Duty IMC Director and the AODM. The AODM will notify the DWC and IMC of their decision in advance to provide adequate time to notify the community.

To ensure flights are prioritised in a fair and robust manner, ground handlers should input accurate TOBT (Target Off Blocks Time) times always. This time indicates the estimated time that the flight will be ready for de-icing. On activation of the DSP, the TOBT times will be used to formulate the sequence of aircraft departures. If two aircraft have the same TOBT, the aircraft will then be sequenced by the original STD, with the earliest departure being prioritised.

In addition to TOBT, de-icing providers should ensure accurate Estimated De-icing Start Time (ECZT) and Estimated De-icing End Time (EEZT) times are inputted. This will ensure the community is advised of the current priority listing, and the estimated time until each flight will be serviced by de-icing media.

9.5.2 Reciprocal Agreements – Aircraft De-icing

Following consultation with the relevant parties, a decision has been taken by de-icing companies and airlines to maintain agreed contracts with regards to aircraft de-icing. Under this agreement, airlines will only be serviced by their respective contracted de-icing company. Aircraft will be sequenced as required by the aerodrome authority, apart from Airlines de-iced by Menzies de-icing operation.

9.5.3 Applied Rules

- Airline operators and/or GHA are to publish times that each flight is expected to be ready for pushback (TOBT).
- If an airline's nominated de-icing provider is unable to automatically sequence aircraft, then ERZT times are to be entered in addition to the TOBT. These times are to be entered into CHROMA.
- ERZT-listed flights with the same time entered will be re-prioritised against STD.
- The number of flights to be prioritised per hour will be based upon an expected departure rate as published by the airport operator.
- Additional flights will be prioritised but not published in readiness for any improved conditions. The formula to be applied is outbound flow plus 50%.
- Departure rates or applied outbound flow will vary dependent upon the most restrictive element on any given day.
- The applied outbound flow rate will incorporate a tolerance of minus 2 aircraft to allow for variations and further unexpected delays.
- The priority listing will be published on CHROMA and the Flights page of the Community App by Airfield Control.
- The published priority listings will be used by Airlines, GHA, de-icing providers, fuellers and MA to allocate resources accordingly.
- De-icing providers are to populate the Estimated De-icing Start (ECZT) and Estimated De-icing End (EEZT) times into CHROMA either manually or using their chosen software solution.
- GHA are to update the Estimated Time of Departure (ETD) information into CHROMA.
- Flights with no published TOBT or ERZT times will not be prioritised.
- Flights which are not ready at the published TOBT will be reverted to the bottom of the priority order or re-sequenced at the earliest opportunity.
- All queries relating to the DSP are to be directed to Airfield Control via the relevant option of the Airfield Operations Switchboard (x3331).

Updates are to take place every 30 minutes and will re-prioritise the next 60 minutes based upon TOBT and ERZT times published by the airlines.

9.5.4 Verification

Airfield Operations frontline teams may audit to verify the readiness of prioritised flights. Any flights which have been declared as ready but are clearly not, will be removed from the prioritisation list

and placed at the end of the list being used. These aircraft will be de-iced prior to publication of the next priority list update.

9.5.5 Exceptional Requests

Exceptional requests to operate outside of the published priority orders will be considered by Snowman Terminals. Such requests must be accompanied by a written account as to the reason why it should be considered and what disruption mitigation such request would achieve.

Exceptional requests will be escalated to Airfield Control for final approval.

Exceptional requests whereby an airline wishes to substitute a prioritised flight for another of their own flights will be considered through the exceptional request process. This may be accepted at the discretion of Airfield Control where this does not impact upon any other carriers. Additionally, where a prioritised aircraft is swapped with the same carrier, the flight taken out of prioritisation, inherits the shorter STD of the flight it swaps with. Records of updates and priority listings will be retained for future review.

9.5.6 Communication

Implementation communication to be sent via the Community App & Email to the T1, T2 and T3 External Stakeholders distribution lists. A CHROMA banner will be updated where possible and a conference call may be held by IMC with the ADM or deputy dialling in to provide a specific DSP update. This communication should be sent at least 1hr prior to reinstatement of operations (where possible).

The following information is to be promulgated as a minimum standard by IMC following an update of the following by the AODM.

Upon initiation:

- Instruction to GHA and de-icing providers to update TOBT and ERZT times
- Expected runway opening time
- Estimated outbound flow rate (if appropriate – based upon limiting factors i.e. average de-ice time/number of de-ice rigs available)

Example:

"EGCC Winter Ops: 23R SRW to open 1300z. Outbound rate 10ph. Departure Sequencing Protocol (DSP) in force. All airline operators populate accurate TOBT and ERZT times."

Upon initial priority list publication

- Time of publication
- Refresh period

Example:

"DSP priority list published 1300z. Next review 1330z. All airline operators populate accurate TOBT and ERZT times. Exceptional requests to be made to Airfield Control x3331."

9.5.7 Records

- Every review of the ERZT times will be captured as a screenshot by Airfield Control prior to applying the ERZT rule and retained. (paper copy)
- ECZT and EEZT times will populated with estimates, and then corrected with actuals to ensure a transparent process.
- Every new priority list update will be captured as a screenshot by Airfield Control and retained (paper copy).
- Any written exceptional requests are to be retained by Snowman Terminals.

9.5.8 Responsibilities

Airfield Control

- To prioritise the current flights populated with TOBT and ERZT times in CHROMA.
- Ensuring absolute application of the specified rules.
- Publish the priority listings on time.
- Record all listings and associated ERZT, ECZT and EEZT times, remarks, omissions and amendments.

De-icing providers

- From the onset of DWS Level 2 populate the DWC (remotely if required) with operational representative to coordinate aircraft de-icing operations between MA, de-icing providers, GHA and Airlines.
- Inform DWC of rig availability.
- Communicate and change to expectations.
- Direct resources as per the priority listings.
- Enter ECZT and EEZT times into Chroma Fusion on activation of the Departure Sequencing Protocol

Airline Operators

- Ensure accurate TOBT times for all flights.
- Direct any exceptional request to Snowman Terminal to be accompanied with written confirmation / rationale.
- Continually update any new TOBT/ERZT times for consideration.

GHA

- Ensure accurate TOBT times for all flights.
- Direct resources as per the priority listings
- Advise DWC of any specific issues impeding a priority flight

NATS

- Advise on any network restrictions.
- Advise any change to tactical flow rates applied.
- Immediately inform DWC of any change in operational conditions.

Snowman Terminals

- Collate and record any exceptional requests.
- Record rationale behind any accepted exceptional requests.
- Assess and escalate accepted exceptional requests to Airfield Control for further approval.

Snowman Airfield

- Advise on the current airfield status.
- Update with expected re-opening times.
- Monitor GHA compliance of inputted TOBT times and report inaccuracies to Airfield Control.
- Advise of any operational restrictions post opening

DWC

- Initiate commencement of the protocol (final decision made by the ADM).
- Publish communications (if IMC not active).
- Direct resources as per the priority listings.

Airfield Operations will be ultimately responsible for determining whether a stand is “serviceable” and available for use by aircraft. A serviceable stand is one which has been cleared of snow and ice contamination and has been appropriately treated with ant-icing chemicals to prevent further

ice formation. The cleared area should account for the footprint of the maximum size aircraft and the areas used by Ground Service Equipment during the turnaround process. Safe access around the aircraft, and its wingtips will be maintained as far as possible. Isolated patches of snow and ice may be present and where possible these areas will be treated using the granular de-icing products available on each stand. It must however be noted that it is not possible to fully clear a stand which is already occupied by a parked aircraft and therefore personnel must be extra cautious when preparing such aircraft for departure. The policy outlined in red text above is therefore applicable to arriving aircraft only.

10. High Winds

10.1 Structure and implementation of response plans

The response to high/strong winds will be based upon the forecast or actual wind strength. As per ASI19 in the Aerodrome Manual, the definition of wind conditions shall be as follows

- Strong Wind – mean speed >24kts
- Gale Force Wind – mean speed >34kts
- Severe Gale Force Wind – mean speed >44kts
- Storm Force Wind – mean speed >52kts
- Violent Storm Force Wind – mean speed >60kts

10.2 Notification

The MET Office will issue Strong Wind and Gale Warnings direct to the AODM. Forecasting will be undertaken by StormGeo and regular updates communicated via the StormGeo portal to the ADM who will monitor these forecast wind speeds against the categories detailed in section 9.1.

10.2.1 Landside Procedures

In the event of high wind, the LDM is to instruct the Traffic Marshall team to ensure the following is done prior to the wind arriving.

- Lower any VMS matrix signs
- Lay flat or sandbag any none fixed A Frames*
- Check and secure any temporary fencing or hoardings

If prolonged strong winds are expected S&B will need to check if each device has wind deflectors installed to prevent muffled calls, potentially additional workload for S&B. If we have prior notice of bad weather, we will need to contact S&B Service Delivery manager to ensure they have adequate engineers on site. In some extreme cases barriers may need to be removed if they pose

a threat to guests / property. If possible, the barrier area will be cordoned off or a Traffic Marshal placed in position to ensure no access permitted in error.

*sandbags can be obtained via R&M Developments for weighing down signs and barriers only. Mark Henry 07831 120156. Daytime hrs only and these are chargeable so you must only request the amount we need.

The LDM will ensure issues affecting the road network or issues that could cause potential disruption to the Landside Operation are reported accordingly to the CPOM, CTTM, ADM and the CPTM.

10.2.2 Airside Procedures

10.2.3 Organisation

The AODM is responsible for implementing the 'internal' notification procedure by issuing a Community App message. The same warning will appear on the message bar of CHROMA.

The AODM will then ensure the duty airfield team carry out the following duties:

- Instigating inspections to ensure that the possibility of FOD blowing on the movement areas is minimised
- Instigating inspections to ensure that apron equipment is secured and parked appropriately to minimise the possibility of such equipment blowing on to persons, aircraft or vehicles
- Ensuring that any construction contractors in landside and airside areas take appropriate action to secure equipment and materials, as well as lowering cranes etc when appropriate
- Instigating inspections to ensure aircraft are adequately chocked and/or tied down to prevent weathercocking. Particular attention should be paid to aircraft parked in exposed parts of the airfield, i.e. TATON and head of pier stands
- Ensuring service partners are made aware of warnings via a brief from the ASCO team

Handling Agents and other ramp staff are responsible for:

- ULD's to be checked to ensure they are correctly racked with stops' raised. Stowing ULD's on Weldwork Trailers will not normally be acceptable. Where possible towing empty ULD containers should be avoided during strong winds

- Where ULD's cannot be stored on the airfield racking system, rope should be obtained from Airfield Operations, and ULD's secured together in a designated place identified by the AODM
- Steps must be fully lowered and, where possible, turned into wind with stabilisers down and brakes on
- Ensuring that all covers on trucks and trailers are lashed down
- Ensuring that parked steps have stabilisers down and brakes on
- Check that all equipment is correctly parked in designated equipment parking areas and secured
- Removing any items of litter or debris that are likely to constitute a FOD Hazard to aircraft.

Aircraft Engineers are responsible for:

- Ensuring aircraft are fully chocked and the parking brake reset at regular intervals in accordance with company and aircraft manufacturer requirements.

Airfield Control is responsible for:

- Inform AST and request that all out of use airbridges are retracted, lowered to their lower limits and parked correctly with shutters down and doors closed. Follow-up inspections will be undertaken by Airfield Operations personnel.

10.2.3.1 Non-standard Aircraft Parking

Parked aircraft may sustain damage to control surfaces or may risk ground-swinging ('weathercocking') in strong wind conditions. It will be for airlines and aircraft engineers to determine whether it is desirable to park any particular aircraft facing into the prevailing wind.

When this is the case, the relevant operator must contact MA Airfield Control on ext. 3695 and make this request. Aircraft must not be re-positioned without approval from the Airfield Operations Duty Manager. The AODM will consider the practicality of non-standard parking and will consult with Airfield Control should any possibility of impact on taxiway strips and adjacent stands be suspected.

Permission to park non-standard will be given by the AODM. If necessary, the AODM will discuss requirements with the operator's representative. Aircraft will not normally be allowed to park non-standard under their own power but will require to be re-positioned by a tug after arrival and disembarkation. Likewise, aircraft parked non-standard into wind will not normally be permitted

to self-manoeuvre off stand due to the hazards posed by jet blast, particularly on pier-served/contact stands.

11. Heavy Rain and Flooding

11.1 Structure and implementation of response plans

Heavy rain and flooding may occur as part of a wider inclement weather event or in a standalone scenario. The Met Office may choose to issue a weather warning pertaining to heavy rain however this is not always the case, and even in such a scenario the warning will not be localised or take into account the specific topography or risk profile of Manchester Airport.

Therefore, all airport users should ensure they are aware of forecast heavy rainfall using the StormGeo platform and consider areas of their operation which may become adversely affected as a result.

11.2 Notification

If a weather warning is issued or there is severe rainfall in the forecast which is believed to have the potential to cause operational disruption then the AODM in conjunction with the ADM will jointly agree a message to send via the Community App.

On receipt of this message, the LDM, ADM and EBDM should ensure they check their respective areas of responsibility to mitigate the risk to the operation should such rainfall transpire.

The ADM will chair a conference call with the Community if deemed appropriate.

11.3 Landside Procedures

- If heavy rain is forecast, the LDM would be responsible for ensuring the Traffic Marshall community complete regular checks of the road network and MAG car parks – where feedback to the LDM would be expected if a build-up of water or flooding is occurring.
- The Control Room would be expected to continually monitor CCTV of the road network and Car Parks and report to the LDM any build-up of water or flooding.
- Any reports of flooding of the road network or car parks would be circulated by the LDM to the CTTM, CPTM, ADM, GMP. If applicable the Highways Agency and MCC would be informed.
- Known locations:
    - Shadow Moss car park
    - Area 350 (Beryl) M&G Parking on Thorley Lane
    - Thorley Lane by the entrance to JP1 & Private Hire Waiting Area
    - Parade Road by the mini roundabout

- Outwood Lane

The requirement is to monitor these areas but not close them until it becomes an issue.

- Monitor arterial roads surrounding the area (MARR, M56 etc)
- A map of the MAG road network and MCC adopted roads are available in Appendix 7.
- If a road or car park is suffering from flooding, the LDM in conjunction with the CPOM (if it is a car park) would make a dynamic risk assessment as to the safety of the area. If required, the Fire Service can be requested to assist in pumping excess water away from areas most affected. If required sandbags can be obtained from MAG FOH.
    - Road network - If there is a risk to the public or staff due to the flooding of a road, a diversion would be put in place to enable safe and undisrupted traffic flow.
    - Car Park – If it is no longer safe to use a car park an alternative car park list is available in the Appendix 6. The Control Room would need to be advised and monitor diverted vehicles away from booked car parks. Traffic Marshall attendance at both the closed car park and alternative car park will be required.

11.4 Airside Procedures

The focus of the airside team during periods of heavy or prolonged rainfall should be to closely monitor all airside areas in case of pooling or flooding, hereafter referred to as 'contamination'.

There are some areas which are prone to pooling or flooding. These have been identified over many years and should be closely monitored during heavy or prolonged rainfall:

- Stands 62-63 – slot drains
- Pier B, T1 – odd stands (1-7)
- P-DZ runway crossing point
- Mobile barrier storage area near Stand 12 (outside of taxiway strip)
- Taxiway Z

Should the surface become contaminated in such a way that it is deemed to have the potential for a safety effect on airside users, vehicles or assets the Airfield Operations team shall close the affected area until such time that the contamination has subsided.

Any closure is to be communicated to the AODM and in turn to the Community via the Community App. The same applies to reopening such areas.

In addition, the EBDM is responsible for ensuring that the impact upon water, power, gas supply services and effluent disposal is assessed, and likely implications passed to the ADM & AODM.

12. Low Visibility

12.1 Structure and implementation of response plans

Low Visibility affects

12.2 Landside Procedures

- Ensure teams are briefed appropriately if low visibility is expected.
- Maintain suitable monitoring of the Landside operation during times of low visibility.

12.3 Airside Procedures

The airside response to Low Visibility conditions is well refined and documented. For the purposes of this document, this section serves as an overview of the key principles undertaken by the airside teams to ensure a safe operation in such conditions.

- The ADM shall (at an agreed weather minima) safeguard the airfield to ensure that additional risk mitigation measures are in place when a period of actual low visibility is realised.
- Airside driving will be limited (in terms of driving rights and number of occupants) during low visibility.
- The airfield lighting system will adopt a different configuration to provide additional safety measures to flight-crew.

A complete record of airside procedures is detailed in Airfield Operations Local Operating Procedure (LOP) 001. This document is available on request.

13. Appendices

Appendix 1 – Landside Gritting Routes and Mileage

Following areas closed for this season, those highlighted in red do not require gritting.

- Jet Parks Ringway
- Hasty Lane (Meet and Greet Storage)
- Thorley Lane (Meet and Greet Storage)

Following areas will be considered a lesser priority due to above closures but will require gritting.

- Ramp Road South
- Ramp Road North
- T2 Forecourt arrivals
- T2 Forecourt departures
- Melbourne Ave (leading to T2 dept)
- MSCP East Top floor
- Meet and Greet T2
- MSCP West top floor
- T2 Forecourt arrivals
- T2 Forecourt departures

Terminal 1

Hand Grits - Inbound & Outbound	Mileage	Vehicle - Inbound &Outbound	Mileage
Footpath outside T1/Pass Office	0.10	Ramp Road East - to T1 Short Stay	0.20
Footpath Terminal Road North & South	0.20	Ramp Road South	0.20
Footpath Outwood Lane	1.00	Ramp Road North	0.20
Footpath North Gate Landside	0.50	Exit Road West	0.10
Footpath T2 East Service Yard	0.50	Short Stay T1 top floor	0.10
Footpaths Malaga Ave	0.20	Top Floor MSCP 1	0.10
Train Station Pedestrian Area	0.10	Drop off T1	0.10
Bus Station Pedestrian Area	0.10	Terminal Rd South	0.30
Footpath Chicago Ave	0.20	North Gate landside	0.10
Footpath Voyager and staff car park 2	0.20	T2 East Service Yard	0.20
		Outwood Lane	1.00
		Outwood Lane into Bus Station Entrance	0.20
		Bus Station Exit to Voyager roundabout	0.10
		Terminal Rd North	0.10
		Toronto Ave	0.10
		Meet and Greet T1	0.10
		Arrivals T1 Forecourt	0.10
		Departures T1 Forecourt	0.10
		Malaga Ave	0.10
		Chicago Ave	0.10
Total Mileage	3.10		3.60

Terminal 1 Travel

Travel to load	2.50
Travel return	2.40
Number of trips	3.00
Total Travel Mileage	14.70

Terminal 2

Hand Grits - Inbound & Outbound	Mileage	Vehicle - Inbound &Outbound	Mileage
Footpath World Way	1.00	Atlanta Ave	1.50
Footpath Atlanta Ave	1.50	World Way	0.90
Footpath Palma Ave	1.50	World Way roundabout	0.10
Footpath Sydney Ave	0.10	Palma Ave	1.40
T2 Forecourt arrivals	0.30	Palma Ave/Sydney Ave Roundabout	0.10
T2 Forecourt departures	0.30	Sydney Ave	0.10
Melbourne Ave (leading to T2 dept)	0.20	MSCP East Top floor	0.40
		Meet and Greet T2	0.20
		MSCP West top floor	0.40
		T2 Forecourt arrivals	0.20
		T2 Forecourt departures	0.20
		Jet Parks 1	0.50
		Staff West	0.40
Total Mileage	4.90		6.40

Terminal 2 Travel

Travel to load	2.50
Travel return	2.40
Number of trips	5.00
Total Travel Mileage	24.50

Terminal 3

Hand Grits - Inbound & Outbound	Mileage	Vehicle - Inbound &Outbound	Mileage
Footpaths outside Terminal 3 leading to OH	0.10	Top floor midstay (Viaform)	0.20
Bus Stops T3	0.10	Ground Floor Midstay	0.30
Meet and Greet T3	0.10	Top floor MSCP 3	0.30
Entrances/outside MSCP 3	0.20	Ringway Road	0.60
Memorial Gardens inc stops	0.10	Domestic Approach	0.30
Euro Gardens	0.10	Hotel Road	0.10
Bus Stop Drop & Go	0.10	Taxi Feeder	0.10
Footpaths Drop & Go	0.10	Car Rental village/transporter area	0.20
Footpaths Midstay carpark	0.20	Drop & Go top floor (Viaform)	0.50
Footpath Hotel Road/Air House	0.10	Drop & Go Bus stop	0.10
Footpaths Ringway Road	0.20	A1 car park top floor (Viaform)	0.30
Taxi feeder inc steps into cabins	0.10	Woodhouse Lane	0.40
Car Rental footpaths	0.20	Drop off T3	0.20
Police station footpaths and carpark	0.10	Pick Up T3	0.20
Footpaths Domestic Approach	0.40	Meet and Greet T3	0.10
Footpaths International Approach	0.20	Drop off T1	0.10
Footpaths Olympic House	0.10	International approach	0.20
Compactor/Service Yard T3	0.10		
Tower Road Service yard inc all areas in quad	0.10		
Total Mileage	2.70		4.20

Terminal 3 Travel

Travel to load	2.50
Travel return	2.40
Number of trips	4.00
Total Travel Mileage	19.60

Western Maintenance

Hand Grits - Inbound & Outbound	Mileage	Vehicle - Inbound &Outbound	Mileage
Motor Transport Carparks	1.00	Pinfold Lane	1.50
Aeroco Carpark	0.20	Hangar 4/MT	0.20
		Aeroco	0.10
		Reservoir	0.20
		Fire Station North	0.20
		Nats Carpark	0.10
		RVP	0.50
		Jet Parks 3 (GMP Dog kennel access)	0.30
		Road leading to Staff East	0.20
		Staff East	0.40
		Jet Parks Ringway	0.30
		Jet Parks Shadow Moss	0.30
		CTOC	0.20
		D'Nata Roadway	0.10
		Waste Facility West Gate	0.30
		Staff South (2020/2021 NHS Test Centre)	0.30
		Hasty Lane (Meet & Greet Storage)	0.10
		Fire Station (South)	0.10
		Runger Lane - M&G storage	0.10
		Western maintenance roads	1.00
Total Mileage	**1.20**		**6.50**

Western Maintenance Travel

Travel to load	2.50
Travel return	2.40
Number of trips	5.00
Total Travel Mileage	**24.50**

Viaform & Reloader

Hand Grits - Inbound & Outbound	Mileage	Vehicle - Inbound &Outbound	Mileage
Hand spreading Top floor midstay	0.20	Top floor midstay **(Viaform)**	0.20
Hand spreading top floor Drop & Go	0.50	Drop & Go top floor **(Viaform)**	0.50
Hand spreading top floor A1 car park	0.30	A1 car park top floor **(Viaform)**	0.30
Total Mileage	**1.00**		**1.00**

Viaform & Reloader Travel

Travel to load	2.50
Travel return	2.40
Number of trips	1.00
Total Travel Mileage	**4.90**

Mileage Totals

Areas	Hand Grit Mileage	Vehicle Grit Mileage	Travel Mileage
T1	3.10	3.60	14.70
T2	4.90	6.40	24.50
T3	2.70	4.20	19.60
Western Maintenance	1.20	6.50	24.50
Viaform & Reloader	1.00	1.00	4.90
Total Mileage	11.9	20.7	88.20
Hand Grit, Vehicle & Travel Mileage	120.80		

Appendix 2 – Grit bin locations

Terminals	Car Parks
T1 Terminal Rd South Retail Bay	T1 Arrivals Decked Top Deck Pedestrian walkway
T1 Arrivals Road under link near zebra crossing	T1 Arrivals Decked Mid Deck Pedestrian walkway
T1 Arrivals Road near cycle shed	T1 Arrivals Decked Ground Floor
T1 Up Ramp near Sub Station / Cycle Park	T1 Arrivals Decked Ground Floor
T1 Malaga Ave - Junction to Toronto Ave	Mid Stay Entrance
T1 Terminal Road North near crossing	Mid Stay Decking West Viaform
T1 Skylink South End Meet and Greet Reception	Mid Stay Decking East Viaform
T1 Skylink North End	Drop & Go Top Deck Viaform
T1 Meet and Greet Wash Area	Drop & Go Car Entrance
T1/T2 Chicago Ave	Drop & Go Bus Stop
T2 World Way	MSCP 1 Level 13
T2 Palma Ave Bus Stops	MSCP 1 Level 13 Down Ramp West
T2 Coach Drop Off	MSCP 1 Level 13 Down Ramp East
T2 Arrivals Road East (Entrance)	MSCP 1 Level 12
T2 Arrivals Road West (near Car Rental Bus Stop)	MSCP 1 Top of Short Ramp
T2 Forecourt Exit	MSCP 2 East Level D
T2 Melbourne Ave/Roundabout	MSCP 2 East Level D Centre Lift lobby
T2 Service Yard rear of compactors	MSCP 2 East Level D East
T3 Service Yard	MSCP 2 West Ground Floor Pedestrian entrance
T3 East near Service Yard Entrance	MSCP 3 Level 5 North Side
T3 Meet and Greet Reception	MSCP3 Level 5 South Side
T3 Forecourt on Drop Off Bend	MSCP A1 Top Deck Viaform
T3 Forecourt on Drop Off Near HV Barrier	Jet Park 1 Reception
T3 Forecourt Olympic House/GMP	Jet Park 2 Reception
T3 Exit Zebra Crossing near GMP	Jet Park 3 Bend West of South Zone
T3 Outwood Lane West	Jet Park 3 Ramp to West Zone
T3 Pick Up Zone East	Jet Park 3 West Zone South West
T3 Pick Up Zone West	Jet Park 3 West Zone South East
Police Station car park Supplied and Stocked by GMP	Jet Park 3 West Zone North East
Olympic House (North Side) Near Tower Rd	Jet Park 3 West Zone North West
The Station Forecourt	Staff East Bussing Rest Room
Bus Station Stand A	Staff East Near Exit Barriers
Bus Station GTI Service Yard Gate	Staff South Barriers
Aviation Viewing Park	Car Rental Village Reception Island
Entrance	Car Rental Village Reception West
Skips	Car Rental Village Next to Car Wash
Monarch Plane	Taxi Feeder
Entrance to Car Park	Security West Gate
Path to External Toilets	Security Little West Gate
West Viewing Hill	Security North Gate
Middle Viewing Hill	Bussing Facility Wash Exit
East Viewing Hill	Hangar 4 Motor Transport Wash
Coffee Bar	
Side of Toilets near Shop	

Appendix 3 – Decision Matrix

<table>
<tr><th rowspan="2">Road Surface Temperature (RST)</th><th rowspan="2">Precipitation</th><th colspan="3">Predicted Road Conditions</th></tr>
<tr><th>Wet</th><th>Damp</th><th>Dry</th></tr>
<tr><td>May fall below 1°C</td><td>No rain
No hoar frost
No fog</td><td rowspan="3">Pre-treat prior to RSTs < 1°C</td><td rowspan="2">Pre-treat prior to RSTs < 1°C</td><td rowspan="2">No action needed – continue to monitor (see Note A)</td></tr>
<tr><td rowspan="4">Expected to fall below 1 °C</td><td>No rain
No hoar frost
No fog</td></tr>
<tr><td>Hoar frost forecast
Fog forecast</td><td colspan="2">Pre-treat prior to RSTs < 1°C (see Note B)</td></tr>
<tr><td>Rain forecast prior to RSTs > 1°C</td><td colspan="3">Treat after rain stops but prior to RSTs < 1°C (see Note C)</td></tr>
<tr><td>Rain forecast whilst RSTs > 1°C</td><td colspan="3">Treat prior to rain, as required during rain and immediately after rain stops (see Note D)</td></tr>
<tr><td>Rain possible
Hoar frost possible Fog possible</td><td colspan="2">Pre-treat prior to RSTs < 1°C</td><td>Monitor weather conditions</td></tr>
<tr><td>May fall below 1°C</td><td>Snow forecast</td><td colspan="3">Pre-treat prior to snowfall and post snowfall if required</td></tr>
<tr><td>Expected to fall below 1 °C</td><td>Snow forecast</td><td colspan="3">Pre-treat prior to snowfall and post snowfall if required</td></tr>
</table>

- Particular attention should be given to the possibility of water running across carriageways and other running surfaces, particularly after periods of heavy, sustained rainfall. Such locations should be closely monitored and may require 'spot' treating in the evening, morning and possibly on other occasions should conditions dictate.
- When a weather warning contains reference to expected hoarfrost, considerable deposits of frost are likely to occur. Hoarfrost usually occurs in the early morning and is difficult to

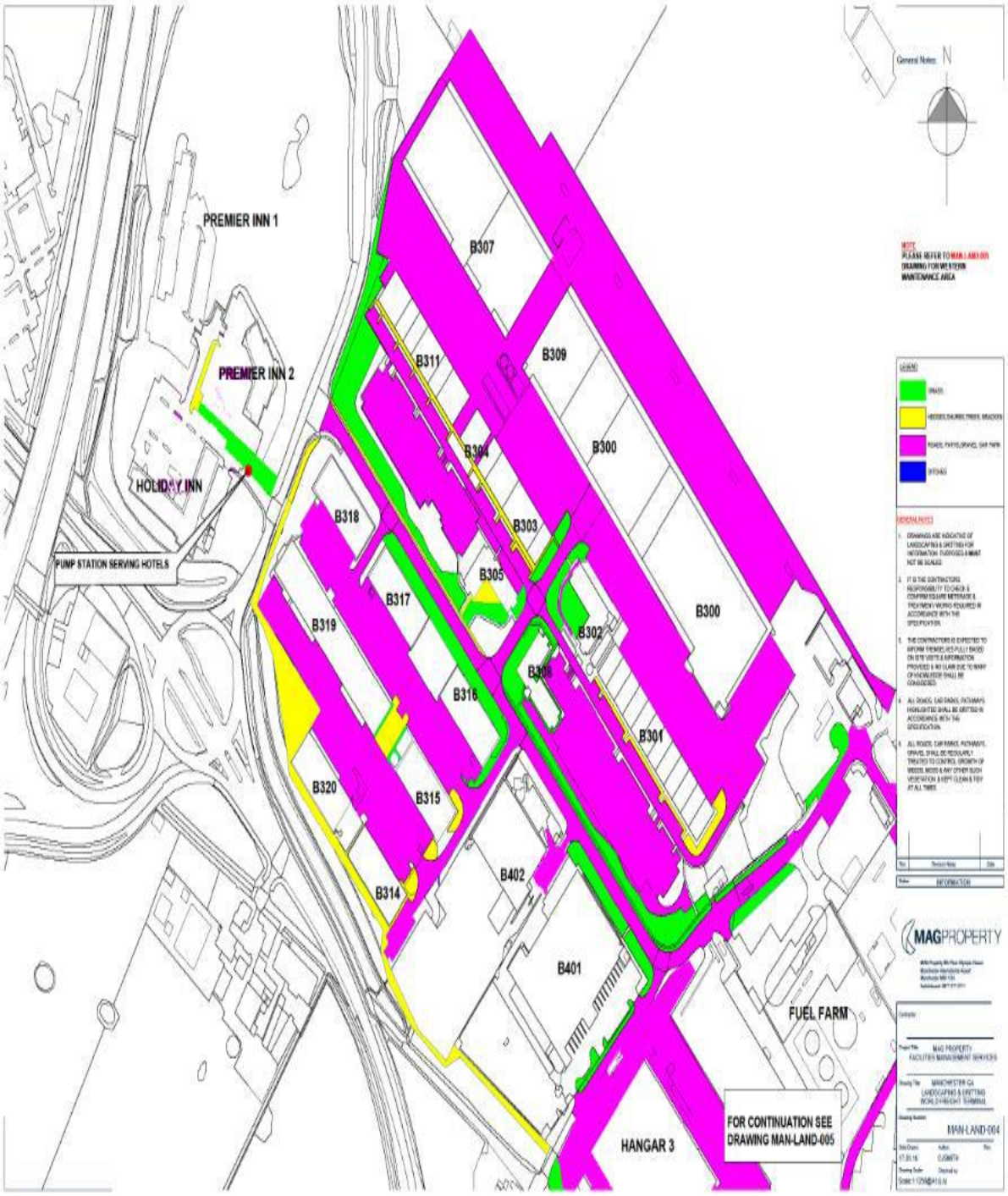
cater for because of the probability that any salt deposited on a dry road too soon before its onset may be dispersed before it can become effective. Close monitoring is required under this forecast condition and ideally the route should be treated just as the hoarfrost is forming. Such action is usually not practicable, and salt may have to be deposited on a dry road prior to and as close as possible to the expected time of the condition. Hoarfrost may be forecast at other times in which case the timing of salting operations should be adjusted accordingly.

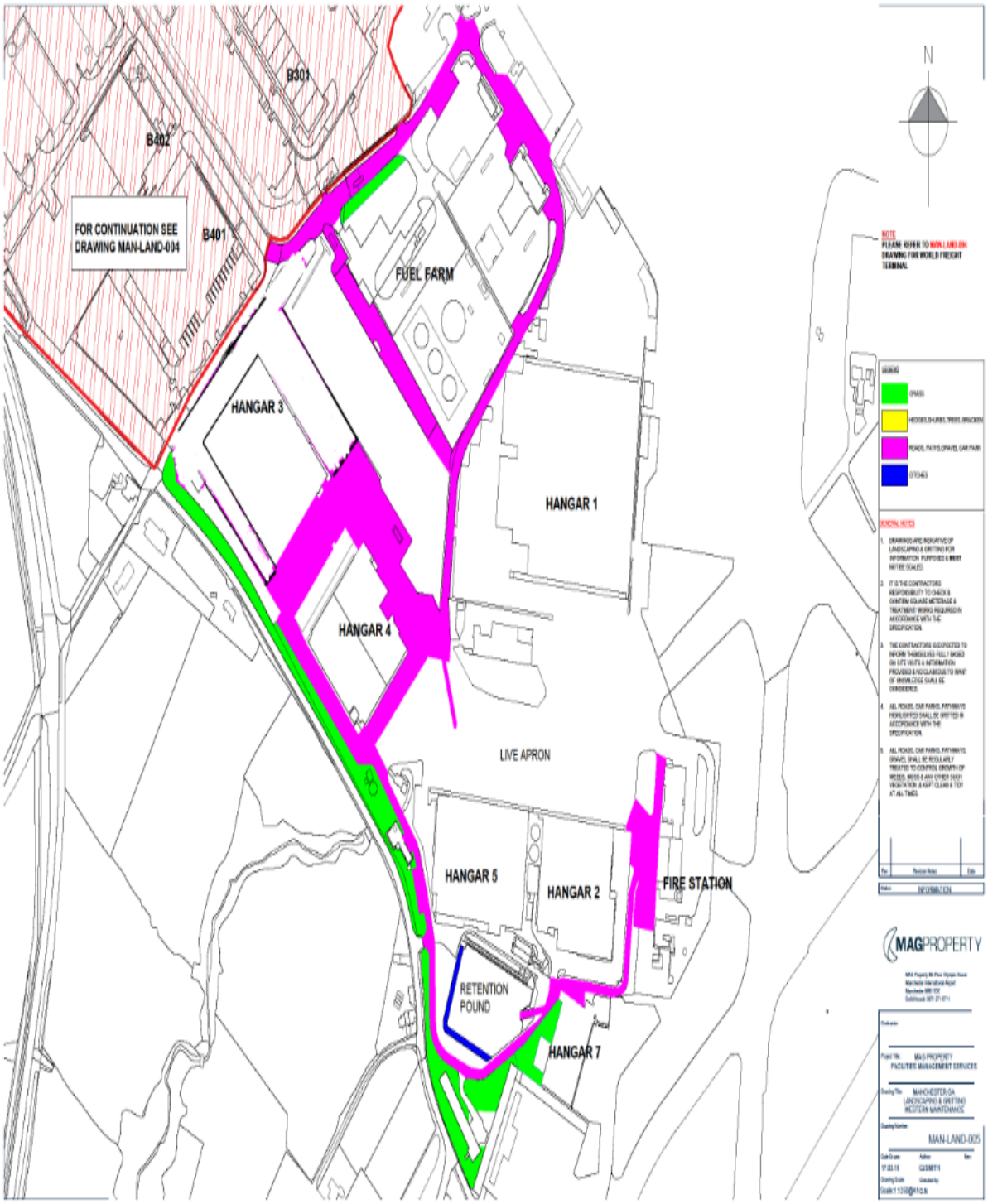
- If, under these conditions, rain has not ceased by early morning, crews should be called out and action initiated as rain ceases.
- Under these circumstances, rain will freeze on contact with running surfaces and full pre-treatment should be provided, even on dry roads. This is a most serious situation and weather conditions should be monitored closely and continuously throughout the period when such conditions are forecast to occur.

Appendix 4 – Recommended Spread Rates

Weather Conditions Road Surface Conditions Road Surface Temperatures	Air Temperature	Recommended Spread Rate (g/m2)
Frost or forecast frost RST at or above –2oC		10
Frost or forecast frost RST below –2oC but above –5oC		20
Frost or forecast frost RST below –5oC but above –10oC and dry or damp road conditions		20
Frost or forecast frost RST below –5oC but above –10oC and wet road conditions (existing or anticipated)		2 x 20
Light Snow Forecast (<10mm)		20
Medium / Heavy Snow Forecast		2 x 20
Ice formed (minor accumulations)	Above – 5oC	20
Ice formed	At or below –5oC	2 x 20
Snow covering > 30mm		20 – 40 (successive)
Hard Packed Snow / Ice	Above – 8oC	20 – 40 (successive)
Hard Packed Snow / Ice	At or below –8oC	

Appendix 5 – World Cargo Centre and Cargo Clearance Routes

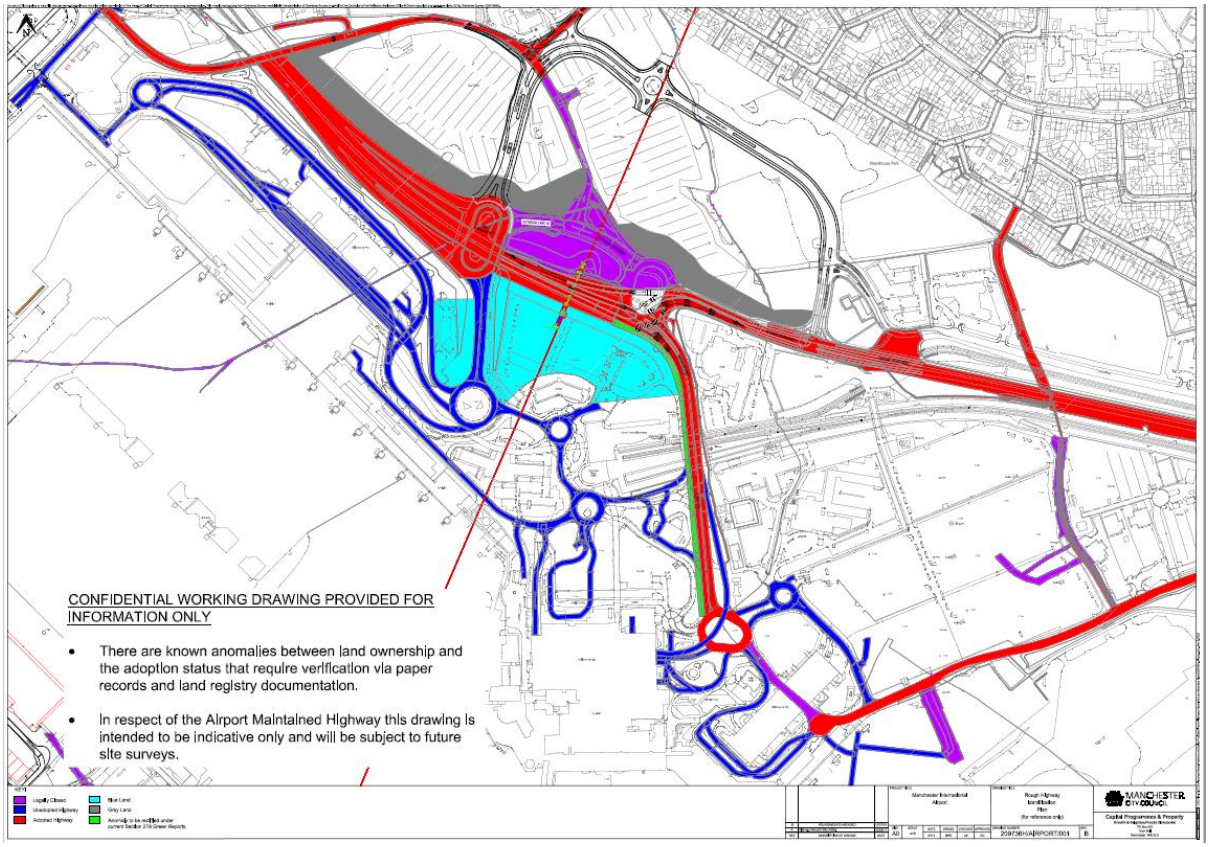



B301
B402
B401
FOR CONTINUATION SEE DRAWING MAN-LAND-004
FUEL FARM
HANGAR 3
HANGAR 1
HANGAR 4
LIVE APRON
HANGAR 5
HANGAR 2
FIRE STATION
RETENTION POND
HANGAR 7
N
MAGPROPERTY
MAN-LAND-005

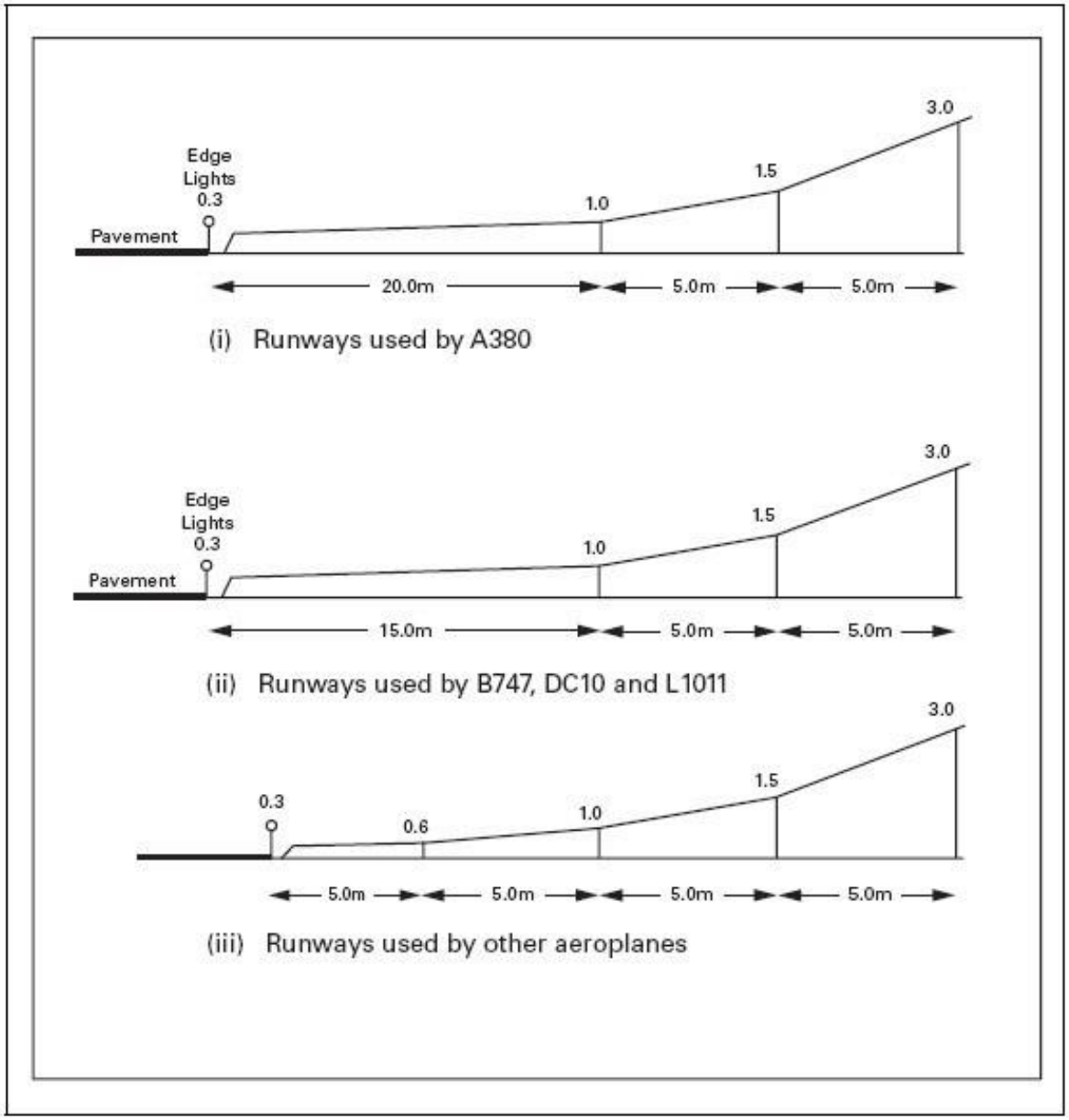
Appendix 6 – Car Park Diversionary Capacity Plan

Car Park At Capacity	First Divert	Secondary Divert	Third Option
T1 MSCP	Mid Stay	T3 Multi	JP3/JPR
T1 SS	T1 MSCP	T3 MSCP	Mid Stay
Midstay	T3 Multi	T1 Multi	JP3/JPR
T2 East	T2 West	JP3/JPR	
T2 West	T1 SS	JP3/JPR	
T3 MSCP	T1 Multi	Mid Stay	JP3/JPR
JP3	JPR	T1 MSCP	T2 West
JPR	JP3	T1 MSCP	T2 West
Drop & Go	T3 M&G	T3 MSCP	Midstay
T1 M&G	T1 MSCP	T1 SS	D&G
T2 M&G	T2 West	D&G	
T3 M&G	D&G	T3 MSCP	Midstay

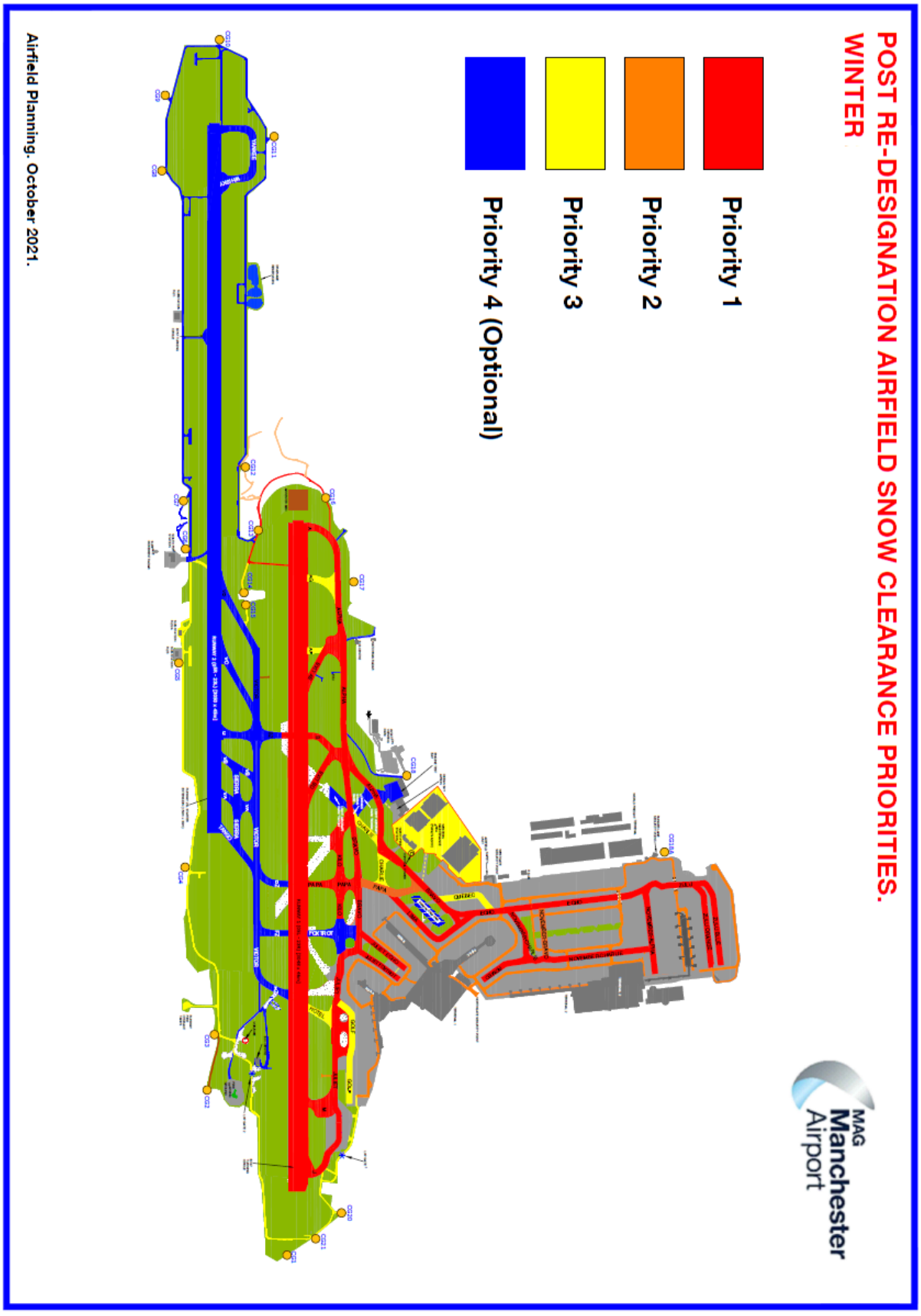
Appendix 7 – Specific Road Responsibilities~~Clearance Priorities~~



Appendix 8 – Snow Bank Profiles

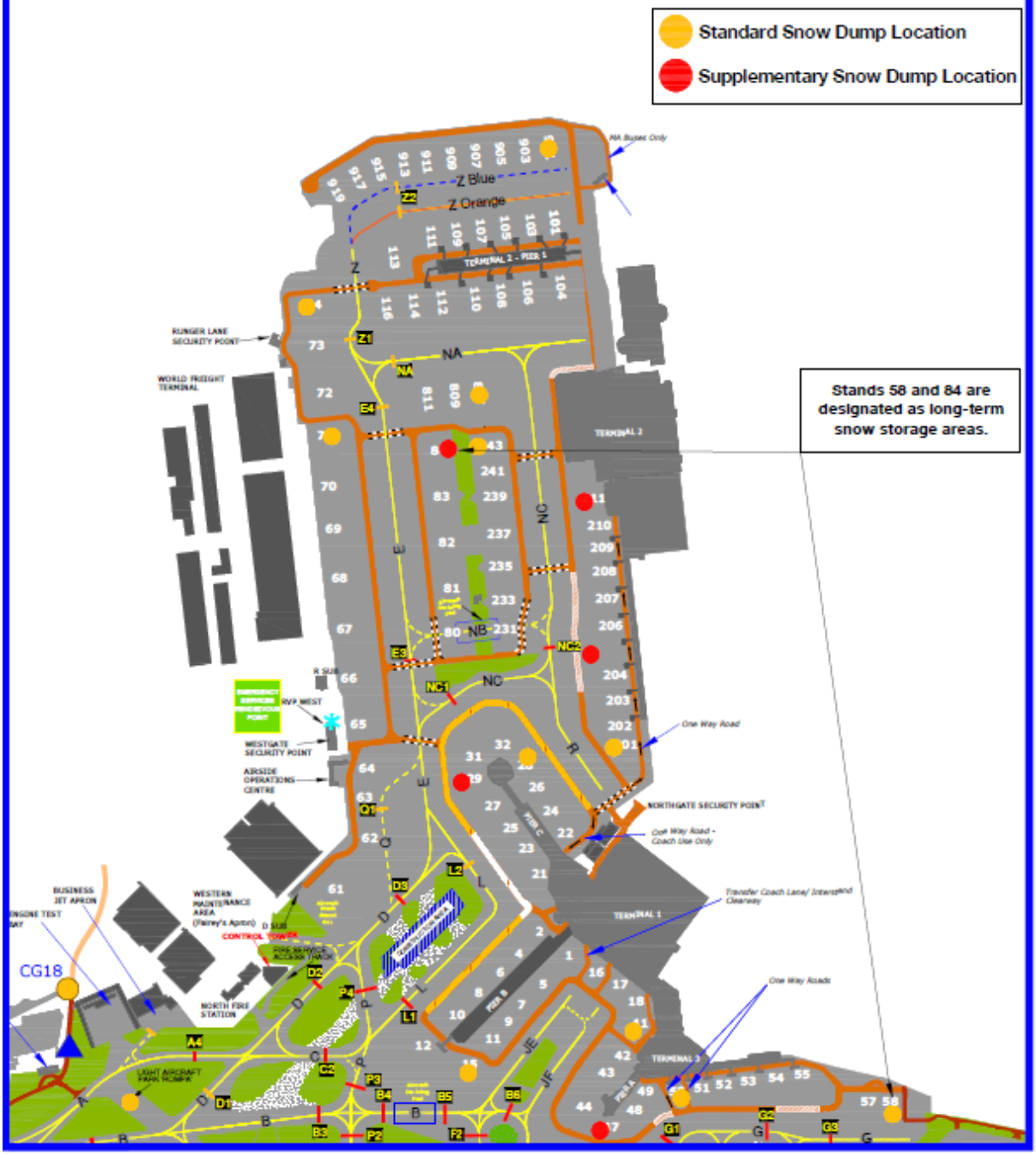


Appendix 9 – Aerodrome Snow Clearance Priorities



AIRFIELD SNOW DUMP LOCATIONS - WINTER

- *Do not brush snow towards the head of stand, as this can prohibit the movement of airbridges, and impede access to FEGP and equipment bays.*
- *Snow should be brushed to the rear of stands towards taxiways and then ploughed to an allocated snow dump location.*
- *Snow may be brushed onto grass areas at the head of Stands 233-241 and 81-83.*



Appendix 11 – Airside Snow Clearing Equipment

Snow Fleet 2022/23		
M/C ID	Machine Make/Use	
Ice1	Schmidt 12,00 litre De-Icer Spreader Unit	MA
Ice 2	Schmidt 12,00 litre De-Icer Spreader Unit	MA
Ice 3	Schmidt combi unit 6000 litres and solids	MA
Ice 4 (Sir Bruce Thaws Ice)	Schmidt ASP 12,00 litre De-Icer Spreader Unit	MA
Ice 5 (Clouey)	Schmidt ASP 12,00 litre De-Icer Spreader Unit	MA
CJS 1	Schmidt Compact Jet Sweeper	MA
CJS 2	Schmidt Compact Jet Sweeper	MA
CJS 3	Schmidt Compact Jet Sweeper	MA
CJS 4	Schmidt Compact Jet Sweeper	MA
CJS 5	Schmidt Compact Jet Sweeper	MA
CJS 6	Schmidt Compact Jet Sweeper	MA
CJS 7	Schmidt Compact Jet Sweeper	MA
CJS 8	Schmidt Compact Jet Sweeper	MA
CJS 9	Schmidt Compact Jet Sweeper	MA
Supra	Schmidt Supra 4002 Snow Cutter	MA
John Deere	Ramp Hog 16ft	Hired Tractor/ Buckhurst
John Deere	Ramp Hog 16ft	Hired Tractor/ Buckhurst
John Deere	Ramp Hog 20ft	Hired Tractor/ Buckhurst
John Deere	Ramp Hog 20ft	Hired Tractor/ Buckhurst
John Deere	Tractor Mounted Snow Brush (Stands)	Hired Tractor/ Cornthwaites
John Deere	Tractor Mounted Snow Brush (Stands)	Hired Tractor/ Cornthwaites
John Deere	Tractor Mounted Snow Brush (Stands)	Hired Tractor/ Cornthwaites
John Deere	Tractor Mounted Snow Brush (Stands)	Hired Tractor/ Cornthwaites
John Deere	Tractor Mounted 10ft Snow Plough (Stands)	Hired Tractor/ Cornthwaites
John Deere	Tractor Mounted 10ft Snow Plough (Stands)	Hired Tractor/ Cornthwaites
John Deere	Tractor Mounted 10ft Snow Plough (Stands)	Hired Tractor/ Cornthwaites
John Deere	Tractor Mounted 10ft Snow Plough (Stands)	Hired Tractor/ Cornthwaites
JCB 1	Telehandler With Bucket	Hired/Buckhurst
JCB 2	Telehandler With Bucket	MA
Grit 1	Tractor Rock Salt Spreader	Hired/Buckhurst
Trailer 1	Dump Trailer	Hired Attch Tractor when Required
Trailer 2	Dump Trailer	Hired Attch Tractor when Required
Trailer 3	Dump Trailer	MA
OV 1	Overaasen 200 Towed snow brush with front plough	MA TR22
OV 2	Overaasen 200 Towed snow brush with front plough	MA TR23
EM1	Emergency Tractor	Hired Tractor/ Cornthwaites
EM2	Emergency Tractor	Hired Tractor/ Cornthwaites
EM3	Emergency Tractor	Hired Tractor/ Cornthwaites
EM4	Emergency Tractor	Hired Tractor/ Cornthwaites

Appendix 12 – SNOCLO Matrix (Estimated Closure Periods)

Snow Accumulation	Estimated Duration of Airfield Closure
3mm – 5mm	1 Hour 30 Minutes
6mm – 10mm	2 Hours 30 Minutes
11mm – 20mm	3 Hours
20mm – 100mm	Approximately 4 Hours 30 Minutes
100mm – 200mm	Approximately 6 Hours
200mm +	Approximately 6 - 12 +

Appendix 13 – Runway Anti-icing Media Application Rates

	Ground temp. 0 to -5°C	Ground temp. -5 to -10°C	Ground temp. Below -10°C
Frost/Rime	5-7 g/m^2	7-9 g/m^2	10 g/m^2
Black Ice	8-12 g/m^2	17-20 g/m^2	23-26 g/m^2
Packed snow/ice, depth <10mm	10-14 g/m^2	19-23 g/m^2	29-32 g/m^2
Packed snow/ice, depth >10mm	16-24 g/m^2	29-35 g/m^2	44-48 g/m^2

Anti-Icing

Wet surface, temperature expected to fall below 0°C	6-8 g/m^2
Expected freezing rain	10-15 g/m^2

Appendix 14 – Anti-icing Technical Standard 2020

The purpose of this document is to optimize the decision making when anti-icing runways, taxiways and apron in winter weather conditions

Introduction

Compared to snow events, the prevention of frost or ice on airfield runways, taxiways and aprons is more frequent but requires a less extensive response. This resource will be drawn from Engineering Operations.

As frost or ice can form quickly over a large surface area, it is not possible to guarantee that all areas will be treated, particularly when a 'flash-freeze' scenario occurs. All airside users should be alert to the presence of ice hazards and take appropriate care. 'Flash-freezing' is a common feature of UK winter weather and usually occurs following a rapid decrease in surface temperature as precipitation dissipates and the sky clears. A 'flash-freeze' scenario can occur within a period of minutes, providing only a short window of opportunity to carry out anti-icing as precipitation ceases and the temperature falls. Airside users should also be aware that the temperatures will often subside during the period immediately following daybreak, posing a greater risk to operations during the busy morning peak period.

Whenever ice conditions are likely the Airfield Duty Manager should action, via Asset Engineering Operations a pre-emptive airfield anti-icing in an attempt to prevent the accretion of ice. The following factors should be considered when taking a decision to anti-ice:

The amount of surface water present on the Movement Area and the potential for anti-icing chemicals to become diluted

Actual and Forecast Surface Temperatures

The current weather, and likelihood of precipitation in the form of sleet/rain in advance of snowfall

Practicality of undertaking anti-icing from an operational perspective

Decision Making Protocol

Manchester Airport has the provision of several differing sources of information and software tools when making decisions on pavement pre-emptive anti-icing / de-icing:

Airfield Operations carry out regular manual surface inspections

Vaisala Weather Information System

StormGeo weather services

MET Office Forecaster-phone call facility MET Office Forecaster at any time H24, the Forecaster we talk to is the one responsible for the TAF (Terminal Aerodrome Forecast) for MAN /EGCC

Manufacturers guidelines- Anti-Icing media application rates

The latest weather prediction tools combined with experienced operational personnel provide a robust decision-making protocol

Decision Making Tools

Vaisala

Vaisala Runway Weather Information System (RWIS) is installed on the Aerodrome. Data is intelligently combined using several weather sites situated at different locations on the aerodrome and the use of strategically located sensors

Runway 23R Touch Down Zone (TDZ)

Runway 05L Touch Down Zone (TDZ)

Runway 23L Touch Down Zone (TDZ)

Runway 05R Touch Down Zone (TDZ)

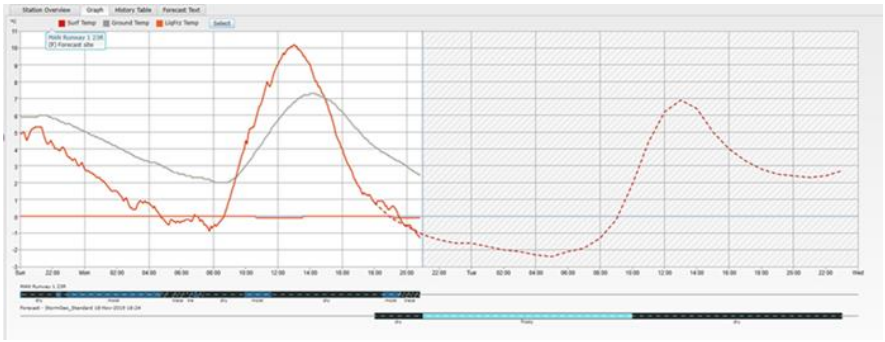
Taxiway Victor Touch Down Zone (TDZ)

Terminal One ramp

The sensors and weather sites gather valuable weather data containing measurements of water content, ground freezing temperature, liquid freezing point and air temperature. Other parameters can be selected like wind speed and dew point and anti-icing media content. The online portal contains all the valuable weather information for the operational teams to view. Below is a snap shot indicating an ice event scenario event in graph format

Vaisala Station Summary

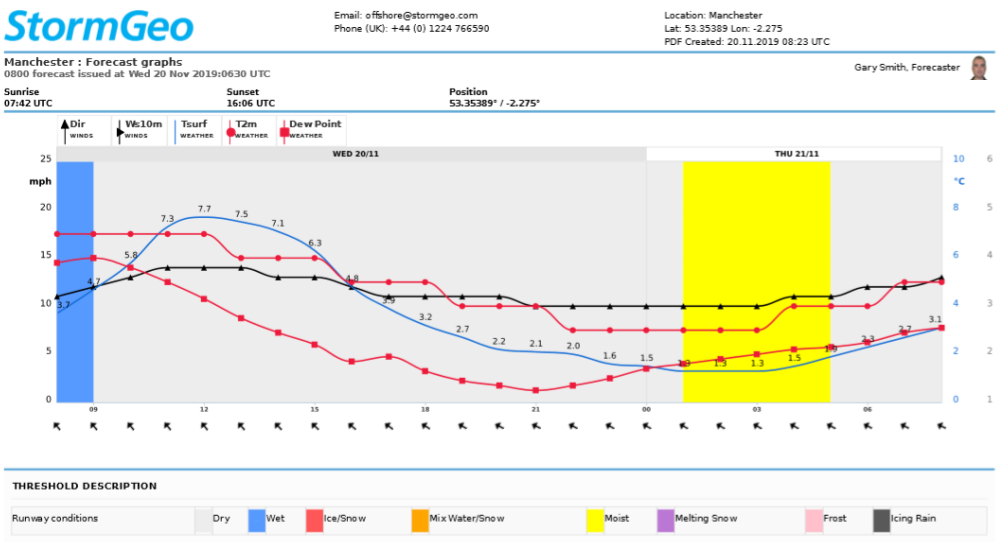
23R Sensor graph presenting surface temp, ground temp and liquid freezing temp



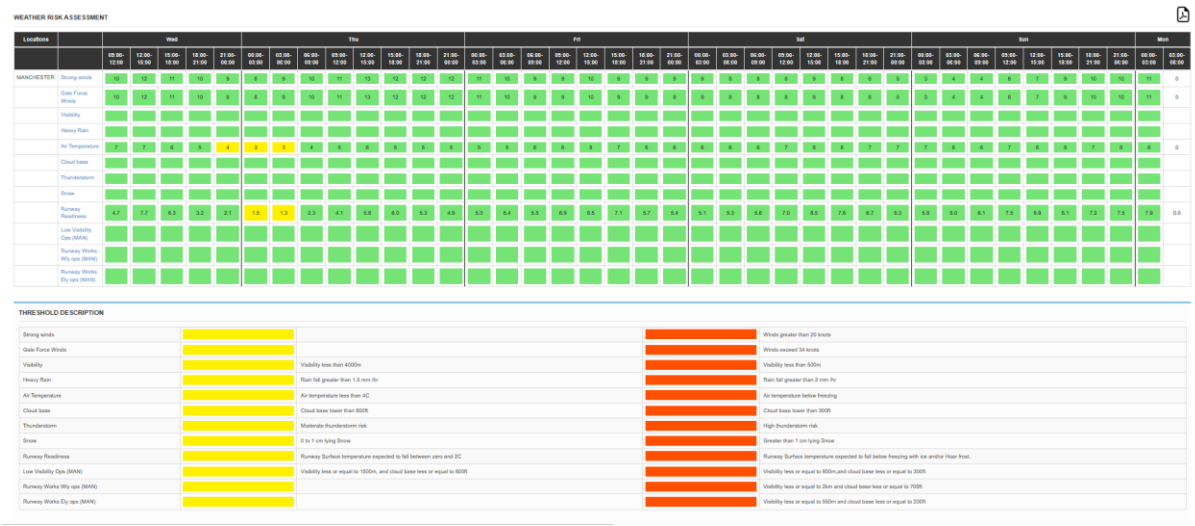
StormGeo

StormGeo is the weather forecasting provider adopted by Manchester Airport. StormGeo provides short- and long-term range forecasts based on human decision protocol. StormGeo is used to reinforce decision making for Aerodrome Operations

StormGeo Forecast graph presenting various weather parameters



Weather risk assessment portraying potential weather risks to the Aerodrome



MET TAF

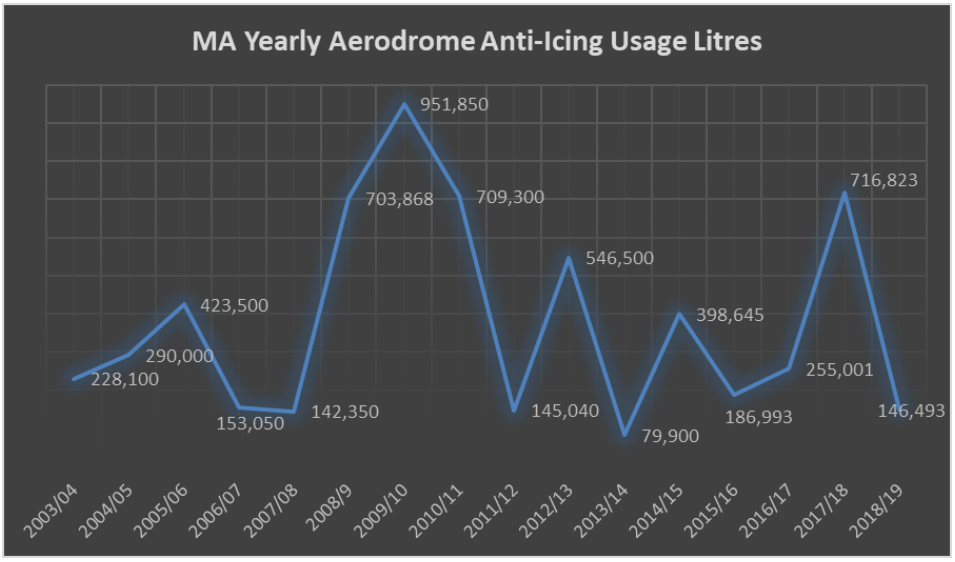
MET Office Forecaster can be contacted at any time, the Forecaster is responsible for the TAF (Terminal Aerodrome Forecast) for MAN /EGCC, the service provides a second option on weather related fronts

Storage Infrastructure

Manchester airport has the facility to hold 760,000 Litres of Safegrip® ECO2 anti-icing media. The two tanks are located landside at the CHP compound, and are equipped with an airside delivery system.

On average 371,636 Litres is used per annum on the Aerodrome **taken over a 16-year period; however, during the winter of 2009/2010 951,850 litres was distributed on the Aerodrome. Figure 1.3 presents the yearly distribution of anti-icing media for the past sixteen winter seasons.

MAN Yearly Aerodrome Anti Icing Usage



Two large storage tanks are located landside at the CHP compound Terminal Two, their original use was to store gas oil to supply the CHP. In 2009 Tank One was commissioned to store anti-icing media giving a capacity of 380,000 litres of storage capability in summer 2019 Tank Two was commissioned to hold an additional 380,00 litres of media. This now improves the storage capability to hold media on-site to 760,00 litres, doubling the winter resilience storage capability

Delivery Equipment

The Manchester airport fleet dedicated to the delivery of Aerodrome anti-icing fluid consists of:

2x Abei Schmidt ASP sprayers complete with, 12,000L tank, nozzle spray system, 15-40g/m2 @ 15-45km/h, 17m to 30m bi-foldable booms, spray width 3.7m

1x Abei Schmidt spinner nozzle hybrid Liquid/Solid

The three machines are calibrated to the specific gravity of the associated anti icing media product, in the case of Safegrip® EC20 the specific gravity is 1.40

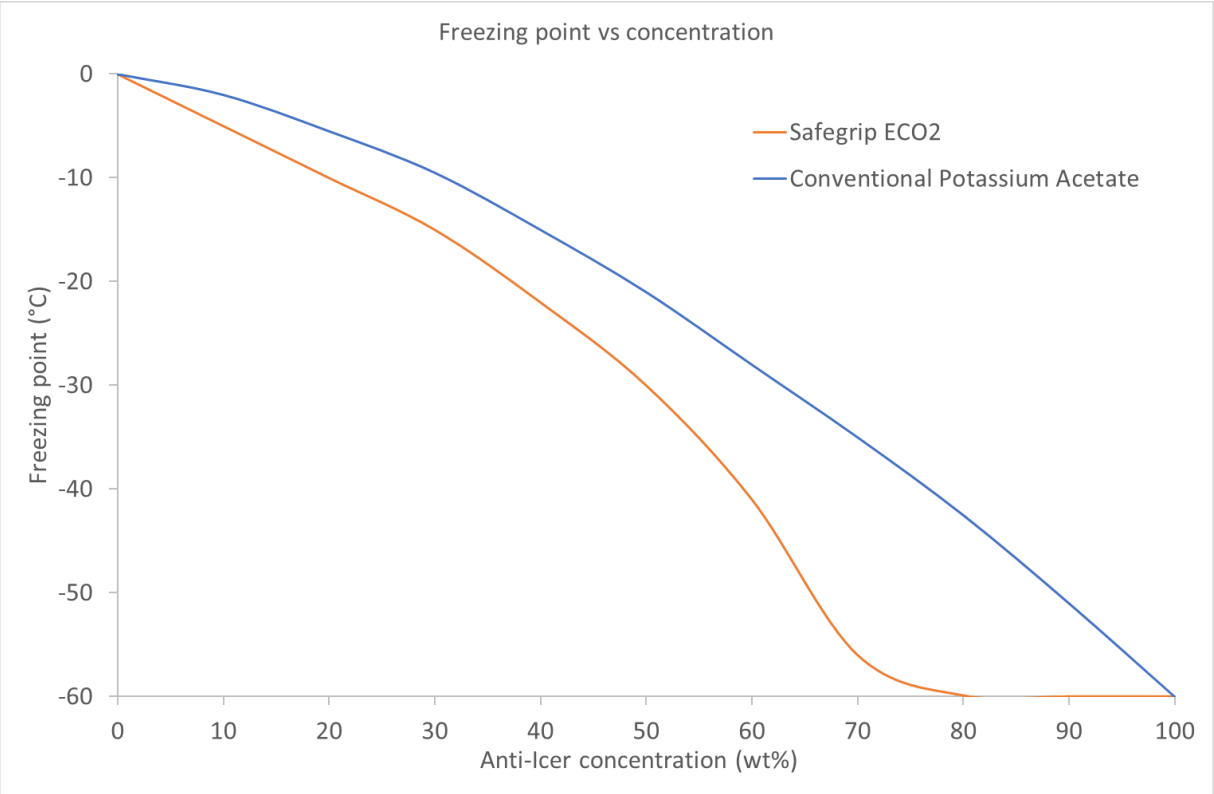
Anti-Icing Media Characteristics

Media Characteristics

Airfield anti-icing fluids work by mixing with water-based surface contamination and lowering its freezing point. Provided that the freezing point of treated contamination is lower than the ambient surface temperature, it will not freeze. This maintains a surface free from bonded frozen contamination

Anti-icing failure (surface freezing/contamination bonding) occurs when the ambient surface temperature equals or falls below the freezing point of the treated contamination. The freezing point of treated contamination depends on the concentration of anti-icer in it

Freezing point vs Concentration



Safegrip® ECO2 can be diluted with around two to three times more contamination than traditional potassium acetate or glycol based anti-icers before freezing at the same temperature. However, the general contamination vs freezing rule applies for any anti-icer regardless of its effectiveness. Roughly, doubling the amount of contamination will halve the freezing point protection given by an anti-icer treatment

An anti-icer treatment is more likely to fail if;

- The surface temperature is lower.
- The amount of contamination is increased.
- The amount of anti-icer on the surface is reduced.
- Surface temperature cannot be controlled, only predicted. The amount of contamination can be reduced with careful planning and application.

- The amount of anti-icer on the surface is not only dependant on application rate, it is also dependant on application circumstances and timing. The amount of anti-icer on the surface can be maximised with careful planning and application

Anti-icer treatment 'life cycle'

The protection offered by an anti-icer treatment is affected by spray drift, run-off, starting contamination, and precipitation

Spray drift

The actual application rate of anti-icer equals the headline rate (sprayer setting) minus any material lost to spray drift away from the treated area. A 25% loss of anti-icer to spray drift, for example, will reduce anti-icing treatment effectiveness by 25%.

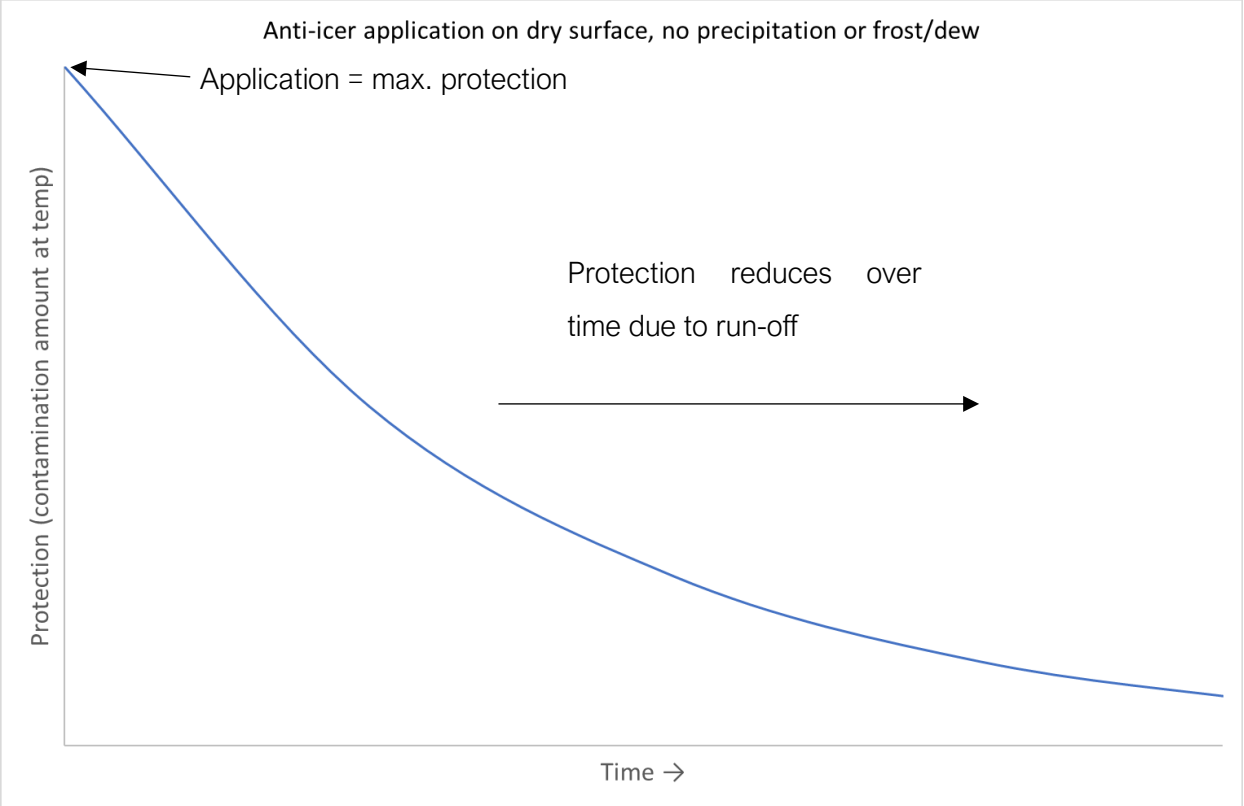
Spray drift can be minimised by ensuring optimum sprayer set-up (use of anti-drift nozzles, setting the sprayer bar as close to the surface as possible whilst still ensuring even surface coverage), and by avoiding spraying during windy conditions if possible

7.4 Run-off

Airfield surfaces are designed to drain away water. They will also drain away liquid anti-icer. Anti-icer will slowly drain (run-off) from surfaces starting from the moment as it is applied. Even in the absence of contamination, anti-icing protection is reduced over time by the elimination of anti-icer from treated surfaces by run-off

Depending on airfield surface type, traffic patterns etc., anti-icing protection from an application on a dry surface may typically be halved after 6-12 hours due to run-off

Application vs Run Off

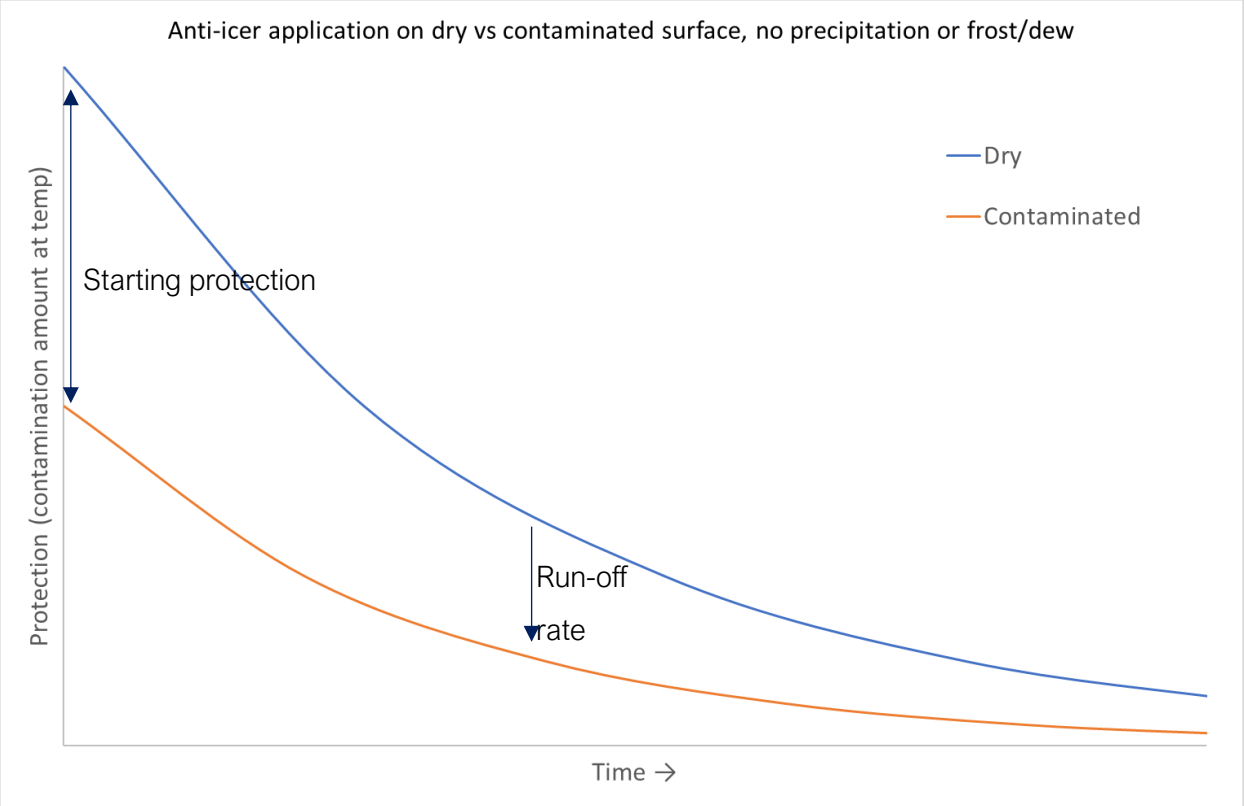


Run-off losses can be minimised by applying anti-icer as close as possible to the onset of the freezing event.

Contamination

Contamination on the surface at the time of application dilutes the anti-icer. As well as reducing freezing protection from the start of the application, dilution also increases the runoff rate

Dry vs Contaminated Surface



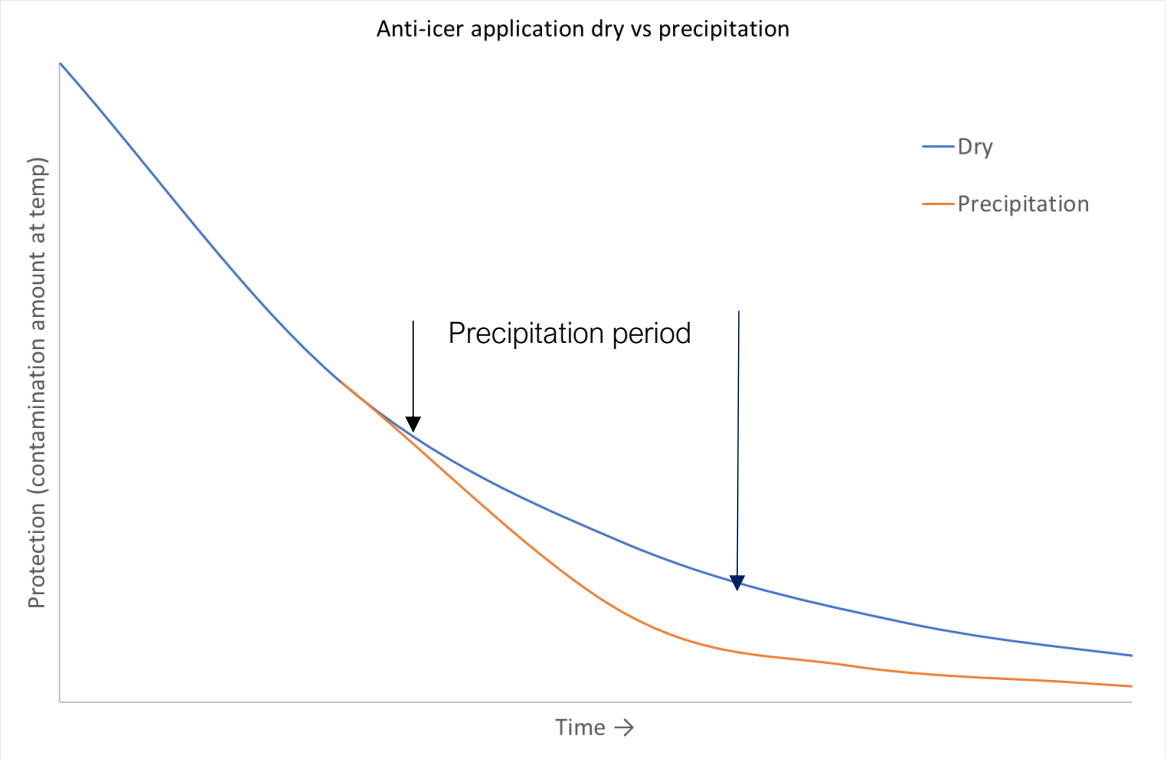
Anti-icer dilution due to surface contamination can be minimised by removing surface contamination prior to application. This can be achieved by brushing water or other contamination from surfaces (mechanical removal), as well as allowing surfaces to drain/dry off as much as possible prior to application (natural removal). Natural removal is typically maximised by applying anti-icer as close as possible to the onset of the freezing event.

Removing half of any surface contamination prior to anti-icer application will double the effectiveness of the application.

Precipitation

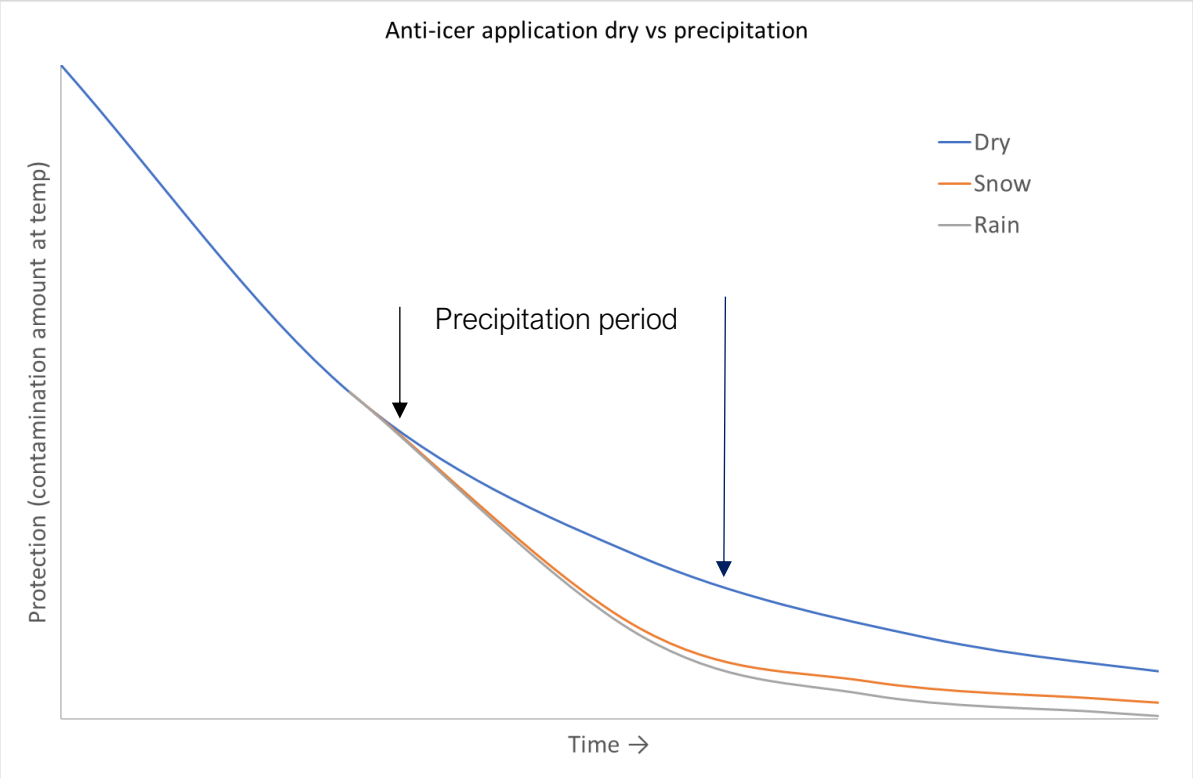
Precipitation dilutes anti-icer and reduces anti-icing protection throughout the precipitation event. The run-off rate of residual anti-icer is also increased after the event due to dilution. The heavier the precipitation, the greater the dilution. Frost and dew have the same effect as precipitation, albeit generally less intense

Dry vs Precipitation



Compared to frozen or freezing precipitation, rain also tends to wash anti-icer off the surface, increasing the rate at which protection is decreased

Dry vs Snow



Anti-icer must be on the surface during a frozen/freezing precipitation event to protect it, so the amount of precipitation exposure during freezing events cannot be controlled, only predicted.

Anti-icer does not need to be on the surface during non-freezing rain events. Anti-icer applied prior to a non-freezing rain event achieves nothing other than to waste anti-icer. As well as effective use of weather prediction, the chances of anti-icer dilution and wash-off due to non-freezing rain can be minimised by applying as close as possible to the onset of freezing events

Runway Surface Characteristics

Grooved Marshal Asphalt runway surfaces will increase surface run off as per design, in effect any surface moisture present on the runway surface will be subject to run off, this includes anti-icing media. BBA runway surfaces will hold moisture and appear damper, however for the application of anti-icing media both runway surfaces should be treated in the same manner and application rates for media distribution are prescribed

Weather Scenario

Figure 2.1 outlines a 24hr weather scenario, surface temperatures are predicted to drop below zero at 03:00, light precipitation is predicted to fail on and off over the 24hr period, accumulations of snow is predicted to fall from 21:00 to 02:00 at 1mm to 3mm. The weather minima have been confirmed by Vaisala and StormGeo

Timestamp	Surface Temperature (°C)	Surface State	Air Temperature (°C)	Dew Point Temperature (°C)	Rain State	Wind Speed (kn)	Wind Direction (°)	Cloud Type	Total Cloud Amount (octa)	Snow Acc (mm)
12:00	5.5	damp	4.9	1.7	med	11.5	224	low	6	0
13:00	5.6	damp	5.3	1.5	no precip	12.4	231	low	7	0
14:00	5.1	damp	5.5	1.5	no precip	10.7	230	low	7	0
15:00	4.3	damp	4.9	1.7	light	9.5	224	low	6	0
16:00	2.8	damp	4.4	1.8	no precip	9.1	211	low	5	0
17:00	1.9	damp	3.8	1.6	light	8.7	200	low	4	0
18:00	1.6	wet	3.3	1.5	no precip	7.8	202	low	6	0
19:00	1.8	wet	3.3	1.6	light	7.6	216	low	7	0
20:00	1.7	wet	3.3	2.1	light	6.6	210	low	7	0
21:00	1.5	wet	3.2	2.2	no precip	5.8	225	low	6	1
22:00	1.5	wet	3.2	2.5	light	5.6	250	low	6	1.5
23:00	0.9	wet	3	2.1	light	5.2	245	low	5	2.5
00:00	0.6	wet	2.5	2.1	light	4.5	222	low	6	3
01:00	0.8	wet	2.7	2.3	light	4.1	317	low	7	3
02:00	0.6	wet	2.6	2	light	4.1	296	low	7	0
03:00	-0.1	ice	2.1	1.6	light	5.2	335	low	6	0
04:00	-0.6	ice	1.8	0.9	no precip	6.2	317	low	3	0
05:00	-0.8	ice	1.3	0.3	no precip	7.6	321	low	4	0
06:00	-0.7	ice	1.3	0.1	light	8.7	321	low	5	0
07:00	-0.7	ice	1.7	0.4	no precip	8.9	321	low	5	0
08:00	-0.7	ice	1.6	0.1	no precip	8.4	325	low	5	0
09:00	-0.5	ice	1.9	0.1	no precip	8.2	326	low	3	0
10:00	0.6	wet	2.3	0.4	no precip	7.4	322	low	1	0
11:00	3	wet	3.2	1.2	no precip	7.8	323	low	3	0
12:00	4.5	wet	4.2	2	no precip	9.3	330	low	5	0

The optimum time to treat runways, taxiways and aprons would be a delivery of anti-icing media at 17:00, one application at 8g/m2

Summary

Airfield anti-icer effectiveness will be maximised by following simple rules on how and when to apply anti-icer:

- Ensure anti-icer sprayer equipment is optimised to minimise spray drift
- Always apply anti-icer as close as possible to the onset of a freezing event i.e. 60mins before event
- Always remove as much surface contamination as possible before applying anti-icer
- Do not remove media from treated surfaces post initial treatment with equipment i.e. sweepers or snow blower/brush
- Never apply anti-icer prior to non-freezing rain events
- Following these rules will maximise anti-icing hold-over, minimise surface icing events, maximise runway, taxiway and apron availability, and minimise anti-icer fluid consumption

Document End