

DUNDEE CITY COUNCIL
CITY DEVELOPMENT DEPARTMENT
ROAD MAINTENANCE PARTNERSHIP

WINTER GRITTING
& SNOWCLEARING SERVICES

POLICY STATEMENT

2016/17



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WINTER MAINTENANCE POLICY AND LEVEL OF SERVICE 2016/17

1 POLICY

- 1.1 Dundee City Council will operate a priority system of winter maintenance which, as far as reasonably practicable, will permit the safe movement of vehicular and pedestrian traffic on the more important parts of the road network while minimising delays directly attributable to the adverse weather conditions and will aim to provide a suitable level of service on footways subject to available resources.
- 1.2 The objective of this policy is to enable the Council to comply with its statutory duty to:-
- “take such steps as they consider reasonable to prevent snow and ice endangering the safe passage of pedestrians and vehicles over public roads” (Roads (Scotland) Act 1984).**
- 1.3 As part of the Road Maintenance Partnership, Tayside Contracts operate and maintain a fleet of dedicated winter maintenance vehicles to carry out winter maintenance operations on the adopted roads and footways maintained by Dundee City Council City.
- 1.4 These roads and footways have been prioritised as priority, secondary or cul de sac depending on their strategic importance etc as referred to later in this report.
- 1.5 Winter maintenance is an expensive operation and the Director of City Development will continue to investigate new methods/systems that may offer opportunities to reduce costs.

2 SERVICE PROVISION

Operating Period

- 2.1 The winter operating period will run from October until April each year.
- 2.2 The “core” period for 24 hour continual monitoring and priority operating will run from the middle of October until early April. Carriageway, secondary and cul de sac route additional support resource will run from late October to late March. Footway operations will commence in the middle of November until the middle of March, the exact starting and completion dates to be established each pre winter season and as currently detailed in Appendix A.

Service Provision

- 2.3 During this period, Tayside Contracts, the operational arm of the Road Maintenance Partnership, as principal service provider, will provide the necessary resources (including suitably trained personnel) in order to achieve the required standards. These resources cover priority, secondary and cul de sac carriageway routes. Appendix B details the resources in place to deliver the winter service. Appropriate arrangements will be made to ensure a continuity of service during the festive season and other holiday periods.
- 2.4 During the winter period, the Road Maintenance Partnership will operate a 24 hour winter service, using weather forecasts, road and weather monitoring data supplied through competitive tender.

- 2.5 The primary focus of the Road Maintenance Partnership is to manage the overall winter service and to directly provide an effective roads gritting & snow clearing service. To deliver this service, operatives' standby arrangements will be made which are suitable and sufficient to meet the defined standards of service required. It is expected that standby personnel will be at their base, fit for work, within 1 hour of receiving a call. The standby period for operatives will normally be consistent with the "core" winter period as defined in Section 2.2 above and as detailed in Appendix A.
- 2.6 In severe winter conditions, a carriageway secondary and cul de sac route snow clearing service is provided by external resources procured through Tayside Contracts, to work under the direction of Road Maintenance Partnership staff. Eight tractors and drivers will be employed on a standby basis. These will be deployed dependant on conditions and forecast, although one could be allocated per council ward if operationally viable and conditions allowed. It is intended that this resource will be deployed in severe winter conditions i.e. snow or extreme ice no later than 24 hours after initial treatment has started.
- 2.7 A footway gritting and snow clearing service is provided by the Environment Department engaged by means of an agreed Service Level Agreement to work under the direction of Road Maintenance Partnership staff. A standby service for winter footway action on weekday, public holidays and weekends is in place as defined in Appendix A.
- 2.8 When severe weather conditions prevent normal outdoor activities such as grass cutting, grounds maintenance and various construction related work, such available resources are allocated to winter services as required. A priority system along with associated resource has been identified to address the clearance of snow in those areas of roads and footways within and around schools, sheltered housing, social work and Leisure & Culture Dundee properties. In liaison with the various departments a priority order of snow clearance has been established and each property categorised into operational priorities 1, 2 and 3. By prioritising the properties into priorities 1, 2 and 3, this gives most flexibility to react to varying circumstances. In the event of extreme winter conditions, the Chief Executive will call an emergency meeting of appropriate Chief Officers to determine the appropriate priorities at that time. Ordinarily, schools will be given priority. Sheltered housing and social work properties will follow, with priority 1's cleared first, then priority 2's and then 3's. Plans have been prepared for each property which clearly show the routes and areas to be cleared and which resource will be used to clear each. e.g. Roads - mainline gritters, Footways - Environment Dept, Environment Dept Additional resource – agreed areas around priority Council properties, Internal footpaths - facilities staff. Such additional employees from the Environment Department are allocated to the most appropriate activity and directed by Road Maintenance Partnership staff to assist in the delivery of a prioritised winter service. The agreed resources to be provided by the Department are also detailed in Appendix B.

Sub-contractors

- 2.9 In "Red Alert" circumstances, such as extreme weather i.e. heavy/drifted snow and extreme ice, external contractors and other resources, such as JCB's, diggers, tractor ploughs etc may also be engaged. These will be procured through existing arrangements with Tayside Contracts.

Salt Resilience/Storage

- 2.10 Salt is purchased each year to restore stocks to a level sufficient to meet the anticipated requirements for treating the road network and these stocks are closely monitored and controlled with restocking ordered as necessary throughout the winter to maintain agreed stock targets.
- 2.11 6mm marine salt is predominately used on the network and is currently stored uncovered at Marchbanks depot. Although considerably more expensive than indigenous rock salt, the characteristics of marine salt mean that it can remain uncovered and still perform well throughout the winter. Indigenous rock salt that is left uncovered does not flow well through gritting equipment when the moisture content increases and therefore cannot be exposed to the elements for any length of time, without affecting its performance.
- 2.12 Savings could be made if salt was stored undercover as this would allow both marine salt and indigenous rock salt to be used. Having the ability to store different types of salt, also means that there is not a reliance on an individual source, which was one of the recommendations in the UKRLG 2009 report and the recently revised Appendix H of "Well Maintained Highways".
- 2.13 As part of future development of Marchbanks Waste Management facility and the benefits identified above with regards storing salt under cover, funds have been allocated within the capital plan for the construction of a covered storage facility within Dundee. This project is inclusive of the "Changing for the Future 4 (CFTF4), Depot Rationalisation Project", as yet a specific site location for the facility has not been established,
- 2.14 As recommended by the UKRLG 2009 report, appropriate resilience has been set to meet supply and demand of salt. With Tayside Contracts procuring salt for the three surrounding councils this has never been an issue. However, decisions have been taken to implement formal resilience based on the 2009 recommendations and the experiences of 2009/10 and 2010/11 winters. The number of days of resilience is determined by each Council depending on re-stock arrangements e.g. in Dundee salt is delivered by sea, arrangements with Tayside Contracts and available depot storage space. As shown in Appendix C, the minimum stock level during the winter period is determined at 2,340 tonnes. Recommendations made with the revised Appendix H of "Well Maintained Highways" will be taken into consideration over the coming years.
- 2.15 As part of the Changing for the Future 4 (CFTF4) process, a review of salt usage since 2010/11 was undertaken. The average salt usage over the last 5 years has been 7,000T, based on this review the Dundee salt holding at the commencement of winter has been set at the revised level, reducing from 10,000T to 8,200T to assist with the necessary revenue cost savings exercise. Alternate resilience provisions are in place, including mid season re-stocking from Scotland Excel suppliers, access to Tayside Contracts and Transport Scotland salt resilience stock.

3 INFORMATION FOR ACTION

Weather Forecasting Information

- 3.1 The Head of Roads & Transportation will receive a road related weather forecast specific to the City early each afternoon during the winter maintenance period to assist him in deciding if Tayside Contracts should treat the roads and footways.

Subject to the nature of the forecast, the instruction to Tayside Contracts can be to pre-treat the roads that evening and/or instruct the priority route crews to report to the depot at a specific time the following morning. At that time a more accurate assessment of conditions can be made by the Winter Maintenance Controller using the Ice Prediction System and any updates to the forecast, leading to a decision to either send the crews out or to stand them down.

Road Weather Prediction System

- 3.2 The Ice Prediction System will also take data from outstations, such as air and road temperatures, precipitation, road wetness and presence of salt, available to the weather forecast provider to refine the accuracy of the forecast, which, will automatically produce a graphical image of minimum expected road temperatures for the priority network. This enables selective gritting to be carried out on a route basis when freezing is likely to be restricted to relatively few locations.

GPS Information System

- 3.3 GPS monitoring systems attached to gritting plant and other selected vehicles has been in operation for a number of years. The use of GPS equipment has provided a number of benefits, including the ability to confirm when roads and footpaths have actually been treated in winter conditions. They have assisted in dealing with enquiries from the public, as well as defending public liability claims. In addition, the information provided will greatly assist in identifying future efficiency savings through improved route optimisation.
- 3.4 Investigations continue to take place in the benefits of upgrading gritters that can follow pre determined routes i.e. like satellite navigation talk through and also automatic salting based on prescribed route conditions. This allows any driver to operate a particular route that they are unfamiliar with and spread salt/grit only when required. Based on investigations to date, the mainline gritting fleet for 2016/17 season will be fitted with a system that will allow the driver to be directed along a specified route (satellite navigation system). A further nine gritters will have the ability to follow pre determined routes, only spreading salt when required on the route i.e. not salting a section travelled by a previous gritter. The benefits of such equipment will be fully explored as part of the ongoing route review and route optimisation process, with a view to expanding this within the fleet.

Levels of Readiness

- 3.5 Three levels of readiness are to be applied throughout the Winter period:

Green:

- 3.6 'Normal' monitoring and action conditions apply. When sub zero temperatures are forecast over no more than 4 consecutive days to be followed by a thaw, a daily standard action of pre-grits on Priority Routes will be applied, rates of spread will be determined by use of the treatment matrix in Appendix E. Only staff and workforce whose normal duties include winter action, monitoring and supervision are involved.
- 3.7 Routes treated under Green:
- a Carriageway Priority routes only.
 - b Footway: No treatment of footway routes.

Amber:

- 3.8 Extended monitoring and action conditions apply. When prolonged freezing conditions i.e. 5-10 consecutive days, snowfall or extreme ice is forecast. Additional staff will be allocated duties to handle extended reporting systems etc. Workforce participation will be extended as appropriate, other Services will be notified for assistance as required, including Emergency Planning, Environment Department and Emergency Services. The state of readiness of plant and equipment will be checked, inspect and replenish grit bins where appropriate.
- 3.9 Routes treated under Amber:
- a Carriageway Priority and Secondary routes, any variance from this at discretion of RMP Manager.
 - b Footway: Priority routes, any variance from this at discretion of RMP Manager.

Red:

- 3.10 Full monitoring and action conditions apply. Severe and continued snowfall or extreme ice is forecast endangering the continuity of the infrastructure. Actions as per Amber, mobilisation of additional external resource and supplementary resource from other departments. Full reporting systems in place, including daily status reports to members, Contact Centre, emergency services and appropriate Council Services.
- 3.11 Routes treated under Red:
- a Carriageway Priority, Secondary and cul de sac routes, any variance from this at discretion of RMP Manager.
 - b Footway: Priority and secondary routes, any variance from this at discretion of RMP Manager.
- 3.12 It is the responsibility of the Road Maintenance Partnership Manager to implement the necessary level of readiness (Green, Amber or Red) in relation to ground conditions and forecast information.

4 PRIORITIES AND TREATMENT STANDARDSAdopted Carriageways

- 4.1 The basis for establishing priority routes in relation to the formally adopted road network is as follows:
- i All strategic routes
 - ii Main service bus routes
 - iii Other heavily trafficked roads
 - iv Other adopted roads
- 4.2 In order that treatment of major roads (i-iii above) can be provided within an acceptable timescale, the number and length of priority routes must be held to a level commensurate with available resources.

Night Shift Cover

- 4.3 A limited night shift cover will operate on certain routes of major importance within Dundee City because of the need to treat these roads outwith priority treatment times.
- 4.4 The night shift will operate from between 21.00 hours and 05.30 hours. With the pre-wetted system, this vehicle can effectively treat strategic roads in marginal conditions.
- 4.5 The night shift crew will be based at Fairmuir Depot and can be instructed to patrol or treat these routes, initially based on the early afternoon forecast. Subsequent forecast updates or changes in actual conditions may result in this instruction being amended by either the Winter Maintenance Controller or a duty standby supervisor (Assistant Controller) depending on the time of this decision.

Treatment Routes

- 4.6 The respective categories covered are as follows:

<u>Route Category</u>	<u>Hours of Cover</u>
Priority Routes	0500-2200
Secondary Routes	0730-1600
Cul de sac Routes	0730-1600

Resources have been established to carry out the treatment of the priority carriageway network within a 2 hour period during normal precautionary treatment.

It is expected that standby personnel will be at their base, fit for work, within 1 hour of receiving a call.

Cover may be extended on secondary and cul de sac routes during snow or extreme ice conditions as authorised by the Director or Head of Roads & Transportation.

Priority Routes

- 4.7 The night shift will operate with 1 crew.
- 4.8 The main standby system will operate for all 14 priority routes.
- 4.9 Specific dates and times of operation are detailed in Appendix A.
- 4.10 As part of the standby system between Mondays to Saturdays, regular early morning reporting at 0400 hours will operate (with the facility to call the crews out as early as 0500 hours for priority routes if conditions dictate). During periods of anticipated relatively mild weather an operational decision may be taken daily to temporarily suspend this, though road temperatures will still be monitored.
- 4.11 On Sundays and public holidays reporting of standby personnel will only be carried out if required.
- 4.12 It should be noted that while the standby crews' initial priorities are as detailed above, some flexibility in the deployment of these standby crews throughout the city is

operated, depending upon the prevailing weather conditions and the requirements of the service, but priority routes will still be treated first.

Secondary and Cul de sac Routes

- 4.13 All resources will initially be concentrated on priority routes, and it is only when these priority routes have been adequately dealt with that resources will be deployed on secondary routes and then cul de sac routes.
- 4.14 In order to improve the service for secondary and cul de sac routes an additional supporting resource will be engaged. In severe conditions, this resource will be engaged to start within 24 hours of priority routes starting.
- 4.15 It is inevitable that many cul-de-sacs do not receive prompt treatment because large purpose-built winter maintenance vehicles have difficulty in manoeuvring due to parked cars and unsuitable turning points. It is thus not practicable to include most cul-de-sacs within priority and secondary gritting routes due to the unacceptable route times which would result.
- 4.16 The supporting additional external resource and the use of 3.5T and 7.5T demount gritters allocated to clearing cul-de-sacs on completion of other priorities will improve the service to cul de sacs. Where practicable, some main carriageway gritters are also deployed to cul-de-sacs as their through routes are completed.

Weight Limited Bridges

- 4.17 There are a number of weight limited bridges in the City. While the above 7.5T demount gritter can be used on several such bridges, it is still too heavy to treat those with 3 tonne limits. A "small" gritter mounted on a pick-up is now used at these locations. After treating these bridges, this equipment is also used to treat the Murraygate and areas of footways around the Overgate and City Square. Following completion the gritter will be allocated to assisting in treating cul-de-sacs.

Unadopted (Private) Roads/Footways

- 4.18 Following discussion at Committee when the 1998/99 Winter Maintenance Policy and Level of Service Report was approved, investigations were carried out on the feasibility of providing a winter maintenance service on unadopted roads. It was established that quite apart from the problem of insufficient resources, the law made no specific provision to undertake this work and any insurance cover may be invalidated if such work was undertaken. While the general legal position has changed since 1 April 2003 with the establishment of the general "Power to Advance Well-Being" under Section 20 of the Local Government in Scotland Act 2003, the use of any new general powers to extend winter maintenance to unadopted roads would be subject to ensuring that private roads were not given unreasonable priority before any adopted roads, otherwise the Council may be found to be in breach of their statutory duties in, for example, a case brought against the Council by someone injured on a public road due to winter conditions.
- 4.19 The Director of Finance at that time indicated that inevitable/unavoidable damage to unadopted footways and carriageways from winter maintenance operations due to the vulnerability of unmade and substandard surfaces would not be met by the Insurance Fund. The Public Liability insurance held by the Council responds to unforeseen loss or damage rather than inevitable/unavoidable damage. This is standard insurance market practice for this class of cover. In addition, as the Roads

(Scotland) Act 1984 makes no provision to carry out winter maintenance operations on unadopted roads the Council's insurers may question our actions if claims from these areas were brought against the Council.

- 4.20 In view of all of the above and the fact that the Council has insufficient resources to deal with the unadopted network, no provision will be made for treating non Council owned roads and footpaths.
- 4.21 During periods of sustained severe weather identified as 'Red' within the level of readiness, assistance may be available through the use of Criminal Justice System offenders for clearing elderly/disabled private paths etc.

Adopted Footways

- 4.22 The basis for establishing priority routes in relation to the formally adopted footway network is as follows:
- i Education establishments (secondary, primary and nursery).
 - ii Main retail locations (City Centre, Lochee, Perth Road, Albert Street, Hilltown and Broughty Ferry).
 - iii Area Housing offices (East and West).
 - iv Other retail clusters (eg Camphill, Menzieshill, Charleston etc).

Resources have been established to carry out the treatment of the priority footway network within a 2 hour period during normal precautionary treatment.

- 4.23 In order that treatment of major footways (i-iv above) can be provided within an acceptable timescale, the number and length of priority routes must be held to a level commensurate with available resources.
- 4.24 Adopted footways are also categorised into priority routes and secondary routes. The priority routes are those which the footway snow ploughs deal with first, namely education establishments and shopping areas and main bus routes. Once the priority routes have been treated to a reasonable standard, secondary routes will be dealt with next.
- 4.25 Whilst the Department's aim is to clear all adopted footways, the total lengths involved mean this can take some days, particularly in recurring snow or when ice has formed and daytime temperatures remain very low. In such circumstances, the additional resource from other departments will be utilised to assist in clearing these areas as quickly as possible. In such circumstances however, a number of footways may still be untreated when a thaw occurs.
- 4.26 The fleet of footway tractor ploughs is available during the winter maintenance period to treat ice or snow. Hoar frost on footways will not be treated unless prolonged over a number of days, due to the generally more effective result of normal daytime temperatures in such conditions. Unlike carriageway treatment, footways are not pre treated in advance of expected weather conditions.

Adopted Footways – Priority Routes

- 4.27 During snow or severe ice conditions these routes will have coverage from 0600 hours to 2100 hours on all days including Saturdays, Sundays and public holidays. Cover outwith normal working hours will be by operatives who participate in the Winter Maintenance Standby Rota.

Adopted Footways – Secondary Routes

- 4.28 These footways will have similar coverage to priority routes and will be treated after the priority routes have been adequately dealt with.

Cycle Route Treatment

- 4.29 Many of the cycle routes across Dundee are covered within the current carriageway and footway treatment routes, the exception to this are those which are remote from an adopted carriageway or footway.
- 4.30 In 2015/16 the remote cycle/walking route from Dighty Burn (Esplanade, Broughty ferry) to Invergowrie, part of National Cycle Routes 1 & 77, was introduced and will be treated in accordance with footway secondary routes in 4.28 above.
- 4.31 Over the next 12 months the principle cycle routes within Dundee will be reviewed as part of the “Cycling Strategy” to establish if an extended network for treatment is required along with the level of priority.

Grit Bins (Adopted Roads/Footways)

- 4.32 Grit bins are a popular method of providing self-help in the least accessible locations and to deliver this service Dundee provides approximately 830 bins across the city on adopted footways and Council housing footways. It is the Council’s current policy that new grit bins will be provided on request on adopted roads/footways, only at locations where the undernoted criteria are met, and that no further grit bins be provided where the carriageway or footway (as appropriate to the request) is not adopted. On Housing Department footpaths, locations based on similar criteria were initially agreed in 2004/05 and a number of further such locations have subsequently been added.
- 4.33 The criteria referred to above are:
- 1 the location is not on a Priority footway gritting route, **AND**
 - 2 the location has a gradient greater than 6%, **OR**
 - 3 the location is on a tight bend (if request relates to carriageway) **OR**
 - 4 the location incorporates a series of steps (within the adopted road boundaries) **OR**
 - 5 the location is within a sheltered housing area and is the main link road to local shops or public transport.
- 4.34 Information relating to the number, location and distribution of grit bins is held at the operational depot at Fairmuir. Following yearly increases in the provision of grit bins, there are now approximately 700 approved locations throughout the city, including approximately 100 on housing footpaths. This information is also available via the Dundee City Council web site.
- 4.35 In new housing developments grit bins are to be provided by the Developer through Road Construction Consents to the agreed specification at appropriate locations.
- 4.36 Following the successful trial in 2008/09 and 2009/10, grit bins are to remain in position throughout the year. In areas of high vandalism, recorded damage or where members of the public have identified a nuisance then these bins will be removed as notified and re-established each October or re-located following consultation with the Local Councillors.

- 4.37 Grit bins are replenished prior to the onset of winter and periodically as required throughout the course of the winter season. Specific requests for refilling will be actioned normally within 5 working days. Grit bins are filled with a 1:6 mixture of salt and sand/grit.
- 4.38 As identified in the level of readiness, additional resources will be deployed during severe winter conditions to ensure that grit bins remain replenished, enabling self help.

Footways/Footpaths and Other Areas Maintained by Other DCC Departments

- 4.39 As noted earlier, winter maintenance service provision by the Council goes wider than the adopted road network. With the exception of weather conditions that result in a "Red Alert" being called, All other council departments/units have responsibility in the interests of public safety for winter maintenance on the areas which they look after (e.g. schools, parks and cemeteries, council owned housing schemes, day-care centres, car parks etc). Each department /unit has measures in place to ensure this is managed as far is reasonably practical.
- 4.40 Environment Department staff will be used to deliver a service clearing snow and extreme ice at Cemeteries, Educational, Sheltered Housing, Social Work and Leisure & Culture Dundee establishments in an agreed prioritised manner during an "Amber or Red Alert" scenario.
- 4.41 All such staff from the Environment Department will come under the control of the Head of Roads & Transportation/Roads Maintenance Partnership Manager when providing a winter service during an "Amber or Red Alert" scenario.

Exceptions

- 4.42 Exceptions to paragraphs 4.1- 4.35 may be granted for snow or severe ice emergencies but will be subject to approval from the Director of City Development or the Head of Roads & Transportation.

Roads Salting

Decision Making Treatment Matrix:

- 4.43 The SCOTS Winter Service Subgroup consulted with the National Winter Service Research Group (NWSRG) in 2014/15, concerning the implementation of Appendix H of Well Maintained Highways published in November 2013 and a summary of that consultation process is available on request entitled NWSRG_SCOTS_Combined_Response_AppH.pdf. This document contains a number of suggestions developed by the SCOTS Winter Service Subgroup to implement Appendix H that have been commented on by the NWSRG. These comments indicate where the NWSRG agree with the SCOTS Winter Service Subgroup interpretation of Appendix H, where they do not agree and where they indicate that they will review the text of Appendix H in relation to these matters. It is intended that this document is provided to the Scottish Roads Authorities to inform their understanding of the requirements of Appendix H. The primary residual issues that the SCOTS Winter Service Subgroup have identified with Appendix H are indicated below along with advice for variations to be applied.
- 4.44 Having considered the feedback from the NWSRG on the review of Appendix H the SCOTS Winter Service Subgroup provided advice that Scottish Local Roads

Authorities adopt the variations to Appendix H of Well Maintained Highways. This advice and Dundee City Councils response to the advice is detailed in Appendix D.

- 4.45 Detailed below is the justification provided by the SCOTS Winter Service Subgroup for advising these variations and this is supported by Dundee City Council officers and were considered fully when providing the response in Appendix D.
- Review conclusions based on significant experience of delivering winter service by Scottish local Authorities.
 - Review conclusions based on developed best practice within Scottish local Authorities.
 - Recognition that going forward that these variations to Appendix H, and the successor document, need to be monitored in relation to the development of equipment, research undertaken and revisions to Appendix H.
 - These variations to Appendix H of Well Maintained Highways need to be kept under review by the SCOTS Roads Group/SCOTS Winter Service Subgroup to continue to inform the most appropriate approach to Winter Service to be taken by Scottish Roads Authorities.
 - The treatment matrix developed through the SCOTS Winter Sub group is being adopted by Dundee City Council and is detailed in Appendix E along with associated notes.

Salt Conservation Procedures:

- 4.46 Excessive use of salt and grit is detrimental to the environment. Minimum spread rates of unmodified salt are suggested in Appendix E treatment matrix for different operational scenarios. However during conservation measures implemented during 2008/09, 2009/10 and 2010/11, it has been found that rates of spread can be reduced below that suggested and still be effective. Further research is ongoing into the effects of reduced spread rates.
- 4.47 Salt resilience levels have been determined to cope with a severe winter. However in the event that the weather pattern has been so extreme and combined with a national salt crisis that has impacted on Dundee's salt stock levels, the following good practice guidelines for salt conservation will be applied:
- Reduce salt spread rates as appropriate
 - Restrict Salt Spreading Service to Primary Nightshift Routes
 - Move to using salt/grit mixes on Priority routes
 - Move to using grit only on Secondary routes
 - Grit only to be used on hard packed snow on priority/secondary/cul de sac routes
 - Replenish Grit Bins with grit only
 - Move to using grit only on priority and secondary footway routes
 - Start spreading salt, grit or mixture on reverse run when ploughing
- 4.48 The use of the above salt resilience levels will be discussed in more detail with Road Maintenance Partnership Manager prior to being implemented on the ground. This will be dependent on road condition etc.

5 COMMUNICATIONS

- 5.1 A Winter Maintenance leaflet is available on the Council's website.
- 5.2 Up-to-date information similar to the leaflet's content is also available on the Council's website, along with full interactive details of the Priority carriageway and footway gritting routes and grit bin locations. The Council's Winter Maintenance Policy and Level of Service is also available on a dedicated winter maintenance web page.
- 5.3 During snow conditions, relevant calls from the public to the Council's switchboard and the Customer Services lines, will be redirected to the Dundee control room at Fairmuir depot, which will be staffed accordingly. A Freephone number for snow conditions is also displayed on the A-Z section of the Council's website.
- 5.4 During periods of severe weather information on road conditions and closures will be publicised via local radio stations. Further information relating to weather related road closures and winter conditions will be made available on the council web site and the Council's Twitter feed.

APPENDIX A - WINTER COVERAGE DETAILS

NORMAL WINTER PERIOD: DETAILS OF COVERAGE

Adopted Roads & Footways

1 Night Shift Cover – 8 October 2016 to 14 April 2017 (27 weeks)

The night shift will operate between these dates (1 crew), 21.00 to 05.30 hours, 7 days a week. Christmas and New Year cover detailed below.

2 Priority Route Cover –

- Lead in period - 13 October 2016 to 19 October 2016 (1 week)
- Core winter period - 20 October 2016 to 29 March 2017 (23 weeks).
- Lead out period 30 March 2016 to 5 April 2017 (1 week)

The main standby system will operate for all priority routes (14 crews).

2 Secondary Route Cover – 20 October 2016 to 29 March 2017 (23 weeks)

The main standby system will operate for all priority routes (14 crews).

3 Supporting Secondary and Cul de Sac Route Cover – 20 October 2016 to 29 March 2017 (23 weeks)

The 36 hour advanced notice standby system will operate for all supporting secondary routes (8 crews).

4 Carriageway Cover

	<u>Weekdays</u>	<u>Weekends and Holidays</u>
Priority	0500 to 2200	0500 to 2200
Secondary*	0730 to 1600	Nil
Cul de Sac*	0730 to 1600	Nil

(* subject to provision for exceptions in snow and extreme ice emergencies)

5 Footway Priority and Secondary Route Cover – 10 November 2016 to 22 March 2017 (19 weeks)

The 36 hour advanced notice standby system will operate for all priority routes (21 crews).

6 Footway Cover

	<u>Weekdays</u>	<u>Weekends and Holidays</u>
Priority	0600 to 2100	0600 to 2100
Secondary *	0600 to 2100	Nil

(* subject to provision for exceptions in snow and extreme ice emergencies)

7 Grit Bin Cover

	<u>Weekdays</u>	<u>Weekends</u>	<u>Holidays</u>
Grit Bin Filling *	0800 to 1600	Nil	0800 to 1600

(* subject to provision for exceptions in snow and extreme ice emergencies)

WINTER CHRISTMAS/NEW YEAR PERIOD: DETAILS OF COVERAGE**Adopted Roads**1 Nightshift Route

Nightshift will operate as normal throughout the period with standby providing cover at other times to give a 24 hour coverage.

2 Other Carriageway Routes

The coverage for all other routes will be by standby only as follows:

Friday 23 December 2016	Weekday cover
Saturday 24 December 2016	Weekend/Holiday cover
Sunday 25 December 2016	Weekend/Holiday cover
Monday 26 December 2016	Weekend/Holiday cover
Tuesday 27 December 2016	Weekend/Holiday cover
Wednesday 28 December 2016	Weekday cover
Thursday 29 December 2016	Weekday cover
Friday 30 December 2016	Weekday cover
Saturday 31 December 2016	Weekend/Holiday cover
Sunday 1 January 2017	Weekend/Holiday cover
Monday 2 January 2017	Weekend/Holiday cover
Tuesday 3 January 2017	Weekend/Holiday cover
Wednesday 4 January 2017	Weekday cover

Adopted Footways

3 Cover provided in snow and extreme ice conditions throughout holiday period. Reduced cover on Christmas Day/Boxing Day and New Years Day/2 January only.

Friday 23 December 2016	Weekday cover
Saturday 24 December 2016	Weekend/Holiday cover
Sunday 25 December 2016	Weekend/Holiday cover
Monday 26 December 2016	Weekend/Holiday cover
Tuesday 27 December 2016	Weekend/Holiday cover
Wednesday 28 December 2016	Weekday cover
Thursday 29 December 2016	Weekday cover
Friday 30 December 2016	Weekday cover

Saturday 31 December 2016	Weekend/Holiday cover
Sunday 1 January 2017	Weekend/Holiday cover
Monday 2 January 2017	Weekend/Holiday cover
Tuesday 3 January 2017	Weekend/Holiday cover
Wednesday 4 January 2017	Weekday cover

Grit Bin Filling

- 4 The filling of grit bins will be covered as follows:

Grit Bin Cover

Friday 23 December 2016	Holiday cover
Saturday 24 December 2016	Weekend
Sunday 25 December 2016	Weekend
Monday 26 December 2016	Holiday cover
Tuesday 27 December 2016	Holiday cover
Wednesday 28 December 2016	Weekday cover
Thursday 29 December 2016	Weekday cover
Friday 30 December 2016	Weekday cover
Saturday 31 December 2016	Weekend
Sunday 1 January 2017	Weekend
Monday 2 January 2017	Holiday cover
Tuesday 3 January 2017	Holiday cover
Wednesday 4 January 2017	Weekday cover

Reduced cover will be provided for filling grit bins during "Holiday Cover".

Note: Schools start back on Wednesday 4 January 2017.

APPENDIX B - RESOURCES**Road Maintenance Partnership Operational (Tayside Contracts)**

Winter Plant	
Vehicle Type Carriageway	No.
6cum 4x4 fixed body gritter	1
6cum 4x2 fixed body gritter	6
6cum 6x4 Gritter / Tipper Quick Change Body	1
6cum Gritter / Hot box Tipper Demount	1
6cum Gritter / 18T Tipper Demount	4
2cum Gritter / 7.5T Lining vehicle Demount	1
1.2cum Gritter / 5.2T Pick up Demount	1
0.8cum Gritter / 3.5T Pick up Demount	1
Telehandler loading shovel	1
	17

External Supporting Resource	No.
Tractors, provided by external resource. Hydraulic plough and 0.8cum hopper gritter provided by TC	8
	8

Vehicle Type Footway	No.
3.5 T & 5.2 T pick ups	9
Footway mini plough & gritter	22
	27

The Service also has the following vehicles available when severe weather occurs:

- 3 No. pickups (Street lighting)
- 8 No. other operational vehicles (Operations & Street lighting)

During the winter from the middle of October until the start of April duty rosters are:

Winter Weekly Labour	
Carriageway	No.
Nightshift operative 21.00 to 05.30, 7 days	1
Frontline 7 day 24 hour standby	16
Frontline 5 day Monday to Friday 24 hour standby	16
	33

Footway	No.
Operatives on 48hour standby notice	34

The carriageway routes are covered by a 1 in 3 standby rota as detailed below:

- Week 1 - 7 day 24 hour standby (morning and weekend)
- Week 2 - 5 day Monday to Friday 24 hour standby (evening)
- Week 3 - 7 day no standby (week off)

The operation of the rota allows drivers hours to be managed and also provides flexibility of working during severe weather.

Note – “Lead In and Out Weeks” - 7 day 24 hour standby (morning, evening and weekend)

The Service also has the following resources available Monday to Friday when severe weather occurs:

- 35 No. operatives (Operations)
- 5 No. operatives (Street Lighting)

Environment Department – Environmental Management Division

Service level agreement requirements:-

23 No. mini plough drivers and pick up operatives.

21 No. additional resource for filling grit bins, clearing bus stops etc

In extreme/severe weather, the additional resources available from the Environmental Management Division are 94 No. operatives, 24 No. pickups and 19 No. operational vehicles, (this does not include cemetery staff).

When weather conditions prevent the delivery of the normal outdoor duties of the Environment Department Environmental Management Division employees, they will be allocated to assist in the delivery of a prioritised winter service under the direction and control of the Roads Maintenance Partnership Winter Manager.

Environment Department – Construction Division

When weather conditions prevent the delivery of the normal outdoor duties of the Environment Department Construction Division employees, they will be allocated to assist in the delivery of a prioritised winter service under the direction and control of the Roads Maintenance Partnership Winter Manager.

In extreme/severe weather, the additional resources available from the Construction Division are 50 No. operatives, 6 No. pickups and 3 No. operational vehicles.

Environment Department – Environmental Protection Division

When weather conditions prevent the delivery of the normal outdoor duties of the Environment Department Environmental Protection Division employees, they will be allocated to assist in the delivery of a prioritised winter service under the direction and control of the Roads Maintenance Partnership Winter Manager.

In extreme/severe weather, the additional resources available from the Environmental Protection Division are 105 No. Operatives and 10 No. pickups.

Note:- During extreme/severe conditions these additional resources will be engaged only during normal working hours Monday to Friday. If resource is required outwith these times agreement will be reached in advance with appropriate operational managers.

APPENDIX C - SALT RESILIENCE

Salt Resilience Levels:

Dundee City Council's Resilience Level is determined as:

Overall Winter Period	1st October to 30th April
Core Winter Period	1st December to 31st January
Days Resilience (Overall Winter Period)	9 days
Days resilience (Core Winter Period)	15 days

Minimum Salt Stocks				
Route Priorities	Minimum Winter Network (tonnes/run)	Minimum Winter Network (tonnes/day)	Minimum Stock	
			Overall Winter Period 9 days resilience*	Core Winter Period 15 days resilience*
Priority	65 x 2	130 tonnes	1170 tonnes	1950 tonnes
Priority Nightshift	20	20 tonnes	180 tonnes	300 tonnes
Secondary	75	75 tonnes	675 tonnes	1125 tonnes
Footways	35	35 tonnes	315 tonnes	525 tonnes
Total		260 tonnes	2340 tonnes	3900 tonnes

Mutual aid in salt supply and other aspects of winter service and contingency arrangements in advance, are in place through the Salt Cell Group. The 32 Scottish Councils are represented on this group through SCOTS, SOLACE and COSLA. Salt Cell is monitoring salt restock for winter 2016/17.

On the basis of recent winter experience and the CFTF4 review (2016/17) the salt holding at the commencement of winter is to be available at Marchbanks 6,700 tonnes and an additional 1,500 tonnes of salt is stored at an alternative location, taking the total salt available to 8,200 tonnes, which is more than sufficient for an average winter.

Daily monitoring of salt stocks will be undertaken through the winter maintenance daily costing system and reconciliation of daily weighbridge tickets through Tayside Contracts stock management system.

Dundee City Council has also signed up to the mutual aid agreement with Transport Scotland.

APPENDIX D – SCOTS Advised Variation to Appendix H

Detailed below is the response made to SCOTS Winter Subgroup regarding the advised variations to “Well Maintained Highways Appendix H”

Advised Variation to Appendix H	Applying Variation? – Yes or No / Reasons
<p>Section 4 De-Icing Materials and Section 7 Calibration of Salt Spreaders – In relation to the calibration of spreaders – “Spreaders should be calibrated twice per season ie in advance of the winter season and at mid-season. Additional calibration may be required dependant on concerns raised or changes to relevant parameters through the regular monitoring of treatments carried out.”</p>	<p>Dundee City Council will comply with SCOTS advice opposite as agreed with PKC and Angus.</p> <p>Priority – purpose and demount gritters – to be set for coarsest salt – i.e. rock/marine Dundee only use marine and will therefore set marine.</p> <p>Dundee will not calibrate footway gritters.</p>
<p>Section 4 De-Icing Materials – In relation to salt/abrasive mixes – “It would be up to each Roads Authority, during periods of salt conservation, to determine the appropriate ratio of salt/abrasive mix dependant on prevailing weather conditions and salt reserves.”</p>	<p>Will comply with SCOTS advice opposite. Normally 1:1; salt to sand mix.</p>
<p>Section 6 Salt Storage – in relation to spread rates for salt stored outside and unprotected – “Salt stored outside and unprotected should not be spread at rates lower than 10-15g/m².”</p>	<p>Dundee City Council agree and will follow SCOTS advice opposite.</p> <p>If no salt on the network the first treatment will always be 15g/m²</p>
<p>Section 6 Salt Storage – In relation to salt stockpile rotation – “Where salt is to be used that has been stored outside and unprotected for more than one winter season or stored outside and under cover for more than 3 winter seasons then a risk based approach, including testing, calibration and monitoring, should be undertaken in determining the adequacy of the salt for use in carriageway treatments and the subsequent spread rates.”</p>	<p>Dundee City Council agree and will follow SCOTS advice opposite.</p>
<p>Section 6 Salt Storage – In relation to salt testing frequency – “Salt testing should be carried out twice per season ie in advance of the winter season and at mid-season. Additional testing may be required dependant on concerns raised through the regular monitoring of treatments carried out.”</p>	<p>Dundee City Council will comply with SCOTS advice opposite, testing for moisture content as agreed with PKC and Angus.</p>
<p>Section 6 Salt Storage – In relation to the use of salt with a high moisture content -“Where salt is to be used that has a moisture content in excess of 4.5% then a risk based approach, including testing,</p>	<p>Agreed – likely to be “poor” salt distribution anyway due to outside unprotected salt stockpile.</p>

<p>calibration and monitoring, should be undertaken in determining the adequacy of the salt for use in carriageway treatments and the subsequent spread rates.”</p>	
<p>Section 10 Treatment Spread Rates – In relation to treatment spread rates – “The treatment rates derived from the development work undertaken by the Edinburgh, Lothian, Borders and Fife Councils Roads Working Group and indicated in the SCOTS Winter Service Treatment Matrix should be utilised by the Scottish Local Roads Authorities”.</p>	<p>Dundee agreed for when using dry salt. Based on the assessment of, uncovered storage, medium traffic flow and medium loss, Dundee will utilise “Column C” of the matrix for decision making purposes for the following reasons:- <u>Poor Cover</u> – Salt stockpile outside and unprotected <u>Traffic</u> – Medium as less than 250 vehicles per hour per carriageway for the majority of roads out with peak times. <u>Losses</u> – Normal as not heavy traffic after spreading and moisture content above 2%</p>
<p>Section 10 Treatment Spread Rates – In relation to change in spread rates for spreading when there is no or very little traffic (Table H13) – “Do not increase the spread rates by 25% for spreading when there is no or very little traffic”.</p>	<p>Dundee City Council agrees and will follow SCOTS advice opposite.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to depths of snow – “Light snow should be defined as <10mm and moderate/heavy snow should be defined as ≥ 10mm”.</p>	<p>Dundee City Council agrees and will follow SCOTS advice opposite.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to ploughing at level crossings - “A standard agreement with Network Rail on ploughing procedures at level crossings should be developed.”</p>	<p>Dundee City Council agrees with SCOTS advice opposite. Dundee do not plough across railway lines.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to precautionary treatments before snow or freezing rain (replacing treatment matrix D) - “For precautionary treatments before snow or freezing rain the treatment rates indicated in the SCOTS Winter Service Treatment Matrix should be utilised by the Scottish Local Roads Authorities”.</p>	<p>Dundee City Council agrees and will follow SCOTS advice opposite.</p>
<p>Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to treatments during snowfall (replacing Appendix H Treatment Matrices E and F) - “During snowfall treatments following ploughing should be undertaken to provide a de-bonding layer at 20g/m² of dry salt, 20g/m² of treated salt or 15g/m² of pre-wetted salt”.</p>	<p>Dundee City Council agrees and will follow SCOTS advice opposite.</p>

Section 11 Treatments for Snow, Ice and Freezing Rain – In relation to treatments for thin layers of ice and layers of compacted snow and ice (replacing Appendix H Treatment Matrix G) - **“For treatments of thin layers of ice, layers of compacted snow and ice omit Appendix H Treatment Matrix G and use Appendix H Treatment Matrix H”**.

Dundee City Council agrees and will follow SCOTS advice opposite.

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APPENDIX E – Decision Making Treatment Matrix

WINTER TREATMENT SPREAD RATE MATRIX SCOTS WINTER SERVICE SUBGROUP ADVICE - JULY 2015

Salt Type	Precautionary Treatment for frost / ice	Variation of Well Maintained Highways Appendix H - September 2013					
		Column C	Column D	Column G	Column H	Column K	Column L
		Poor Cover medium Traffic Normal Loss	Poor Cover medium Traffic High Loss	Fair Cover medium Traffic Normal Loss	Fair Cover medium Traffic High Loss	Good Cover medium Traffic Normal Loss	Good Cover medium Traffic High Loss
Dry Salt	RST at or above -2 Degrees and damp road conditions <i>Table H9 of Code - where the road surface is dry no action is needed even when conditions are below zero</i>	10(8)	10(8)	10(8)	10(8)	10(8)	10(8)
Pre-wet Salt		10(8)	10(8)	10(8)	10(8)	10(8)	10(8)
Treated Salt		10(7)	10(7)	10(7)	10(7)	10(7)	10(7)
Dry Salt	RST at or above -2 Degrees and wet road conditions	15(13)	20(16)	10 or 15(11)	15(13)	10(8)	10
Pre-wet Salt		15(12)	15(14)	10(10)	15(12)	10(8)	10(9)
Treated Salt		10(10)	10 or 15(11)	10(8)	10(10)	10(7)	10(7)
Dry Salt	RST below -2 deg C and above -5 deg C and damp road conditions	15 or 20(17)	20	10 or 15(14)	20(17)	10 or 15(11)	15(13)
Pre-wet Salt		15 or 20(16)	20(18)	15(14)	15(16)	15(11)	15(12)
Treated Salt		15(12)	15(14)	10 or 15 (11)	15(12)	10(8)	10(10)

Dry Salt	RST below -2 deg C and above -5 deg C and wet road conditions	1 x 20 then monitor & treat as required(2x17)	1 x 20 then monitor & treat as requ'ed(2x20)	1 x 20 then monitor & treat as requ'ed(2x28)	1 x 20 then monitor&treatas requ'ed(2x17)	20(20)	1 x 20 then monitor & treat as required(25)
Pre-wet Salt		1 x 20 then monitor & treat as required(2x16)	1 x 20 then monitor & treat as requ'ed(2x18)	1 x 20 then monitor & treat as requ'ed (27)	1 x 20 then monitor & treat as requ'ed(31)	1 x 20 then monitor & treat as requ'ed(21)	1 x 20 then monitor & treat as required(24)
Treated Salt		1 x 20 then monitor & treat as required(24)	1 x 20 then monitor & treat as requ'ed(28)	1 x 20 then monitor & treat as requ'ed (21)	1 x 20 then monitor & treat as requ'ed(24)	1 x 20 then monitor & treat as requ'ed(16)	1 x 20 then monitor & treat as required(19)
Dry Salt	RST at or below -5 deg C and above -10 deg C and damp road conditions	1 x 20 then monitor & treat as required(2x16)	1 x 20 then monitor & treat as requ'ed(2x19)	1 x 20 then monitor & treat as requ'ed(27)	1 x 20 then monitor&treatas requ'ed(2x16)	20	1 x 20 then monitor & treat as required(24)
Pre-wet Salt		1 x 20 then monitor & treat as required(2x16)	1 x 20 then monitor & treat as requ'ed(2x18)	1 x 20 then monitor & treat as requ'ed(27)	1 x 20 then monitor & treat as requ'ed(31)	1 x 20 then monitor & treat as requ'ed(21)	1 x 20 then monitor & treat as required(24)
Treated Salt		1 x 20 then monitor & treat as required(23)	1 x 20 then monitor & treat as requ'ed(27)	1 x 20 then monitor & treat as requ'ed (20)	1 x 20 then monitor & treat as requ'ed(23)	1 x 20 then monitor & treat as requ'ed(15)	1 x 20 then monitor & treat as required(18)
Dry Salt	RST below -5 deg C and above -10 deg C and wet road conditions	1 x 20 then monitor & treat as required(32)	1 x 20 then monitor & treat as requ'ed(2x39)	1 x 20 then monitor & treat as requ'ed(2x27)	1 x 20 then monitor&treatas requ'ed(2x32)	1 x 20 then monitor & treat as requ'ed(2x20)	1 x 20 then monitor & treat as required(2x24)
Pre-wet Salt		1 x 20* then monitor & treat as required(2x31)	1 x 20 then monitor & treat as requ'ed(2x36)	1 x 20 then monitor & treat as requ'ed2x(27)	1 x 20 then monitor & treat as requ'ed(2x31)	1 x 20 then monitor & treat as requ'ed(2x21)	1 x 20 then monitor & treat as requ'ed(2x24)
Treated Salt		1 x 20 then monitor & treat as req'red(2x23)	1 x 20 then monitor & treat as requ'ed(2x27)	1 x 20 then monitor & treat as requ'ed(2x20)	1 x 20 then monitor & treat as requ'ed(2x23)	1 x 20 then monitor & treat as requ'ed(30)	1 x 20 then monitor & treat as required(2x18)

Key:

() = Appendix H recommendations

Treatment Matrix for Snow Conditions

Salt Type	Precautionary Treatments Before Snow or Freezing rain	Light or Medium Traffic	Heavy Traffic
Dry Salt	Light Snow Forecast	20g/m ²	20g/m ²
Pre-wet Salt		20g/m ²	20g/m ²
Treated Salt		15g/m ²	15g/m ²
Dry Salt	Moderate/Heavy Snow Forecast	20g/m ²	40g/m ²
Pre-wet Salt		20g/m ²	40g/m ²
Treated Salt		15g/m ²	30g/m ²
Dry Salt	Freezing rain Forecast	1 x20g/m ² then monitor	
Pre-wet Salt		1 x20g/m ² then monitor	
Treated Salt		1 x15g/m ² then monitor	

All decisions should be taken with reference to Notes (a) to (i) below

Matrix Notes

- a. The Intervention Matrix is based on low/medium traffic levels as defined in Appendix H; table H11. Available traffic survey information has highlighted that many streets within Dundee may be categorised as heavy traffic level when considering peak flow data. Salting is normally planned to be treated out with peak periods when traffic flow is lighter. Appendix H; Matrix A for dry salting, stipulates slightly greater spread rates are required for low/medium traffic level than for heavy traffic level, therefore, at this time a conservative approach has been taken and low/medium traffic levels used to specify spread rates.
- b. Based on the assessment of, uncovered storage, medium traffic flow and medium loss, Dundee will utilise "Column C" of the matrix for decision making purposes for the following reasons:-
 - i. Poor Cover – Salt stockpile outside and unprotected.
 - ii. Traffic – Medium as less than 250 vehicles per hour per carriageway for the majority of roads out with peak times.
 - iii. Losses – Normal as not heavy traffic after spreading and moisture content above 2%
- c. The intervention Matrix assumes no residual de-icing material on the carriageway. The presence of residual de-icing material will be taken into account and spread rates adjusted in preparing proposed action plans.
- d. For salt stored under cover a pre treatment can be 10g/sqm; for salt stored outside, a first pre treatment should be 15g/sqm, thereafter the matrix above can be followed whilst residual salt is available on the network..
- e. Particular attention should be given to possibility of water running across carriageways and other surfaces e.g., off adjacent fields after heavy rains, washing off previously deposited salt. Such locations should be closely monitored and may require further treatments.
- f. When a weather warning contains reference to expected hoar frost, considerable deposits of frost are likely to occur. Hoar frost 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 which should ideally be treated just as the frost 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 subject to the Council's hours of cover. Hoar frost may be forecast at other times in which case the timing of the salting operations should be adjusted accordingly.

- g. When rain is forecast prior to frost, treatment should be timed to commence at the cessation of rainfall subject to being completed within the council's hours of cover.
- h. If rain is forecast to fall on frozen surfaces then treatment should take place on the dry roads prior to the commencement of the rain and again during the rainfall until temperatures are above 0°C, subject to being completed within the council's hours of cover.
- i. Proposed action plans should take into account the hours of cover provided by Dundee City Council. If possible treatment should be brought forward to ensure treatment before hours of cover are exceeded.
- j. Salt is less effective when road temperatures are below -5°C. However salt and grit may be used on sheet ice or hard-packed snow when temperatures are exceptionally low. Where hard packed snow and ice have formed and cannot be removed by ploughing, a salt sand mix can be used in successive treatments at a spread rate of 20 – 40 g/sqm. This aids vehicle traction and acts to break up the snow and ice.
- k. Sand used in mixes shall be single sized abrasive such as 5mm sand having a low fines content. The particles should be angular in shape and suitable to create an abrasive surface. The sand can be added to salt at a rate of 1:1 by weight
- l. H4.34 of Appendix H. The dry salt: brine mix proportions can be varied but are typically 70:30 by weight. Therefore 10g of pre wetted salt contains 7g of dry salt plus 0.66g of (pure) salt in the brine if the brine concentration is 22%.
- m. Please note that NWSRG were not able to answer whether 2x16, etc was to be placed before freezing conditions or during to cover the period of the forecast.
- n. Please see H10.25 of Appendix H regarding effectiveness of sodium chloride at low temperatures.

Priority Footway Gritting Decision Making

1. On issuing the mid day action plan the Dundee City Council duty controller considers the 5 day forecast noting that Tayside Contracts require 48 hours notice for priority footway treatment. If forecast suggests wet surfaces and sub zero temps or snow/ice he puts priority footway crews on standby for 6am treatment (i.e. in approx. 36 hours' time). The controller has the option of not placing minis on standby where they are able to justify this decision e.g. weather conditions, residual salt, etc and reasons must be recorded.
2. On issuing the mid day action plan the day before the planned treatment (i.e., in approx 18 hours time) the duty controller determines whether or not forecast still suggests wet surfaces and sub zero temps or snow/ice, hoar frost, then priority footway crews remain on stand by for 6am treatment. If there is a significant change

to forecast whereby wet surfaces and sub zero temps no longer apply then priority footway crews are removed from stand by requirement.

3. On the actual day where priority footway crews report at 6 am. the Dundee City Council supervisors will confirm treatment is still required, following this treatment will commence on priority footways as required. The supervisors have the ability to decide not to treat if the weather or conditions are such that treatment is not needed or there is sufficient residual salt already down although all such decisions must be recorded. It is noted that spread rates for minis are not given. The controller also has the option of not placing minis on standby where they are able to justify this decision e.g. weather conditions, residual salt, etc and again reasons must be recorded.

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