Dorset Highways Winter Service Policy and Adverse Weather Plan 2019/20

Working together for a strong and successful Dorset

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1. Introduction

Winter Service – Statutory Duty

The legal position relating to the Highway Authority's responsibility in respect of the winter service is set out in an amendment to Section 41(1) Highways Act 1980 (c.66) (duty of highway authority to maintain the highway).

(1A) in particular details that a highway authority is under a duty to ensure, so far as is reasonably practicable, the safe passage along a highway is not endangered by ice or snow.

The Council recognises that the winter service is essential in aiding the safe movement of highway users, maintaining communications, reducing delays and enabling everyday life to continue. It is very important to both road safety and the local economy. The winter service that the Council provides is believed to be sufficient, so far as is reasonably practical, to discharge the duty imposed by the legislation. However, it is important to recognise that the Council has to prioritise its response to deal with winter weather due to logistics and available resources.

The Council provides the winter service through Dorset Highways

1.1 Winter Service Standards

In order to respond as quickly and efficiently as possible to its responsibilities Dorset Highways has adopted policies and standards for each of the winter service activities and these are detailed within this document. The operational details for the winter service activities in Dorset are detailed in Part 2 of this document and complement this Policy Statement.

Dorset Highways provides a winter service which, as far as reasonably practicable will:

Minimise the risk of loss of life and injury to highway users, including pedestrians and preventing damage to vehicles and other property.

Keep the highway free from obstruction and thereby avoiding unnecessary delay to passage.

The winter maintenance period runs from 1st October to 30th April.

1.2 Council Maintained Highways

Dorset Highways delivers the winter service on Dorset Council maintained highways.

1.3 Trunk Roads

The Department for Transport (DfT) is the highway authority for trunk roads in Dorset and Highways England acts for the DfT in this respect. Responsibility for the operational maintenance of the trunk roads lies with Highway England. Dorset Highways has no responsibility for the winter service activities on these roads. Close liaison exists between Dorset Highways and Highways England during the winter service operational period.

2. Winter Service Objectives

Dorset Councils winter service policy follows the recommendations issues by the UKRLG (UK Road Liaison Group) and takes into account the recommendations contained in “Well Managed Highways Infrastructure” and NWSRG guidance. These documents are reviewed annually, and any recommendations are included within our policy where practical. Consistency with the policies of neighbouring authorities is considered and applied when reasonably practicable.

2.1 Salting

Objectives:

- To prevent the formation of ice on carriageways (precautionary salting).
- To facilitate the removal of ice and snow from carriageways (post salting).

Roads to be included within **Precautionary Salting Routes** Link to online winter service pages (Appendix 1):

- All of the following network classes
  - 2 Strategic
  - 3 Main distributors
  - 4 Secondary distributors
  - (All A, B and well-used C class roads)
- Links to hospitals, large industrial estates, transport interchanges, emergency service (including manned Coastguard and RNLI) stations and identified critical infrastructure.
- Routes to all urban schools with more than 500 pupils and rural schools with more than 350 pupils.
- Primary bus routes with a substantial frequency, School bus routes are not included.
- Main routes, that don’t meet criteria 1 above, through towns and villages with populations of more than 750.

Our policy is not to treat any of the footway network unless in extreme conditions and then only when resources are available.

Consideration will be given to salting diversion routes where interruptions to the precautionary network have occurred.

The aim of this criteria is to treat the roads used by the majority of the travelling public this amounts to 1100km - about 28% of the overall road network.

Roads to be included within **Community Links Network**: Link to online winter service pages (see also Appendix 2)

These routes form a secondary network which serves the smaller villages and hamlets as defined by the Network Operations Service Manager. These routes will be treated during prolonged periods where temperature remain at or below

freezing and pre-treated following a snow forecast and post snowfall will be ploughed and salted as resources allow.

Footways

It would be impractical and financially draining to carry out precautionary salting of footways, pedestrian precincts or cycleways and therefore no provision has been made. However, there will be a certain amount of salt overspill onto footways and cycleways when precautionary salting is being carried out on adjacent carriageways. Post salting of footways and cycleways will be carried out on a priority basis during severe weather as resources permit.

2.2 Snow Clearance

Objectives:

- To prevent injury or damage caused by snow.
- To remove obstructions caused by the accumulation of snow (section 150 Highways Act 1980).
- To reduce delays and inconvenience caused by snow.

Snow clearance on carriageways will be carried out on a priority basis.

Snow clearance of some minor routes will be carried out by local farmers and contractors under agreement with the Council. Snow clearance on other minor routes will be carried out as resources permit and some routes and cul-de-sacs will be left to thaw naturally.

Snow clearance on footways and cycleways will only be carried out by Dorset Highways if resources are available. Some towns and parishes will carry out clearing of priority footways when and as their resources become available.

3. Winter Service General

Winter Service Operations

The winter service in Dorset is operated by Dorset Highways

3.1 Winter Service Season

The winter weather across Dorset tends to be marginal. The winter service period runs from runs from 1st October to 30th April.

3.2 Salt and Alternatives to Salt

Currently 6mm dry rock salt is used across the County for precautionary and post event salting.

Where heavy snowfall has occurred grit sand will be added to the salt or laid on its own to aid traffic movement.

A number of alternative materials to salt are now available which can be used for the precautionary and post event treatment of ice and snow. The costs of these are very high and there are associated environmental issues associated with them. Therefore, 6mm dry rock salt will continue to be used across Dorset for the precautionary and post event treatment of ice and snow.

The moisture content of salt plays a major part in the spread rate decision making process. For optimum performance rock salt should have moisture content of between 2 –4%. Moisture contents more than 1% outside of this range **have** to be reported to the duty engineer.

Potential actions when salt is outside optimum moisture content range

Wet (>4.5%)

Review spread rates and increase to account for poorer distribution

Consider moving wet salt away from the stockpile to dry (in a suitably contained area to minimise environmental impact)

When the moisture content reaches the optimum range, the salt can be mixed with drier salt in the stockpile or from new deliveries

Samples should be checked after mixing to confirm that the moisture content is in the optimum range

Wet (<4.5%)

Review spread rates and increase to account for poorer distribution

Consider mixing with drier salt in the stockpile or from new deliveries

Samples should be checked after mixing to confirm that the moisture content is in the optimum range

Optimum l TARGET RANGE ✓

Dry

For dry salting, assume high losses after spreading

Consider mixing with salt of higher moisture content in the stockpile or from new deliveries

The moisture content of the salt at each of the storage points will be tested as follows-

- On delivery
- Before calibration of spreaders
- Covered depots – once per month through the winter season
- Ad-hoc testing may follow any specific issues relating to spread rates.

3.3 Calibration of spreaders

Spreaders to be calibrated before the start of each season, mid-season (One vehicle from each depot to be checked and calibrated at 25 run intervals) and following incidents or conditions that may require recalibration.

Should appropriate calibration setting not be met then Duty Engineer must be contacted so route specific spread rate(s) can be adjusted.

Calibration procedures to be in accordance with recommendations in well managed Highway infrastructure and NWSRG guidance

3.4 Preparations for Winter Period

- Before 1 November each year the following operations must be completed:
- Ensure salt stocks have been replenished (Part 1, Section 5).
- Salt bins filled (Part 1, Section 5).
- Bulk supplies and dumpy bags delivered to boroughs, towns and parishes (Part 3).
- Service level agreements are in place with snow ploughing contractors.
- Training days are arranged pre winter season for all staff involved in delivering the winter service.
- All gritters are serviced and calibrated.
- All operatives are trained, competent and are working towards or have achieved accreditation.
- Moisture content of salt tested and recorded

Liaise with neighbouring authorities to identify best practise.

4. Weather Forecast Information

Weather Information Systems

An effective and efficient winter service is only possible with reliable and accurate information about weather conditions. Without this information it is not possible to make effective and appropriate decisions on the winter service operations. Dorset Highways utilises the best weather information available from its weather forecast provider, currently Meteo Group, to ensure that decisions are based on the most accurate data available.

4.1 Weather Reports

During the winter service period Dorset Highways receives detailed weather forecasts and reports specifically dedicated to the roads and the 4 weather domains within Dorset. This data is based upon national weather forecasts and the data collected from 11 roadside weather stations positioned across the County.

4.2 Winter Duty Engineers

Experienced members of staff from Dorset Highways will act as Duty Engineers throughout the operational winter service period on a rota basis. The Duty Engineer is responsible for:

- Receiving forecast information from the forecast provider.
- Monitoring current weather conditions.
- Issuing salting instructions for the precautionary network based on the 4 domain forecasts.
- Posting the forecast decision on the Icelert Bureau.
- Assisting and advising during snow events and severe weather events.
- Convening the “Extreme Weather Event Board”
- Establishing liaison/contact with Dorset Police Control Room
- Participating in any teleconferences convened

5. Salting

Planning of Precautionary Salting Routes

The precautionary salting network is developed from those lengths of highway that qualify for treatment whenever ice, frost or snowfall is forecast. Each precautionary route will have a vehicle assigned which is capable of having a snow plough fitted when required. Following a forecast of snow, the community link network will receive a precautionary treatment of salt.

5.1 Precautionary Salting

Precautionary salting will take place on the scheduled network on a pre-planned basis to help prevent the formation of ice, frost and / or the accumulation of snow on carriageway surfaces.

5.2 Post Salting

Post salting will normally take place on the scheduled precautionary salting network to treat ice, frost and snow that has already formed on carriageways. Post salting may in exceptional circumstances also be carried out on roads or sections of roads beyond the scheduled precautionary salting routes.

5.3 Spot Salting

Spot salting may take place on parts or sections of the scheduled salting routes either to help prevent formation of ice, frost and / or accumulations of snow or as a treatment to ice, frost and the accumulation of snow that has already formed on the carriageway. Spot salting may in exceptional circumstances also be required on roads beyond the precautionary salting network.

5.4 Instructions for Salting the Precautionary Network

Instructions for precautionary salting of the network will be issued if road surface temperatures are expected to fall below 1ºC unless:

Road surfaces are expected to be dry and frost is not expected to form on the road surface.

Residual salt on the road surface is expected to provide adequate protection against ice or frost forming.

Instructions for salting of the precautionary network will also be issued if snowfall is expected.

The Duty Engineer will issue the instructions for precautionary salting of the network for each of the 4 weather domains. These decisions will be posted on the Icelert Bureau.

The Duty Engineer may issue instructions for post and spot salting and post those decisions on the Icelert Bureau.

5.5 Instructions to Salt the Community Routes

The Duty Engineer will issue instructions to pre-salt the Community Routes if snow is forecast or if temperatures are expected to fall below freezing for a prolonged period. These decisions will also be posted on the Icelert Bureau. There is an expectation that pre-salt action on the Community Routes network would be completed within 6 hours of the action being called.

5.6 Salt Stocks

Depot	Capacity	Min Stock
Blandford	1300	850
Ferndown	2950	900
Wareham	1800	920
Charminster	4000	2200
Gibbs Marsh	3350	930
	13400	5800

Salt stocks will be replenished before 1 November each year. Minimum stock levels are maintained for the core winter service period.

Dorset Highways will arrange for the Stock Control Spreadsheet, held within the winter service and emergency folder on the highways computer server. This is

updated following each treatment of the network. Dependent on usage salt stock levels will be replenished as required to ensure minimum stocks are held. This will be subject to the control of the Governments 'Salt Cell'.

5.7 Route Treatment Times

The Precautionary Salted Network will be fully treated within 2.5 hours (20g per m^2 spread rate or less) of instructed commencement time.

5.8 Emergency Treatment Times

When an urgent instruction to treat the precautionary network is issued by the Duty Engineer then the treatment of the network will commence within 1.5 hours.

5.9 Level Crossings

Salting will not take place across level crossings as this can affect the track side communications.

6. Severe Weather Conditions

Persistent Ice on Minor Roads

During longer periods of cold weather, the Duty Engineer may instruct salting to deal with persistent ice on minor roads which are not included within the precautionary or community networks and invoke arrangements with borough, district, town and parish councils to take action in their area.

6.1 Ice and Snow Emergencies

During the winter months as the likelihood of an extreme weather event increases, it is essential that a clear management process is in place to ensure that the necessary resources are effectively deployed, and all internal and external stakeholders are involved and informed as necessary.

Dorset Highways have established the following processes and procedures to ensure this is achieved.

6.2 Notification of an Extreme Weather Event

The MeteoGroup will inform Dorset Highways well in advance of any severe event and on receipt of this information, a meeting of the "Extreme Weather Event Board" will be convened.

The Board will consist of:

- Corporate Director – Economic Growth and Infrastructure (Chair)
- Head of Highways
- Network Operations Service Manager
- Community Highways Manager
- Senior Site Agents
- Emergency Planning Representative
- Traffic Team Leader
- Duty Engineer
- Communications Officer
- Duty Gold Officer

- Duty Silver Officer
- Adult Services Representative
- Children Services Representative
- Dorset Direct Representative

At this meeting all operational arrangements and procedures will be agreed and implemented, See Winter Service Operations section 3, and the necessary press releases issued.

(contact details can be found on the LICOS system)

7. Snow Clearance

Instructions for Snow Clearance

Snow clearance will initially take place on the precautionary salting network when snowfall is light.

During heavy and prolonged snowfall instructions may be issued to clear and treat the Priority Snow Ploughing Network as detailed below and in the Operational Plan. Once this network is clear resources will be directed to clear the rest of the precautionary salting network.

7.1 Priority Ploughing Network – Link to online winter service pages (see also Appendix 3)

A37 (*)	**A31, Monkeys Jump to Somerset Boundary (*)**
A30	**Shaftesbury to Yeovil, Somerset Boundary**
A35	**Bere Regis to Holes Bay Roundabout**
A354	**Portland, Easton Square to A35, Tesco Roundabout**
A354	**Junction A35 to Blandford**
A354/A350	**Blandford Bypass**
A354 (**)	**Blandford to Wiltshire Boundary (**)**
A350	**A35 Bakers Arms to A31 Roundabout**
A350	**A31 Roundabout to A354 Blandford**
A350	**Blandford to Shaftesbury to Wiltshire Boundary**
B3073	**A35 to Blackwater Junction**
B3073	**Blackwater Junction to A31 Canford Bottom Roundabout**
A348	**A31 Tricketts Cross to Bear Cross Roundabout**

A352/A351	**Dorchester to Wareham to A35 Bakers Arms Roundabout**
A353	**A352 Warmwell r/bout to Weymouth**
A3066	**Bridport to Somerset Boundary, Misterton**
A356	**Junction A37 to Somerset Boundary, Misterton**
A352	**A37 Charminster to A30 Sherborne**
A3030	**A352 Sherborne – A357 Lydlinch**
A351	**Swanage to Wareham**
A357	**Blandford to Henstridge**
B3081	**Shaftesbury to Gillingham to A303**
(*) & (**)	Extra resources may be required to clear these roads.

As and when resources become available instructions will be issued to plough and treat the Community Routes.

Snow ploughing will not take place on carriageways where there are physical restrictions due to traffic calming measures unless it has been deemed safe to do so following a formal risk assessment and a safe method of operation documented.

7.2 Snow Clearing of Footways

The clearance of footways will take place as and when resources become available, some of the towns and parishes have arrangements in place to clear shopping areas and other well used public accesses.

7.3 Farmers and Contractors Snow Ploughs

Some parish and town councils have their own arrangements in place to plough and treat the network within their boundaries. The Council has a database of farmers who will assist in clearing certain roads on the remainder of the network that compliment both the precautionary and community link networks.

Dorset Council will engage farmers / contractors directly to clear specific routes such as the precautionary salting network, priority ploughing network, community routes and other roads designated by the Duty Engineer as conditions dictate.

8. Roadside Salt Bins

Provision of Roadside Salt Bins

The Council does not provide salt bins and it is the Town and Parish Councils choice, should they require a salt bin(s) within their community, to purchase and place the bins following consultation with the County Council. Roadside grit bins

can be sited at potentially hazardous locations for use by the public to treat ice and snow over small areas of carriageway.

The Council has classified all salt bins on its network as either a ‘strategic’ or ‘community’ bin.

At the start of each winter, **all** salt bins will be filled with salt the cost of which will be borne by the Council.

Following this initial fill, only those bins classified as ‘strategic’ will be refilled during the winter by the Council, free of charge.

In the event of severe weather, further refills will be carried out as time and resources permit. Community bins are the responsibility of the Town or Parish councils to refill. If Councils require Dorset Council to fill these bins, as agreed by Dorset Council members, this will be subject to a charge. Town or Parish Councils can purchase 1 tonne dumpy bags, of a salt from the Council and as with Community bins, a charge will be made for this service. Salt bins will not be located on any of the precautionary salting network.

Specific grit bin policy and assessment sheet for the categorising of salt bins is available from the Council on request.

9. Budgets

Winter Service Budget

The budget allocated to the winter service is reviewed annually and is managed by Dorset Highways.

9.1 Severe Ice and Snow Events

There is no specific budget allocation within Dorset Highways to respond to severe ice and snow events. The cost of dealing with the events will be met by virement from other planned programmes of work on the highway or from special contingency funds for emergencies.

10. Public & Media Communications

Neighbouring Authorities and other Agencies

The Dorset Highways Weather Forecast containing the winter service action for Dorset will be transmitted daily to neighbouring highway authorities and other agencies so that activities can be co-ordinated regionally.

10.1 The Media

Communication with communities, businesses and emergency services during winter is essential to delivering an effective service. Local media organisations will be informed when instructions for salting the precautionary network are issued. The Dorset Council website, https://www.dorsetcouncil.gov.uk/emergencies-severe-weather/gritting/gritting-updates.aspx will be updated regularly. Dorset Highways also uses social media to communicate decisions and actions taken.

10.2 Pre-season Publicity

It is important that the public are aware of and understand the Dorset Highways approach to the winter service. This will be done via a pre-season press release with information posted on the Dorset For You website.

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1. Introduction

The operations of the Council's winter service are managed by Dorset Highways, operating a fleet of 27 gritters and ploughs across 5 depots within the County. Some 13,500 tonnes of de-icing salt is stored in these depots.

The winter period runs from 1 October to 30 April and Dorset Highways run a 24-hour 7 day on call rota from 1 November to 31 March each year.

A weather forecasting service is provided by MeteoGroup, which includes:

- Morning, lunchtime, afternoon and evening updates.
- County and Domain forecasts (covering 4 weather domains).
- Site specific forecast graphs.
- 2-5 day forecasts.
- Satellite images and radar precipitation data.
- 24/7 consultation with forecasters.

In addition to the forecast data the Council has 11 roadside weather stations across the County which enables the collection of local weather data to assist the forecast provider in compiling the domain forecasts. These are located:

- A30 Sherborne
- C12 Black Hill Cross
- B3143 Buckland Newton
- A354 Blandford by pass
- A30 Shaftesbury
- A356 Tollerdown
- B3165 Birdsmoorgate
- A354 Weymouth Relief Road
- B3153 Wyke Road Weymouth
- A354 Sixpenny Handley
- A35 Organford

Dorset has 4 weather domains and independent forecasts are provided for each of these domains and action decisions are based on these forecasts. The weather domains are:

- Weymouth (coastal)
- Tollerdown
- Sherborne
- Wimborne

The Duty Engineer is responsible for:

- Taking the action decision and for entering the details into the Icelert system.
- Entering the action onto the telephone announcement system.
- Informing Dorset Highway Duty Supervisors of the action to be taken.
- Responding to updated weather forecasts and arranging actions.
- Recording of daily decision-making process in the Meteo Group Roadmaster website.

2. Actions Following Forecast

Ice and Frost

Following receipt of the forecast the Duty Engineer will assess the risk across the network, referring to the decision matrix and instruct any action on a domain basis. Other factors to be considered are residual salt level and the local effects of known frost hollows, bridge decks etc. on the road surface.

Precautionary salting for ice and frost will be instructed on a domain basis and be carried out at a rate detailed in **Part 2 Section 4**.

The timing of precautionary salting is dependent upon the prevailing weather conditions and should be arranged to ensure the network is treated prior to the formation of ice and frost.

Snow – extreme weather event

Deploying the necessary Management and Operational Resources

(i) Council Emergency Centre

Should the Extreme Weather Event Board decide to open the Emergency Centre this will be manned as follows -

ITS. Engineer

Highways Operations representative

Duty Engineer

Communication Officer (between 6am and 6pm)

Appropriate number of Support Staff

(ii) Dorset Direct Call Centre

During normal working hours an experienced highway officer will establish a link with Dorset Direct to offer the necessary specialist operational advice and guidance.

(iii) Operational Depots

Operational management will be located within three “control depots “under the direction of a Duty Supervisor.

These depots will be Gibbs Marsh, Charminster and Ferndown and each will be staffed over 12 hour shifts by a Duty Supervisor and a highway support officer.

In addition, a team of “spotters” will be deployed from within the Highway Community Officer Teams to patrol the network and provide condition reports directly to the Duty Supervisor within the control depot.

(iv) Drivers and Associated Operatives

Prior to any extreme weather event, the Network Operations Service Manager will convene a meeting with his operational managers to compile the necessary staffing rotas to ensure a 24-hour resource plan is in place.

These rotas should be published 24 hours before any event to ensure those involved have sufficient notice and any personal arrangements can be successfully finalised.

2.1 Clearance of Snow – Precautionary Network:

Ploughing is the most effective method of dealing with snow and ploughing should aim to clear the snow from the road surface back to black to snowfall a 40g/m² pre-treatment will take place across the entire precautionary and community link network. This approach to snow clearance will provide a de-bonding coat of salt which should assist future ploughing operations.

Ploughing should commence as soon as practical on the network where conditions allow. Each pass should be supplemented by salt or salt / grit mix with a spread rate as shown in **Part 2 Section 4**.

In urban areas, where ploughing is impractical, repeated applications of salt / grit mix can be used to remove heavy accumulations of snow. This practice should not be used where ploughing is possible.

During repeat actions the salt may be supplemented by grit – **see Part 2 Section 4.**

During prolonged snowfall it may be necessary to plough continuously to prevent build up and compaction of the snow by traffic. However, once the depth of snow exceeds 100 – 120mm, or on steep gradients, it may be necessary to plough without salting to aid traction.

2.2 Clearance of snow – Community Link Network:

Following a forecast of settling snow the community link network will be pre-salted at 20-40g/m² dry salt.

After snow, the network will be ploughed and salted as soon as resources become available, either by Dorset Highways or by nominated contractors. Repeated ploughing and salting will take place when resources are available.

2.3 Clearance of Snow Following Heavy and Prolonged Fall

<u>Priority Ploughing Routes:</u>

During very heavy, prolonged and county wide snowfall it is not normally possible to keep all of the precautionary salting routes free from accumulations of snow. It is therefore necessary to focus resources on key routes. The need to run two vehicles on these routes, one to plough the other salting/gritting, reduces our capacity to treat the entire network. The aim should be to keep these priority routes clear and once achieved to move onto clearing the rest of the precautionary network.

Extra resources, such as ploughing contractors, should be deployed at the earliest opportunity to assist in clearing these routes.

This operation accepts that, at times, some of the precautionary network will become impassable but by concentrating on principal routes some traffic movement can be maintained.

Other Routes

Other routes will be ploughed and treated as directed by the Duty Engineer.

3. Control and Information during Severe Conditions

When heavy snowfall is expected to affect the County the Extreme Weather Event Board will establish a Control Centre in the Emergency Centre at County Hall.

The Control Centre Team will liaise with the Operational Teams, Network Traffic Manager, Emergency Services, Dorset Direct, Communications Team, Duty Engineer and other officers as required.

The Control Centre Team will be responsible for:

- Maintaining a diary record of the event.
- Entering road closures / reopening information on Travel Dorset.
- Issuing condition reports to media via Communications Team.
- Issue direction regarding snow clearance priorities.
- Liaise with adjacent Authorities to co-ordinate cross boundary clearance.
- Liaise with Dorset Council Emergency Planning regarding stranded drivers, local emergencies, requests from emergency services.

In the case of widespread disruption, the Dorset Highways 'Emergency Planning Liaison Officers' will act in a co-ordinating role with Dorset Council Emergency Planning.

4. Winter Service Decision Procedure

The decision-making process used by Dorset Council follows the recommendations issued by the NWSRG and supersedes the recommendations contained in 'Well Maintained Highways – Appendix H, Section H7 amended September 2013.

4.1 Road Surface Wetness

For the purpose of allocating treatments, a distinction is made between dry, damp and wet road surfaces. The following definitions should be used when making the treatment decision.

Table 1 – Road Surface Wetness

Dry Road	A road that shows no signs of water or dampness at the surface but maybe just detectably darker (however it may have moisture contained in pores below the surface that is not "pumped" to the surface by traffic).
Damp Road	A road that is clearly dark but traffic does not generate any spray. This would be typical of a well-drained road when there has been no rainfall after 6 hours before the treatment time.
Wet Road	A road on which traffic produces spray but not small water droplets. This would be typical of a well-drained road when there has been rainfall up to 3 hours before the treatment time.

4.2 Precautionary Treatment Decision Matrix

A decision matrix for precautionary treatments based on road surface conditions and predicted weather conditions is given in the tables below.

Table 3 – Precautionary Treatment Decision Matrix

<table>
<tr><th rowspan="2">Road Surface Temperature</th><th rowspan="2">Precipitation</th><th colspan="3">Predicted Road Conditions</th></tr>
<tr><th>Wet/ Damp</th><th>Wet Patches</th><th>Dry</th></tr>
<tr><td>May fall below 1°C</td><td><u>No</u> rain
<u>No</u> hoar frost
<u>No</u> fog</td><td rowspan="3">Salt before frost</td><td rowspan="2">Salt before frost (see note a)</td><td rowspan="2">No action likely, monitor weather (see note a)</td></tr>
<tr><td rowspan="5">Expected to fall below 1°C</td><td><u>No</u> rain
<u>No</u> hoar frost
<u>No</u> fog</td></tr>
<tr><td><u>Expected</u> hoar frost.
<u>Expected</u>
fog</td><td colspan="2">Salt before frost (see note b)</td></tr>
<tr><td><u>Expected</u> rain
<u>BEFORE</u> freezing</td><td colspan="3">Salt after rain stops (see note c)</td></tr>
<tr><td><u>Expected</u> rain
<u>DURING</u> freezing</td><td colspan="3">Salt before frost, as required during rain and after rain stops (see note d)</td></tr>
<tr><td><u>Possible</u> rain
<u>Possible</u> hoar frost
<u>Possible</u> fog</td><td colspan="2">Salt before frost</td><td>Monitor weather conditions</td></tr>
<tr><td colspan="2">Expected snow (see section 4.5)</td><td colspan="3">Salt before snow fall</td></tr>
<tr><td colspan="5">The decision to undertake precautionary treatments should be, if appropriate, adjusted to take account of residual salt or surface moisture.

All decisions should be evidence based, recorded and require continuous monitoring and review.</td></tr>
</table>

Notes:

a) Particular attention should be given to the possibility of water running across carriageways and other running surfaces e.g. off adjacent fields after heavy rain, washing off salt previously deposited.

b) 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 hoar 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 formation of frost. Hoar frost may be forecast at other times in which case the timing of the salting operation should be adjusted accordingly.

c) If, under these conditions, rain has not ceased by early morning the action should be initiated as rain ceases.

d) Under these circumstances rain will freeze on contact with the running surfaces and full precautionary treatment should be provided, even on dry roads. This is a most serious condition and should be monitored closely and continuously throughout the danger period.

e) Weather warnings are often qualified by altitudes in which case differing action may be required for each domain or from each depot.

f) Where there is a hint of moisture being present a pessimistic view of the forecast should be taken when considering treatment to negatively textured surfaces.

4.3 Traffic Levels

For the purpose of allocating treatments two levels of traffic flow are defined – heavy and low/medium.

Table 2 – Traffic Level

Level	**Vehicles Per lane per hour**
Heavy	250 or more
Medium	20- 250
Low	Less than 20
Congested	250 or more moving slowly

Spread rates in the provided matrices assume heavy or medium traffic. If the traffic level rate is known to be low or congested, then rates should be increased by 25%. Congestion should be expected when spreading between 07:30-09:30 and 15:30-18:30

4.4 Determining salt coverage/ Spreader capability's

For the purposes of the decision-making Dorset's gritting fleet is regarded as having 'Good' coverage. When using the table below to decide on spread rates the exception to this is where salt is taken from uncovered stockpiles then fair coverage should be selected when deciding on spread rates for those routes affected

4.5 Salt Loss

Wind speed and direction can affect the spreading of salt and, in dry conditions, also affect the length of time that the salt will remain on the road surface. When practical, it is therefore recommended that we avoid spreading during the predicted high wind period, i.e. periods when mean wind speeds are predicted to be 20mph or more.

This issue is likely to affect some locations on the salted network more than others, and the precise effects of high winds are difficult to quantify due to the nature of the wind field close to the road surface and the number of variables involved which include, amongst other factors, the direction of the wind field relative to the salting vehicle, the treatment type being utilised (dry, treated or pre-wetted etc) and the grain size of the salt etc.

It should be taken in to account that forecast mean wind speeds typically relate to those at a height of 10 metres above the ground and these are not likely to be the same as those closer to the ground and care should be taken when comparing wind data from RWIS to forecasts etc.

When treatments are carried out during high wind conditions, Duty Engineers will monitor residual salt levels and carry out re-treatments if and where necessary. If this issue is considered to pose a significant risk, spread rates should be increased by 25% when carrying out precautionary salting operations during periods when forecast mean wind speeds are 20mph or higher and roads surfaces are predicted to be dry.

4.6 Spread Rates for Precautionary Treatments

4.6.1 Spread Rates for Precautionary Treatments – Forecast Frost Conditions

The following points must be considered when using the spread rate matrix.

a. The given are for sections of well drained roads without ponding or runoff from adjacent areas.
b. The rates may be adjusted to take account of variations occurring along routes such as temperature, surface moisture, road alignment and traffic density.
c. The rates may be adjusted to take account of residual salt levels. However, residual salt levels will tend to be lower if lower spread rates are introduced. Residual salt levels are most likely to be significant on marginal nights after

treatments on two or three successive days without precipitation in the intervening period.

d. All decisions should be evidence based, recorded and require appropriate monitoring and review.

e. During periods of sustained freezing and provided that surfaces are well drained and there is neither seepage (from melt water) nor ice present, rates of spread for treatments carried out within six hours of previous treatments may be 50% of the rates stated in the matrix.

Recommended Spread Rates – Dry Salting(g/m2)

Road Surface Temperature (RST) When Frost Ice is expected	Spreader Capability Fair Dry/Damp Road	Spreader Capability Fair Wet Road	Spreader Capability Good Dry/Damp Road	Spreader Capability Good Wet Road
At or above -1.0 °c	8	8	8	8
-1.1°c to -2.0°c	8	11	8	8
-2.1°c to -3.0°c	9	17	8	13
-3.1°c to -4.0°c	12	23	9	17
-4.1°c to -5.0°c	14	28	11	21
-5.1°c to -7.0°c	20	39	15	30
-7.1°c to -10.0°c	27	54	20	40
-10.1°c to -15.0 °c	38	75	28	56

Important note: When using salt for uncovered stock piles the minimum spread rate must be 15g per m2

4.6.2 Treatments for Snow, Ice and freezing rain

- It is impractical to spread sufficient salt to melt anything other than very thin layers of ice or snow.
- Ploughing is the only economical, effective and environmentally acceptable way to deal with all but very light snow.
- Ploughing down to the road surface is preferred. However, snow ploughs should be set to avoid risk of damage to the plough, the road surface, street furniture and level crossings.
- Ploughing to the road surface minimises salt usage and makes salt treatments more effective.
- Drainage should not be obstructed when ploughing. Windrows or piles of snow should be removed or be positioned to allow melt water to reach the drains. If necessary piles of snow should be removed so that melted snow does not overload the drainage system or run back onto the road.
- Windrows should be removed or ploughed back when further periods of snow are anticipated. This will provide space to plough further snowfalls.

4.6.3 Preparation before Ice and Snow

To prepare for and facilitate ice and snow treatments the following should be considered:

- When snow is forecast, ploughs should be prepared and contractors placed on stand-by in order that snow clearance can start without delay as and when required.
- To facilitate the break up and dispersal of ice and snow by traffic, treatments must be made before snowfall and freezing rain so that sufficient de-icer is present on the surface to provide a debonding layer.
- Although it will increase salt usage before snowfall and where practicable consideration should be given to spreading salt on as much of the network as possible (i.e. beyond the precautionary and community networks). This will provide a debonding layer and facilitate the break up and dispersal of snow by traffic in areas where subsequent treatments may not take place for some considerable time or at all.

4.6.4 Depths of Snow (light snow, moderate to heavy snow)

This guidance defines two main snowfall categories – light snow and moderate / heavy snow. The reasons for this are: -

The highest practicable spread rates are considered to be 40 g/m² of dry salt. When combined with the action of traffic this is sufficient de-icer to melt snow depths which are equivalent to 1mm of water at temperatures down to -2°C. Generally, there is approximately 1mm of water in 5mm depth of wet snow, 10mm depth of ‘normal’ snow and 15mm depth of dry, powdery snow.

In this guidance ‘light’ snow is taken to be snow equivalent to 1mm water (or less) while snowfalls equivalent to more than 1mm are considered to be moderate / heavy, as shown in the diagram in Table 5.

Table 5 - Snow Type

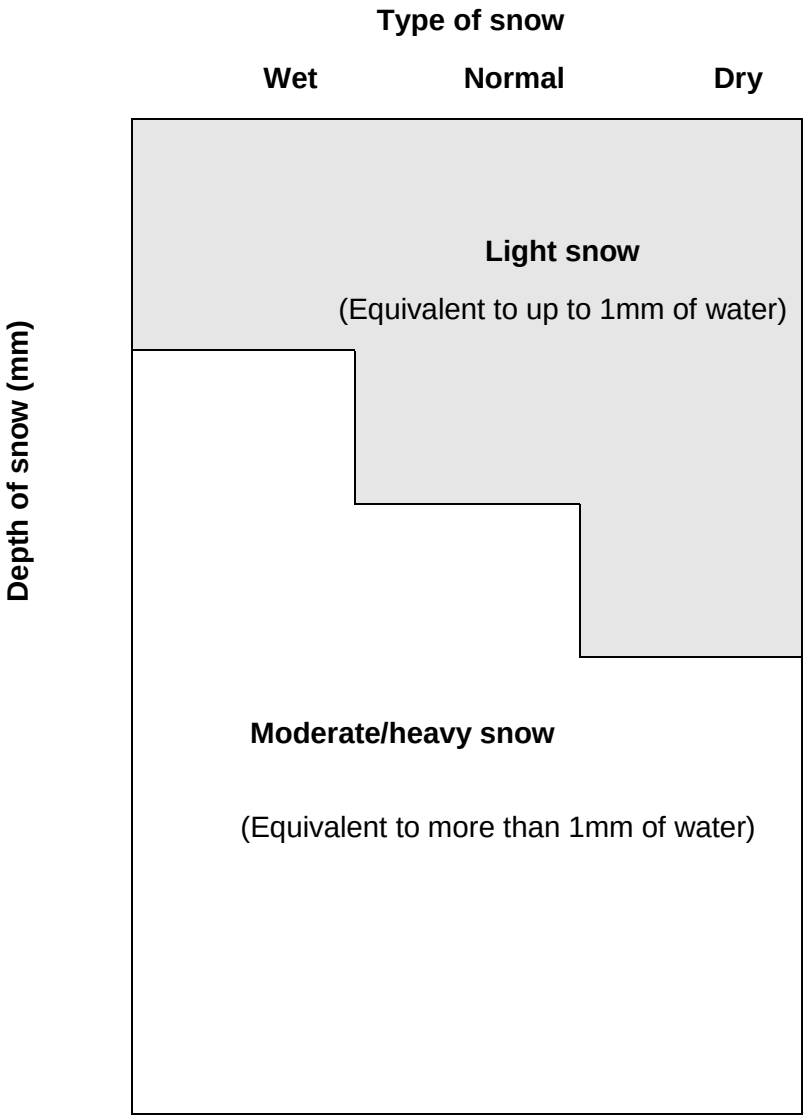


Table 6 - Precautionary Treatments before Snow or Freezing Rain

Weather Conditions	**medium Traffic**	**Heavy Traffic**
Light snow forecast	Spread: • 40g/m² of dry salt	Spread: • 40g/m² of dry salt
Moderate / Heavy snow forecast	Spread: • 20-40g/m² dry salt see note 1	Spread: • 20-40g/m² of dry salt see note 1
Freezing Rain	Spread: • 40 or 2 x 20g/m² of dry salt	

Note 1:

Where time constraints dictate, a treatment of 20g/m2 across the whole of the scheduled network before the commencement of snow or freezing rain is more advantageous than 40g/m2 on only part of the network.

4.6.5 Treatments during Snowfall

- **Ploughing should start and, where practicable, be continuous to prevent a build-up of snow.**
- **On roads with heavy traffic, it is preferable to prevent a build-up of more than 10mm depth of snow, whereas the build-up should be no more than 50mm depth where there is a risk of compaction by traffic**

Table 7 - Treatment during Snowfall

<table>
<tr><td colspan="3">Plough to remove as much material as possible (e.g. slush, snow and compacted snow).

Ploughing should be as near as possible to the level of the road surface.</td></tr>
<tr><td>No ice or compacted snow on surface</td><td colspan="2">Ice or compacted snow on surface (see Note 2)</td></tr>
<tr><td rowspan="2">To provide a debonding layer spread:

• 20g/m² dry salt
(see Note 1)</td><td colspan="2">Is traffic likely to compact subsequent snowfall before further ploughing is possible?</td></tr>
<tr><td>Yes</td><td>No</td></tr>
<tr><td></td><td>To provide a debonding layer, spread:

• 20g/m² dry salt (see Note 1)</td><td>No de-icer should be spread</td></tr>
</table>

Note 1: During and after snowfall, only the ploughed lane should be treated if other lanes have still to be ploughed. The spread width settings should be adjusted accordingly.

Note 2: A de-icer should not be spread alone without abrasives to anything other than a thin layer of ice or compacted snow when snowfall has ceased or future snowfall will be less than 10mm. Applying salt alone to compacted snow and ice can produce dangerously slippery conditions if a weak brine film is formed on top of the ice/snow layer.

4.6.6 Treatment when slush is on the road (and may refreeze)

It is important to remove as much slush as possible by ploughing to reduce the amount of material available to form ice when temperatures drop, as well as to reduce the amount of salt required for subsequent treatments.

Table 8 - Treatment when slush present

Plough to remove as much slush as possible. Ploughing should be as near as possible to the level of the road surface.
After removing slush, spread: • 40 g/m² of dry salt (see Note 1)
Note 1: After snowfall, and when there will be no further ploughing but some slush remains on the road surface, it may be necessary to change the settings normally used for precautionary treatment to ensure a satisfactory distribution is achieved over the target spread width.

4.6.7 Treatment when thin layers of ice (up to 1mm) have formed

When a thin layer of ice has formed, including freezing rain the following treatment should be made:

Table 9 - Treatment for Thin Ice

Forecast weather and surface conditions	**Medium Traffic**	**Heavy Traffic**
Lowering of air or road surface temperature **(Higher than -5°C)**	Spread: • 40g/m² dry salt • 40g/m² of salt / abrasive mix (see Notes 1 & 2)	Spread: • 40g/m² dry salt • 40g/m² of salt / abrasive mix (see Notes 1 & 2)
Lowering of air or road surface temperature **(Less than -5°C)**	Spread: • 40g/m² of salt/abrasive mix (50:50) (see Notes 1 & 2)	Spread: • 40g/m² of salt/abrasive mix (50:50) (see Notes 1 & 2)

Note 1: Abrasives should ideally be 5-6mm and angular, but gradings down to 1-5mm should be reasonably effective. After abrasives have been used drainage systems should be checked and cleared if necessary. Recovered material, which will be contaminated with road oil, must be disposed of safely.

Note 2: Care is needed when salt is mixed with abrasives with high moisture content. Checks should be made that the mixture remains free flowing, does not clump and can be spread effectively.

4.6.8 Treatment for Thicker Layers of Ice or Compacted Snow

When thicker layers of ice have formed, including freezing rain, the treatment should be as follows:

Table 10 - Treatment for Thicker Layers of Ice and Compacted Snow

<table>
<tr><td colspan="2">Plough to remove as much material (e.g. slush, snow and compacted snow) as possible from the top of the compacted layer.</td></tr>
<tr><td>Medium Layer Thickness

(1 to 5mm)</td><td>High Layer Thickness

(greater than 5mm)</td></tr>
<tr><td>For initial treatment, spread:

• 40g/m² of salt/abrasive mix (50:50) (see Notes 1.3.4 & 5)

For successive treatments, spread:

• 20g/m² of salt/abrasive mix (50:50) (see Notes 1,3,4 & 5)</td><td>For initial treatment, spread:

• 40g/m² of abrasives only (see Notes 2,3,5 & 6)

For successive treatments, spread:

• 20g/m² of abrasives only (see Notes 2,3,5 & 6)

After traffic has started breaking up the layer, spread:

• 20g/m² of salt/abrasive mix (50:50) so salt can penetrate the layer and reach the road surface (see Notes 1,3,4 and 5)</td></tr>
</table>

Note 1: For medium thicknesses of compacted snow and ice, treatments without abrasives should only be used when earlier precautionary treatments have successfully established a debonding layer, and there is sufficient traffic to break up the layer of ice quickly.

Note 2: For high thickness of compacted snow and ice (greater than 5mm) treatments with a significant amount of salt should not be considered because they may leave the surface uneven. Any brine formed on the surface may collect in hollows and deepen them further, which can lead to a very uneven surface.

Note 3: Abrasives should ideally be 5-6mm and angular, but gradings down to 1-5mm should be reasonably effective. After abrasives have been used drainage systems should be checked and cleared if necessary. Recovered material, which will be contaminated with road oil, must be disposed of safely.

Note 4: Care is needed when salt is mixed with abrasives with a high moisture content. Checks should be made that the mixture remains free flowing, does not clump and can be spread effectively.

Note 5: When there are layers of snow, compacted snow, or ice of medium or high thickness on the road surface, it may be necessary to change the settings normally used for precautionary treatment to ensure a satisfactory distribution is achieved over the target spread width.

Note 6: A small amount of salt should be added to the abrasive to prevent freezing of the water within it. If the moisture content of the abrasive is 7%, 25g per tonne of abrasive is sufficient to prevent freezing if thoroughly mixed

5. Performance Monitoring

Salt Stock Control

Throughout the winter period the salt stock control spreadsheet (located on the Winter Service and Emergency folder on the highways computer server) is to be updated daily following an action.

5.1 Forecast Monitoring

Throughout the winter period the minimum forecast surface temperatures for each domain and the actual minimum temperatures recorded by the 11 weather stations are to be recorded daily this information will be held by are forecast provider on there systems. Due notice is to be given to any revision in forecast.. This information will be used by the forecast provider to assist any future modelling of the weather domains and route optimisation.

Regular meetings are to be held with the forecast provider throughout the winter season to monitor the forecast performance.

5.2 Decision Monitoring

The Action Decision made by the Duty Engineers will be monitored independently against each of the domain forecasts (This work to be carried out by Forecast Provider).

5.3 Route Compliance Audit

The Senior Agent will audit routes utilising our vehicle telematics software throughout the winter season. This will be logged on the Highways Computer Server or SharePoint.

6. Training

Operational Staff

All operational drivers will hold City and Guilds Unit 6159 Winter Maintenance Operations and will receive refresher training on a five year frequency. Those drivers in the process of training towards the City and Guilds qualification will be assessed for competency based on the criteria of Unit 6159 by a competent person. All those involved in the winter maintenance service will attend part or all of the Dorset Highway winter service dry run induction day.

New operational drivers will be shadowed by an experienced driver until such time as they are deemed competent and are confident to carry out treatment routes unaided.

6.1 Duty Engineers

Duty Engineers will receive training in basic winter road forecasting and advanced winter road forecasting by the current winter forecasting provider, prior to first carrying out winter service duties. One to one mentoring of new Duty Engineers will be carried out until they are sufficiently competent to carry out the decision making duties on their own. The Duty Engineers will receive refresher training in advanced winter road forecasting on a five year basis unless specific training need is identified. Duty Engineers will undertake the IHE winter decision maker accreditation within a reasonable period.

Part 3 -Dorset Highways Adverse Weather Plan

1. Introduction

1.1 Following the release of the new Code of Practice “Well-managed Highways Infrastructure” our adverse weather plan now covers all weather impacts on the highway network and does not just concentrated on snow and ice. Sections include:

- Flooding
- High winds
- Heat
- Cold temperature and snow

This document describes Dorset Council’s arrangements for dealing with adverse weather on the highway. It also provides contact information for key personnel.

1.2 The plan covers arrangements for roads and structure in Dorset that are the responsibility of Dorset Council. It excludes arrangements for roads that are the responsibility of the Highways England, i.e.

- A35 Bere Regis to Lyme Regis
- A31 Bere Regis to Ringwood
- A303 at Bourton

1.3 General description of service

Dorset Council (DC) is committed to providing a robust adverse weather service including responding to winter and other adverse weather conditions. The adverse weather service is provided internally by DC through Dorset Highways. The extent of the service provided will vary depending upon the severity and nature of adverse weather conditions and resources availability.

1.4 Objectives

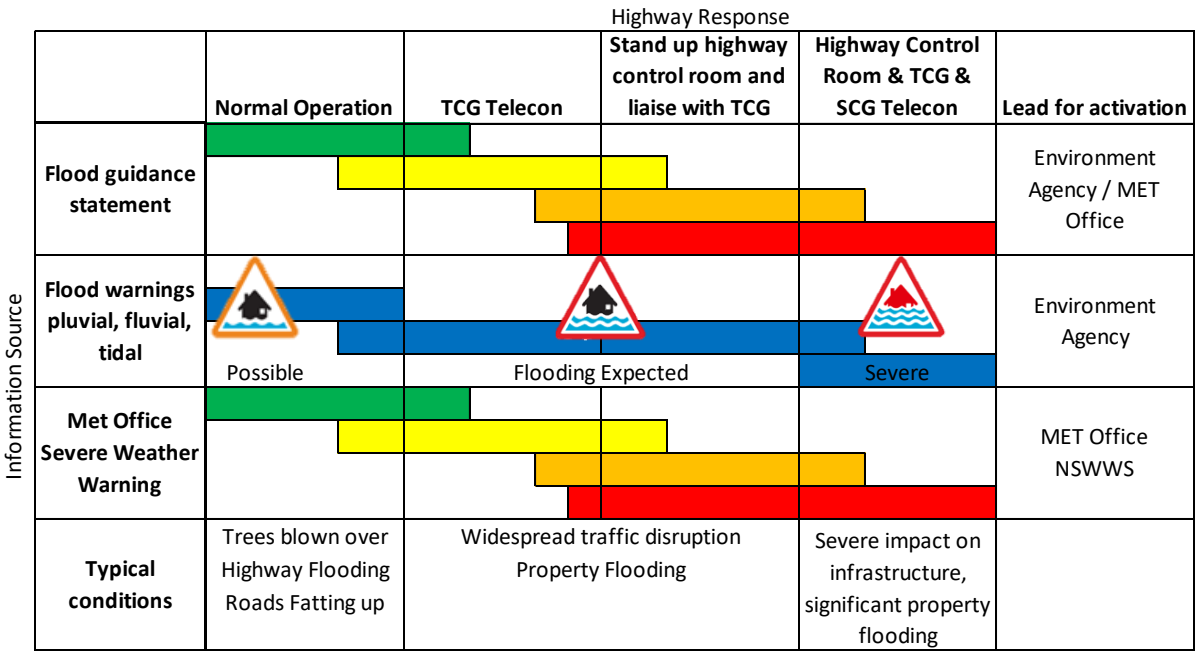
DC aims to safeguard the travelling public from the hazardous effects of snow or ice or other adverse weather conditions so far as it is practicably able to with the resources available. Proactive winter maintenance and other emergency operations will normally be undertaken based upon available weather forecast information, knowledge of prevailing local weather conditions and resource availability.

1.5 Reaction to weather warnings

The following matrix identifies how Dorset Highways will strategically react to weather warnings or evidence of severe weather. For such events Dorset Highways and Dorset Council will partake in the Local Resilience Forum (LRF) Tactical Coordination Group

(TCG) and Strategic Coordination Group (SCG) via teleconference. Acting as part of this will ensure a coordinated multiagency response is given to severe weather conditions.

Figure 1, Highways strategic response to severe weather conditions



Key: Green – No severe weather, Yellow – Low Impact, Amber – Widespread Disruption, Red – High Risk to Life

2. Flooding

2.1 Dorset has experienced a number of flood events over recent years and these fit under three headings, either fluvial, pluvial or tidal flooding. Working closely with the Environmental Agency and our internal Flood Risk Management team we have a good understanding of the impact of river levels on the county and the impact of intensive rain on surface water runoff.

2.2 Response to minor carriageway flooding will be through our standard business as usual operations reacting to in hours and out of hours call outs. This provides a 24-hour response to highway flooding issues.

2.3 For more severe weather warnings we will consider standing up a control room to strategically manage the response and work with the LRF if the TCG or SCG meet.

3. High Winds

3.1 Dorset Council manages the impact of high winds on the highway and associated emergency responses. The extent of the service provided will vary depending upon the severity and nature of high wind conditions and resources availability. During normal working hours the response will be made by the Arboricultural team. Outside of working hours the response will be made by Dorset Highways

3.2 Dorset Council will have in house resources available and access to their supply chain to react to emergency situations.

3.3 Dorset Council has a tree policy Dorset Council online tree information which states the inspection period for the highway trees. These are the trees which DC are responsible for.

4. Heat

4.1 Dorset Highways monitors the weather throughout the year especially in times of prolonged periods of high temperatures when our carriageway surfacing could be affected as well as the delivery of our capital structural maintenance schemes.

4.2 Dorset Council's Emergency Planning team has access to the Met Office to provide weather warnings in period of high temperatures as this has an impact on other services provided by the Council. These weather warnings are circulated to Dorset Highways.

4.3 An extended period of elevated temperatures can have a detrimental effect on the highway network.

Carriageway melting

Bitumen within the surfacing material can begin to melt, this can in extreme circumstances result in a reduction of skid resistance. The micro texture of the material becomes saturated.

Remedial measures – Sites identified as becoming "soft" should be monitored throughout the period of elevated temperature. If the surface starts to appear "fatty" or polished the site should be dusted with 3mm to dust aggregate. This will restore skid resistance by both binding with the bitumen and aiding removal through abrasion. This process needs to be repeated until skid resistance is satisfactory.

Cracking due to shrinkage

Prolonged heat can cause rapid drying of subsoil leading to contraction, if the contraction is significant it can result in surface cracking and failure.

Remedial measures - Make safe and repair with safety defect procedure.

Appendix 1 Precautionary Salting Network

Appendix 2 Community links networks

Appendix 3 Priority Ploughing Network